PACIFIC POWER
A DIVISION OF PACIFICORP

825 NE Multnomah St
Portland, OR 97232

May 2, 2023

VIA ELECTRONIC FILING

Leslie L. Palmer, Director
Safety and Enforcement Division
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, California, 94102-3298
Leslie.Palmer@cpuc.ca.gov

RE: (U-901-E) PacifiCorp's 2022 Annual Report in Compliance with General Order No. 166 (D. 98-07-097)

Enclosed is a copy of PacifiCorp's d/b/a Pacific Power, 2022 Annual Report in compliance with General Order No. 166 (D.98-07-097), revised by D.21-05-019. A redacted version of this report is also being submitted in accordance with Energy Division instruction.

PacifiCorp is requesting confidential treatment of certain phone numbers and locations identified in Attachment B and other supporting documents (exhibits). To the best of the company's knowledge, this information has not been published externally, and confidential treatment is requested for privacy and security reasons.

Confidential and redacted versions are enclosed, along with the declaration required under D.16-08-024.

Please direct any inquires to Pooja Kishore, California Regulatory Affairs Manager, at (503) 813-7314.

Sincerely,

Matthew McVee
Vice President, Regulatory Policy and Operations

Enclosures

CC: Leslie.Palmer@cpuc.ca.gov
Danjel.Bout@cpuc.ca.gov
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Karin.Nguyen@cpuc.ca.gov

DECLARATION OF

MATT MCVEE (PACIFICORP)

1. My name is Matthew McVee. My business address is 825 NE Multnomah Street, Suite 2000, Portland, Oregon 97232.

2. I am Vice President, Regulatory Policy and Operations, for PacifiCorp d/b/a Pacific Power (PacifiCorp or the Company). PacifiCorp is a multi-jurisdictional utility providing electric retail service to customers in California, Idaho, Oregon, Utah, Washington, and Wyoming. PacifiCorp serves approximately 48,000 customers in portions of Del Norte, Modoc, Shasta, and Siskiyou Counties in northern California.

3. This declaration is based on my information and belief and is submitted in accordance with General Order (GO) 66-D of the California Public Utilities Commission (Commission).

4. Section 3.2 of GO 66-D provides that when a utility submits documents for which it seeks confidential treatment to the Commission or staff of the Commission outside of a formal proceeding, the utility must mark the document or applicable portions confidential and provide the basis for confidential treatment specified. Additionally, any such request must be accompanied by a declaration signed by an officer of the requesting company.

5. PacifiCorp hereby requests confidential treatment for certain information contained in its updated 2022 Annual Report in Compliance with Standard 11 of General Order No. 166, including certain phone numbers and location information provided in the Company's emergency response plan and the Company's transmission and distribution response support and incident plan. This information has not been published externally by the Company, and confidential treatment of this data is requested for privacy reasons that protect this data from disclosure under California law.[1] Release of this information (specifically locations identified as emergency operation centers during events) could also result in disruptions in execution of the

[1] Cal. Gov't Code §§7927.700, 7927.705, and 7929.205.

Company's emergency response plan; accordingly, it is in the public interest to maintain this information as confidential.[2] Protection of this information will ensure that the Company is able to quickly and efficiently respond to emergency conditions without interference.

6. Information regarding requests for disclosure of the information for which PacifiCorp seeks confidential treatment should be directed to the following individuals:

California Dockets
PacifiCorp
californiadockets@pacificorp.com

Pooja Kishore
PacifiCorp
Regulatory Affairs Manager
pooja.kishore@pacificorp.com

I declare under penalty of perjury of the laws of the state of California that the foregoing is true and correct.

Executed in Portland, Oregon, May 2, 2023.

Matthew McVee
Vice President, Regulatory Policy and Operations
PacifiCorp

[2] Cal. Gov't Code, § 7922.000.

Attachment A

PacifiCorp

General Order No. 166

Compliance Report

Year Ending December 31, 2022

PACIFICORP'S (U 901 E)

ANNUAL REPORT IN COMPLIANCE WITH

GENERAL ORDER NO. 166

Pursuant to General Order 166, Standard 11, PacifiCorp d/b/a Pacific Power ("PacifiCorp" or "Pacific Power" or "Company") hereby submits its report on its compliance with General Order 166 for the period January 1, 2022, through December 31, 2022 ("compliance period"). This report demonstrates PacifiCorp's compliance with each of the fourteen standards of the General Order and is submitted as two Attachments (A – 2022 Annual Report with exhibits A through D) and (Attachment B – Emergency Response Plan with supplemental annexes 01 through 10). Table 3 below details the various documents and exhibits filed with this report.

Standard 1 - Prepare an emergency response plan and update the plan annually.
The 2023 PacifiCorp Emergency Response Plan consists of one volume, included as Attachment B with 10 annexes. The Emergency Response Plan addresses each of the items specified in Standard 1. The following Table 1 sets forth the location in PacifiCorp's Emergency Response Plan where in the Plan required elements are covered. Applicable information regarding company personnel is updated on a regular and frequent basis from the human resources database. The plans as filed are the most current version and are reviewed for improvement after any exercise or response.

The following documents support this standard:

00 Emergency Response Plan
Annex 01 Governance Transfer
Annex 02 Executive Policy Group
Annex 03 Operational Leadership Branch
Annex 04 Emergency Coordination Center
Annex 05 Department Operations Center
Annex 06 On-Scene Response
Annex 07 Resourcing and Mutual Assistance
Annex 08 Training and Exercise
Annex 09 Emergency Communications
Annex 10 Outage Procedures – Restoration

Requirement

A. Internal coordination functions, including gathering, processing are outlined in Annex 04 Emergency Coordination Center. External coordination activities are outlined in Annex 09 Emergency Communications and restoration activities are outlined in Annex 10: Outage Procedures – Restoration.

B. ISO/TSO coordination is outlined in Annex 09 Emergency Communications, pages 13-15.

C. Media coordination before, during and after an outage is outlined in Annex 09 Emergency Communications, pages 16-26.

D. External and Governmental Coordination with essential customers and appropriate state and local government agencies is outlined in Annex 09, Emergency Communications, p 11-16. PacifiCorp is a multi-state company and uses the National Incident Management System (NIMS) instead of SEMS as agreed by the CPUC and listed in the rules.

E. The Wildfire Mitigation Plan is provided as Exhibit C.

F. Pacific Power utilizes employees qualified to identify electrical equipment and the hazards of electrically energized components to respond during an incident to ensure both the safety of the employee and the safety of the public. Pacific Power's response plan include classifications that can recognize energized safety hazards and assure public safety is maintained, has processes to prioritize response to reported public safety hazards, and in a major event or disaster can deploy either internal resources from adjacent districts, or contract resources, to evaluate reports of hazards and stay on scene for the safety of the public until the situation can be made safe or permanently repaired.

G. Pacific Power assesses damages in a prioritized fashion that includes first priority evaluation of public safety hazards such as reports of lines down. Personnel deployed are electrically qualified to identify the hazard, standby until made safe, and / or repair the public safety hazard. Staffing contingencies include properly trained single resources to respond specifically to reports of public safety hazards. Single man and crew resources are prioritized further based on a combination of factors that include the number of customers

H. Restoration priority guidelines are outlined in Annex 10 Outage Procedures – Restoration.

I. Mutual Assistance process is outlined in Annex 07 Resourcing and Mutual Assistance and signed Mutual Assistance Agreements are provided as Exhibits A1 – A5.

J. PacifiCorp's Emergency Response Plan and the PSPS Playbook is updated annually and following emergencies and disasters to ensure standards and considerations are appropriate. In 2024, PacifiCorp is planning to conduct a broader plan rewrite in partnership with internal and external stakeholders, including but not limited to local government representatives. Primary changes to the Plan are outlined in Table 1 below

Table 1:
Description of Changes

PacifiCorp has modified sections of the Emergency Response Plan per guidance in order to provide further clarity regarding PacifiCorp's compliance actions. The following is a summary of the changes PacifiCorp made to its 2023 Emergency Response Plan during the compliance period.

Part of Document	Section in 2023 Filing	Change
00 Emergency Response Plan	Title page Record of Revisions Section 1 Section 2 Section 3 Section 6 Section 8	Formatting and copyright notice Addition of reviewers and approvers of plan Updated company Overview Updated purpose Updated situation Updated Mutual Assistance Agreements Updated Sheltering, Evacuation and Accountability

Standard 2 - Enter into mutual assistance agreements with other utilities.
(See Annex 7 – Resourcing and Mutual Assistance, and Exhibits A1-A5)

PacifiCorp has the unique ability to leverage mutual assistance in serving its California customers. It offers a breadth of resources across PacifiCorp's parent company, Berkshire Hathaway Energy. This includes resources in other Pacific Power jurisdictions (Oregon and Washington), those in Rocky Mountain Power (Utah, Wyoming and Idaho), also NV Energy (Nevada) and MidAmerican Energy (Iowa and Illinois). Further, PacifiCorp is a member of several mutual assistance organizations, including most significantly, the California Utilities Emergency Association (CUEA) and the Western Energy Institute's Western Region Mutual Assistance Group (WRMAG), which is coordinated through the Edison Electric Institute's (EEI) Mutual Assistance Network. The CUEA allows immediate access to regional, state and federal information. CUEA, via the executive director, actively participates in senior leadership and executive level planning sessions and working groups. The executive director serves as the California Office of Emergency Services Utilities Branch liaison at the state operations center or one of the regional operation centers, representing the CUEA member utilities. The WRMAG accesses resources from Western Energy Institute members spanning across areas west of the Rocky Mountains, while EEI has members across the continent accessible when support from outside the western region is necessary.

These associations, and the agreements which support the mutual assistance arrangements, provide access to many resources across the western region of the United States and also provide streamlined administration during situations where mutual assistance agreements are needed.

Requirement

A. Resources available to be shared are entered in real time within the RampUp tool that is available through the WRMAG agreement as listed in requirement A above.

B. Procedures for requesting and providing assistance are outlined in each of the three agreements listed in requirement A above.

C. Provisions for payment, cost recovery, liability and other financial arrangements are outlined in each of the three agreements listed in requirement A above.

A. Activation and deactivation criteria are outlined in each of the three agreements listed in requirement A above.

The mutual assistance agreements and signatory pages are provided as Exhibits A1 – A5 submitted with this filing.

Standard 3 - Conduct annual emergency training and exercises using the utility's emergency response plan.
(See Annex 08 – Training and Exercise, and Exhibits B1-B18)

Requirement

A. On April 28, 2022, PacifiCorp hosted a tabletop and on May 26, 2022 a functional exercise in Siskiyou County. The exercises simulated wildfire mitigation procedures in which a public safety power shutoff was necessary. The tabletop exercise measured the ability of the company and agencies to coordinate effectively and communicate during an event. This exercise was attended by state, county, tribal, joint-use telecommunications and local agencies and allowed us to further coordinate response plans and procedures with public sector entities throughout multiple jurisdictions. Provided as Exhibits B1-B16 are the presentations, sign in sheets and after-action reports for the tabletop exercises

B. The utility shall annually evaluate its response to an exercise or major outage. These evaluations are provided in Exhibits B17 and B18.

C. PacifiCorp employees participate in monthly safety meetings to discuss ongoing company safety standards, including responding to emergency situations. Employee telephone numbers are available on an "emergency call out list" which is updated and circulated bi-monthly. Field employee contact information is stored and utilized for automated call-outs through a system called Automated Roster Call-Out System (ARCOS).

   PacifiCorp employees who are responsible for an activity when the Pacific Power Emergency Operations Center (PPECC) is activated complete a computer-based training course annually. Hands-on classroom training is provided to PPECC members annually, as well as National Institute Management System training which is available through Federal Emergency Management Agency's independent study on-line course.

D. Invitations and notice of PacifiCorp's annual exercise to appropriate state and local authorities, including the CPUC, state and regional offices of the OES or its successor, the California Energy Commission, and emergency offices of the counties at or adjacent to the exercise were delivered in advance of 10 days. PacifiCorp participated in Southern California Edison's (SCE) exercise.

Standard 4 - Develop a strategy for informing the public and relevant agencies of a major outage.
(See Annex 09 – Emergency Communications)
PacifiCorp's strategy for communicating with the media, customers, regulatory agencies, and other local governmental organizations is contained in Annex 09 – Emergency Communications.

Requirement

A. Annex 9 outlines communications to customers and media before, during and immediately following a major outage using a variety of communication methods including text, email, or phone call based on their preference. If no preference is selected, a phone call will be made to the primary phone number on the account. Event messages will be posted on social media, PacifiCorp website and media advisories sent via FlashAlert. Known vulnerable customers (i.e., medical conditions) will receive additional outreach from the company requesting they evaluate the safety of their situations and consider a back-up plan in case of a shut-off or any emergency outage., as outlined on page 18 of Annex 9. The communication methodology aligns with the PSPS Playboook for PSPS specific events. Additional outreach coordination with local emergency management and health services for customers not successfully contacted will also take place prior to a power loss event.

B. During a major event, communication is concurrently directed through the 911 call center for immediate dispatch of first responders and between PacifiCorp's Emergency Manager and county and local emergency management agencies for additional response coordination. PacifiCorp coordinates all aspects of emergency planning with local governments, this includes but is not limited to: availability of cooling/warming centers, availability of backup generators, and coordination with agencies regarding egress.

C. Grid Operations Dispatch will establish and maintain communications with the California Independent System Operator (CAISO), Pacific Gas & Electric, and Bonneville Power Administration for bulk electric system and Critical Path facilities, specifically Line 14 and Path 66 transmission lines.

Standard 5 - Coordinate internal activities during a major outage in a timely manner. (See Annex 04 – Emergency Coordination Center)

The Pacific Power Emergency Coordination Center (PPECC) can be activated for any event that requires enhanced strategic planning, incident management, communication, and resource coordination. When there is advanced warning of an event that can have potential widespread impacts to customers and/or company operations (e.g. National Weather service alert), the PPECC may be activated to facilitate pre-event planning and communications.

- Pacific Power did not experience a major event outage as defined by GO 166 during the January 1, 2022 – December 31, 2022 reporting period.[1]

Standard 6 – Notify relevant individuals and agencies of an emergency or major outage in a timely manner. (See Annex 09 – Emergency Communications, pages 11-13)

PacifiCorp will follow the procedures outlined in the Commission's July 29, 2009 Guidelines for Notifying Energy Division of Electrical and Gas Emergencies.

[1] For utilities with less than 150,000 customers within California, a major outage occurs when 50 percent of the electric utility's serviceable customers experience a simultaneous, non-momentary interruption of service.

As soon as possible or each time new blocks of circuits are interrupted:

Imminent or planned implementation of Interruptible Electric Load Curtailments or Rotating Outages of firm Electric Load by your utility, either ordered by the CAISO (Stage 2 or 3) or made necessary by other emergencies.

Within one hour:

Outage of electric service expected to accrue to over 300,000 customer hours, or exceeding 300 megawatts of interrupted load, or affecting more than 10% of your electric customers. (For utilities with fewer than 150,000 customers in California (small utilities), report when 50% of your customers are affected or 30,000 customer hours of interruption are expected to accrue.)

Within one hour:

An emergency, involving facilities or personnel, likely to be reported statewide or in more than one major media market.

Within one hour:

Interruptions to bulk power supply (generators, transmission lines, or other equipment) that are likely to lead to an ISO declared Stage 2 or 3 emergency on or before the next business day.

Notify by 9 a.m. the next business day:

An electric outage affecting more than 30,000 customers, or lasting over 24 hours for 2,500 customers, or expected to total over 60,000 customer hours, or a situation (such as floodwaters threatening a substation) likely to lead to such an outage (Small utilities shall report outages affecting 3,000 customers, or lasting over 24 hours for more than 250 customers, or are expected to accrue to more than 6,000 customer hours.)

Notify as soon as possible:

Electric outages associated with Office of Emergency Services declared state of emergency, not otherwise reportable under above criteria.

Standard 7 - Mutual Assistance Evaluation
(See Annex 7 – Resourcing and Mutual Assistance)

The On-Scene Incident Commander or their designee has the responsibility to identify the need for mutual assistance and to initiate and coordinate Mutual Assistance as outlined in Annex 09 – Resourcing and Mutual Assistance. Pacific Power evaluates estimated time of repair following assessment and based on priorities. This information is manually updated and communicated during major outage events. The need for mutual assistance is evaluated on an ongoing basis.

Standard 8 – Major Outage and Restoration Estimate Communication
(See Annex 09 – Emergency Communications)

Requirement

A. Within four hours of the identification of a major outage, PacifiCorp's call centers shall make information available to customers through the company's integrated voice response telecommunication system the location of the outage, the cause of the outage, and the expected duration of the outage. PacifiCorp will notify essential customers, state and local public agencies and the media. PacifiCorp will continue to provide estimates of restoration times as soon as possible following an initial assessment of damage and the establishment of priorities for service restoration When call volume exceeds the integrated voice response system capabilities, PacifiCorp will activate an external call handling system to divert some of the high call volume coming into the business centers and to prevent long queue times and busy signals.

B. During a major outage, corporate communications will make proactive contact with the media to provide outage news releases. The releases will include the number of customers and areas affected, estimated duration of outage, and public electrical safety messages as applicable. PacifiCorp will notify essential customers, state and local public agencies and the media.

C. Per Restoration time estimates are generated automatically at initiation of outage based on the outage extent and an algorithm of historically similar events. During an emergency or disaster, automated restoration estimates are often disabled, and estimates are updated manually on an ongoing basis for the duration of the emergency or disaster. Customers are informed of restoration time estimates via PacifiCorp's Outage Map. In addition, updates are posted on social media, customer specific restoration time estimates are communicated by outbound call, e-mail, or text notification for the duration of the emergency or disaster.

D. Annex 09 – Emergency Communications is compatible with the Public Safety Power Shutoff Playbook

Standard 9 - Personnel Redeployment Planning Standard

PacifiCorp trains field personnel both on electronic tools use and roles for safety standby and damage assessment. Safety standby and damage assessment is extended to journeymen linemen, journeymen substation personnel, journeymen estimators and where needed contract line resources when a major event is anticipated. In order to ensure adequate personnel PacifiCorp also augments with internal personnel from adjacent districts in Southern Oregon for safety standby, augmentation to local personnel on safety standby, and to deploy additional for damage assessment and restoration activities.

PacifiCorp utilizes its Line Services Agreement partnership to stage and utilize contract resources and vegetation management resources to augment and support both damage assessment and improve repair and response times beyond internal resource capabilities in a disaster or major event.

Standard 10 - Annual Pre-Event Coordination Standard.

PacifiCorp is a member of several mutual assistance organizations who are incorporated into regular activation processes and regularly update methods of communications and contacts. PacifiCorp coordinates with the Northwest Power Pool and all neighboring entities throughout the grid. PacifiCorp routinely updates and exchanges contact information with state, county, and local agencies and also participates in planning exercises when requested.

Standard 11 - Annual Report

PacifiCorp is in compliance with GO 166, with the submission of this annual report which includes the company's Emergency Response Plan, which was updated as of April 2023.

The number of repair and maintenance personnel in each personnel classification, identified by county (and throughout the company) is updated and provided in Table 2 below.

Table 2:
Number of Pacific Power Repair and Maintenance Personnel

	December 31, 2022
Location	**Number of Personnel**
Alturas	1
Crescent City	9
Mt. Shasta	2
Yreka	21
Total California Service Territory	36
Total within 2 hour travel time to California Service Territory	125

Standard 12 – Restoration performance benchmark for a measured event.

As a utility with fewer than 150,000 electric customers, PacifiCorp qualifies for the exemption D, Attachment 1 Additional Provisions to GO 166.

Standard 13 – Call center performance benchmark for a measured event.

As a utility with fewer than 150,000 electric customers, PacifiCorp qualifies for the exemption D, Attachment 1 Additional Provisions to GO 166.

Standard 14 – Plan Development Coordinating and Public Meeting

PacifiCorp conducts annual plan development meetings in conjunction with the tabletop exercises and workshops. These meetings confirmed that PacifiCorp plans were in alignment with county and local plans. Additionally, PacifiCorp engaged with Del Norte County and provided input on the rewrite of the county's power outage annex.

Table 3:
Table of Contents

Item	Supporting Documents	Compliance Purpose/ Relevant Standard
Attachment A – PacifiCorp Annual GO 166 Compliance Report Year Ending December 31, 2022	See below	Describes how PacifiCorp has complied with the standards listed in GO 166 in compliance with Standard 11
Attachment B – PacifiCorp's Emergency Response Plan describes the key activities to be addressed in response to an emergency incident or planned event	**00** Emergency Response Plan **Annex 01** Governance Transfer **Annex 02** Executive Policy Group **Annex 03** Operational Leadership Group **Annex 04** Emergency Operations Center **Annex 05** Department Operations Center **Annex 06** On-scene Incident Response **Annex 07** Resourcing and Mutual Assistance **Annex 08** Training and Exercise **Annex 09** Emergency Communications **Annex 10** Outage Procedures - Restoration	Provides PacifiCorp's Emergency Response Plan and supporting documentation in compliance with Standard 1
Exhibit A – Mutual Assistance Agreements	**Exhibit A1** California Utilities Emergency Association (CUEA) Mutual Assistance Agreement Among Members of the **Exhibit A2** PacifiCorp's signatory page Exhibit A3 Intercompany Mutual Assistance Agreement **Exhibit A3** Western Region Mutual Assistance Agreement Exhibit A3 PacifiCorp's signatory page	Provides PacifiCorp's inter-company and inter-utility mutual assistance agreements, in compliance with Standard 2
Exhibit B – Emergency Response Tabletop Exercise Documents from April 28, May 26, 2022	**Exhibit B1** Siskiyou County Functional Exercise Presentation	Provides agenda, presentation slides and exercise evaluation report in compliance with Standard 3

	Exhibit B2 Siskiyou County Tabletop Exercise presentation **Exhibit B3** Siskiyou PSPS and wildfire mitigation Presentation **Exhibit B4** Siskiyou Post exercise after action evaluation Report **Exhibit B5** Mid Term and Final Planning meeting presentation **Exhibit B6** Siskiyou County tabletop sign in sheet **Exhibit B7** Siskiyou County tabletop attendance report **Exhibit B8** Siskiyou County functional attendance report **Exhibit B9** Functional exercise planning meeting report **Exhibit B10** Functional exercise attendance report **Exhibit B11** Exercise Plan **Exhibit B12** Functional Exercise Plan **Exhibit B13** Tabletop Exercise Plan **Exhibit B14** Functional post exercise review **Exhibit B15** Tabletop post exercise review **Exhibit B16** Tabletop facilitator guide **Exhibit B17** functional post exercise review **Exhibit B18** tabletop post exercise review	
Exhibit C – Wildfire Mitigation Plan	**Exhibit C** PacifiCorp Wildfire Mitigation Plan originally filed May 6, 2022; revised and refiled July 2022	Provides 2022 WMP, per GO 166 Standard 1E
Exhibit D – Public Safety Power Shutoff Execution Playbook	**Exhibit D1** Public Safety Power Shutoff Execution Playbook **Exhibit D2** Community Resource Center Plan	Playbook documenting the company's process for PSPS events and supplement procedure for California

Please direct any informal questions regarding this filing to Pooja Kishore, Regulatory Affairs Manager, at (503) 813-7314.

DATED: May 2, 2023

Respectfully submitted,

Mathew McVee
Vice President, Regulatory Policy and Operations
PacifiCorp

Attachment B

PacifiCorp

Emergency Response Plan

PUBLIC VERSION

THIS ATTACHMENT IS CONFIDENTIAL IN ITS ENTIRETY AND IS PROVIDED UNDER SEPARATE COVER

Exhibit A

PacifiCorp

Mutual Assistance Agreements

MUTUAL ASSISTANCE AGREEMENT
(Electric and Natural Gas)

AMONG

MEMBERS OF THE
CALIFORNIA UTILITIES EMERGENCY
ASSOCIATION

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ATTACHMENT A A-1
Parties to the Agreement

ATTACHMENT B A-2
Names and Address of Authorized Representative(s)/Invoicing

ATTACHMENT C A-3
Custodianship of Agreement

ATTACHMENT D A-4
Procedures for Requesting and Providing Assistance

ATTACHMENT E A-5
Procedures for Deactivation of Assistance

ATTACHMENT F A-6
Request for Assistance Letter

ATTACHMENT G A-7
Invoice

0. DEFINITIONS

As used herein, unless otherwise indicated, the following terms are defined as set forth below.

0.1 Activation: The initiation of the Assistance and administrative process of this Agreement including: request for Assistance, assessing and communicating the scope of assistance request, assessing and communicating the resources available for Assistance, activation procedures, mutual assistance coordination, and other processes and procedures supporting the Mobilization of Assistance resources.

0.2 Assistance: Includes all arrangements and preparation for and the actual mobilization of personnel, material, equipment, supplies and/or tools or any other form of aid or assistance, including all related costs and expenses as set forth in this Agreement, provided by an Assisting Party to a Requesting Party, from the time of the official authorization by the Requesting Party and including the return and demobilization by an Assisting Party of its personnel and equipment, also as set forth in this Agreement.

0.3 Deactivation: The termination of the Assistance and administrative process including: notification of Deactivation, Demobilization planning, identification of applicable costs, processes and procedures supporting Demobilization of resources, provide for invoicing, audit, critique information, and closure of the Assistance.

0.4 Demobilization: The actual returning of all Assistance resources to the Assisting Party's normal base.

0.5 Emergency: Any unplanned event that, in the reasonable opinion of the Party to this Agreement, could result, or has resulted, in (a) a hazard to the public, to employees of any Party, or to the environment; (b) material loss to property; or (c) a detrimental effect on the reliability of any Party's electric or natural gas system. The Emergency may be confined to the utility infrastructure or may include community-wide damage and emergency response. An Emergency may be a natural or human caused event.

0.6 Mobilization: The actual collecting, assigning, preparing and transporting of all Assistance resources.

0.7 Mutual Assistance Liaison: The person(s) designated by the Requesting Party, and Assisting Party, to coordinate all administrative requirements of the Agreement.

0.8 Natural Gas or Gas: The term "natural gas" as used in this Agreement shall include all commercially available forms of natural gas including Synthetic Natural Gas.

0.9 Operations Liaison: As described in Section 3.18, the person or persons designated by the Requesting Party to provide direct contact, communications and coordination at the operations level for Assisting Party's crews and resources at the location of the assistance. This may include but is not limited to: contact and communications for assisting crews, safety information processes and procedures, ensuring coordination of lodging and meals, addressing issues of Equipment requirements, materials requirements, and other logistical issues necessary to ensure safe effective working conditions.

0.10 Qualified: The training, education and experience of employees completing an apprenticeship or other industry / trade training requirements consistent with Federal Bureau of Apprenticeships and Training, Department of Transportation Pipeline Safety Regulations, or other recognized training authority or regulation. Training and qualification standards and are the responsibility of the Requesting Party to evaluate, in advance, the acceptable level of qualification for trade employees (i.e. lineman, electrician, fitter, etc.).

0.11 Work Stoppages: Any labor disputes, labor union disagreements, strikes, or any circumstance creating a shortage of qualified labor for a company during a non-emergency situation.

MUTUAL ASSISTANCE AGREEMENT
(Electric and Natural Gas)

1. PARTIES

This Mutual Assistance Agreement (hereinafter referred to as "Agreement") is made and entered into effective September 15, 2005. Each Party is, and at all times it remains a Party, shall be a member in good standing of the California Utilities Emergency Association. Each of the parties that has executed this Agreement may hereinafter be referred to individually as "Party" and collectively as "Parties." The Parties to this Agreement are listed in Attachment "A" hereto.

2. RECITALS

This Agreement is made with reference to the following facts, among others:

2.1 Certain of the Parties to this Agreement entered into a prior agreement ("Prior Agreement") dated December 16, 1994 to provide one another with mutual assistance. This Prior Agreement set forth procedures governing the requesting and providing of assistance in the restoration of electric and/or natural gas service. It is the intention of the Parties that this new Agreement, when signed by the Parties shall be effective for requesting or providing Assistance for the restoration of electric service following natural or man-made Emergencies which may occur on or after the date on which each of the Parties involved in the requesting or providing of Assistance signed this Agreement. Upon execution of this Agreement the Prior Agreement shall terminate, except that any rights or obligations which arose under the Prior Agreement shall remain unaffected by this new Agreement. Upon satisfaction of any such rights or obligations, the Prior Agreement shall be of no further validity or effect.

2.2 Being a Party to this Agreement does not by itself assure any Party that Assistance will be provided if, when or as requested. Each Party reserves the sole right to respond or not to respond to requests for Assistance on a case-by-case basis. By signing this Agreement, each Party thereby agrees that any Assistance which is received or given upon the request of a Party to this Agreement shall be subject to each and every one of the terms and conditions of this Agreement.

2.3 The Parties own, operate and maintain electric and/or natural gas utility facilities and are engaged in the production, acquisition, transmission, and / or distribution of electricity or natural gas.

2.4 Each of the Parties operates and maintains their respective facilities within accepted industry practices and employs skilled and Qualified personnel to operate, repair and maintain such facilities according to such industry practices.

2.5 It is in the mutual interest of the Parties to be prepared to provide for Emergency repair and restoration to such services, systems and facilities on a reciprocal basis. The purpose of this new Agreement is to provide the procedures under which one Party may request and receive assistance from another Party. This new Agreement is also designed to allow a new Party to join in the Agreement by signing a copy of this Agreement following the giving of notice to the existing Parties pursuant to Section 6.3 of this Agreement.

2.6 Assistance for labor shortages due to Work Stoppages are beyond the scope of this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants and agreements contained herein, the Parties have mutually agreed effective on the date set forth on the signature page hereof and agree further as follows:

3. SCOPE OF ASSISTANCE

3.1 In the event of an Emergency affecting the electrical generation, electrical or natural gas transmission, distribution, and/or related facilities owned or controlled by a Party, such Party ("Requesting Party") may request another Party ("Assisting Party") to provide Assistance. The Assisting Party shall, in its sole discretion, determine if it shall provide such Assistance. If the Assisting Party determines to provide Assistance, such Assistance shall be provided in accordance with the terms and conditions of this Agreement.

3.2 Requests for Assistance may be made either verbally or in writing by the Authorized Representative of the Requesting Party and shall be directed to the Authorized Representative of the Assisting Party. Authorized Representatives of the Parties are identified in Attachment “B” hereto and shall be updated upon any change in such Authorized Representative. Upon acceptance of a request for Assistance either verbally or in writing, the Assisting Party shall respond with reasonable dispatch to the request in accordance with information and instructions supplied by the Requesting Party. All requests for Assistance shall follow the procedures described in Attachment "D". The Requesting Party shall also follow the procedures set forth in Attachment “E” for Deactivation of Assistance.

3.3 The Requesting Party shall provide the Assisting Party with a description of the work needed to address the Emergency, with the most urgent needs for Assistance addressed first. If the request is not based on a lack of resources, such information must be stated in the request. The Assisting Party shall use its reasonable efforts to schedule the Assistance in accordance with the Requesting Party's request. However, the Assisting Party reserves the right to recall any and all personnel, material, Equipment, supplies, and/or tools at any time that the Assisting Party determines necessary for its own operations. Any Requesting Party for whom an Operator Qualification (OQ) Program and/or Drug and Alcohol Program under 49 CFR Parts 192 and 199 respectively, is required should pre-screen the other Parties to this Agreement to determine which Parties have compatible regulatory agency accepted programs and may therefore be contacted for assistance. Parties to this agreement agree to make their programs and related records available for review to assist in the pre-screening.

3.4 The Requesting Party will provide the name and contact information for the person(s) designated as the Mutual Assistance Liaison(s), the Operations Liaison(s) described in Section 3.18, and person(s) to be designated as supervisory personnel to accompany the crews and Equipment. The Assisting Party will provide the name(s) and contact information for the person(s) designated to be the Mutual Assistance Liaison and the Operations Liaison(s).

3.5 All Reasonable Costs and Expenses associated with the furnishing of Assistance shall be the responsibility of the Requesting Party and deemed to have commenced when the Requesting Party officially authorizes the Assisting Party to proceed with Mobilization of the personnel and Equipment necessary to furnish Assistance, and shall be deemed to have terminated after Demobilization when the transportation of Assisting Party personnel and Equipment returns to the work headquarters, individual district office, or home (to which such personnel are assigned for personnel returning at other than regular working hours) is completed.

For the purposes of this Agreement, a Requesting Party shall be deemed to have authorized the Assisting Party to proceed with Mobilization when the Requesting Party signs and submits a formal request to the Assisting Party, in a form substantially similar to that included as Attachment “F”. If written information cannot be furnished, a verbal confirmation will be acceptable, with a written confirmation to follow within 24 hours.

The Parties hereto agree that costs arising out of inquiries as to the availability of personnel, material, Equipment, supplies and/or tools or any other matter made by one party to another prior to the Requesting Party

authorizing the Assisting Party to proceed with Mobilization, as set forth in this Section 3.5, will not be charged to the potentially Requesting Party.

3.6 For purposes of this Agreement, the term "Reasonable Costs or Expenses" shall be defined to mean those costs, expenses, charges, or outlays paid or incurred by an Assisting Party in any approved phase of rendering Assistance to a Requesting Party pursuant to the provisions of this Agreement. Reasonable Costs or Expenses shall be deemed to include those costs and/or expenses that are appropriate and not excessive; under the circumstances prevailing at the time the cost or expense is paid or incurred. Reasonable Costs or Expenses may include, but are not limited to, direct operating expenses such as wages, materials and supplies, transportation, fuel, utilities, housing or shelter, food, communications, and reasonable incidental expenses, as well as indirect expenses and overhead costs such as payroll additives, taxes, insurance, depreciation, and administrative and general expenses. Notwithstanding the above, any such Reasonable Costs or Expenses shall continue to be subject to the provisions of Section 5 of this Agreement regarding Audit and Arbitration.

3.7 The Assisting Party and Requesting Party shall mutually agree upon and make all arrangements for the preparation and actual Mobilization of personnel, material, Equipment, supplies and/or tools to the Requesting Party's work area and the return (i.e. Demobilization) of such personnel, material, Equipment, supplies and/or tools to the Assisting Party's work area. The Requesting Party shall be responsible for all Reasonable Costs or Expenses incurred by the Assisting Party for Mobilization and/or Demobilization, notwithstanding any early termination of such assistance by the Requesting Party.

3.8 Unless otherwise agreed upon in writing, the Requesting Party shall be responsible for providing food and lodging for the personnel of the Assisting Party from the time of their arrival at the designated location to the time of their departure. The food and housing provided shall be subject to the approval of the supervisory personnel of the Assisting Party.

3.9 If requested by the Assisting Party, the Requesting Party, at its own cost, shall make or cause to be made all reasonable repairs to the Assisting Party's Equipment, necessary to maintain such Equipment safe and operational, while the Equipment is in transit or being used in providing Assistance. However, the Requesting Party shall not be liable for cost of repair required by the gross negligence, bad faith or willful acts or misconduct of the Assisting Party.

3.10 Unless otherwise agreed the Requesting Party shall provide fuels and other supplies needed for operation of the Assisting Party's vehicles and Equipment being used in providing Assistance.

3.11 Unless otherwise agreed to by the Parties, the Requesting Party shall provide field communications Equipment and instructions for the Assisting Party's use. The Assisting Party shall exercise due care in use of the Equipment and return the Equipment to the Requesting Party at the time of departure in like condition; provided, however, if repairs are necessary the Requesting Party will be financially responsible unless such repairs are necessitated by the gross negligence, bad faith or willful acts or misconduct of the Assisting Party.

3.12 Employees of the Assisting Party shall at all times continue to be employees of the Assisting Party, and such employees shall at no time and for no purpose be deemed to be employees of the Requesting Party.

3.13 Wages, hours and other terms and conditions of employment applicable to personnel provided by the Assisting Party, shall continue to be those of the Assisting Party.

3.14 If the Assisting Party provides a crew or crews, it shall assign supervisory personnel as deemed necessary by the Assisting Party, who shall be directly in charge of the crew or crews providing Assistance.

3.15 All time sheets, Equipment and work records pertaining to personnel, material, vehicles, Equipment, supplies and/or tools provided by the Assisting Party shall be kept by the Assisting Party for invoicing and auditing purposes as provided in this Agreement.

3.16 No Party shall be deemed the employee, agent, representative, partner or the co-venturer of another Party or the other Parties in the performance of activities undertaken pursuant to this Agreement.

3.17 The Parties shall, in good faith, attempt to resolve any differences in work rules and other requirements affecting the performance of the Parties' obligations pursuant to this Agreement.

3.18 The Requesting Party and Assisting Party shall each provide an Operations Liaison to assist with operations, personnel and crew safety. These individuals shall be the link between the Parties and keep the crews apprised of safety, operational, and communication issues.

3.19 All work performed by the Parties under this Agreement shall conform to all applicable Laws and Good Utility Practices.

3.20 All workers performing work under this Agreement shall follow their own employer's established safety and other operation rules. Each Party will use its best reasonable effort to respect the safety and work practices of

the other Party, and will at all times cooperate in the interest of the safety of both Parties. Where it is not possible for both Parties to safely and independently follow their own safety and work practices, field personnel will discuss and mutually agree upon the safety and work practices for both Parties for the particular work at issue

4. PAYMENT

4.1 The Requesting Party shall reimburse the Assisting Party for all Reasonable Costs and Expenses that are appropriate and not excessive, under the circumstances prevailing at the time the cost or expense is paid or incurred by the Assisting Party as a result of furnishing Assistance. Such costs and expenses shall include, but not be limited to, the following:

(a) Employees' wages and salaries for paid time spent in Requesting Party's service area and paid time during travel to and from such service area, plus the Assisting Party's standard payroll additives to cover all employee benefits and allowances for vacation, sick leave, holiday pay, retirement benefits, all payroll taxes, workers' compensation, employer's liability insurance, administrative and general expenses, and other benefits imposed by applicable law or regulation.

(b) Employee travel and living expenses (meals, lodging, and reasonable incidentals).

(c) Cost of Equipment, materials, supplies and tools at daily or hourly rate, including their normally applied overhead costs inclusive of taxes, insurance, depreciation, and administrative expenses. Cost to replace or repair Equipment, materials, supplies, and tools (hereinafter collectively referred to as the "Equipment", which are expended, used, damaged, or stolen while the Equipment is being used in providing Assistance; provided, however, the Requesting Party's financial obligation under this Section 4.1 (c): (i) shall not apply to any damage or loss resulting from the gross negligence, bad faith or willful misconduct of the Assisting Party, and (ii) shall only apply in excess of, and not contribute with, any valid and collectible property insurance which applies to such damage or loss.

(d) Cost of vehicles provided by Assisting Party for performing Assistance at daily or hourly rate, including normally applied overhead costs inclusive of taxes, insurance, depreciation, and administrative expenses. Cost to repair or replace vehicles which are damaged or stolen while the vehicles are used in providing Assistance; provided, however, that Requesting Party's financial

obligation under this Section 4.1 (d): (i) shall not apply to any damage or loss resulting from the gross negligence, bad faith or willful misconduct of the Assisting Party, and (ii) shall only apply in excess of, and not contribute with, any valid and collectible first-party physical damage insurance which applies to such loss.

(e) Administrative and general costs which are properly allocable to the Assistance to the extent such costs are not chargeable pursuant to the foregoing subsections.

(f) Overtime costs incurred by the Assisting Party in their service territory as a result of Assistance provided to the Requesting Party.

4.2 Unless otherwise mutually agreed to, the Assisting Party shall invoice the Requesting Party at the address designated on Attachment "B" for all Reasonable Costs and Expenses of the Assisting Party in one invoice. If the Assistance extends beyond a thirty (30) day period, invoicing can occur monthly unless otherwise agreed upon in writing. The Assisting Party shall provide the invoice in substantially the form set forth in Attachment "G".

4.3 The Requesting Party shall pay such invoice in full within sixty (60) days of receipt of the invoice, and shall send payment to the Assisting Party at the address listed in Attachment "B" unless otherwise agreed to in writing.

4.4 Delinquent payment of invoices shall accrue interest at a rate of twelve percent (12%) per year prorated by days until such invoices are paid in full.

5. AUDIT AND ARBITRATION

5.1 A Requesting Party has the right to designate its own qualified employee representative(s) or its contracted representative(s) with a management/accounting firm who shall have the right to audit and to examine any cost, payment, settlement, or supporting documentation relating to any invoice submitted to the Requesting Party pursuant to this Agreement.

5.2 A request for audit shall not affect the obligation of the Requesting Party to pay amounts due as required herein. Any such audit(s) shall be undertaken by the Requesting Party or its representative(s) upon notice to the Assisting Party at reasonable times in conformance with generally accepted auditing standards. The Assisting Party agrees to reasonably cooperate with any such audit(s).

5.3 This right to audit shall extend for a period of two (2) years following the receipt by Requesting Party invoices for all Reasonable Costs and Expenses. The Assisting Party agrees to retain all necessary records/documentation for the said two-year period, and the entire length of this audit, in accordance with its normal business procedures.

5.4 The Assisting Party shall be notified by the Requesting Party, in writing, of any exception taken as a result of the audit. In the event of a disagreement between the Requesting Party and the Assisting Party over audit exceptions, the Parties agree to use good faith efforts to resolve their differences through negotiation.

5.5 If ninety (90) days or more have passed since the notice of audit exception was received by the Assisting Party, and the Parties have failed to resolve their differences, the Parties agree to submit any unresolved dispute to binding arbitration before an impartial member of an unaffiliated management/accounting firm. Arbitration shall be governed by the laws of the State of California. Each Party to an arbitration will bear its own costs, and the expenses of the arbitrator shall be shared equally by the Parties to the dispute.

6. TERM AND TERMINATION

6.1 This Agreement shall be effective on the date of execution by at least two Parties hereto and shall continue in effect indefinitely, except as otherwise provided herein. Any Party may withdraw its participation at any time after the effective date with thirty (30) days prior written notice to all other Parties.

6.2 As of the effective date of any withdrawal, the withdrawing Party shall have no further rights or obligations under this Agreement except the right to collect money owed to such Party, the obligation to pay amounts due to other Parties, and the rights and obligations pursuant to Section 5 and Section 7 of this Agreement.

6.3 Notwithstanding Section 12, additional parties may be added to the Agreement, without amendment, provided that thirty 30 days notice is given to all Parties and that any new Party agrees to be bound by the terms and conditions of this Agreement by executing a copy of the same which shall be deemed an original and constitute the same agreement executed by the Parties. The addition or withdrawal of any Party to this Agreement shall not change the status of the Agreement among the remaining Parties.

7. LIABILITY

7.1 Except as otherwise specifically provided by Section 4.1 and Section 7.2 herein, to the extent permitted by law and without restricting the immunities of any Party, the Requesting Party shall defend, indemnify and hold harmless the Assisting Party, its directors, officers, agents, employees, successors and assigns from and against any and all liability, damages, losses, claims, demands actions, causes of action, and costs including reasonable attorneys' fees and expenses, resulting from the death or injury to any person or damage to any property, which results from the furnishing of Assistance by the Assisting Party, unless such death or injury to person, or damage to property, is caused by the gross negligence or willful misconduct of the Assisting Party.

7.2 Each Party shall bear the total cost of discharging all liability arising during the performance of Assistance by one Party to the other (including costs and expenses for reasonable attorneys' fees and other costs of defending, settling, or otherwise administering claims) which results from workers' compensation claims or employers' liability claims brought by its own employees. Each Party agrees to waive, on it own behalf, and on behalf of its insurers, any subrogation rights for benefits or compensation paid to such Party's employees for such claims.

7.3 In the event any claim or demand is made, or suit or action is filed, against the Assisting Party, alleging liability for which the Requesting Party shall indemnify and hold harmless the Assisting Party, Assisting Party shall notify the Requesting Party thereof, and the Requesting Party, at its sole cost and expense, shall settle, compromise or defend the same in such manner as it, in its sole discretion, deems necessary or prudent. However, Requesting Party shall consult with Assisting Party during the pendency of all such claims or demands, and shall advise Assisting Party of Requesting Party's intent to settle any such claim or demand. The Party requesting indemnification should notify the other Party in writing of that request.

7.4 The Equipment which the Assisting Party shall provide to the Requesting Party pursuant to Section 3 above, is accepted by the Requesting Party in an "as is" condition, and the Assisting Party makes no representations or warranties as to the condition, suitability for use, freedom from defect or otherwise of such Equipment. Requesting Party shall utilize the Equipment at its own risk. Requesting Party shall, at its sole cost and expense, defend, indemnify and hold harmless Assisting Party, its directors, officers, agents, employees, successors and assigns, from and against any and all liability, damages, losses, claims, demands, actions, causes of action, and costs including reasonable attorneys' fees and expenses, resulting from the death or injury to any person or damage to

any property, arising out of the utilization of the Equipment by or for the Requesting Party, or its employees, agents, or representatives, unless such death, injury, or damage is caused by the gross negligence, bad faith or willful misconduct of the Assisting Party.

7.5 No Party shall be liable to another Party for any incidental, indirect, or consequential damages, including, but not limited to, under-utilization of labor and facilities, loss of revenue or anticipated profits, or claims of customers arising out of supplying electric or natural gas service, resulting from performance or nonperformance of the obligations under this Agreement.

7.6 Nothing in Section 7, Liability, or elsewhere in this Agreement, shall be construed to make the Requesting Party liable to the Assisting Party for any liability for death, injury, or property damage arising out of the ownership, use, or maintenance of any watercraft (over 17 feet in length) or aircraft which is supplied by or provided by the Assisting Party. It shall be the responsibility of the Assisting Party to carry liability and hull insurance on such aircraft and watercraft as it sees fit. Also, during periods of operation of watercraft (over 17 feet in length) or aircraft in a situation covered by this Agreement, the Party which is the owner/lessee of such aircraft or watercraft shall use its best efforts to have the other Parties to this Agreement named as additional insures on such liability coverage.

8. GOVERNING LAW

This Agreement shall be interpreted, governed and construed by and under the laws of the State of California as if executed and to be performed wholly within the State of California.

9. AUTHORIZED REPRESENTATIVE

The Parties shall, within thirty 30 days following execution of this Agreement, appoint Authorized Representatives and Alternate Authorized Representatives, and exchange all such information as provided in Attachment "B". Such information shall be updated by each Party prior to January 1st of each year that this Agreement remains in effect, or within 30 days of any change in Authorized Representative or Alternate Representative. The Authorized Representatives or the Alternate Authorized Representatives shall have the authority to request and provide Assistance.

10. ASSIGNMENT OF AGREEMENT

No Party may assign this Agreement, or any interest herein, to a third party, without the written consent of the other Parties.

11. WAIVERS OF AGREEMENT

Failure of a Party to enforce any provision of this Agreement, or to require performance by the other Parties of any of the provisions hereof, shall not be construed to waive such provision, nor to affect the validity of this Agreement or any part thereof, or the right of such Parties to thereafter enforce each and every provision. This Agreement may not be altered or amended, except by a written document signed by all Parties.

12. ENTIRE AGREEMENT

This Agreement and the Exhibits referenced in or attached to this Agreement constitute the entire agreement between the Parties concerning the subject matter of the Agreement. It supersedes and takes the place of all conversations the Parties may have had, or documents the Parties may have exchanged, with regard to the subject matter, including the Prior Agreement.

13. AMENDMENT

No changes to this Agreement other than the addition of new Parties shall be effective unless such changes are made by an amendment in writing, signed by each of the Parties hereto. A new Party may be added to this Agreement upon the giving of 30 days notice to the existing Parties and upon the new Party's signing a copy of this Agreement as in effect upon the date the new Party agrees to be bound by each and every one of the Agreement's terms and conditions.

14. NOTICES

All communications between the Parties relating to the provisions of this Agreement shall be addressed to the Authorized Representatives of the Parties, or in their absence, to the Alternate Authorized Representative as identified in Attachment "B". Communications shall be in writing, and shall be deemed given if made or sent by e-mail with confirmation of receipt by reply email, confirmed fax, personal delivery, or registered or certified mail postage prepaid. Each Party reserves the right to change the names of those individuals identified in Attachment "B" applicable to that Party, and shall notify each of the other Parties of such change in writing. All Parties shall keep the California Utilities Emergency Association informed of the information contained in Attachment "B"

and reply to all reasonable requests of such association for information regarding the administration of this Agreement.

15. GENERAL AUTHORITY

Each Party hereby represents and warrants to the other Parties that as of the date this Agreement is executed by the Parties: (i) the execution, delivery and performance of this Agreement have been duly authorized by all necessary action on its part and it has duly and validly executed and delivered this Agreement; (ii) the execution, delivery and performance of this Agreement does not violate its charter, by-laws or any law or regulation by which it is bound or governed, and (iii) this Agreement constitutes a legal, valid and binding obligation of such Party enforceable against it in accordance with the terms hereof, except to the extent such enforceability may be limited by bankruptcy, insolvency, reorganization of creditors' rights generally and by general equitable principles.

16. ATTACHMENTS

The following attachments to this Agreement are incorporated herein by this reference:

Attachment A Parties to the Agreement;

Attachment B Names and Address of Authorized Representative(s)/Invoicing;

Attachment C Custodianship of Agreement;

Attachment D Procedures for Requesting and Providing Assistance;

Attachment E Procedures for Deactivation of Assistance;

Attachment F Request for Assistance Letter;

Attachment G Invoice.

16. SIGNATURE CLAUSE

This Agreement may be executed in any number of counterparts, each of which shall be an original, but all of which together shall constitute one and the same agreement.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their respective duly authorized officers as of the dates set forth below.

Company Name: _____

Signature of Officer: _____

Title of Officer: _____

Date Executed: _____

ATTACHMENT A
September 2010

Parties to the Mutual Assistance Agreement
(Electric and Natural Gas)
Among Members of the California Utilities Emergency Association

- **Anza Electric Cooperative, Inc (2009)**
  Gloria Britton gloriab@anzaelectric.org
  Cellular Phone: 951-551-0373

- **Azusa Light & Water (2009)**
  David M. Ramirez dramirez@ci.azusa.ca.us
  Cellular Phone: 909-255-3105

- **Bear Valley Electric Service (2009)**
  Ken Markling kmarkling@bves.com
  Cellular Phone: 909-744-4730

- **Burbank Water and Power (2010)**
  Jorge Somoano jsomoano@ci.burbank.ca.us
  Cellular Phone: 818-399-5171

- **Colton Public Utilities (2009)**
  Guadalupe Rubio grubio@ci.colton.ca.us
  Cellular Phone: 909-772-7874

- **Glendale Water and Power (2010)**
  Ramon Abueg rabueg@ci.glendale.ca.us
  Cellular Phone: 818-262-7496

- **City of Healdsburg Electric Department (2009)**
  Janval Macor gmacor@ci.healdsburg.ca.us
  Cellular Phone: 707-953-1548

- **Lassen Municipal Utility District (2010)**
  David Folce dfolce@lmud.org
  Cellular Phone: 530-310-2704

- **City of Lompoc (2010)**
  Ronald Stassi r_stassi@ci.lompoc.ca.
  Cellular Phone: 805-588-3163

- **Los Angeles Department of Water and Power (2010)**
  Jay Puklavetz jay.puklavetz@ladwp.com
  Cellular Phone: 310-261-8014

- **Modesto Irrigation District (2010)**
  Thomas Kimball tomk@mid.org
  Cellular Phone: 209-652-0283

- **Pacific Gas & Electric Company (2010)**
  Helen Fernandez hme2@pge.com
  Cellular Phone: 925-642-1189

- **Pacific Power, a division of PacifiCorp (2010)**
  William Eaquinto Bill.eaquinto@pacificorp.com
  Cellular Phone: 503-819-5449

- **City of Palo Alto (2009)**
  Dean Batchelor dean.batchelor@cityofpaloalto.org
  Cellular Phone: 650-444-6204

- **Pasadena Water and Power: Power Delivery (2009)**
  Joe Awad jawad@cityofpasadena.net
  Cellular Phone: 626-399-6569

- **Plumas-Sierra Rural Electric Cooperative (2009)**
  Terry Daley tdaley@psrec.coop
  Cellular Phone: 530-251-7983

- **City of Redding – Redding Electric Utility (2009)**
  Brian King bking@ci.redding.ca.us
  Cellular Phone: 530-356-2458

- **City of Riverside, Public Utilities Department (2009)**
  Ron Cox rcox@riversideca.gov
  Cellular Phone: 951-850-4546

- **City of Roseville – Roseville Electric (2010)**
  David Brown djbrown@roseville.ca.us
  Cellular Phone: 916-847-5640

- **Sacramento Municipal Utility District (2010)**
  Selby Mohr smohr@smud.org
  Cellular Phone: 916-798-6647

- **San Diego Gas & Electric Company (2010)**
  Ken Fussell kfussell@semprautilties.com
  Cellular Phone: 619-851-4598

- **City of Shasta Lake (2010)**
  Tom Miller tom.miller@ci.shasta-lake.ca.us
  Cellular Phone: 530-917-9711

- **Sierra Pacific Power Company, dba Nevada Energy (2010)**
  B. Jim Reagan jreagan@sppc.com
  Cellular Phone: 775-846-4864

- **Silicon Valley Power, Electric Utility of City of Santa Clara (2010)**
  Paul Foster pfoster@svpower.com
  Cellular Phone: 408-640-6980

- **Southern California Edison Company (2010)**
  Rachel Sherrill Rachel.sherrill@sce.com
  Cellular Phone: 626-388-5754

- **Southern California Gas Company (2010)**
  Ken Fussell kfussell@semprautilties.com
  Cellular Phone: 619-851-4598

- **Truckee-Donner Public Utility District (N/A) (2010)**
  Jim Wilson jimwilson@tdpud.org
  Cellular Phone: 530-448-3016

- **City of Ukiah (2010)**
  Colin Murphy cmurphey@cityofukiah.com
  Cellular Phone: 707-272-0880

ATTACHMENT B

Names and Address of Authorized Representative(s)/Invoicing

Date _____
Name of Utility _____
Mailing Address _____
City, State, Zip _____

Individuals to Call for Emergency Assistance:

AUTHORIZED REPRESENTATIVE

Name _____
Title _____ Address _____
E-Mail _____ Pager No. _____
Day Phone _____ Night Phone _____
FAX _____ Cellular Phone _____

ALTERNATE AUTHORIZED REPRESENTATIVE

Name _____
Title _____ Address _____
E-Mail _____ Pager No. _____
Day Phone _____ Night Phone _____
FAX _____ Cellular Phone _____

DISPATCH CENTER WITH 24-HOUR TELEPHONE ANSWERING

Name _____
Title _____
Address _____
Phone _____ Radio Frequency _____
FAX _____

INVOICING/PAYMENT ADDRESS

Name of Utility _____
Department of Utility _____
Invoicing/Payment Address _____
City, State, Zip _____
Telephone No. _____
FAX _____

ATTACHMENT C

Custodianship of Agreement

Responsibilities of the California Utilities Emergency Association's Mutual Assistance Agreement (Electric) Custodian are:

A. Request all Parties provide an annual update of the Authorized Representative and Alternate Authorized Representative, as identified in Attachment "B", no later than December 15 of each year.

B. Distribute annual update of Attachment "B" no later than January 15 of each year.

C. Coordinate and facilitate meetings of the parties to the Agreement, as necessary, to include an after action review of recent mutual assistance activations and document changes requested by any party to the Agreement. An annual meeting will also be held to review general mutual assistance issues.

D. Assist and guide utilities interested in becoming a party to the Agreement by providing a copy of the existing Agreement for their review and signature.

E. Facilitate any necessary reviews of the Agreement.

ATTACHMENT D

Procedures for Requesting and Providing Assistance

A. The Requesting Party shall include the following information, as available in its request for Assistance:

A.1 A brief description of the Emergency creating the need for the Assistance;
A.2 A general description of the damage sustained by the Requesting Party, including the part of the electrical or natural gas system, e.g., generation, transmission, substation, or distribution, affected by the Emergency;
A.3 The number and type of personnel, Equipment, materials and supplies needed;
A.4 A reasonable estimate of the length of time that the Assistance will be needed;
A.5 The name of individuals employed by the Requesting Party who will coordinate the Assistance;
A.6 A specific time and place for the designated representative of the Requesting Party to meet the personnel and Equipment being provided by the Assisting Party;
A.7 Type of fuel available (gasoline, propane or diesel) to operate Equipment;
A.8 Availability of food and lodging for personnel provided by the Assisting Party; and
A.9 Current weather conditions and weather forecast for the following twenty-four hours or longer.

B. The Assisting Party, in response to a request for Assistance, shall provide the following information, as available, to the Requesting Party:

B.1 The name(s) of designated representative(s) to be available to coordinate Assistance;
B.2 The number and type of crews and Equipment available to be furnished;
B.3 Materials available to be furnished;
B.4 An estimate of the length of time that personnel and Equipment will be available;
B.5 The name of the person(s) to be designated as supervisory personnel to accompany the crews and Equipment; and
B.6 When and where Assistance will be provided, giving consideration to the request set forth in section A.6. above.

ATTACHMENT E

Procedures for Deactivation of Assistance

A. The Requesting Party shall, as appropriate, include the following in their Deactivation:

- A.1 Number of crews returning and, if not all crews are returning, expected return date of remaining crews.
- A.2 Notification to the Assisting Party of the time crews will be departing.
- A.3 Information on whether crews have been rested prior to their release or status of crew rest periods.
- A.4 Current weather and travel conditions along with suggested routing for the Assisting Party's return.

B. The Assisting Party shall, as appropriate, include the following in their Deactivation:

- B.1 Return of any Equipment, material, or supplies, provided by the Requesting Party.
- B.2 Provide any information that may be of value to the Requesting Party in their critique of response efforts.
- B.3 Estimation as to when invoice will be available.
- B.4 Invoice to include detail under headings such as labor charges (including hours) by normal time and overtime, payroll taxes, overheads, material, vehicle costs, fuel costs, Equipment rental, telephone charges, administrative costs, employee expenses, and any other significant costs incurred.
- B.5 Retention of documentation as specified in Section 5.3 of the Mutual Assistance Agreement.
- B.6 Confirmation that all information pertaining to the building, modification, or other corrective actions taken by the Assisting Party have been appropriately communicated to the Requesting Party.

ATTACHMENT F

Letter Requesting Assistance

Date

Assisting Party Name

Assisting Party Address

In recognition of the personnel, material, Equipment, supplies and/or tools being sent to us by [name of Assisting Party] in response to a request for mutual assistance made by [Requesting Party] on [date of request], we agree to be bound by the principles noted in the California Utilities Emergency Association Mutual Assistance Agreement (Electric and Natural Gas).

(Brief Statement of Assistance Required)

[Requesting Party Name]

[Authorized Representative of Requesting Party].

[Signature of Authorized Representative of Requesting Party]

ATTACHMENT G

SUPPLEMENTAL INVOICE INFORMATION

Sections 4 and 5 of this Mutual Assistance Agreement provide for the accumulation of costs incurred by the Assisting Party to be billed to the Requesting Party for Assistance provided. Each utility company has their own accounts receivable or other business enterprise system that generates their billing invoices. Generally these invoices do not provide for a breakdown of costs that delineate labor hours, transportation costs, or other expenses incurred in travel to and from the Assistance, or the subsequent repair of equipment that may be necessary.

This attachment provides guidelines, format and explanations of the types of cost breakdown, and supportive information and documentation that are important to accompany the invoice for providing of mutual assistance. It is intended to provide sufficient information to the Requesting Party at the time of invoice to minimize an exchange of detail information requests that may delay the payment of the invoice.

This information in no way eliminates the requesting Party's ability to audit the information or request additional cost detail or documentation.

Supplemental Invoice Information is a recommendation and not a requirement.

The form is available electronically from the Agreement Custodian.

CUEA MUTUAL ASSISTANCE AGREEMENT
(ELECTRIC – NATURAL GAS)
SUPPLEMENTAL INVOICE INFORMATION

This supplemental invoice information detail is submitted pursuant to Sections 4.0 and 5.0 of the CUEA, Mutual Assistance Agreement for Electric and Natural Gas, for assistance provided. *(RP = Requesting Party, AP = Assisting Party)*

AP Invoice Date: _____ RP Purchase Order # 1 _____

AP Invoice #: _____ RP Reference or W/O# 2 _____

Bill To: 3 (Requesting Party)
Address: _____
_____
_____
_____
Phone: _____
Attention: 5 _____

Remit To: 4 (Assisting Party)
Address: _____
_____
_____
_____
Phone: _____
Attention: 6 _____

Name or Description of Event: _____

Location of Assistance or Event: _____

Assistance / Billing Period: From: 7 _____ To: 8 _____

Date Assistance Accepted: _____ Date Demobilization Complete: _____

LABOR 1: *Employee Wages and Salary while at RP Service Area* 9

Labor:	*Hours*	Wages	*Additives*	
Straight Time, Overtime and Premiums:				***LABOR 1 Subtotal:***

LABOR 2: *Employee Wages and Salary while traveling to and from RP Service Area* 10

Labor:	*Hours*	Wages	*Additives*	
Straight Time, Overtime and Premiums:				***LABOR 2 Subtotal:***

LABOR 3: *Employee Wages and Salary of service and support personnel not traveling to RP Service Area* 11

Labor:	*Hours*	Wages	*Additives*	
Straight Time, Overtime and Premiums:				***LABOR 3 Subtotal:***

LABOR 4: *Overtime Wages and Salary Incurred in AP Service Area as a Result of Assistance* 12

Labor:	*Hours*	Wages	*Additives*	
Overtime and Premiums:				***LABOR 4 Subtotal:***

LABOR TOTAL ***TOTAL Wages, Salaries and Payroll Additives:*** _____

MATERIALS: *Cost of materials, supplies, tools, and repair or replacement of non-fleet equipment used in assistance* 13

MATERIALS TOTAL ***TOTAL Materials, Equipment, etc. and Additives:*** _____

TRANSPORTATION: *Cost of vehicles and equipment including parts and repairs and Additives (No Wages)*

Fleet Costs: *(Hourly or Use Charge for vehicles and equipment and Additives)* 14 _____

Repair Costs: *(Cost of repair or replacement of vehicles and equipment, excluding labor)* 15 _____

TRANSPORTATION TOTAL ***TOTAL Vehicles, Equipment, etc. and Additives:*** _____

EXPENSE: *Cost of transporting employees and equipment, to and from RP's Service area, and living expenses not provided by RP.*

Transportation Expense: *Cost to transport vehicles and equipment (fleet) to and from RP Service Area* 16 _____

Travel Expense: *Cost to transport personnel, airfare etc., (non-fleet equip/tools) to and from RP Service Area* 17 _____

Living Expense: *Cost of meals, lodging and incidentals not provided by RP or incurred during travel* 18 _____

Meals: _____ *Lodging:* _____ *Incidentals:* _____

EXPENSE TOTAL ***TOTAL Transportation, Travel and Living and Additives:*** _____

ADMINISTRATIVE & GENERAL COSTS: *Cost properly allocable to the Assistance and not charged in above sections* 19

ADMINISTRATIVE & GENERAL TOTAL

TOTAL Administrative & General:

All costs and expenses of Assisting Company are summarized in this Invoice.

Pay This Amount:

(A Form W-9, Request for Taxpayer Identification Number and Certification, has been included with this invoice.) ***20***

Instructions and Explanations

This information provides a breakdown of costs incurred in the providing of assistance, and is intended to provide sufficient details to allow Requesting Party to expedite payment by minimizing requests for detailed information. This detailed breakdown, and supportive documentation, should supplement the remittance invoice normally generated by the utility's business enterprise or accounts receivable systems.

Reference Section Explanations: (Numbers correspond to sections on preceding supplemental invoice page(s).)
(Information in parentheses and italics are references to the related section of the CUEA MAA)

1 If Requesting Company has designated a Purchase Order to be used for this remittance, provide the PO number in this space.

2 If Requesting Company has designated a Work Order or Tracking number to be used for this remittance, provide the number here.

3 This "Bill To" address is designated by the Requesting Party and may be the same as the Billing / Payment Address as it appears on the Assisting Company's "Attachment B" of the Agreement. *(Sec. 4.2)*

4 This "Remittance Address" is the address specified on the Assisting Company's Primary Invoice.

5 The person identified in Billing / Payment section of Requesting Party's "Attachment B", or Authorized Representative, or the Requesting Party's designated Mutual Assistance Coordinator.

6 The person identified in Billing / Payment section of Requesting Party's "Attachment B", or Authorized Representative, or the Assisting Party's designated Mutual Assistance Coordinator.

7 The date the assistance was agreed to commence. *(Sec. 3.2)*

8 The date the assistance demobilization is complete. *(Sec. 3.7) (Note: subsequent repair or replacement costs incurred by the AP may be realized and billed past this date, as noticed by the AP to the RP in writing.)*

9 Labor 1: This total includes all hourly wages, including straight time, overtime, premium pay and payroll additives that are the normal payroll of the Assisting Party. This is for time worked in the Requesting Party's service area, and does NOT include time or pay for travel to, or from, the Requesting Party's service area. Labor 1 total includes all employees, management and supervision, that physically traveled to the Requesting Party's service area. (The numbers are reported as totals for Hours, Wages, and Additives (premiums and additives reported in same total). Supportive information such as time sheets, or spreadsheets, that break down the totals reported, is strongly recommended.) *(Sec. 4.1(a))*

10 Labor 2: This total includes all hourly wages, including straight time, overtime, premium pay and payroll additives that are the normal payroll of the Assisting Party. This is for time or pay for travel to, or from, the Requesting Party's service area, and does NOT include time worked in RP's service area. Labor 2 total includes all employees, management and supervision, that physically traveled to the Requesting Party's service area. (The numbers are reported as totals for Hours, Wages, and

Additives (premiums and additives reported in same total). Supportive information such as time sheets, or spreadsheets, that break down the totals reported, is strongly recommended.) *(Sec. 4.1(b))*

11 Labor 3: This total includes all hourly wages, including straight time, overtime, premium pay and payroll additives that are the normal payroll of the Assisting Party. This is for time or pay for employees, management, or supervision that is directly attributed to the assistance, but did NOT travel to the Requesting Party's service area. Labor 3 total may include support services in the Assisting party's own service area such as warehouse, fleet, Assistance Liaisons, administrative and coordination personnel. (The numbers are reported as totals for Hours, Wages, and Additives (premiums and additives reported in same total). (Supportive information such as time sheets, or spreadsheets, that break down the totals reported, is strongly recommended.) *(Sec. 4.1)*

12 Labor 4: This total includes only overtime pay and additives that are incurred by the Assisting Party for emergency response in the Assisting Party's service area, that is directly attributable to the providing of assistance. This total requires detailed support information and explanation provided to the Requesting Party prior to the inclusion of costs for assistance. *(Sec. 4.1 (f))*

13 Materials: This total includes all non-fleet equipment, tools and supplies, provided by Assisting Party's warehouse or other supplier that was used, consumed, or has normally applied overhead costs or depreciation, as outlined in the agreement. *(Sec. 4.1 (c))*

14 Transportation: This total includes the hourly or use charge of vehicles and equipment, and normally applies overheads and additives, for all vehicles and equipment used in the providing of assistance. These are direct *"Fleet"* costs excluding labor, which is included in Labor totals. *(Sec. 4.1 (d))*

15 Transportation: This total includes cost of repair or replacement of vehicles or equipment used in the providing of assistance, by AP, dealer service, or contracted repairs, including all normally applies overheads and additives. These are direct *"Fleet"* costs excluding labor, which is included in Labor totals. *(Sec. 4.1 (d))*

16 Transportation Expense: This total includes only the incurred costs of transporting, by contractor or entity other than the AP or RP, the fleet vehicles and equipment to RP's service area, and return to AP's home base. (Supportive information such as contract carrier's invoice or trip tickets is recommended.)

17 Travel Expense: These include all costs incurred by AP for the transportation of personnel to and from the RP's service area. These include airfare, cab fare, rental vehicles, or any other transportation not provided by the RP. It also included the transportation or shipping costs of non-fleet tools or equipment to and from the RP's service area. *(Sec. 4.1)*

18 Living Expense: This includes all meals, lodging, and incidentals incurred during travel to and from RP's service area. It includes any of these costs incurred while working in the RP's service area that were not provided by the RP. *(Sec. 4.1(b))*

19 Administrative and General Costs: This includes all costs that are allocable to the Assistance, to the extent that they are not included in all the foregoing costs identified in this invoice. *(Sec. 4.1(e))*

20 Form W-9, Tax Identification and Certification: This standard tax form should be completed and accompany this form, unless such information has been previously transmitted to the Requesting Company.

16. SIGNATURE CLAUSE

This Agreement may be executed in any number of counterparts, each of which shall be an original, but all of which together shall constitute one and the same agreement.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their respective duly authorized officers as of the dates set forth below.

Company Name: Pacific Power

Signature of Officer: W Eagenter

Title of Officer: Vice President, T&D Operations

Date Executed: 5-10-10

BERKSHIRE HATHAWAY ENERGY

FIRST AMENDED INTERCOMPANY MUTUAL ASSISTANCE AGREEMENT BY AND BETWEEN RATE-REGULATED SUBSIDIARIES OF BERKSHIRE HATHAWAY ENERGY COMPANY

This First Amended Intercompany Mutual Assistance Agreement ("Agreement") is entered into by and between rate-regulated public utility subsidiaries of Berkshire Hathaway Energy Company ("Company") (each a "Party" and together the "Parties") effective March 15, 2015.

WHEREAS, the Parties, with the exception of Nevada Power Company DBA NV Energy and Sierra Pacific Power Company DBA NV Energy, are the signatories of the Intercompany Mutual Assistance Agreement by and between Rate-regulated Subsidiaries of MidAmerican Energy Holdings Company effective February 15, 2011 and wish to amend and restate their agreement in the manner provided herein; and

WHEREAS, each of the Parties is either an electric public utility providing services to captive customers within franchised service areas, a transmission company, a local distribution company or an interstate pipeline company and each of the Parties is subject to the oversight of regulatory authorities, such as a state public utility commission and/or the Federal Energy Regulatory Commission ("FERC"); and

WHEREAS, a Party may from time to time require mutual aid or assistance from another Party, which may involve the provision of goods, services and/or specialized resources for temporary emergency purposes, or the emergency interchange of equipment or goods by one Party to the other, as long as provided without detriment to the providing Party's public utility obligations ("mutual assistance"); and

WHEREAS, as rate-regulated entities, the Parties have obligations to provide reasonably adequate service, and from time to time may be able to assist one another in providing mutual assistance; and

WHEREAS, the Parties are some of the signatories of the Intercompany Administrative Services Agreement ("IASA") by and between the Company and its subsidiaries, which permits the sharing of professional, technical and other specialized resources, and wish to enter into an agreement that will allow mutual assistance on similar terms; and

WHEREAS, in order to minimize any potential for cross-subsidization or affiliate abuse and ensure appropriate oversight, participation under this Agreement is limited to Rate-Regulated Subsidiaries of the Company; and

WHEREAS, effective May 1, 2014, the name of Company was changed from MidAmerican Energy Holdings Company to Berkshire Hathaway Energy Company; and

WHEREAS, from time to time, additional Rate-Regulated Subsidiaries may wish to execute the Agreement in order to provide and take advantage of mutual assistance provided hereunder.

NOW, THEREFORE, in consideration of the premises and mutual agreements set forth herein, the Parties wish to amend the Agreement and agree as follows:

ARTICLE 1. PROVISION OF MUTUAL ASSISTANCE

Upon and subject to the terms of this Agreement, one Party ("Providing Party") may provide mutual assistance to another Party ("Recipient Party").

Availability and provision of mutual assistance shall be governed by an applicable mutual aid agreement, which may be the Edison Electric Institute Mutual Aid Agreement, the Western Region Mutual Assistance Agreement, or such other agreement as may be customarily used in the region where the mutual assistance is to be provided ("applicable mutual aid agreement"), the provisions of which are incorporated in this Agreement by reference. To the extent not inconsistent with obligations under the applicable mutual aid agreement, the provisions of this Agreement shall govern the conduct and obligations of the Parties.

The Parties recognize that there may be several phases of mutual assistance activity, including pre-notification of a potential need for assistance, a request for information related to the costs and availability of mutual assistance, and actual mobilization. Only actual mobilization is considered the provision of mutual assistance.

ARTICLE 2. DEFINITIONS

For purposes of this Agreement, these terms shall be defined as follows:

(a) "Laws" shall mean any law, statute, rule, regulation or ordinance of any governmental authority, which may be without limitation a federal agency, a state or a governmental subdivision.
(b) "Rate-Regulated Subsidiary" shall mean a subsidiary of the Company ("subsidiary") that is regulated by one or more State Commissions and/or FERC in the subsidiary's capacity of providing regulated public utility services to captive customers within franchised public utility service areas, FERC jurisdictional transmission service or which is an interstate pipeline or local distribution company as defined by FERC.
(c) "State Commissions" shall mean any state public utility commission or state public service commission with utility regulatory jurisdiction over a Rate-Regulated Subsidiary.

ARTICLE 3. EFFECTIVE DATE

This Agreement shall be effective as of the date of execution; provided, however, that in those jurisdictions in which regulatory approval is required before the Agreement becomes effective, the effective date shall be as of the date of such approval.

ARTICLE 4. CHARGES AND PAYMENT

The Parties recognize that charges for mutual assistance will begin when a request for mobilization of assistance is submitted to the Providing Party by the Recipient Party. Costs associated with pre-notification of a potential need or gathering of information associated with a request for mutual assistance will not be charged to the Recipient Party.

Providing Parties will bill Recipient Parties, as appropriate, for mutual assistance rendered under this Agreement in as specific a manner as practicable.

Payments for mutual assistance shall be governed by an applicable mutual aid agreement, which may be the Edison Electric Institute Mutual Aid Agreement, the Western Region Mutual Assistance Agreement, or such other agreement as may be customarily used in the region where the mutual assistance is to be provided.

In the event that the mutual assistance consists only of the interchange of a good in an emergency circumstance, the Recipient Party shall reimburse the Providing Party the replacement cost of the transferred good. Any associated services shall be reimbursed by the Recipient Party as a direct charge, service charge or allocation as applicable pursuant to the IASA.

ARTICLE 5. STANDARD OF CARE

The Parties will comply with all applicable Laws regarding affiliated interest transactions, including timely filing of regulatory filings and reports. The Parties agree not to cross-subsidize and shall comply with any applicable Laws and State Commission, FERC or other applicable orders. Subject to the terms of this Agreement, the Parties shall perform their obligations hereunder in a commercially reasonable manner.

ARTICLE 6. TAXES

Each Party shall bear all taxes, duties and other similar charges, except taxes based upon its gross income (and any related interest and penalties), imposed as a result of its receipt of mutual assistance under this Agreement, including without limitation sales, use and value-added taxes.

ARTICLE 7. ACCOUNTING AND AUDITING

Providing Parties shall maintain such books and records as are necessary to support the charges for mutual assistance, in sufficient detail as may be necessary to enable the Parties to satisfy applicable regulatory requirements ("Records"). All Parties:

(a) Shall provide access to the Records at all reasonable times;
(b) Shall maintain the Records in accordance with good record management practices and with at least the same degree of completeness, accuracy and care as it maintains for its own records; and
(c) Shall maintain its own accounting records, separate from the other Parties' accounting records.

Subject to the provisions of this Agreement, Records supporting mutual assistance billings shall be available for inspection and copying by any qualified representative or agent of a Party, at the expense of the inquiring Party. In addition, FERC or State Commission staff or agents may audit the accounting records of Providing Parties that form the basis for charges to Rate-Regulated Subsidiaries. All Parties agree to cooperate fully with such audits.

ARTICLE 8. COOPERATION WITH OTHERS

The Parties will use good faith efforts to cooperate with each other in all matters related to the provision and receipt of mutual assistance. Such good faith cooperation will include providing electronic access in the same manner as provided other vendors and contractors to systems used in connection with mutual

assistance and using commercially reasonable efforts to obtain all consents, licenses, sublicenses or approvals necessary to permit each Party to perform its obligations.

Each Party shall make available to another Party any information required or reasonably requested by the Party related to the provision of mutual assistance and shall be responsible for timely provision of said information and for the accuracy and completeness of the information; provided, however, that a Party shall not be liable for not providing any information that is subject to a confidentiality obligation or a regulatory obligation not to disclose or be a conduit of information owned by it to a person or regulatory body other than the other Party.

The Parties will cooperate with each other in making such information available as needed in the event of any and all internal or external audits, utility regulatory proceedings, legal actions, or dispute resolution.

Each Party shall fully cooperate and coordinate with each other's employees and contractors in the performance or provision of mutual assistance. The Parties shall not commit or permit any act that will interfere with the performance or receipt of mutual assistance by any Party's employees or contractors.

ARTICLE 9. COMPLIANCE WITH ALL LAWS

Each Party shall be responsible for (a) its compliance with all Laws affecting its business, including, but not limited to, laws and governmental regulations governing federal and state affiliate transactions, workers' compensation, health, safety and security; (b) pursuant to the provisions of the applicable mutual aid agreement, any use it may make of the mutual assistance to assist it in complying with such laws and governmental regulations; and (c) compliance with FERC's Standards of Conduct, Market-Based Rate Affiliate Restrictions, and any comparable restrictions imposed by FERC or a State Commission.

ARTICLE 10. DISPUTE RESOLUTION

The Parties shall promptly resolve any conflicts arising under this Agreement and such resolution shall be final. If applicable, adjustments to the charges will be made as required to reflect the discovery of errors or omissions in the charges. If the Parties are unable to resolve any service, performance or budget issues or if there is a material breach of this Agreement that has not been corrected within ninety (90) days, representatives of the affected Parties will meet promptly to review and resolve those issues in good faith.

ARTICLE 11. TERMINATION FOR CONVENIENCE

A Party may terminate its participation in this Agreement either with respect to all, or part, of the mutual assistance provided hereunder at any time and from time to time, for any reason or no reason, by giving notice of termination to the other Party as soon as reasonably possible.

ARTICLE 12. CONFIDENTIAL INFORMATION/NONDISCLOSURE

To the fullest extent allowed by law, the provision of mutual assistance or reimbursement for mutual assistance provided pursuant to this Agreement shall not operate to impair or waive any privilege available to any Party in connection with the mutual assistance, its provision or reimbursement thereof.

The Parties will handle all information exchanged in the course of performing mutual assistance in accordance with requirements for documenting and handling critical infrastructure information as defined by the North American Electric Reliability Corporation Critical Infrastructure Protection Standards and will further comply with non-disclosure requirements of other applicable regulations.

The Parties shall use good faith efforts at the termination or expiration of this Agreement to ensure that any user access and passwords related to this Agreement are terminated.

ARTICLE 13. PERMITTED DISCLOSURE

Notwithstanding provisions of this Agreement to the contrary, each Party may disclose confidential information:

(a) To the extent required by a State Commission, FERC, a court of competent jurisdiction or other governmental authority or otherwise as required by Laws, including without limitation disclosure obligations imposed under federal securities laws, provided that such Party has given the other Party prior notice of such requirement when legally permissible to permit the other Party to take such legal action to prevent the disclosure as it deems reasonable, appropriate or necessary; or

(b) On a "need-to-know" basis under an obligation of confidentiality to its consultants, legal counsel, affiliates, accountants, banks and other financing sources and their advisors.

ARTICLE 14. SUBCONTRACTORS

To the extent provided herein, the Parties shall be fully responsible for the acts or omissions of any subcontractors of any tier and of all persons employed by such subcontractors and shall maintain complete control over all such subcontractors, it being understood and agreed that anything not contained herein

shall not be deemed to create any contractual relation between the subcontractor of any tier and the Parties.

ARTICLE 15. NONWAIVER

The failure of a Party to insist upon or enforce strict performance of any of the terms of this Agreement or to exercise any rights herein shall not be construed as a waiver or relinquishment to any extent of its right to enforce such terms or rights on any future occasion.

ARTICLE 16. SEVERABILITY

Any provision of this Agreement prohibited or rendered unenforceable by operation of law shall be ineffective only to the extent of such prohibition or unenforceability without invalidating the remaining provisions of this Agreement.

ARTICLE 17. ENTIRE AGREEMENT/DOCUMENTS INCORPORATED BY REFERENCE

All understandings, representations, warranties, agreements and referenced attachments, if any, existing between the Parties regarding the subject matter hereof are merged into this Agreement, which fully and completely express the agreement of the Parties with respect to the subject matter hereof.

ARTICLE 18. ADDITION OF RATE-REGULATED SUBSIDIARIES

Without further action by the Parties, effective on the date of its execution, a Rate-Regulated Subsidiary may enter into the Agreement and be bound thereby.

BERKSHIRE HATHAWAY ENERGY

This Agreement has been duly executed on behalf of the Parties as follows:

KERN RIVER GAS TRANSMISSION COMPANY

By: _____

Title: _____

Name: _____

Date: _____

MIDAMERICAN ENERGY COMPANY

By: _____

Title: _____

Name: _____

Date: _____

NORTHERN NATURAL GAS COMPANY

By: _____

Title: _____

Name: _____

Date: _____

PACIFICORP

By: [signature]

Title: VP, CFO PacifiCorp

Name: Nikki Kobliha

Date: 11/2/2015

NEVADA POWER COMPANY
DBA NV ENERGY

By: _____

Title: _____

Name: _____

Date: _____

SIERRA PACIFIC POWER COMPANY
DBA NV ENERGY

By: _____

Title: _____

Name: _____

Date: _____

BERKSHIRE HATHAWAY ENERGY

This Agreement has been duly executed on behalf of the Parties as follows:

KERN RIVER GAS TRANSMISSION COMPANY

By: _____

Title: VP - Finance

Name: Joseph L Lillo

Date: 7/9/15

MIDAMERICAN ENERGY COMPANY

By: _____

Title: _____

Name: _____

Date: _____

NORTHERN NATURAL GAS COMPANY

By: _____

Title: _____

Name: _____

Date: _____

PACIFICORP

By: _____

Title: _____

Name: _____

Date: _____

NEVADA POWER COMPANY
DBA NV ENERGY

By: _____

Title: _____

Name: _____

Date: _____

SIERRA PACIFIC POWER COMPANY
DBA NV ENERGY

By: _____

Title: _____

Name: _____

Date: _____

BERKSHIRE HATHAWAY ENERGY

This Agreement has been duly executed on behalf of the Parties as follows:

KERN RIVER GAS TRANSMISSION COMPANY

By: _____

Title: _____

Name: _____

Date: _____

MIDAMERICAN ENERGY COMPANY

By: [signature]

Title: VP & CFO

Name: Tom Specketer

Date: March 11, 2015

NORTHERN NATURAL GAS COMPANY

By: _____

Title: _____

Name: _____

Date: _____

PACIFICORP

By: _____

Title: _____

Name: _____

Date: _____

NEVADA POWER COMPANY
DBA NV ENERGY

By: _____

Title: _____

Name: _____

Date: _____

SIERRA PACIFIC POWER COMPANY
DBA NV ENERGY

By: _____

Title: _____

Name: _____

Date: _____

BERKSHIRE HATHAWAY ENERGY

This Agreement has been duly executed on behalf of the Parties as follows:

KERN RIVER GAS TRANSMISSION COMPANY

By: _____

Title: _____

Name: _____

Date: _____

MIDAMERICAN ENERGY COMPANY

By: _____

Title: _____

Name: _____

Date: _____

NORTHERN NATURAL GAS COMPANY

By: _____

Title: VP. Finance

Name: Joseph Lillo

Date: 3/25/15

PACIFICORP

By: _____

Title: _____

Name: _____

Date: _____

NEVADA POWER COMPANY
DBA NV ENERGY

By: _____

Title: _____

Name: _____

Date: _____

SIERRA PACIFIC POWER COMPANY
DBA NV ENERGY

By: _____

Title: _____

Name: _____

Date: _____

BERKSHIRE HATHAWAY ENERGY

This Agreement has been duly executed on behalf of the Parties as follows:

KERN RIVER GAS TRANSMISSION COMPANY

By: _____

Title: _____

Name: _____

Date: _____

MIDAMERICAN ENERGY COMPANY

By: _____

Title: _____

Name: _____

Date: _____

NORTHERN NATURAL GAS COMPANY

By: _____

Title: _____

Name: _____

Date: _____

PACIFICORP

By: _____

Title: _____

Name: _____

Date: _____

NEVADA POWER COMPANY
DBA NV ENERGY

By: E. K. Bethel

Title: SVP, Chief Financial Officer

Name: E. Kevin Bethel

Date: 3/12/15

SIERRA PACIFIC POWER COMPANY
DBA NV ENERGY

By: E. K. Bethel

Title: SVP, Chief Financial Officer

Name: E. Kevin Bethel

Date: 3/12/15

WESTERN REGION

MUTUAL ASSISTANCE AGREEMENT

For

ELECTRIC AND NATURAL GAS UTILITIES

Effective: 11/14/2003

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DEFINITIONS

The following are definitions of terms as used in this agreement:

Activation: The initiation of the Assistance and administrative process of the agreement including: request for Assistance, assessing and communicating the scope of assistance request, assessing and communicating the resources available for Assistance, activation procedures, mutual assistance coordination, and other processes and procedures supporting the Mobilization of Assistance resources.

Deactivation: The termination of the Assistance and administrative process including: notification of Deactivation, Demobilization planning, identification of applicable costs, processes and procedures supporting Demobilization of resources, provide for billing, audit, critique information, and closure of the Assistance.

Demobilization: The actual returning of all Assistance resources to the Assisting Party's normal base.

Emergency: A sudden unplanned disruption of essential systems and infrastructure creating a potential for public safety, severe economic loss, or other socio-economic hardships resulting from the loss of the utility service. The emergency may be confined to the utility infrastructure or may include community-wide damage and emergency response. Emergencies may be natural disasters or human caused events.

Mobilization: The actual collecting, assigning, preparing and transporting of all Assistance resources.

Mutual Assistance Coordinator: The person(s) designated by the Requesting Party, and Assisting Party, to coordinate all administrative requirements of the Agreement.

Natural Gas: Term gas or natural gas referred to in this document include all commercially available forms of natural gas including Synthetic Natural Gas.

Operations Liaison: The person or persons designated by the Requesting Party to provide direct contact, communications and coordination at the operations level for Assisting crews and resources at the location of the assistance. This may include but is not limited to: contact and communications for assisting crews, safety information processes and procedures, ensuring coordination of lodging and meals, addressing issues of equipment requirements, materials requirements, and other logistical issues necessary to ensure safe effective working conditions.

Qualified: The training, education and experience of employees completing an apprenticeship or other industry / trade training requirements consistent with Federal Bureau of Apprenticeships and Training, Department of Transportation Pipeline Safety Regulations, or other recognized training authority or regulation. Training and qualification standards vary by state or province and are the responsibility of the Requesting Party to evaluate, in advance, the acceptable level of qualification for trade employees (i.e. lineman, electrician, fitter, etc.).

Work Stoppages: Any labor disputes, labor union disagreements, strikes, or any circumstance creating a shortage of qualified labor for a company during a non-emergency situation.

WESTERN REGION MUTUAL ASSISTANCE AGREEMENT (Electric and Natural Gas)

1.0 PARTIES

1.1. This Mutual Assistance Agreement (hereinafter referred to as "Agreement") is made and entered into effective November 14, 2003. The Parties to this Agreement are listed in Attachment A of this document. Each of the parties that have executed this Agreement may hereinafter be referred to individually as "Party" and collectively as "Parties."

1.2. Being a Party to this Agreement does not by itself assure any Party that Assistance will be provided if, when, or as requested. Each Party reserves the sole right to respond or not to respond to requests for Assistance on a case-by-case basis. By signing this Agreement, each Party thereby agrees that any Assistance, which is received or given upon the request of a Party to this Agreement, shall be subject to each and every one of the terms and conditions of this Agreement.

2.0 RECITALS

This Agreement is made with reference to the following facts, among others:

2.1. Whereas, the Parties own operate and maintain utility facilities and are engaged in the production, acquisition, transmission, and/or distribution of electricity or natural gas, and

2.2. Whereas, each of the Parties operates and maintains their respective facilities within accepted industry practices and employs skilled and qualified personnel to operate, repair and maintain such facilities according to such industry practices, and

2.3. Whereas, it is in the mutual interest of the Parties to be prepared to provide for emergency repair and restoration to such services, systems and facilities on a reciprocal basis. The purpose of this Agreement is to provide the procedures under which one Party may request and receive assistance from another Party. This Agreement is also designed to allow a new Party to join in the Agreement by signing a copy of this Agreement and the giving of notice to the existing Parties pursuant to Section 6.3 of this Agreement, and

2.4. Whereas, assistance requests for Work Stoppages are beyond the scope of this Agreement.

2.5. Whereas, for purposes of this Agreement, "Assistance" shall be defined as: All preparation and arrangements by the Assisting Party for Activation, Mobilization, Deactivation and Demobilization, of personnel, material, vehicles, equipment, supplies and/or tools or any other requested form of aid or assistance, starting at the time of the authorization by the Requesting Party, as set forth in this Agreement.

THEREFORE THE PARTIES HEREBY AGREE AS FOLLOWS:

3.0 SCOPE OF ASSISTANCE

3.1. In the event of an Emergency affecting the generation, transmission, distribution, services, and/or related facilities owned or controlled by a Party, such Party ("Requesting Party") may request another Party or Parties ("Assisting Party") to provide Assistance. The Assisting Party shall, in its sole discretion, determine if it shall provide such Assistance, including the extent and limitations of that Assistance. If the Assisting Party determines to provide Assistance, such Assistance shall be provided in accordance with the terms and conditions of this Agreement.

3.2. Requests for Assistance may be made either verbally or in writing by the Authorized Representative, as defined in Section 9 and identified in Attachment B, of the Requesting Party and shall be directed to the Authorized Representative of the Assisting Party. Upon acceptance of a request for Assistance, either verbally or in writing, the Assisting Party shall respond with reasonable dispatch to the request in accordance with information and instructions supplied by the Requesting Party. All requests for Assistance shall follow the procedures described by Section 3.0 and in Attachment C.

3.3. The Requesting Party shall provide the Assisting Party with a description of the work needed to address the emergency, with the most urgent needs for Assistance addressed first. The Assisting Party shall use its reasonable efforts to schedule the Assistance in accordance with the Requesting Party's request. However, the Assisting Party reserves the right to recall any and all personnel, material, equipment, supplies, and/or tools at any time that the Assisting Party determines necessary for its own operations. Any Requesting Party for whom an Operator Qualification (OQ) Program is required should pre-screen the other Parties to this Agreement to determine which Parties have compatible regulatory agency accepted programs and may therefore be contacted for assistance.

3.4. The Requesting Party will provide the name and contact information for the person(s) designated as the Mutual Assistance Coordinator(s), the Operations Liaison(s), and person(s) to be designated as supervisory personnel to accompany the crews and equipment. The Assisting Party will provide the name(s) and contact information for the person(s) designated to be the Mutual Assistance Coordinator(s).

3.5. All costs associated with the furnishing of Assistance shall be the responsibility of the Requesting Party and deemed to have commenced when the Requesting Party officially authorizes the Assisting Party to proceed with Mobilization of the personnel and equipment necessary to furnish Assistance, and shall be deemed to have terminated when the transportation of Assisting Party personnel and equipment returns to the work headquarters, individual district office, or home (to which such personnel are assigned for personnel returning at other than regular working hours) and Demobilization is completed.

3.6. For the purposes of this Agreement, a Requesting Party shall be deemed to have authorized the Assisting Party to proceed with Mobilization when the Requesting Party signs and submits a formal request to the Assisting Party, in a form substantially similar to that shown in Attachment C-1. If written information cannot be furnished, a verbal confirmation will be acceptable, with a written confirmation to follow within 24 hours.

3.7. The Parties hereto agree that costs arising out of inquiries as to the availability of personnel, material, equipment, supplies and/or tools or any other matter made by one party to another prior to the Requesting Party authorizing the Assisting Party to proceed with Mobilization will not be charged to the potentially Requesting Party.

3.8. The Requesting Party agrees to repayment of "reasonable costs or expenses", as further described in Section 4.0 of this Agreement, and any such reasonable costs or expenses shall continue to be subject to the provisions of Section 5.0 of this Agreement regarding Audit and Arbitration.

3.9. The Assisting Party and Requesting Party shall mutually agree upon and make all arrangements for the preparation and actual Mobilization of personnel, material, vehicles, equipment, supplies and/or tools to the Requesting Party's work area and the return (i.e. Demobilization) of such personnel, material, vehicles, equipment, supplies and/or tools to the Assisting Party's work area (See Attachments C and D). The Requesting Party shall be responsible for all reasonable costs and expenses incurred by the Assisting Party for Mobilization and/or Demobilization, notwithstanding any early termination of such assistance by the Requesting Party.

3.10. Unless otherwise agreed upon, the Requesting Party shall be responsible for providing food and lodging for the personnel of the Assisting Party from the time of their arrival at the designated location to the time of their departure. The food and housing provided shall be subject to the approval of the supervisory personnel of the Assisting Party.

3.11. If requested by the Assisting Party, the Requesting Party, at its own cost, shall make or cause to be made all reasonable repairs to the Assisting Party's vehicles and equipment, necessary to maintain such equipment safe and operational, while the equipment is in transit or being used in providing Assistance. However, the Requesting Party shall not be liable for cost of repair required by the gross negligence or willful acts of the Assisting Party, or if the vehicles or equipment was not issued by the Assisting Party in safe and operational condition.

3.12. Unless otherwise agreed the Requesting Party shall provide fuels and other supplies needed for operation of the Assisting Party's vehicles and equipment being used in providing Assistance.

3.13. Unless otherwise agreed to by the Parties, the Requesting Party shall provide field communications equipment and instructions for the Assisting Party's use. The Assisting Party shall exercise due care in use of the equipment and return the equipment to the Requesting Party at the time of departure in like condition, provided that if repairs are necessary the Requesting Party will be financially responsible unless such repairs are necessitated by the gross negligence or willful acts of the Assisting Party.

3.14. Employees of the Assisting Party shall at all times continue to be employees of the Assisting Party, and such employees shall at no time and for no purpose be deemed to be employees of the Requesting Party.

3.15. Wages, hours and other terms and conditions of employment applicable to personnel provided by the Assisting Party, shall continue to be those of the Assisting Party.

3.16. If the Assisting Party provides a crew or crews, it shall assign supervisory personnel as deemed necessary by the Assisting Party, who shall be directly in charge of the crew or crews providing Assistance.

3.17. All time sheets, equipment and work records pertaining to personnel, material, vehicles, equipment, supplies and/or tools provided by the Assisting Party shall be kept by the Assisting Party for billing and auditing purposes as provided in this Agreement.

3.18. No Party shall be deemed the employee, agent, representative, partner or the co-venturer of another Party or the other Parties in the performance of activities undertaken pursuant to this Agreement.

3.19. The Parties shall, in good faith, attempt to resolve any differences in work rules and other requirements affecting the performance of the Parties' obligations pursuant to this Agreement.

3.20. The Requesting party shall provide the Assisting Party with an Operations Liaison (See Attachment C, A.5) to assist with operations, personnel and crew safety. This person(s) shall provide the Assisting Party's crews an operational and safety orientation, pertaining to work practices and safety requirements of the Requesting Party's system, prior to Assisting Party commencing work, and continue to be the link between the Parties and keep the crews apprised of safety, operational, and communication issues.

3.21. The Requesting party shall initiate the Deactivation of Assistance by notification to the Assisting Party within 24 hours of deactivation schedule or as soon as is reasonably practicable. Requesting and Assisting Parties will follow the Procedures for Deactivation of Assistance outlined in Attachment D.

4.0 PAYMENT

4.1. The Requesting Party shall reimburse the Assisting Party for all "reasonable costs and expenses" that are appropriate and not excessive, under the circumstances prevailing at the time the cost or expense is paid or incurred by the Assisting Party as a result of furnishing Assistance. Such "reasonable costs or expenses" shall include, but not be limited to, the following:

a) Employees' wages and salaries for paid time spent in Requesting Party's service area and paid time during travel to and from such service area, plus the Assisting Party's standard payroll additives to cover all employee benefits and allowances for vacation, sick leave, holiday pay, retirement benefits, all payroll taxes, workers' compensation, employer's liability insurance, administrative and general expenses, and other benefits imposed by applicable law, regulation, or contract pursuant to Section 3.15.

b) Employees' travel and living expenses such as transportation, fuel, utilities, housing or shelter, food, communications, and reasonable incidental expenses directly attributable to the Assistance.

c) Cost of equipment, materials, supplies and tools at daily or hourly rate including their normally applied overhead costs inclusive of taxes, insurance, depreciation, and administrative expenses. Cost to maintain, fuel, replace or repair equipment, materials, supplies, and tools (hereinafter collectively referred to as the "Equipment"), which are expended, used, damaged, or stolen while the Equipment is being used in providing Assistance; provided, however, the Requesting Party's financial obligation under this Section (4.1. c): (i) shall not apply to any damage or loss resulting from the gross negligence or willful misconduct of the Assisting Party, and (ii) shall only apply in excess of, and not contribute with, any valid and collectible property insurance which applies to such damage or loss.

d) Cost of vehicles provided by Assisting Party for performing assistance at daily or hourly rate including normally applied overhead costs inclusive of taxes, insurance, depreciation, and administrative expenses. Cost to maintain, fuel, and repair vehicles, or replace vehicles which are damaged or stolen while the vehicles are used in providing Assistance; provided, however, that Requesting Party's financial obligation under this Section (4.1.d):(i) shall not apply to any damage or loss resulting from the gross negligence or willful misconduct of the Assisting Party, and (ii) shall only apply in excess of, and not contribute with, any valid and collectible first-party physical damage insurance which applies to such loss.

e) Administrative and general costs, including the costs associated with the Assisting Party's administrative field coordination personnel, which are properly allocable to the Assistance to the extent such costs are not chargeable pursuant to the foregoing subsections.

f) Overtime costs incurred by the Assisting Party in their service territory as a direct result of assistance provided to the Requesting Party.

4.2. Unless otherwise mutually agreed to, the Assisting Party shall bill the Requesting Party at the address designated on Attachment "B" for all costs and expenses of the Assisting Party in one invoice with itemization or supporting documentation of charges. If the assistance extends beyond a 30-day period, billing can occur monthly unless otherwise agreed upon.

4.3. The Requesting Party shall pay such bill in full, not withstanding the rights of Audit and Arbitration in Section 5.0, within thirty 30 days of receipt of the bill, or a remittance period agreed to by both parties, and shall send payment to the Assisting Party at the address listed in Attachment "B".

4.4. Delinquent payment of bills shall accrue interest at a rate equal to the incremental cost of debt replacement for the Assisting Party, not to exceed the legal rate permitted by the Governing Law (Section 8.0) of Assisting Party, and as identified at the time of billing, prorated by days, until such bills are paid. This rate shall be identified on the bill submitted by the Assisting Party.

5.0 AUDIT AND ARBITRATION

5.1. A Requesting Party has the right to designate its own qualified employee representative(s) or its contracted representative(s) with a management or accounting firm who shall have the right to audit and to examine any cost, payment, settlement, or supporting documentation relating to any bill submitted to the Requesting Party pursuant to this Agreement.

5.2. A request for audit shall not affect the obligation of the Requesting Party to pay bills as required herein. The Requesting Party or its representative(s) shall undertake any such audit(s) upon notice to the Assisting Party at reasonable times and in conformance with generally accepted auditing standards (GAAS). The Assisting Party agrees to conform to generally accepted accounting principles (GAAP) and to reasonably cooperate with any such audit(s).

5.3. This right to audit shall extend for a period of two (2) years following the receipt by Requesting Party of billings for all costs and expenses. The Assisting Party agrees to retain all necessary records/documentation for the said two-year period, and the entire length of this audit, in accordance with its normal business procedures.

5.4. The Assisting Party shall be notified by the Requesting Party, in writing, of any exception taken as a result of the audit. In the event of a disagreement between the Requesting Party and the Assisting Party over audit exceptions, the Parties agree to use good faith efforts to resolve their differences through negotiation.

5.5. If ninety (90) days or more have passed since the notice of audit exception was received by the Assisting Party, and the Parties have failed to resolve their differences, the Parties agree to submit any unresolved

dispute to binding arbitration before an impartial member of an unaffiliated management or accounting firm. Governing Law for arbitration is pursuant to Section 8 of this Agreement. Each Party to arbitration will bear its own costs, and the expenses of the arbitrator shall be shared equally by the Parties to the dispute.

6.0 TERM AND TERMINATION

6.1. This Agreement shall be effective on the date of execution by at least two of the Parties hereto and shall continue in effect indefinitely, except as otherwise provided herein. Any Party may withdraw its participation at any time after the effective date with 30 days prior written notice to all other Parties.

6.2. As of the effective date of any withdrawal, the withdrawing Party shall have no further rights or obligations under this Agreement except the right to collect money owed to such Party, the obligation to pay amounts due to other Parties, and the rights and obligations pursuant to Section 5.0 and Section 7.0 of this Agreement.

6.3. Notwithstanding Section 12.0, additional parties may be added to the Agreement, without amendment of the Agreement, provided that notice is given to existing signatories who may contest inclusion of new signatories within 30 days of such notice, and that any new signatories agree to be bound by the terms and conditions of this Agreement by executing a copy of the same which shall be deemed an original and constitute the same agreement executed by the existing signatories. The addition or withdrawal of any party to this Agreement shall not change the status of the Agreement among the remaining Parties.

7.0 LIABILITY

7.1. Except as otherwise specifically provided by Section 4.1 and Section 7.2 herein, to the extent permitted by law and without restricting the immunities of any Party, the Requesting Party shall defend, indemnify and hold harmless the Assisting Party, its directors, officers, agents, employees, successors and assigns from and against any and all liability, damages, losses, claims, demands actions, causes of action, and costs including reasonable attorneys' fees and expenses, resulting from the death or injury to any person or damage to any property, which results from the furnishing of Assistance by the Assisting Party, unless such death or injury to person, or damage to property, is caused by the gross negligence or willful misconduct of the Assisting Party.

7.2. Each Party shall bear the total cost of discharging all liability arising during the performance of Assistance by one Party to the other (including costs and expenses for attorneys' fees and other costs of defending, settling, or otherwise administering claims) which result from workers' compensation claims or employers' liability claims brought by its own employees. Each Party agrees to waive, on its own behalf, and on behalf of its insurers, any subrogation rights for benefits or compensation paid to such Party's employees for such claims.

7.3. In the event any claim or demand is made, or suit or action is filed, against the Assisting Party, alleging liability for which the Requesting Party shall indemnify and hold harmless the Assisting Party, Assisting Party shall promptly notify the Requesting Party thereof, and the Requesting

Party, at its sole cost and expense, shall settle, compromise or defend the same in such manner as it, in its sole discretion, deems necessary or prudent. However, Requesting Party shall consult with Assisting Party during the pendency of all such claims or demands, and shall advise Assisting Party of Requesting Party's intent to settle any such claim or demand. The party requesting indemnification should notify the other party in writing of that request.

7.4. The vehicles or equipment, which the Assisting Party shall provide to the Requesting Party pursuant to Section 3 above, shall not, to the actual knowledge of Assisting Party, be provided in unsafe operating condition, as represented by manufacturer standards and industry practices. Except as provided in the immediately preceding sentence, the Assisting Party makes no representations or warranties as to the condition, suitability for use, freedom from defect or otherwise of such vehicles or equipment. Requesting Party shall utilize the vehicles or equipment at its own risk. Requesting Party shall, at its sole cost and expense, defend, indemnify and hold harmless Assisting Party, its directors, officers, agents, employees, successors and assigns, from and against any and all liability, damages, losses, claims, demands, actions, causes of action, and costs including reasonable attorneys' fees and expenses, resulting from the death or injury to any person or damage to any property, arising out of the utilization of the equipment by or for the Requesting Party, or its employees, agents, or representatives, unless such death, injury, or damage is caused by the gross negligence or willful misconduct of the Assisting Party.

7.5. No Party shall be liable to another Party for any incidental, indirect, or consequential damages, including, but not limited to, under-utilization of labor and facilities, loss of revenue or anticipated profits, or claims of customers arising out of supplying electric or natural gas service, resulting from performance or nonperformance of the obligations under this Agreement.

7.6. Nothing in Section 7.0, or elsewhere in this Agreement, shall be construed to make the Requesting Party liable to the Assisting Party for any liability for death, injury, or property damage arising out of the ownership, use, or maintenance of any aircraft or watercraft (over 17 feet in length) which is supplied by or provided by the Assisting Party. It shall be the responsibility of the Assisting Party to carry liability and hull insurance on such aircraft and watercraft as it sees fit. Also, during periods of operation of aircraft or watercraft (over 17 feet in length) in a situation covered by this Agreement, the Party, which is the owner/lessee of such aircraft or watercraft, shall use its best efforts to have the other Parties to this Agreement named as additional insured's on such liability coverage.

8.0 GOVERNING LAW

8.1. All disputes, contests or arbitration of this Agreement, for assistance provided or requested, shall be interpreted, governed and construed by

the choice of law state or province as specified by the Assisting Party in Attachment B.

9.0 AUTHORIZED REPRESENTATIVE

9.1. The Parties shall, within 30 days following execution of this Agreement, appoint Authorized Representative and Alternate Authorized Representative(s), and exchange all such information as provided in Attachment "B". Such information shall be updated by each Party prior to January 1st of each year that this Agreement remains in effect. The Authorized Representatives or the Alternate Authorized Representatives shall have the authority to request and commit to the providing of Assistance.

10.0 CUSTODIANSHIP OF AGREEMENT

10.1. The custodial responsibilities of this Agreement, as outlined in Attachment E, may be assigned to one of the Parties to this Agreement, which assignment shall be subject to acceptance by such Party, or may be assigned to a third party, in either case by vote of the participating Parties starting within 30 days after the initiation of this Agreement, and then by January 31st of each year.

11.0 ASSIGNMENT OF AGREEMENT

11.1. No Party may assign this Agreement, or any interest herein, to a third party, without the written consent of the other Parties.

12.0 WAIVERS OF AGREEMENT

12.1. Failure of a Party to enforce any provision of this Agreement, or to require performance by the other Parties of any of the provisions hereof, shall not be construed to waive such provision, nor to affect the validity of this Agreement or any part thereof, or the right of such Parties to thereafter enforce each and every provision.

13.0 ENTIRE AGREEMENT

13.1. This Agreement is the entire agreement between the Parties concerning the subject matter of the Agreement. It supercedes and takes the place of all conversations the Parties may have had, or documents the Parties may have exchanged, with regard to the subject matter. The recitals to this agreement are hereby incorporated herein.

14.0 AMENDMENT

14.1. No changes to this Agreement other than the addition of new Parties shall be effective unless such changes are made by an amendment in

writing, signed by each of the Parties hereto. A new Party may be added to this Agreement upon the giving of 30 days notice to the existing Parties and upon the new Party's signing a copy of this Agreement as in effect upon the date the new Party agrees to be bound by each and every one of the Agreement's terms and conditions.

15.0 NOTICES

15.1. All communications between the Parties relating to the provisions of this Agreement shall be addressed to the Authorized Representative of the Parties, or in their absence, to the Alternate Authorized Representative(s) as identified in Attachment "B". Communications shall be in writing, and shall be deemed given if made or sent by e-mail with electronic confirmed delivery, confirmed fax, personal delivery, or registered or certified mail postage prepaid. Each Party reserves the right to change the names of those individuals identified in Attachment "B" applicable to that Party, and shall notify each of the other Parties of such change in writing as described above. All Parties shall keep the Custodian of the Agreement informed of the information contained in Attachment "B" and reply to all reasonable requests of such association for information regarding the administration of this Agreement.

16.0 ATTACHMENTS

Attachment "A" (Parties to this Agreement)
Attachment "B" (Names and Addresses of Authorized Representative(s) /Billing)
Attachment "C" (Activation of Western Regional Mutual Assistance Agreement)
Attachment "C-1" (Sample Written Request for Assistance)
Attachment "D" (Deactivation Under Western Regional Mutual Assistance Agreement)
Attachment "E" (Custodianship of Western Regional Mutual Assistance Agreement)
Attachments to this Agreement are incorporated herein by this reference.

WESTERN REGION MUTUAL ASSISTANCE AGREEMENT (Electric and Natural Gas)

1.0 SIGNATURE CLAUSE

1.1. This Agreement may be executed in any number of counterparts, each of which shall be an original, but all of which together shall constitute one and the same agreement.

1.2. IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their respective duly authorized officers as of the dates set forth below.

Company Name: Pacific Power

Signature of Officer: 

Title of Officer: President

Date Executed: 9/24/07

Print Officer Name: Pat Reiten

ATTACHMENT A

Parties to the Western Region Mutual Assistance Agreement:

Name of Party: Utility Type: Effective Date:	**Service Area:**
Name of Party: Utility Type: Effective Date:	**Service Area:**
Name of Party: Utility Type: Effective Date:	**Service Area:**
Name of Party: Utility Type: Effective Date:	**Service Area:**
Name of Party: Utility Type: Effective Date:	**Service Area:**
Name of Party: Utility Type: Effective Date:	**Service Area:**
Name of Party: Utility Type: Effective Date:	**Service Area:**
Name of Party: Utility Type: Effective Date:	**Service Area:**
Name of Party: Utility Type: Effective Date:	**Service Area:**
Name of Party: Utility Type: Effective Date:	**Service Area:**
Name of Party: Utility Type: Effective Date:	**Service Area:**

ATTACHMENT B

(Sample)

WESTERN REGION MUTUAL ASSISTANCE AGREEMENT (Electric & Natural Gas)

Names and Address of Authorized Representative(s)/Billing

Date _____
Name of Utility _____
Mailing Address _____
_____

Individuals to Call for Emergency Assistance:

AUTHORIZED REPRESENTATIVE

Name _____
Title _____ Address _____
E-Mail _____ Pager No. _____
Day Phone _____ Night Phone _____
FAX _____ Cellular Phone _____

ALTERNATE AUTHORIZED REPRESENTATIVE

Name _____
Title _____ Address _____
E-Mail _____ Pager No. _____
Day Phone _____ Night Phone _____
FAX _____ Cellular Phone _____

DISPATCH CENTER WITH 24-HOUR TELEPHONE ANSWERING

Name _____
Title _____
Address _____
Phone _____ Radio Frequency _____
FAX _____

CHOICE OF LAW (State or Province): _____

BILLING/PAYMENT ADDRESS

Name of Utility _____
Department of Utility _____
Billing/Payment Address _____
_____
Telephone No. _____
FAX _____

Information provided to 2004 WRMAA Custodian: Western Energy Institute

ATTACHMENT C

ACTIVATION OF WESTERN REGION MUTUAL ASSISTANCE AGREEMENT

Procedures for Requesting and Providing Assistance

A. The Requesting Party shall include the following information, as available, in its request for Assistance:

A.1 A brief description of the emergency situation creating the need for Assistance;
A.2 A general description of the damage sustained by the Requesting Party, including the part of the utility system, e.g., generation, transmission, substation, or distribution, affected by the emergency situation;
A.3 The number and type of personnel, equipment, vehicles, materials and supplies needed;
A.4 A reasonable estimate of the length of time that the Assistance will be needed;
A.5 The name(s) and contact information of individuals employed by the Requesting Party who will be the Mutual Assistance Coordinator(s) and Operations Liaison(s);
A.6 A specific time and place for the designated representative of the Requesting Party to meet the personnel and equipment being provided by the Assisting Party;
A.7 Type of fuel available (gasoline, propane, CNG or diesel) to operate equipment;
A.8 Availability of food and lodging for personnel provided by the Assisting Party; and
A.9 Current weather conditions and weather forecast for the following twenty-four hours or longer.

B. The Assisting Party, in response to a request for Assistance, shall provide the following information, as available, to the Requesting Party:

B.1 The name(s) and contact information of designated representative(s) to act as Mutual Assistance Coordinator(s).
B.2 The number and type of crews and equipment available to be furnished;
B.3 The name and title of the crew members responding to the Assistance;
B.4 Materials available to be furnished;
B.5 An estimate of the length of time that personnel and equipment will be available;
B.6 The name and contact information of the person(s) to be designated as supervisory personnel to accompany the crews and equipment; and
B.7 When and where Assistance will be provided, giving consideration to the request set forth in section A.6 above.

ATTACHMENT C-1

ACTIVATION OF WESTERN REGION MUTUAL ASSISTANCE AGREEMENT

Sample Written Request for Assistance

Date
Assisting Party Name
Assisting Party Address

"In recognition of the personnel, material, equipment, supplies and/or tools being sent to us by [name of Assisting Party] in response to a request for mutual assistance made by [Requesting Party] on [date of request], we agree to be bound by the principles noted in the Western Region Mutual Assistance Agreement (Electric and Natural Gas).

(Brief Statement of What Assistance)

[Requesting Party Name]

[Authorized Representative of Requesting Party].

ATTACHMENT D

DEACTIVATION UNDER WESTERN REGION MUTUAL ASSISTANCE AGREEMENT

Procedures for Deactivation of Assistance

A. The Requesting Party shall, as appropriate, include the following in their Deactivation:

A.1. Number of crews returning and, if not all crews are returning, expected return date of remaining crews
A.2. Notification to the Assisting Party of the time crews will be departing.
A.3. Whether crews have been rested prior to their release or status of crew rest periods
A.4. Advisement to the Assisting Party regarding current weather and travel conditions and suggested routing

B. The Assisting Party shall, as appropriate, include the following in their Deactivation:

B.1. Return of any equipment, material, tools, or supplies provided by the Requesting Party
B.2. Provision of any information that may be of value to the Requesting Party in their critique of response efforts
B.3. Estimation as to when billing will be available
B.4. Billing to include detail under headings as outlined in Section 4.0 of this Agreement.
B.5. Retention of documentation as specified in Section 5.3 of the Mutual Assistance Agreement.
B.6. Confirmation that all information pertaining to the building, modification, or other corrective actions taken by the Assisting Party have been appropriately communicated to the Requesting Party

ATTACHMENT E
CUSTODIANSHIP OF WESTERN REGION
MUTUAL ASSISTANCE AGREEMENT

Responsibilities of the Western Region Mutual Assistance Agreement (Electric and Natural Gas) Custodian are:

A. Act as the single repository for all original signature pages, changes, updates, and addendums to the Agreement, including Attachment B.

B. Ensure all Parties provide an annual update of the Authorized Representative and Alternate Authorized Representative(s), as identified in Attachment "B", no later than December 15 of each year.

C. Distribute annual update of Attachment "B" no later than January 15 of each year.

D. Coordinate and facilitate meetings of the parties to the Agreement, as necessary, to include an after action review of recent mutual assistance activations and document changes requested by any party to the Agreement. An annual meeting will also be held to review general mutual assistance issues, and assignment of the Agreement Custodian for the next year.

E. Assist and guide utilities interested in becoming a party to the Agreement by providing a copy of the existing Agreement for their review and signature pursuant to Section 6.3 of this Agreement.

F. Facilitate any necessary reviews of the Agreement.

G. Term of the Custodian responsibilities is annual and will commence on February 1, and terminate on January 31 of the following year. There are no limits to the number of terms or consecutive terms of the custodian. The name and contact information for the current Agreement Custodian will be provided as part of the Attachment B update as outlined in A and B above.

ATTACHMENT A
Parties to the
Western Region Mutual Assistance Agreement

Name of Party:	**Arizona Public Service Co.**	Service Area:
Utility Type:	**Electric Utility**	Throughout the State of Arizona
Effective Date:	**September 30, 2005**	

Name of Party:	**ATCO Gas**	Service Area:
Utility Type:	**Natural Gas**	Province of Alberta, Canada
Effective Date:	**July 20, 2006**	

Name of Party:	**Avista Corporation**	Service Area: Spokane, Washington area, Coeur'D Alene, Idaho area, Medford, Oregon and surrounding areas
Utility Type:	**Electrical and Gas**	
Effective Date:	**November 14, 2003**	

Name of Party:	**Bonneville Power Administration**	Service Area:
Utility Type:		
Effective Date:		

Name of Party:	**Cascade Natural Gas Corporation**	Service Area: Washington and Oregon
Utility Type:	**Natural Gas**	
Effective Date:	**February 2, 2004**	

Name of Party:	**Chelan Public Utility District** (Public Utility District No. 1 of Chelan County)	Service Area: Central Washington, Chelan County
Utility Type:	**Hydroelectric Generation, Electric, Water, Waste Water and Fiber Optics**	
Effective Date:	**December 7, 2004**	

Name of Party:	**City of Mesa**	Service Area: Mesa, Arizona and Pinal County MAGMA Gas System
Utility Type:	**Gas and Electric**	
Effective Date:	**December 1, 2005**	

Name of Party:	**Clark Public Utility**	Service Area: Clark Co. Washington
Utility Type:	**Electric, Water, Waste Water**	
Effective Date:	**June 11, 2004**	

Name of Party:	**El Paso Electric Company**	Service Area: West Texas & Southern New Mexico
Utility Type:	**Electric**	
Effective Date:	**September 13, 2004**	

Name of Party:	**ENSTAR Natural Gas Company**	Service Area: South Central Alaska
Utility Type:	**Natural gas distribution and transmission**	
Effective Date:	**November 16, 2003**	

ATTACHMENT A
Parties to the
Western Region Mutual Assistance Agreement

Name of Party:	**Eugene Water & Electric Board**	Service Area: Eugene, Oregon and McKenzie River Valley
Utility Type:	**Electric and water**	
Effective Date:	**June 2, 2004**	

Name of Party:	**Hawaiian Electric Company, Inc.**	Service Area: Hawaii, to include islands of: Oahu, Maui, Hawaii, Lanai & Molokai
Utility Type:	**Electric**	
Effective Date:	**March 28, 2006**	

Name of Party:	**Idaho Power Company**	Service Area: Southern Idaho and Eastern Oregon
Utility Type:	**Electric Utility**	
Effective Date:	**January 3, 2007**	

Name of Party:	**Intermountain Gas Company**	Service Area: Southern Idaho
Utility Type:	**Natural gas distribution**	
Effective Date:	**January 21, 2004**	

Name of Party:	**Los Angeles Department of Water & Power (LADWP)**	Service Area: Distribution in LA Basin and the Owens Valley Region. Transmission in California, Nevada and Utah
Utility Type:	**Municipal**	
Effective Date:	**July 7, 2009**	

Name of Party:	**NorthWestern Energy, a division of NorthWestern Corp.**	Service Area: Western 2/3 of Montana
Utility Type:	**Electric and Gas**	
Effective Date:	**November 24, 2003**	

Name of Party:	**NV Energy (dba Nevada Power and Sierra Pacific)**	Service Area: Southern Nevada, Las Vegas Metropolitan and surrounding area
Utility Type:	**Electric**	
Effective Date:	**November 14, 2003**	

Name of Party:	**NW Natural**	Service Area: Oregon / SW Washington
Utility Type:	**Natural Gas**	
Effective Date:	**November 14, 2003**	

Name of Party:	**PacifiCorp (dba Pacific Power, Utah Power, Rocky Mountain Power)**	Service Area: Oregon, Washington, Utah, Northern California, SW and Central Wyoming, Southern Idaho
Utility Type:	**Electric Utility**	
Effective Date:	**February 27, 2004**	

Name of Party:	**Pacific Gas & Electric Company**	Service Area: Northern California
Utility Type:	**Gas and Electric**	
Effective Date:	**June 7, 2006**	

ATTACHMENT A
Parties to the
Western Region Mutual Assistance Agreement

Name of Party:	**Portland General Electric**	Service Area: Portland & Salem Oregon and surrounding areas
Utility Type:	**Electric Utility**	
Effective Date:	**November 18, 2003**	

Name of Party:	**Public Service Co. of NM**	Service Area: Throughout the state of New Mexico
Utility Type:	**Electric Utility**	
Effective Date:	**March 2, 2004**	

Name of Party:	**Puget Sound Energy**	Service Area: Western Washington, and portions of Kittitas County
Utility Type:	**Electric & Gas Distribution**	
Effective Date:	**February 19, 2004**	

Name of Party:	**Questar Gas Company**	Service Area: Utah, Southwest Wyoming, Southern Idaho
Utility Type:	**Natural Gas**	
Effective Date:	**February 4, 2004**	

Name of Party:	**Rocky Mountain Power (refer to PacifiCorp)**

Name of Party:	**Sacramento Municipal Utility District**	Service Area:
Utility Type:	**Electric Generation**	Generations facilities in Sacramento, El Dorado, and Solano Counties, California
	Electric distribution	Customers located in Sacramento and a small portion of southern Placer Counties, California
	Gas Pipeline	Pipeline runs through Yolo and
Effective Date:	**April 1, 2004**	Sacramento Counties, California with customers in Sacramento County only

Name of Party:	**Salt River Project Agricultural Improvement and Power District**	Service Area: Phoenix and surrounding area
Utility Type:	**Electric and Water**	
Effective Date:	**May 21, 2004**	

Name of Party:	**Seattle City Light**	Service Area: Burien, Lake Forest Park, Normandy Park, Renton, SeaTac, Seattle, Shoreline, Tukwila, Unincorporated King County
Utility Type:	**Publicly Owned Utility**	
Effective Date:	**February 8, 2007**	

Name of Party:	**Snohomish County PUD No. 1**	Service Area: Snohomish County and Camano Island, State of Washington
Utility Type:	**Electric and Water**	
Effective Date:	**December 10, 2010**	

ATTACHMENT A
Parties to the
Western Region Mutual Assistance Agreement

Name of Party:	**Southern California Edison Company**	Service Area: Southern California
Utility Type:	**Electric**	
Effective Date:	**November 12, 2003**	

Name of Party:	**Southwest Gas Corporation**	Service Area: NV: Northern - Carson City, Elko, Winnemucca, Southern - Las Vegas, Bullhead City CA: Barstow, Big Bear, Needles, Victorville AZ: Central – Phoenix, Tempe, Southern - Tucson, Sierra Vista, Douglas
Utility Type:	**Natural Gas**	
Effective Date:	**April 8, 2005**	

Name of Party:	**Terasen Gas Inc**	Service Area: Most areas of British Columbia including Vancouver Island
Utility Type:	**Natural Gas**	
Effective Date:	**December 1, 2003**	

Name of Party:	**The Gas Company, LLC**	Service Area: State of Hawaii
Utility Type:	**Gas**	
Effective Date:	**November 13, 2003**	

Name of Party:	**Tucson Electric Power Company**	Service Area: Tucson, Arizona Santa Cruz County, Arizona
Utility Type:	**Electric**	
Effective Date:	**June 23, 2005**	

Name of Party:	**Tuscarora Gas Transmission Company**	Service Area: Southern Oregon Northeastern California Northwestern Nevada
Utility Type:	**Interstate Natural Gas Pipeline**	
Effective Date:	**August 26, 2004**	

ATTACHMENT C

ACTIVATION OF WESTERN REGION MUTUAL ASSISTANCE AGREEMENT

Procedures for Requesting and Providing Assistance

A. The Requesting Party shall include the following information, as available, in its request for Assistance:

- A.1 A brief description of the emergency situation creating the need for Assistance;
- A.2 A general description of the damage sustained by the Requesting Party, including the part of the utility system, e.g., generation, transmission, substation, or distribution, affected by the emergency situation;
- A.3 The number and type of personnel, equipment, vehicles, materials and supplies needed;
- A.4 A reasonable estimate of the length of time that the Assistance will be needed;
- A.5 The name(s) and contact information of individuals employed by the Requesting Party who will be the Mutual Assistance Coordinator(s) and Operations Liaison(s);
- A.6 A specific time and place for the designated representative of the Requesting Party to meet the personnel and equipment being provided by the Assisting Party;
- A.7 Type of fuel available (gasoline, propane, CNG or diesel) to operate equipment;
- A.8 Availability of food and lodging for personnel provided by the Assisting Party; and
- A.9 Current weather conditions and weather forecast for the following twenty-four hours or longer.

B. The Assisting Party, in response to a request for Assistance, shall provide the following information, as available, to the Requesting Party:

- B.1 The name(s) and contact information of designated representative(s) to act as Mutual Assistance Coordinator(s).
- B.2 The number and type of crews and equipment available to be furnished;
- B.3 The name and title of the crew members responding to the Assistance;
- B.4 Materials available to be furnished;
- B.5 An estimate of the length of time that personnel and equipment will be available;
- B.6 The name and contact information of the person(s) to be designated as supervisory personnel to accompany the crews and equipment; and
- B.7 When and where Assistance will be provided, giving consideration to the request set forth in section A.6 above.

ATTACHMENT C-1

ACTIVATION OF WESTERN REGION MUTUAL ASSISTANCE AGREEMENT

Sample Written Request for Assistance

Date
Assisting Party Name
Assisting Party Address

"In recognition of the personnel, material, equipment, supplies and/or tools being sent to us by [name of Assisting Party] in response to a request for mutual assistance made by [Requesting Party] on [date of request], we agree to be bound by the principles noted in the Western Region Mutual Assistance Agreement (Electric and Natural Gas).

(Brief Statement of What Assistance)

[Requesting Party Name]

[Authorized Representative of Requesting Party].

ATTACHMENT D

DEACTIVATION UNDER WESTERN REGION MUTUAL ASSISTANCE AGREEMENT

Procedures for Deactivation of Assistance

A. The Requesting Party shall, as appropriate, include the following in their Deactivation:

A.1. Number of crews returning and, if not all crews are returning, expected return date of remaining crews
A.2. Notification to the Assisting Party of the time crews will be departing.
A.3. Whether crews have been rested prior to their release or status of crew rest periods
A.4. Advisement to the Assisting Party regarding current weather and travel conditions and suggested routing

B. The Assisting Party shall, as appropriate, include the following in their Deactivation:

B.1. Return of any equipment, material, tools, or supplies provided by the Requesting Party
B.2. Provision of any information that may be of value to the Requesting Party in their critique of response efforts
B.3. Estimation as to when billing will be available
B.4. Billing to include detail under headings as outlined in Section 4.0 of this Agreement.
B.5. Retention of documentation as specified in Section 5.3 of the Mutual Assistance Agreement.
B.6. Confirmation that all information pertaining to the building, modification, or other corrective actions taken by the Assisting Party have been appropriately communicated to the Requesting Party

ATTACHMENT E
CUSTODIANSHIP OF WESTERN REGION
MUTUAL ASSISTANCE AGREEMENT

Responsibilities of the Western Region Mutual Assistance Agreement (Electric and Natural Gas) Custodian are:

A. Act as the single repository for all original signature pages, changes, updates, and addendums to the Agreement, including Attachment B.

B. Ensure all Parties provide an annual update of the Authorized Representative and Alternate Authorized Representative(s), as identified in Attachment "B", no later than December 15 of each year.

C. Distribute annual update of Attachment "B" no later than January 15 of each year.

D. Coordinate and facilitate meetings of the parties to the Agreement, as necessary, to include an after action review of recent mutual assistance activations and document changes requested by any party to the Agreement. An annual meeting will also be held to review general mutual assistance issues, and assignment of the Agreement Custodian for the next year.

E. Assist and guide utilities interested in becoming a party to the Agreement by providing a copy of the existing Agreement for their review and signature pursuant to Section 6.3 of this Agreement.

F. Facilitate any necessary reviews of the Agreement.

G. Term of the Custodian responsibilities is annual and will commence on February 1, and terminate on January 31 of the following year. There are no limits to the number of terms or consecutive terms of the custodian. The name and contact information for the current Agreement Custodian will be provided as part of the Attachment B update as outlined in A and B above.

ATTACHMENT F

SUPPLEMENTAL INVOICE INFORMATION

Sections 4 and 5 of this Mutual Assistance Agreement provide for the accumulation of costs incurred by the Assisting Party to be billed to the Requesting Party for Assistance provided. Each utility company has their own accounts receivable or other business enterprise system that generates their billing invoices. Generally these invoices do not provide for a breakdown of costs that delineate labor hours, transportation costs, or other expenses incurred in travel to and from the Assistance, or the subsequent repair of equipment that may be necessary.

This attachment provides guidelines, format and explanations of the types of cost breakdown, and supportive information and documentation that are important to accompany the invoice for providing of mutual assistance. It is intended to provide sufficient information to the Requesting Party at the time of invoice to minimize an exchange of detail information requests that may delay the payment of the invoice.

This information in no way eliminates or minimizes the Requesting Party's ability to audit the information or request additional cost detail or documentation.

Supplemental Invoice Information is a recommendation and not a requirement.

The form is available electronically from the Agreement Custodian.

This supplemental invoice information is provided pursuant to Sections 4.0 & 5.0 of the Western Region Mutual Assistance Agreement for Electric and Natural Gas, for assistance provided. ***(RP = Requesting Party, AP = Assisting Party)***

AP Invoice Date: _____

AP Invoice #: _____

RP Purchase Order # *1* _____

RP Reference or W/O# *2* _____

Bill To: *3* (Requesting Party)

Address: _____

Phone: _____

Attention: *5* _____

Remit To: *4* (Assisting Party)

Address: _____

Phone: _____

Attention: *6* _____

Name or Description of Event: _____

Location of Assistance or Event: _____

Assistance / Billing Period: From: *7* _____ (Date Assistance Accepted:) To: *8* _____ (Date Demobilization Complete:)

LABOR 1: *Employee Wages and Salary while at RP Service Area 9*

Labor:	*Hours*	Wages	*Additives*	
Straight Time, Overtime and Premiums:				***LABOR 1 Subtotal:***

LABOR 2: *Employee Wages and Salary while traveling to and from RP Service Area 10*

Labor:	*Hours*	Wages	*Additives*	
Straight Time, Overtime and Premiums:				***LABOR 2 Subtotal:***

LABOR 3: *Employee Wages and Salary of service and support personnel not traveling to RP Service Area 11*

Labor:	*Hours*	Wages	*Additives*	
Straight Time, Overtime and Premiums:				***LABOR 3 Subtotal:***

LABOR 4: *Overtime Wages and Salary Incurred in AP Service Area as a Result of Assistance 12*

Labor:	*Hours*	Wages	*Additives*	
Overtime and Premiums:				***LABOR 4 Subtotal:***

LABOR TOTAL ***TOTAL Wages, Salaries and Payroll Additives:*** _____

MATERIALS: *Cost of materials, supplies, tools, and repair or replacement of non-fleet equipment used in assistance* 13

MATERIALS TOTAL ***TOTAL Materials, Equipment, etc. and Additives:*** _____

TRANSPORTATION: *Cost of vehicles and equipment including parts and repairs and Additives (No Wages)*

Fleet Costs: *(Hourly or Use Charge for vehicles and equipment and Additives)* 14 _____

Repair Costs: *(Cost of repair or replacement of vehicles and equipment, excluding labor)* 15 _____

TRANSPORTATION TOTAL ***TOTAL Vehicles, Equipment, etc. and Additives:*** _____

EXPENSE: *Cost of transporting employees and equipment, to and from RP's Service area, and living expenses not provided by RP.*

Transportation Expense: *Cost to transport vehicles and equipment (fleet) to and from RP Service Area* 16 _____

Travel Expense: *Cost to transport personnel, airfare etc., (non-fleet equip/tools) to and from RP Service Area* 17 _____

Living Expense: *Cost of meals, lodging and incidentals not provided by RP or incurred during travel* 18

Meals: _____ *Lodging:* _____ *Incidentals:* _____ _____

EXPENSE TOTAL ***TOTAL Transportation, Travel and Living and Additives:*** _____

ADMINISTRATIVE & GENERAL COSTS: *Cost properly allocable to the Assistance and not charged in above sections* 19 _____

ADMINISTRATIVE & GENERAL TOTAL ***TOTAL Administrative & General:*** _____

All costs and expenses of Assisting Company are summarized in this Invoice.

Pay This Amount: _____

(A Form W-9, Request for Taxpayer Identification Number and Certification, has been included with this invoice.) 20

Instructions and Explanations

This information provides a breakdown of costs incurred in the providing of assistance, and is intended to provide sufficient details to allow Requesting Party to expedite payment by minimizing requests for detailed information. This detailed breakdown, and supportive documentation, should supplement the remittance invoice normally generated by the utility's business enterprise or accounts receivable systems.

Reference Section Explanations: (Numbers correspond to sections on preceding supplemental invoice page(s).) *(Information in parentheses and italics are references to the related section of the CUEA MAA)*

1 If Requesting Company has designated a Purchase Order to be used for this remittance, provide the PO number in this space.

2 If Requesting Company has designated a Work Order or Tracking number to be used for this remittance, provide the number here.

3 This "Bill To" address is designated by the Requesting Party and may be the same as the Billing / Payment Address as it appears on the Assisting Company's "Attachment B" of the Agreement. *(Sec. 4.2)*

4 This "Remittance Address" is the address specified on the Assisting Company's Primary Invoice.

5 The person identified in Billing / Payment section of Requesting Party's "Attachment B", or Authorized Representative, or the Requesting Party's designated Mutual Assistance Coordinator.

6 The person identified in Billing / Payment section of Requesting Party's "Attachment B", or Authorized Representative, or the Assisting Party's designated Mutual Assistance Coordinator.

7 The date the assistance was agreed to commence. *(Sec. 3.2, 3.5,)*

8 The date the assistance demobilization is complete. *(Sec. 3.5, Att D) (Note: subsequent repair or replacement costs incurred by the AP may be realized and billed past this date, as noticed by the AP to the RP in writing.)*

9 Labor 1: This total includes all hourly wages, including straight time, overtime, premium pay and payroll additives that are the normal payroll of the Assisting Party. This is for time worked in the Requesting Party's service area, and does NOT include time or pay for travel to, or from, the Requesting Party's service area. Labor 1 total includes all employees, management and supervision, that physically traveled to the Requesting Party's service area. (The numbers are reported as totals for Hours, Wages, and Additives (premiums and additives reported in same total). Supportive information such as time sheets, or spreadsheets, that break down the totals reported, is strongly recommended.) *(Sec. 4.1(a))*

10 Labor 2: This total includes all hourly wages, including straight time, overtime, premium pay and payroll additives that are the normal payroll of the Assisting Party. This is for time or pay for travel to, or from, the Requesting Party's service area, and does NOT include time worked in RP's service area. Labor 2 total includes all employees, management and supervision, that physically traveled to the Requesting Party's service area. (The numbers are reported as totals for Hours, Wages, and Additives (premiums and additives reported in same total). Supportive information such as time sheets, or spreadsheets, that break down the totals reported, is strongly recommended.) *(Sec. 4.1(b))*

11 Labor 3: This total includes all hourly wages, including straight time, overtime, premium pay and payroll additives that are the normal payroll of the Assisting Party. This is for time or pay for employees, management, or supervision that is directly attributed to the assistance, but did NOT travel to the Requesting Party's service area. Labor 3 total may include support services in the Assisting party's own service area such as warehouse, fleet, Assistance Liaisons, administrative and coordination personnel. (The numbers are reported as totals for Hours, Wages, and Additives (premiums and additives reported in same total). (Supportive information such as time sheets, or spreadsheets, that break down the totals reported, is strongly recommended.) *(Sec. 4.1)*

12 Labor 4: This total includes only overtime pay and additives that are incurred by the Assisting Party for emergency response in the Assisting Party's service area, that is directly attributable to the providing of assistance. This total requires detailed support information and explanation provided to the Requesting Party prior to the inclusion of costs for assistance. *(Sec. 4.1 (f))*

13 Materials: This total includes all non-fleet equipment, tools and supplies, provided by Assisting Party's warehouse or other supplier that was used, consumed, or has normally applied overhead costs or depreciation, as outlined in the agreement. *(Sec. 4.1 (c))*

14 Transportation: This total includes the hourly or use charge of vehicles and equipment, and normally applies overheads and additives, for all vehicles and equipment used in the providing of assistance. These are direct *"Fleet"* costs excluding labor, which is included in Labor totals. *(Sec. 4.1 (d))*

15 Transportation: This total includes cost of repair or replacement of vehicles or equipment used in the providing of assistance, by AP, dealer service, or contracted repairs, including all normally applies overheads and additives. These are direct *"Fleet"* costs excluding labor, which is included in Labor totals. *(Sec. 4.1 (d))*

16 Transportation Expense: This total includes only the incurred costs of transporting, by contractor or entity other than the AP or RP, the fleet vehicles and equipment to RP's service area, and return to AP's home base. (Supportive information such as contract carrier's invoice or trip tickets is recommended.)

17 Travel Expense: These include all costs incurred by AP for the transportation of personnel to and from the RP's service area. These include airfare, cab fare, rental vehicles, or any other transportation not provided by the RP. It also included the

transportation or shipping costs of non-fleet tools or equipment to and from the RP's service area. *(Sec. 4.1(b))*

18 Living Expense: This includes all meals, lodging, and incidentals incurred during travel to and from RP's service area. It includes any of these costs incurred while working in the RP's service area that were not provided by the RP. *(Sec. 4.1(b))*

19 Administrative and General Costs: This includes all costs that are allocable to the Assistance, to the extent that they are not included in all the foregoing costs identified in this invoice. *(Sec. 4.1(e))*

20 Form W-9, Tax Identification and Certification: This standard tax form should be completed and accompany this form, unless such information has been previously transmitted to the Requesting Company.

Edison Electric Institute
Mutual Assistance Agreement

Edison Electric Institute ("EEI") member companies have established and implemented an effective system whereby member companies may receive and provide assistance in the form of personnel and equipment to aid in restoring and/or maintaining electric utility service when such service has been disrupted by acts of the elements, equipment malfunctions, accidents, sabotage, or any other occurrence for which emergency assistance is deemed to be necessary or advisable ("Emergency Assistance"). This Mutual Assistance Agreement sets forth the terms and conditions to which the undersigned EEI member company ("Participating Company") agrees to be bound on all occasions that it requests and receives ("Requesting Company") or provides ("Responding Company") Emergency Assistance from or to another Participating Company who has also signed the EEI Mutual Assistance Agreement; provided, however, that if a Requesting Company and one or more Responding Companies are parties to another mutual assistance agreement at the time of the Emergency Assistance is requested, such other mutual assistance agreement shall govern the Emergency Assistance among those Participating Companies.

In consideration of the foregoing, the Participating Company hereby agrees as follows:

(1) When providing Emergency Assistance to or receiving Emergency Assistance from another Participating Company, the Participating Company will adhere to the written principles developed by EEI members to govern Emergency Assistance arrangements among member companies ("EEI Principles"), that are in effect as of the date of a specific request for Emergency Assistance, unless otherwise agreed to in writing by each Participating Company.

(2) With respect to each Emergency Assistance event, Requesting Companies agree that they will reimburse Responding Companies for all costs and expenses incurred by Responding Companies in providing Emergency Assistance as provided under the EEI Principles, unless otherwise agreed to in writing by each Participating Company; provided, however, that Responding Companies must maintain auditable records in a manner consistent with the EEI Principles.

(3) During each Emergency Assistance event, the conduct of the Requesting Companies and the Responding Companies shall be subject to the liability and indemnification provisions set forth in the EEI Principles.

(4) A Participating Company may withdraw from this Agreement at any time. In such an event, the company should provide written notice to EEI's Director of Security of Transmission and Distribution Operations.

(5) EEI's Director of Security of Transmission and Distribution Operations shall maintain a list of each Participating Company which shall be posted on the RestorePower web site at www.restorepower.com. However, a Participating Company may request a copy of the signed Mutual Assistance Agreement of another Participating Company prior to providing or receiving Emergency Assistance.

Pacific Power

Company Name

Doug Butler

Signature

Officer Name: Doug Butler
Title: VP, T&D Operations
Date: June 3, 2013

EDISON ELECTRIC INSTITUTE RESTOREPOWER

SUGGESTED GOVERNING PRINCIPLES COVERING EMERGENCY ASSISTANCE ARRANGEMENTS BETWEEN EDISON ELECTRIC INSTITUTE MEMBER COMPANIES

Electric companies have occasion to call upon other companies for emergency assistance in the form of personnel or equipment to aid in maintaining or restoring electric utility service when such service has been disrupted by acts of the elements, equipment malfunctions, accidents, sabotage or any other occurrences where the parties deem emergency assistance to be necessary or advisable. While it is acknowledged that a company is not under any obligation to furnish such emergency assistance, experience indicates that companies are willing to furnish such assistance when personnel or equipment are available.

In the absence of a continuing formal contract between a company requesting emergency assistance ("Requesting Company") and a company willing to furnish such assistance ("Responding Company"), the following principles are suggested as the basis for a contract governing emergency assistance to be established at the time such assistance is requested:

1. The emergency assistance period shall commence when personnel and/or equipment expenses are initially incurred by the Responding Company in response to the Requesting Company's needs. (This would include any request for the Responding Company to prepare its employees and/or equipment for transport to the Requesting Company's location but to await further instructions before departing). The emergency assistance period shall terminate when such employees and/or equipment have returned to the Responding Company, and shall include any mandated DOT rest time resulting from the assistance provided and reasonable time required to prepare the equipment for return to normal activities (e.g. cleaning off trucks, restocking minor materials, etc.).

2. To the extent possible, the companies should reach a mutual understanding and agreement in advance on the anticipated length – in general – of the emergency assistance period. For extended assistance periods, the companies should agree on the process for replacing or providing extra rest for the Responding Company's employees. It is understood and agreed that if; in the Responding Company's judgment such action becomes necessary the decision to terminate the assistance and recall employees, contractors, and equipment lies solely with the Responding Company. The Requesting Company will take the necessary action to return such employees, contractors, and equipment promptly.

3. Employees of Responding Company shall at all times during the emergency assistance period continue to be employees of Responding Company and shall not be deemed employees of Requesting Company for any purpose. Responding Company shall be an independent Contractor of Requesting Company and wages, hours and other terms and conditions of employment of Responding Company shall remain applicable to its employees during the emergency assistance period.

4. Responding Company shall make available at least one supervisor in addition to crew foremen. All instructions for work to be done by Responding Company's crews shall be given by Requesting Company to Responding Company's supervisor(s); or, when

Responding Company's crews are to work in widely separate areas, to such of Responding Company's foremen as may be designated for the purpose by Responding Company's supervisor(s).

5. Unless otherwise agreed by the companies, Requesting Company shall be responsible for supplying and/or coordinating support functions such as lodging, meals, materials, etc. As an exception to this, the Responding Company shall normally be responsible for arranging lodging and meals en route to the Receiving Company and for the return trip home. The cost for these in transit expenses will be covered by the requesting company.

6. Responding Company's safety rules shall apply to all work done by their employees. Unless mutually agreed otherwise, the Requesting Company's switching and tagging rules should be followed to ensure consistent and safe operation. Any questions or concerns arising about any safety rules and/or procedures should be brought to the proper level of management for prompt resolution between management of the Requesting and Responding Companies.

7. All time sheets and work records pertaining to Responding Company's employees furnishing emergency assistance shall be kept by Responding Company.

8. Requesting Company shall indicate to Responding Company the type and size of trucks and other equipment desired as well as the number of job function of employees requested but the extent to which Responding Company makes available such equipment and employees shall be at Responding Company's sole discretion.

9. Requesting Company shall reimburse Responding Company for all costs and expenses incurred by Responding Company as a result of furnishing emergency assistance. Responding Company shall furnish documentation of expenses to Requesting Company. Such costs and expenses shall include, but not be limited to, the following:

   a. Employees' wages and salaries for paid time spent in Requesting Company's service area and paid time during travel to and from such service area, plus Responding Company's standard payable additives to cover all employee benefits and allowances for vacation, sick leave and holiday pay and social and retirement benefits, all payroll taxes, workmen's compensation, employer's liability insurance and other contingencies and benefits imposed by applicable law or regulation.

   b. Employee travel and living expenses (meals, lodging and reasonable incidentals).

   c. Replacement cost of materials and supplies expended or furnished.

   d. Repair or replacement cost of equipment damaged or lost.

   e. Charges, at rates internally used by Responding Company, for the use of transportation equipment and other equipment requested.

f. Administrative and general costs, which are properly allocable to the emergency assistance to the extent such costs, are not chargeable pursuant to the foregoing subsections.

10. Requesting Company shall pay all costs and expenses of Responding Company within sixty days after receiving an invoice therefor.

11. Requesting Company shall indemnify, hold harmless and defend the Responding Company from and against any and all liability for loss, damage, cost or expense which Responding Company may incur by reason of bodily injury, including death, to any person or persons or by reason of damage to or destruction of any property, including the loss of use thereof, which result from furnishing emergency assistance and whether or not due in whole or in part to any act, omission, or negligence of Responding Company except to the extent that such death or injury to person, or damage to property, is caused by the willful or wanton misconduct and / or gross negligence of the Responding Company. Where payments are made by the Responding Company under a workmen's compensation or disability benefits law or any similar law for bodily injury or death resulting from furnishing emergency assistance, Requesting Company shall reimburse the Responding Company for such payments, except to the extent that such bodily injury or death is caused by the willful or wanton misconduct and / or gross negligence of the Responding Company..

12. In the event any claim or demand is made or suit or action is filed against Responding Company alleging liability for which Requesting Company shall indemnify and hold harmless Responding Company under paragraph (11) above, Responding Company shall promptly notify Requesting Company thereof, and Requesting Company, at its sole cost and expense, shall settle, compromise or defend the same in such manner as it in its sole discretion deems necessary or prudent. Responding Company shall cooperate with Requesting Company's reasonable efforts to investigate, defend and settle the claim or lawsuit.

13 Non-affected companies should consider the release of contractors during restoration activities. The non-affected company shall supply the requesting companies with contact information of the contactors (this may be simply supplying the contractors name). The contractors will negotiate directly with requesting companies.

Last update September 2005

- Section 11 and 12 updated

Exhibit B

PacifiCorp

Tabletop Exercise

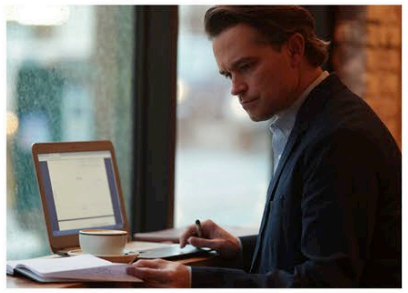
Siskiyou County

Emergency Plan Coordination Meeting and Public Safety Power Shutoff

May 26, 2022








PACIFIC POWER

POWERING YOUR GREATNESS

Agenda

- Critical Facility Portal Presentation
  - 10:00 -10:15
- Introduction to Exercise Scenario
  - 10:15 – 10:30
- Functional Exercise
  - 10:30 – 12:15
- Hotwash
  - 12:15 – 1:00

Exercise Execution

- Functional Exercise is an operations-based exercise which the exercise participants complete their assigned tasks as opposed to discussion-based actions like in a Tabletop Exercise
- No fault environment
- This is the time to find any issues
- Mistakes are expected, better to make them in this environment than during an actual response
- Provide input to roles and responsibilities section of plan
- Improvement will come from your input
- Review plan as exercise progresses looking for holes
- Attempted to keep scenario realistic, however some variances are taken for exercise purposes
- Surveys have been provided, please make notes and return to Emergency Management at the end of the event

Past Event Lessons Learned

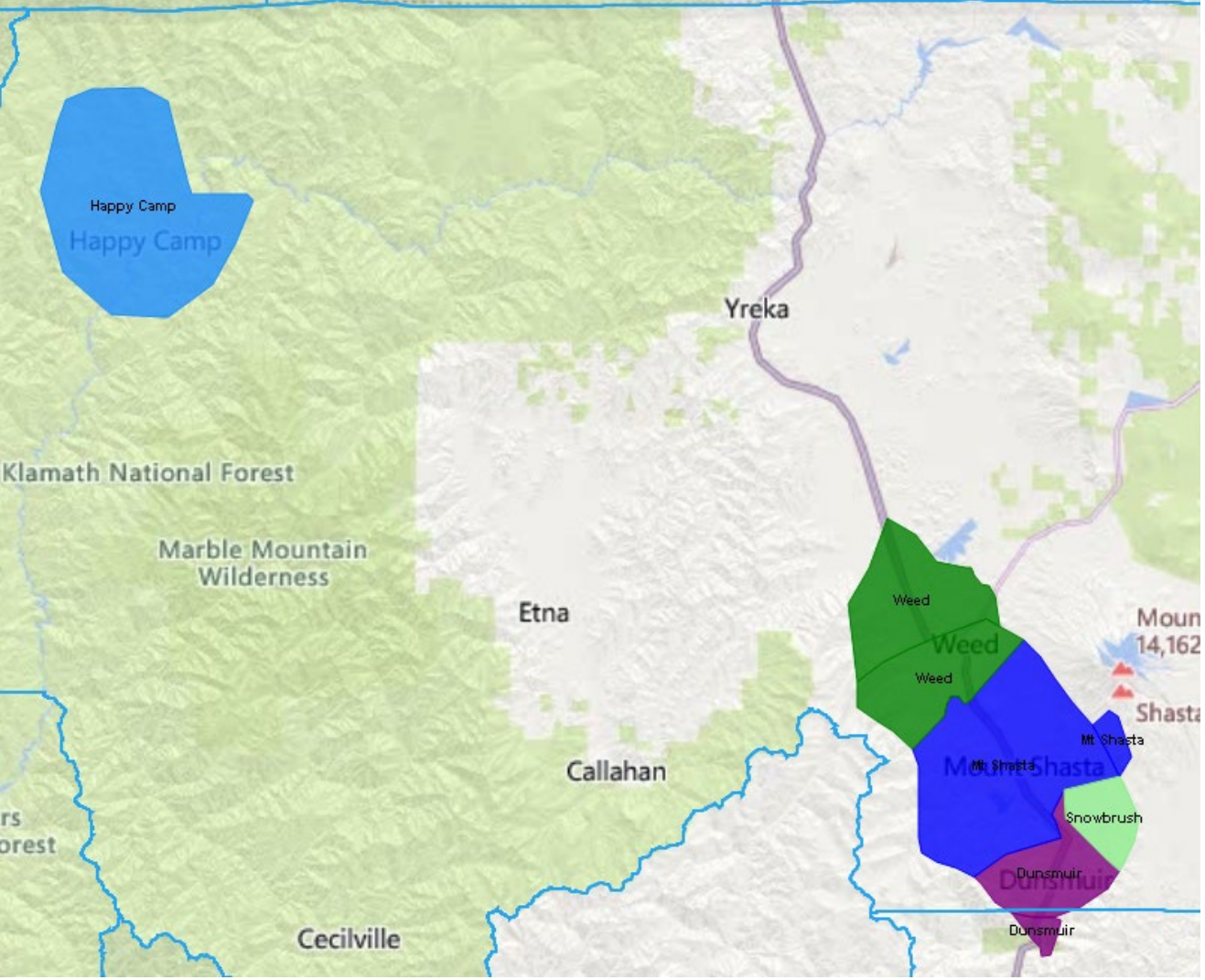
Date	Observation	Action Item/Recommendation	Responsible Person
5/25/2021 TTX	AFN outreach remains a topic for improvement, the county and Pacific Power continue to strive to conduct outreach to the entire AFN population.	Coordinate AFN population outreach	Customer Service
5/25/2021 TTX	Ensuring Joint Information System has timely and accurate information for distribution is a key concern	Continue planning JIS procedures	Public Information Officer
5/25/2021 TTX	Communications capability for direct customer outreach prior to event has limited bandwidth and channels need confirmed	Communications companies in coordination with the county will advise on any solutions	Siskiyou County
8/17/21 PSPS	Confirmation of notifications was delayed and inconsistent	Delays in the detection of notification errors resulted in a deviation from the notification plan.	Customer Service/ Telecommunications Providers
8/17/21 PSPS	AFN and Medical Baseline notifications were not confirmed. In person notification procedures were ad hoc and need refined.	Coordinate roles and responsibilities for AFN/MBL in person customer notification	PacifiCorp EM and County EM
8/17/21 PSPS	CRC information can be communicated better to customers.	Incorporating scripts for automated phone calls to customers providing CRC information will be helpful.	Customer Service and Regional Business Managers
8/17/21 PSPS	Real time production of GIS mapping data was more challenging to produce and distribute than anticipated.	Challenges delayed the ability to share with public safety partners; ability to expedite this process in the future will allow for better planning.	PacifiCorp GIS team

Exercise Goals and Objectives

Exercise Goals
Enhance general awareness of PacifiCorp Public Safety Power Shutoff plans
Enhance understanding roles and responsibilities
Validate plans and procedures
Discuss concepts and/or assess types of systems in a defined incident

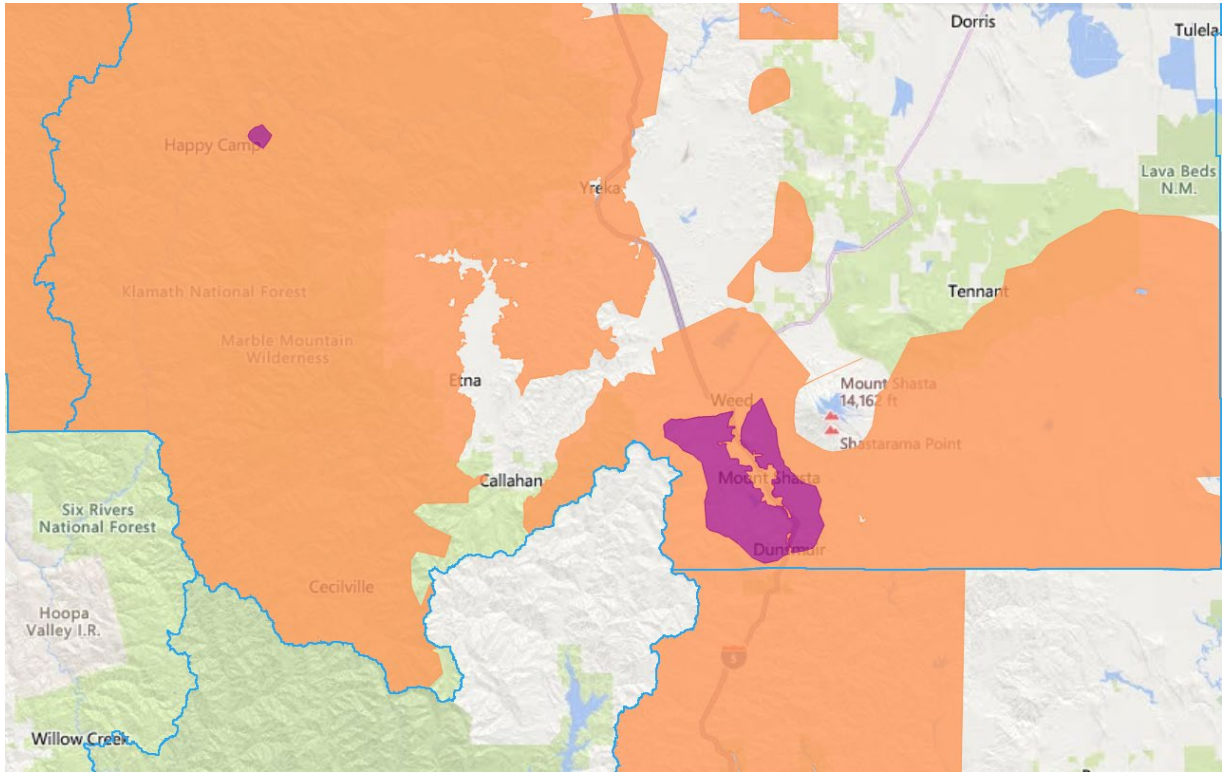
Exercise Objectives
1. Ensure communications channels are viable during PSPS event
2. Evaluate AFN/MBL customer notification process to include in person notification
3. Explore Pacific Powers plans for allocating resources during PSPS events.

Exercise Affected Area



Potential affected households or businesses:

- Happy Camp 865
- Weed 2,589
- Mt Shasta 5,074
- Dunsmuir 1,806
- Snowbrush 17



Situation Update

- 72 and 48 hour notifications regarding weather forecast showing potential for PSPS executions are complete
- No pre-existing incidents in affected area
- Fire resources are providing mutual aid outside their normal jurisdictions

PACIFIC POWER
SYSTEM IMPACTS FORECAST MATRIX

Weather-Related System Impacts (Wx) / Fire Risk Potential (F) / Operational Response

CALIFORNIA	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response
Alturas		F			F			F			F			F	
Crescent City															
Tulelake		F			F			F			F			F	
Yreka		F			F		W	W		W	W			F	

Weather-Related System Impacts (Wx)

Outage Potential
- Widespread Outages with Extended Restoration
- Scattered to Widespread Outages
- Isolated to Scattered Outages
- No System Impacts Expected

Hazards
- (W) Wind
- (L) Lightning / Thunderstorms
- (I) Freezing Rain or Ice
- (S) Snow
- (H) Extreme Heat
- (R) Heavy Rain or Flooding

Fire Risk Potential (F)

GACC Risk Level (Significant Fire Potential)
- HIGH RISK (Windy and Dry - *OR* - Extremely Dry Fuels)
- Moderate Risk - *OR* - High Risk for Non-Windy Weather
- Low Risk

Reason for High Risk
- (W) Wind
- (L) Lightning
- (F) Extremely Dry Fuels
- (H) Hot with Low Humidity

Operational Response
- SP System Patrol
- FS Fire Settings
- NR No Reclose Settings
- PW PSPS Watch
- PS PSPS Event

24-Hour Forecast

PACIFIC POWER
SYSTEM IMPACTS FORECAST MATRIX

Weather-Related System Impacts (Wx) / Fire Risk Potential (F) / Operational Response

CALIFORNIA	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response
Alturas		F			F			F			F			F	
Crescent City															
Tulelake		F			F			F			F			F	
Yreka		F		W	W		W	W			F			F	

Weather-Related System Impacts (Wx)

Outage Potential

- Widespread Outages with Extended Restoration
- Scattered to Widespread Outages
- Isolated to Scattered Outages
- No System Impacts Expected

Hazards

- (W) Wind
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Fire Risk Potential (F)

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Reason for High Risk

- (W) Wind
- (L) Lightning
- (F) Extremely Dry Fuels
- (H) Hot with Low Humidity

Operational Response

- SP: System Patrol
- FS: Fire Settings
- NR: No Reclose Settings
- PW: PSPS Watch
- PS: PSPS Event

Fire Weather

- ERCs are at 97th percentile values, KBDI and Fosberg indices are also at critical levels.
- The GACC has issued a Fuels and Fire Behavior Advisory and grasses are fully cured.
- Strong offshore winds and low RH are forecast for Friday-Saturday. Poor overnight RH recovery is also expected.

Wind

- Strong NE-SE winds may gust to 55-65 mph Friday and 45-55 mph Saturday across the Yreka District. System impacts are likely with these wind speeds.

Thunderstorm / Lightning

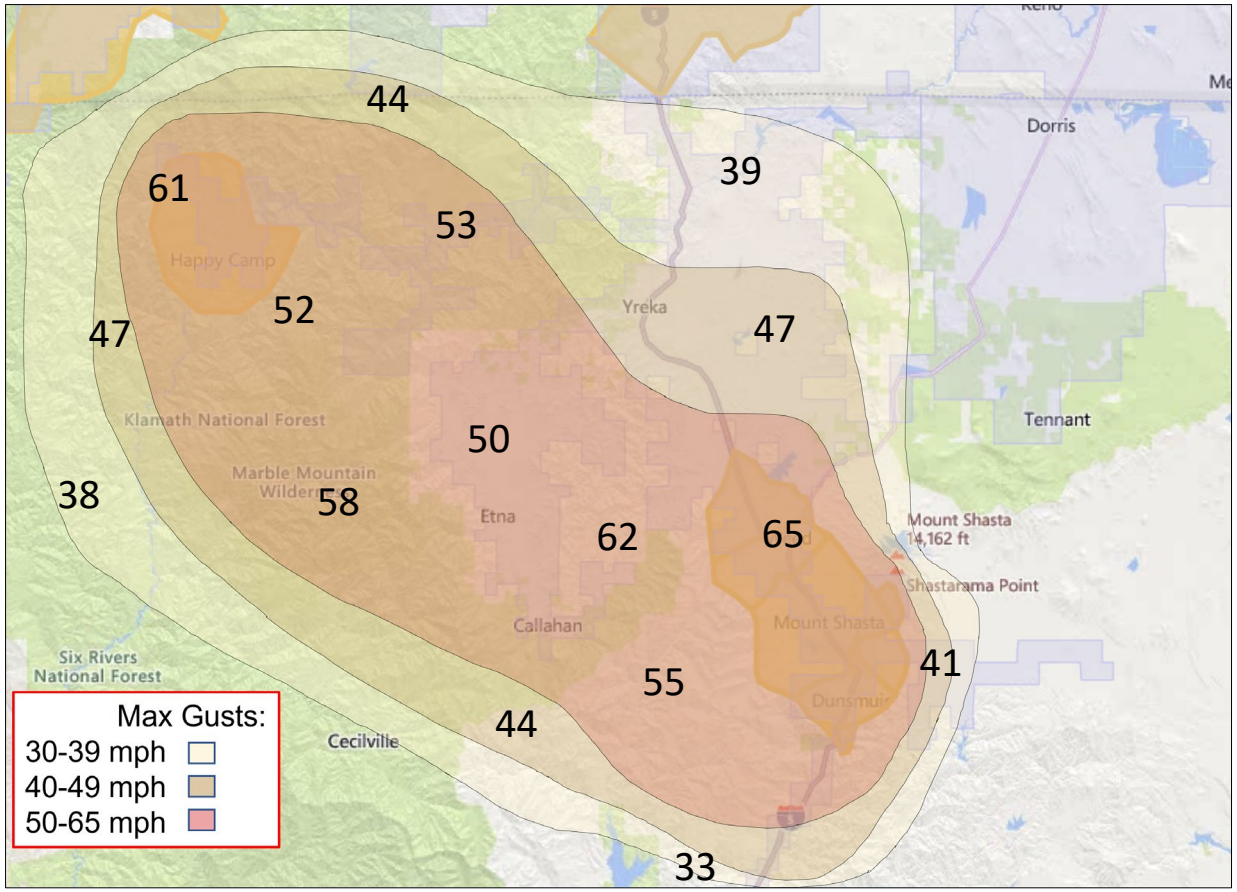
- Thunderstorms are not expected in the next 5 days.

Excessive Heat

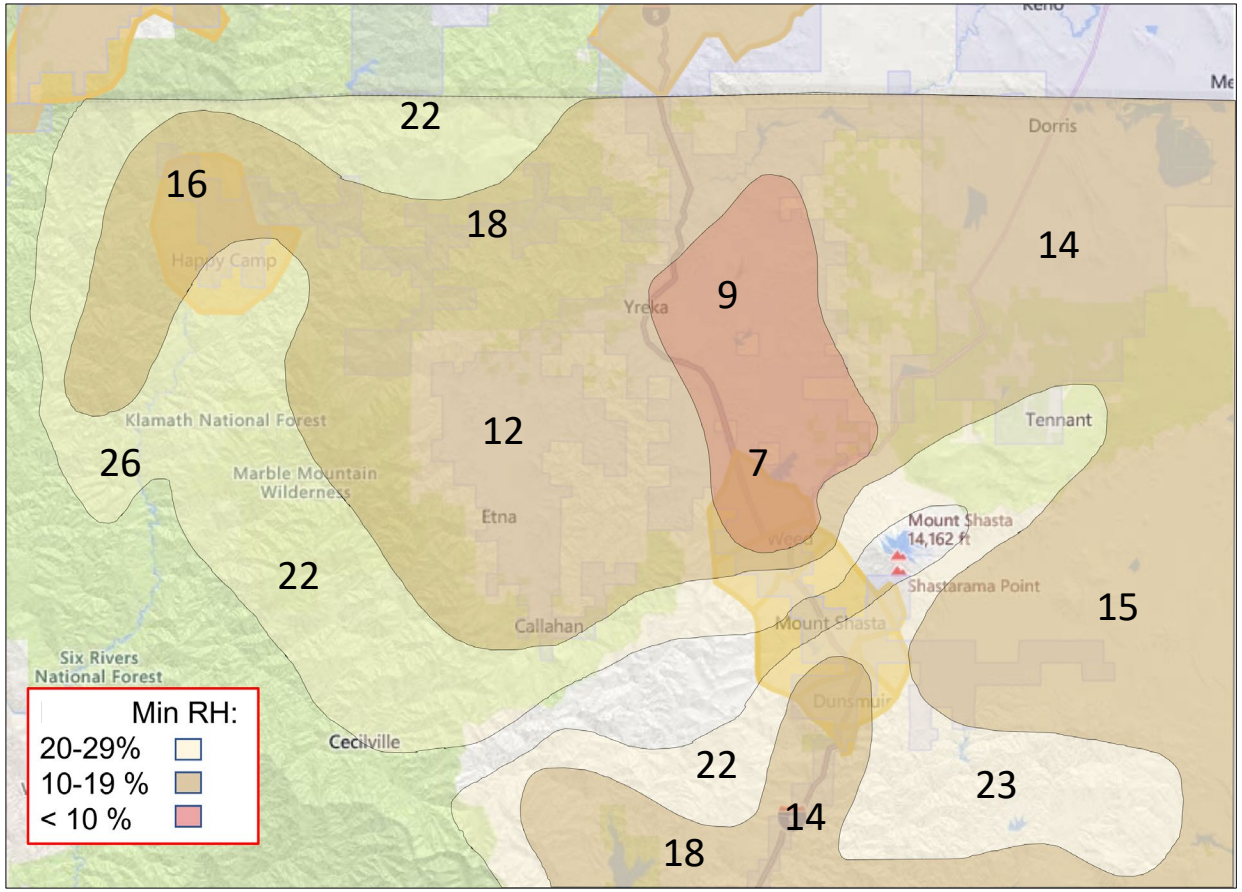
- Morning low temperatures will be 15-20 degrees warmer than average beginning Friday, leading to poor overnight RH recovery and the potential for active nighttime burning with any fires in the district.
- Afternoon temperatures will be 10-15 degrees above average.

24-hr FORECAST – *Siskiyou County, CA*

8 AM



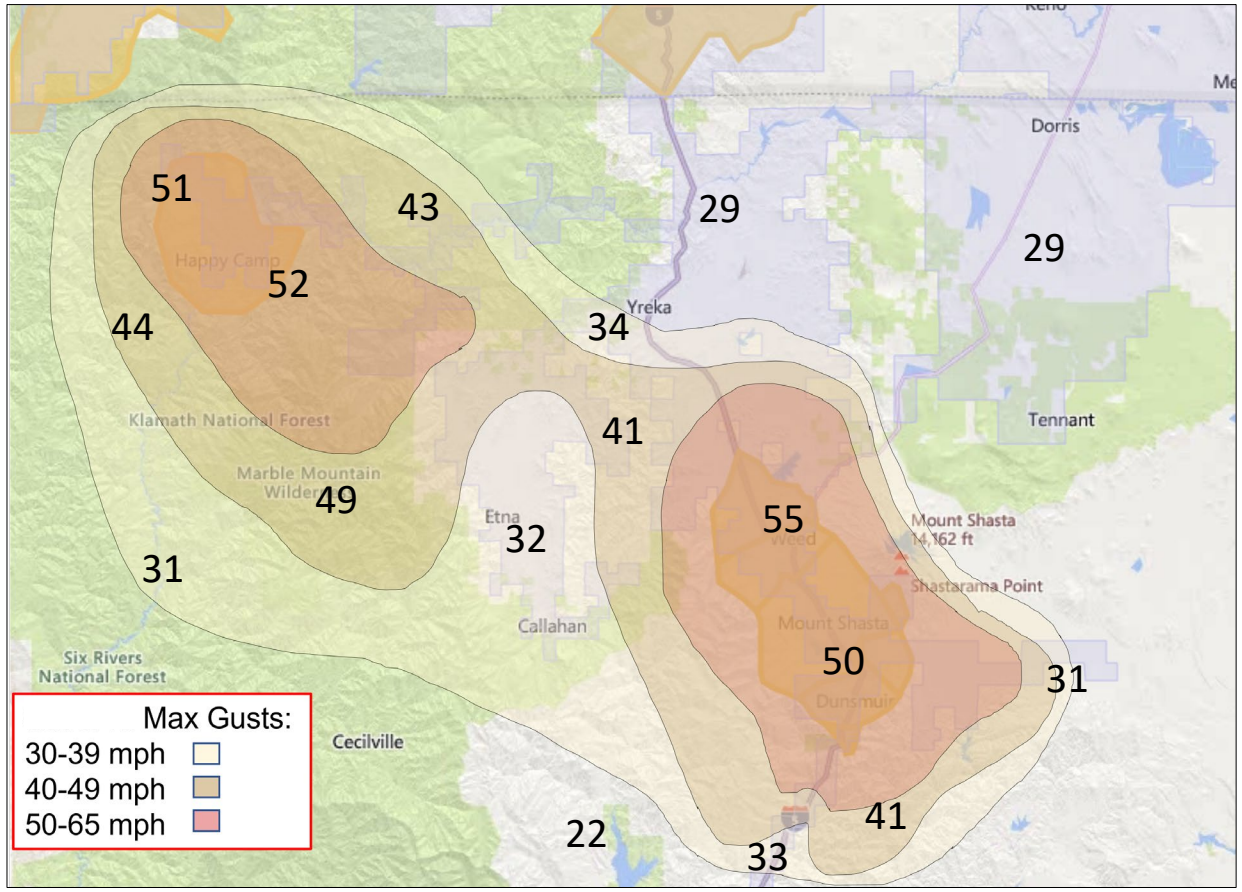
FORECAST FOR 12:00-10:00 PM

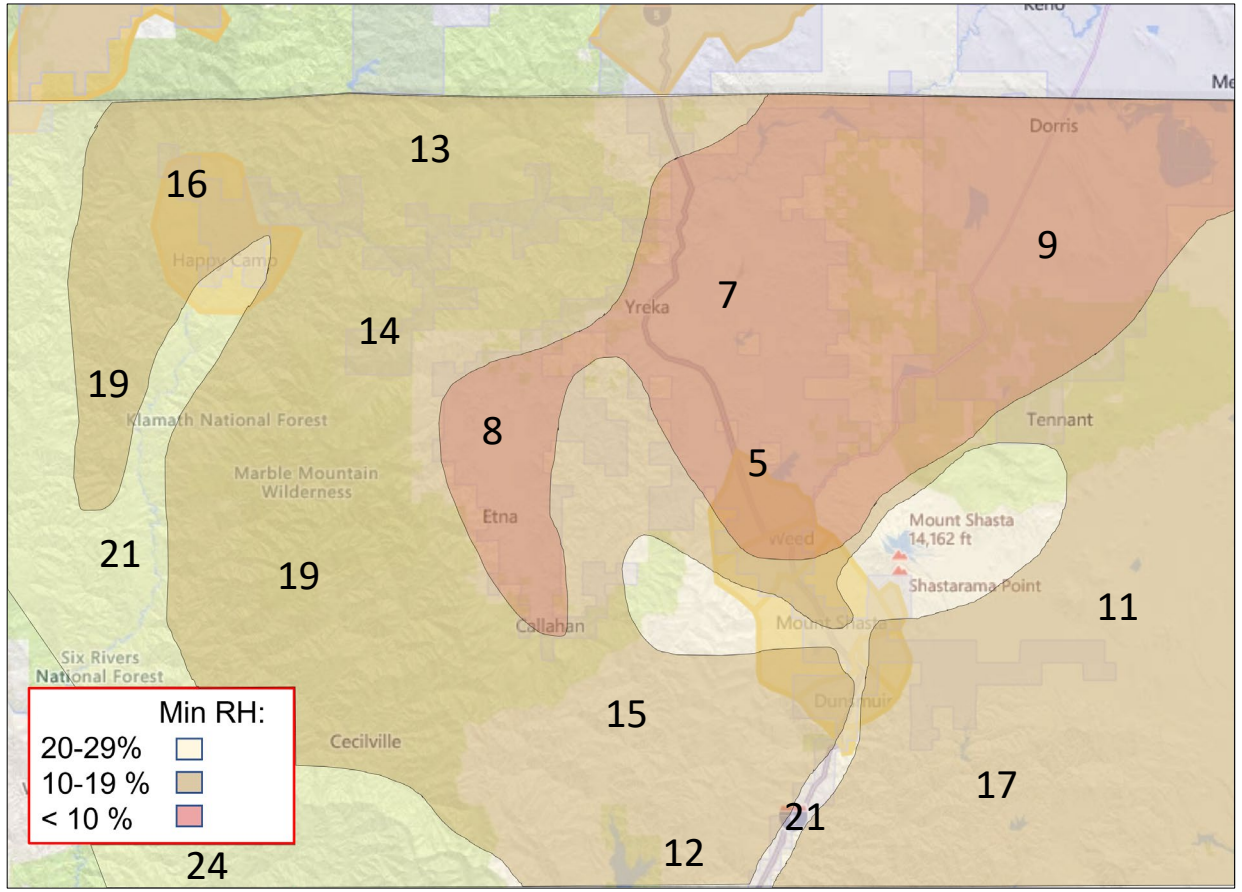


24-hr FORECAST – *Siskiyou County, CA*

8 AM

FORECAST FOR 9:00 AM - 2:00 PM





Execute Exercise Play

PACIFIC POWER

POWERING YOUR GREATNESS

Hotwash

- What went well?
- What challenges do we have?
- What if this had affected generation assets?
- How can we help you prepare for outages in the future?
- Potential solutions?
- Who owes what?
- Surveys

Questions and Comments

For more information about our emergency management program please contact:

Jeff Bolton
Emergency Manager
Pacific Power
503-260-7782 (c)

Tyler Averyt
Emergency Manager
Pacific Power
503-319-6901 (c)

Emergency Management Duty Officer 503-331-4498

Report a power outage
1-877-508-5088

Customer service
1-888-221-7070

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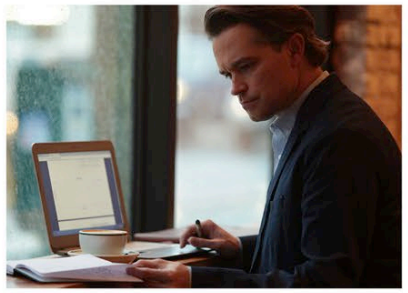
Siskiyou County

Emergency Plan Coordination Meeting and Public Safety Power Shutoff TTX

April 28, 2022





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POWERING YOUR GREATNESS

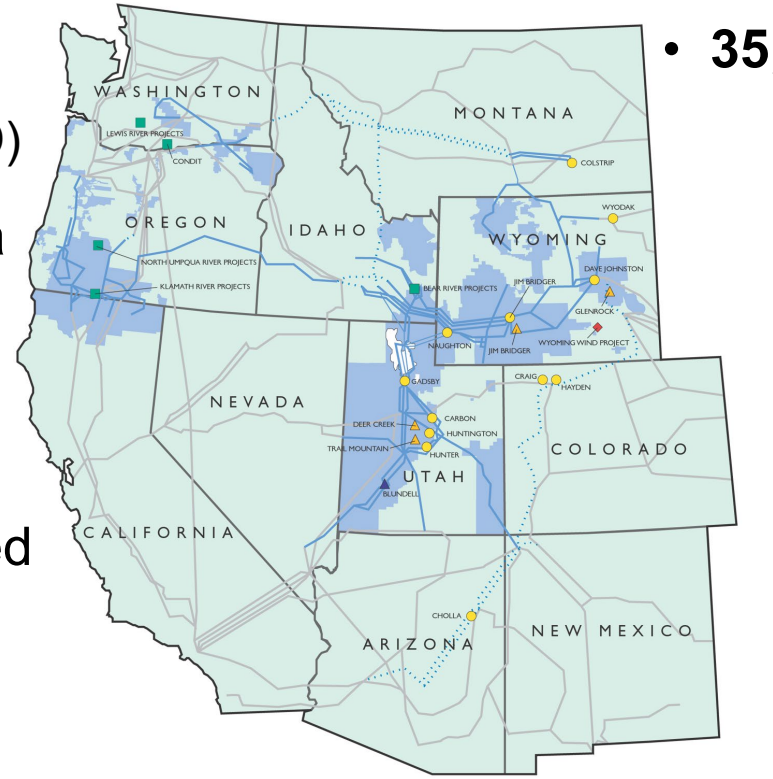
Agenda

- PacifiCorp Overview & Plan Coordination
  - Planning & Preparedness
  - Mitigation
  - Response & Recovery
- Tabletop Exercise
- Hotwash

Company Overview

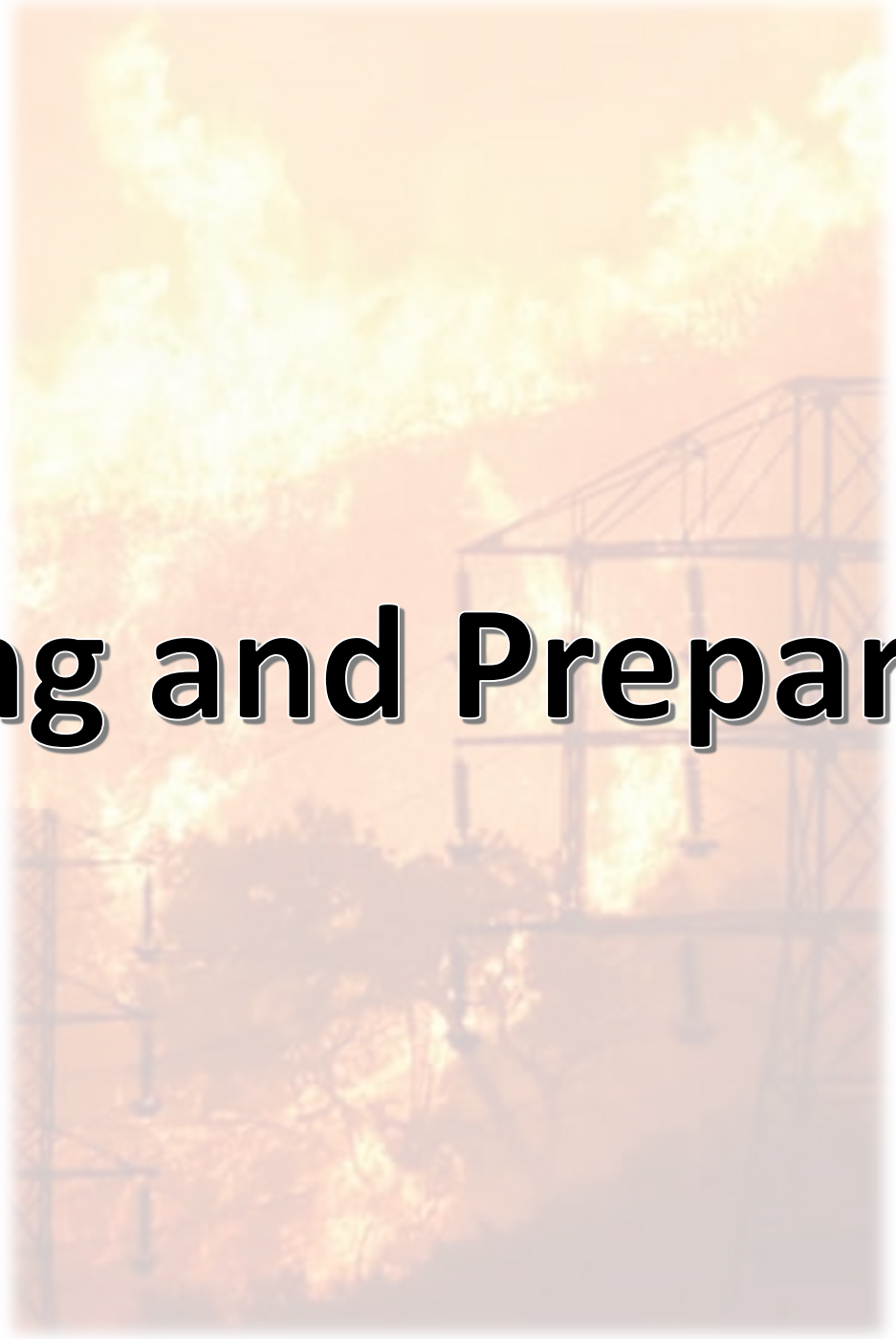
PacifiCorp (Rocky Mtn & Pacific Power)

- Serving 1.8 million customers in 6 states.
  - Pacific Power (CA, OR, WA)
  - Rocky Mountain Power (UT, WY, ID)
- **143,000** square miles of service area
- **5,700** employees
- **80,300** miles of transmission and distribution lines
- **10,800** megawatts of company-owned net generation capacity
- **900** substations



Pacific Power

- *Proudly serving the Pacific Northwest for more than 100 years*
- **35,313** square miles of service area
- **785,000** customers
- **4,392** transmission line miles
- **50,154** transmission poles
- **117** transmission substations
- **26,642** distribution line miles
- **525,453** distribution poles
- **281** distribution substations
- **294,669** service transformers



Planning and Preparedness

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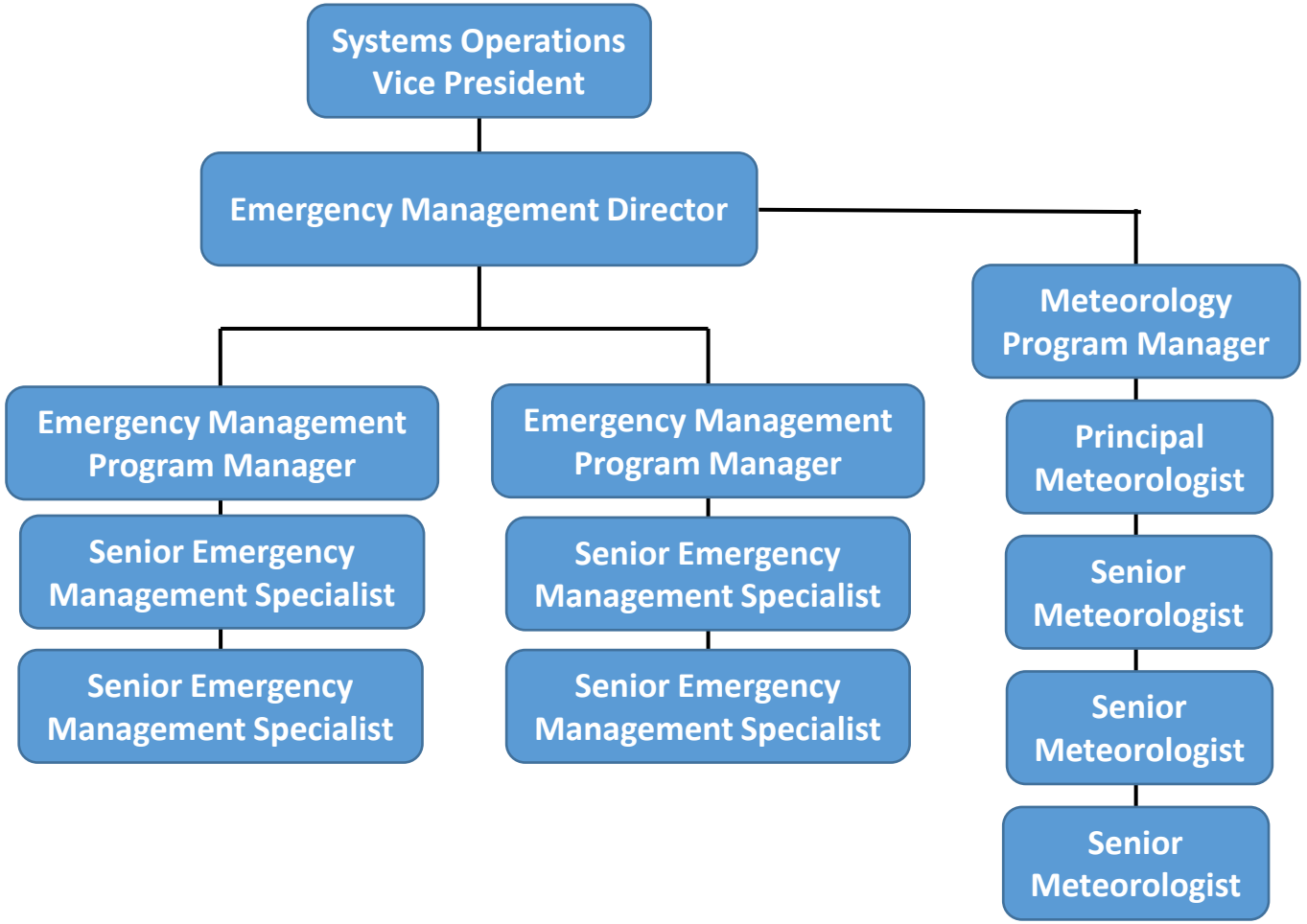
PacifiCorp EM Structure

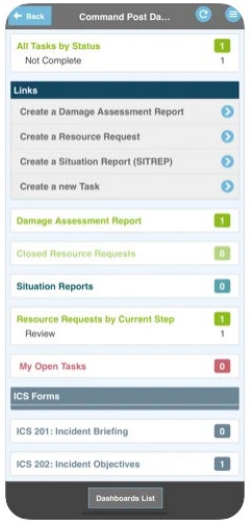


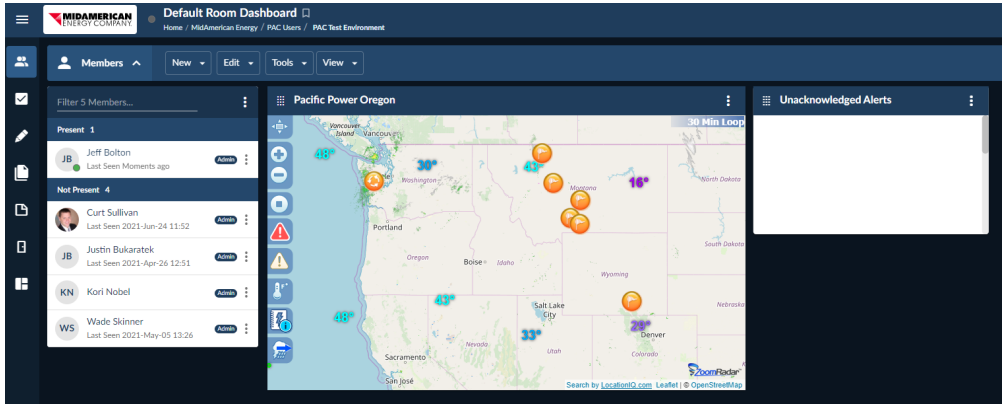
*Position Opening 2022

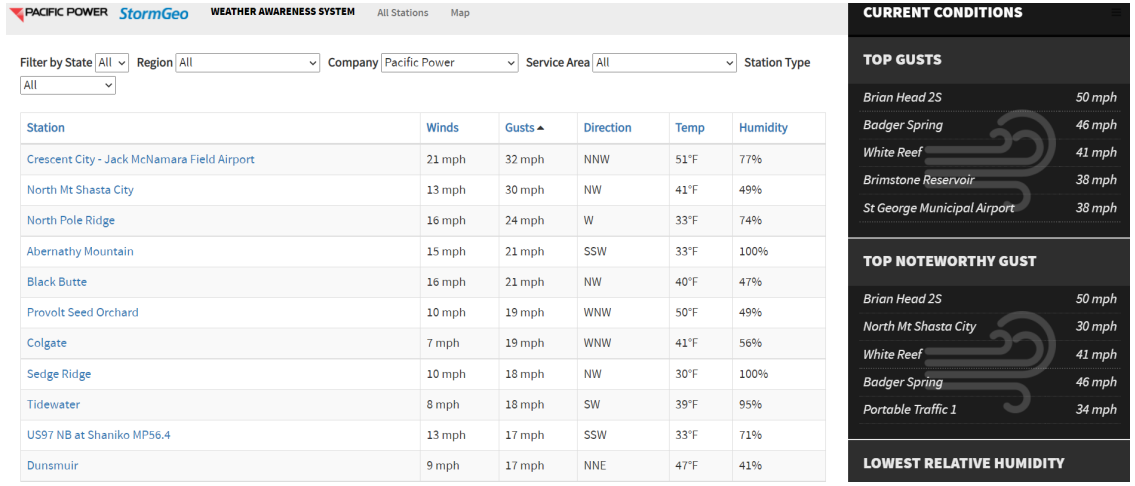
PacifiCorp Emergency Management

Emergency Management Program Improvements

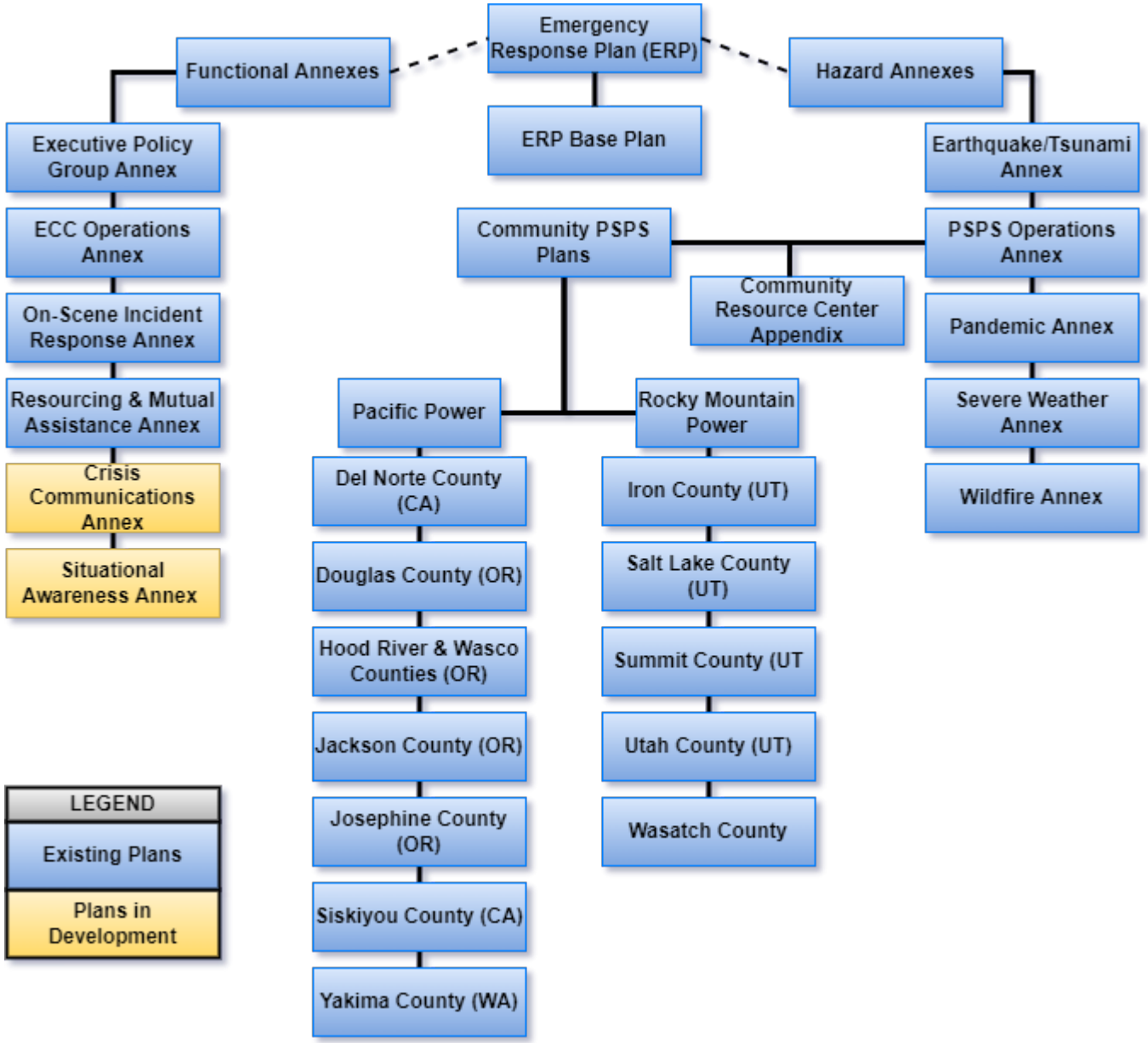
- New tools to better forecast system impacts
  - Technosylva wildfire modeling & risk tool
  - Powerful computer systems for custom weather research & forecasting
  - Installing 250 additional weather stations to increase real-time situational awareness
- New tools to manage incidents and share information
  - VEOCi (Virtual EOC) internal implementation (2022-2023)
  - Alert Media tool for sending alerts and coordinating with ECC members
  - Public facing weather website
  - Refining Critical Infrastructure database
  - Critical Infrastructure Portal in development
- Updated Emergency Coordination Center structure (ECC)
- Implemented Multi-Year Training & Exercise Program
- Developing better alert and warning documents/tools to share with partners
- Overseeing development of “Black Sky” catastrophic event planning







Emergency Planning Structure



Mutual Assistance

- Berkshire Hathaway Energy Inter-Company Agreement
- California Utility Emergency Association (State)
- Western Energy Institute (Regional)
    - Regional Mutual Assistance Group
- Edison Electric Institute (National)
    - National Mutual Assistance Resource Team
    - National Resource Executive Committee

Training & Exercise

- Specific risk-based exercises
  - Cascadia Subduction Zone
  - Dam Failure
  - Landslide
  - Fuel allocation
  - Man-made disaster
  - Cyber/Physical Security
- Homeland Security Exercise and Evaluation Program used as guidance
- Identified improvements from exercises & real-world events are tracked through completion

2022 Overview

Exercises

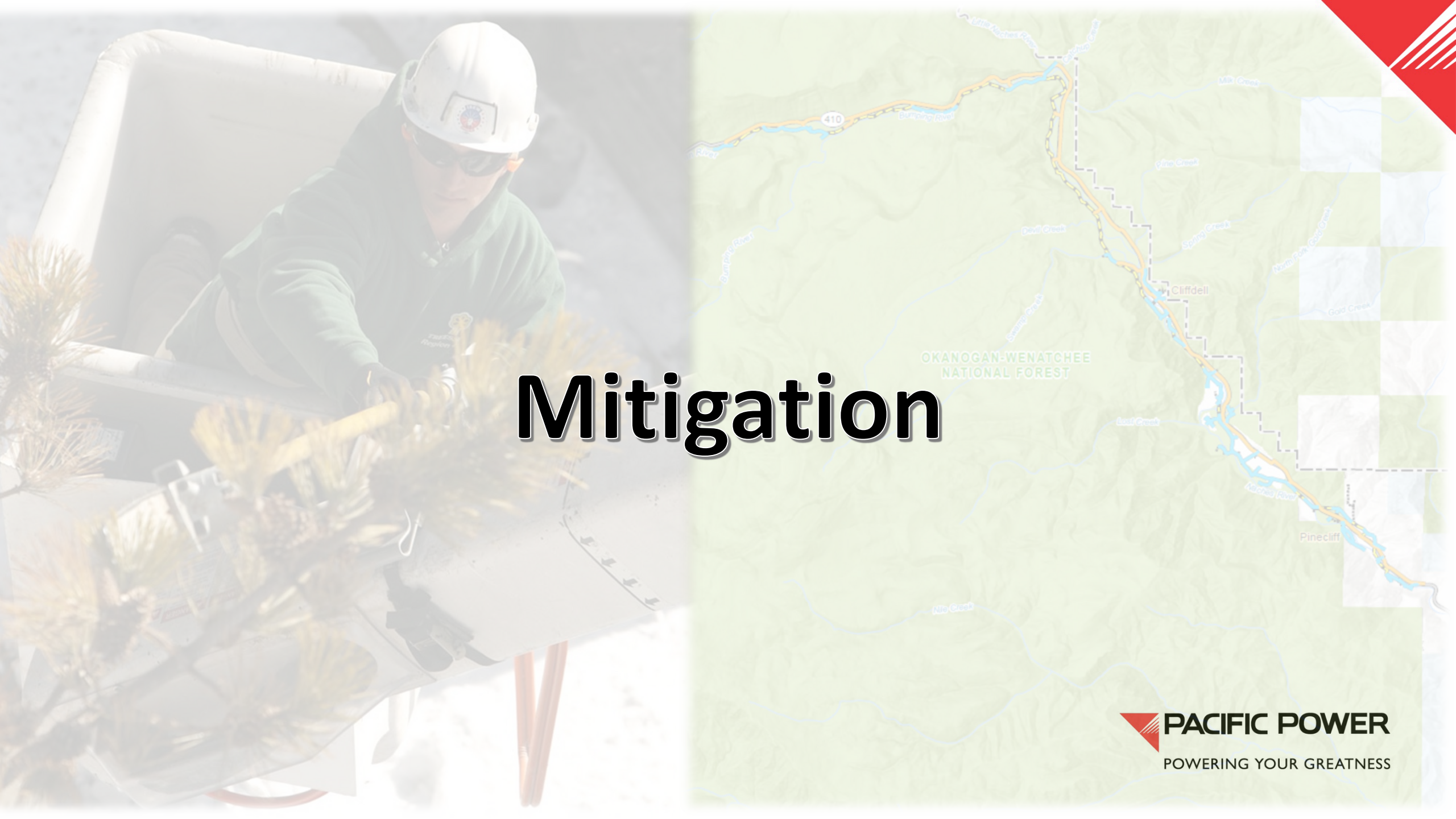
- Internal CRC Exercise
- Cascadia Rising NLE 2022
- CRC Demo/Setup Drill
- Three Hydro Power Functional Exercises
- PSPS TTXs
  - Siskiyou County, CA
  - Southern Oregon/Del Norte County, CA
  - Hood River/Wasco Counties, OR
  - Yakima County, WA

Internal Training

- Emergency Coordination Center Staff Training
- Department Operations Center Training

Overall Preparedness

Grid Hardening & Asset Inspections	Decision Making Criteria & Activation	PSPS Protocols and Readiness	Customer Notifications	External Coordination
✓ Installation of Covered Conductor ✓ Replacement of Small Diameter Conductor ✓ Installation of System Automation Equipment ✓ Wood Pole Replacement / Reinforcement ✓ Asset Inspections	✓ Situational Awareness Capability and Growth ✓ PSPS Threshold Evaluation ✓ Decision Making Protocols	✓ Tabletop Exercises ✓ CRC Readiness and Capability	✓ Incorporation of Customer Survey Results ✓ Customer Notifications ✓ Medical Baseline and AFN Customer Outreach ✓ Website Readiness	✓ Coordination with Critical Facilities ✓ Dynamic Planning and Coordination with Emergency Response Partners ✓ Coordination and outreach to Tribal Communities



Mitigation

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What causes outages?

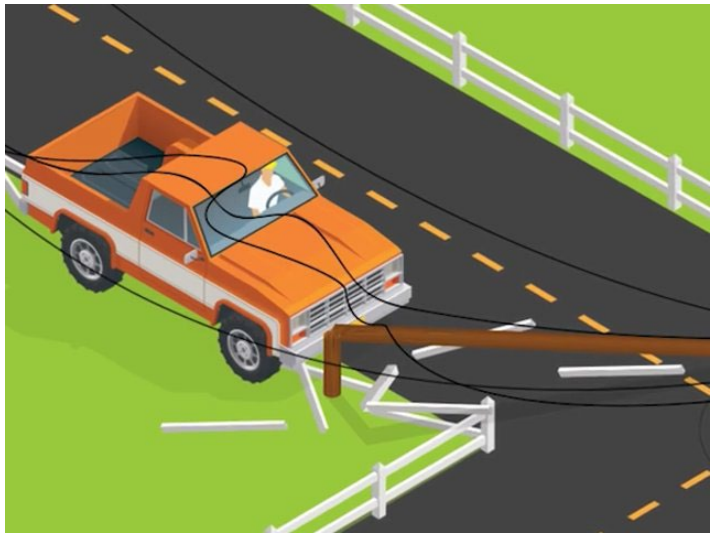
Weather

Trees

Wildlife

Public damage

Equipment Failure



Wildfire Mitigation Plan Components

System Hardening	System modifications to minimize risk and impact to customers, including installation of insulated conductor, relays, and sectionalizing equipment
Situation Monitoring	Implementation of enhanced weather monitoring and weather forecasting in localized areas, including installation of weather monitoring stations
System Settings	Utilization of enhanced protection and control settings during High-Risk Days, which require additional field patrols before re-energizing lines after a fault event
Resource Allocation	During Extreme Risk Days, in identified areas, deploy additional resources to area for assessment/ monitoring at a local level
PSPS	Public Safety Power Shutoff (PSPS) during Extreme Risk Days where thresholds for wind and low precipitation have been exceed

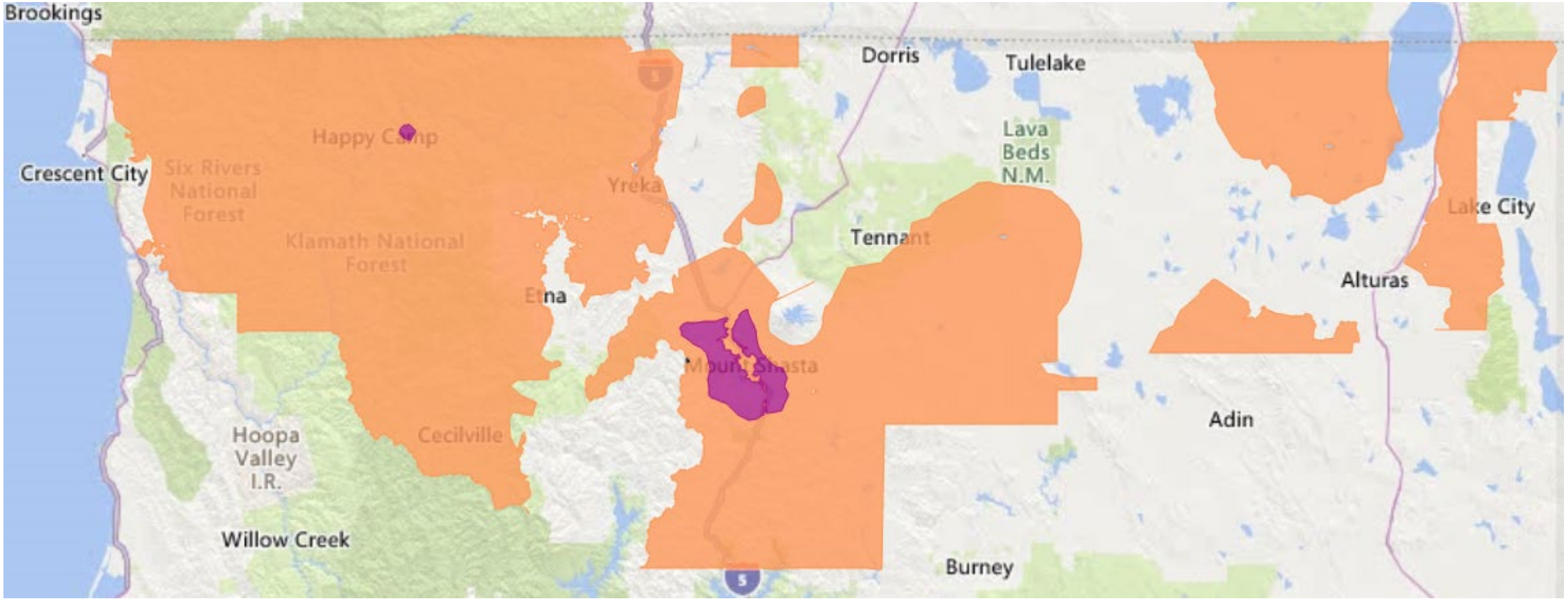
Wildfire Mitigation & Response

- Support incident response as requested
- Mitigation plans developed to minimize risk from electrical assets
- Modified reclosing procedures during fire season
- Increased system patrols
- Vegetation management crews will work in coordination with public sector authorities
- Yearly pruning of 270,000 trees and extended vegetation clearance around poles/lines in areas with higher fire risk
- Continual assessments of potential damage or fire risk is assessed by incident responders and Pacific Power Emergency Management /Meteorology
- Work with local emergency managers to identify further mitigation measures to wildfires and power outages

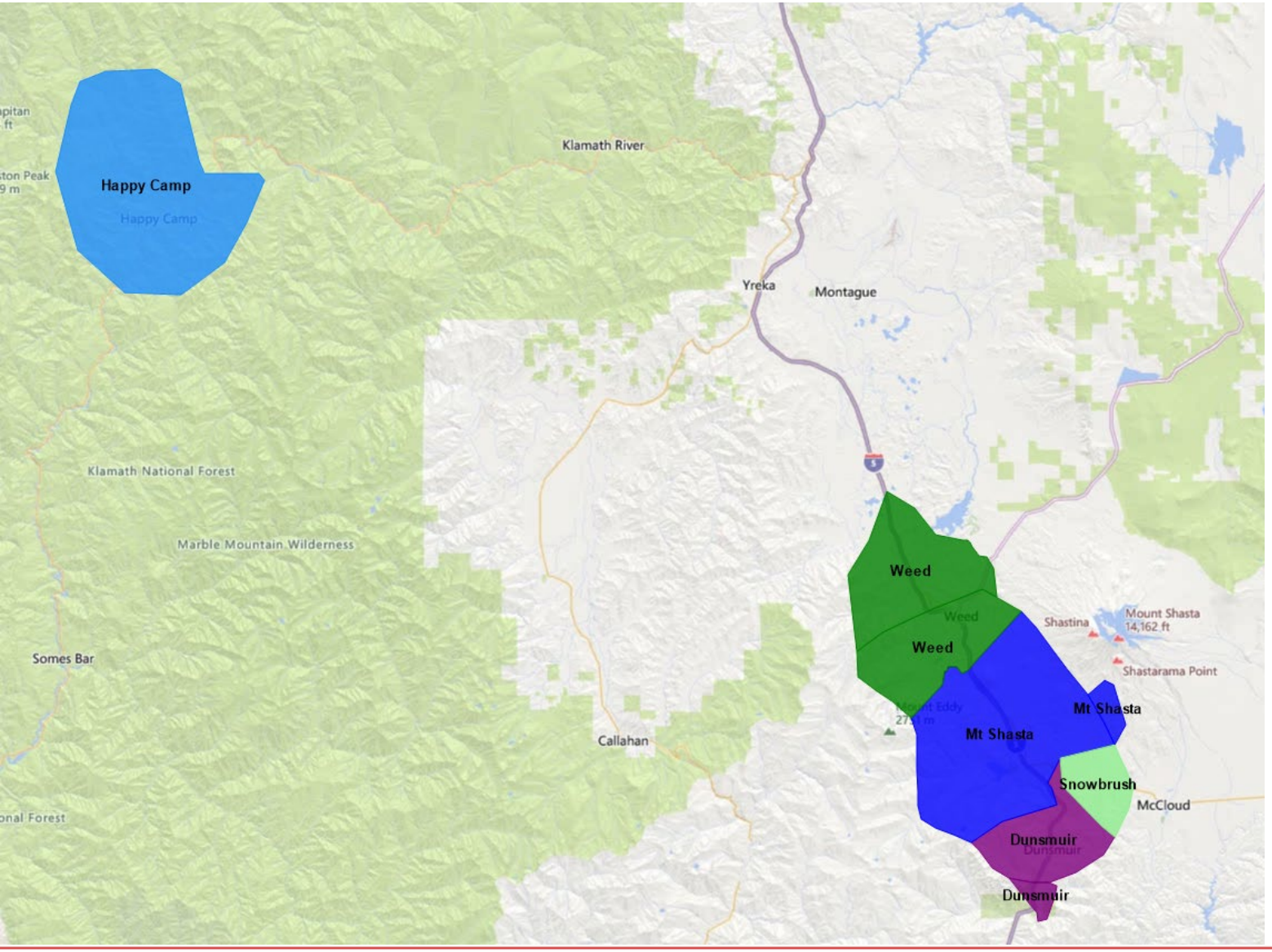
High Fire Threat District (HFTD)

HFTDs are identified using fire threat modeling tools based on local topography, the presence of fuels (timber, vegetation, etc.), proximity to urban populations and historic fire weather patterns.

HFTDs help us determine where to prioritize system improvements and other mitigation efforts.

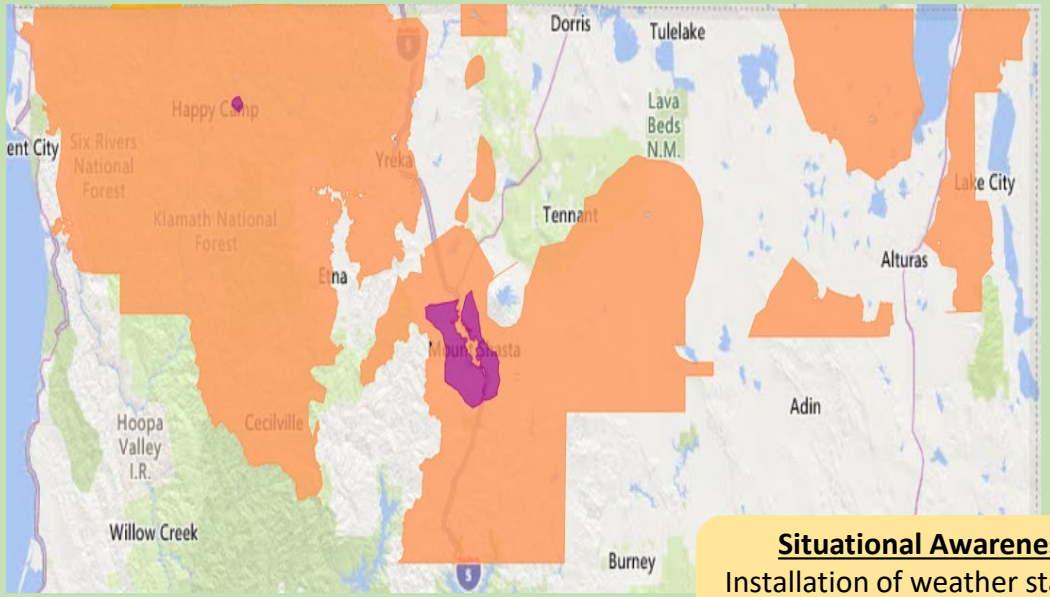


Proactive De-energization Zones



- Zones give us the ability to customize de-energized areas as appropriate
- Possible to limit effects of power losses
- Identified Critical facilities will be mapped within each zone
- PDZs show most likely locations however based on risk analysis, PacifiCorp will operate the system with customer & community safety in mind

California Wildfire Mitigation Programs



System hardening programs are scoped to occur within the areas which represent elevated fire risk. The programs attempt to reduce the occurrence of events involving the emission of sparks (or other forms of heat) from electrical facilities or reduce scale, scope and/or impact of a PSPS. System hardening programs represent the greatest long-term mitigation tool available for use by electric utilities. The phasing and prioritization of such programs are focused on locations that present the greatest risk.

Covered conductor installation to mitigate risk associated with contact. Project completion: 2024.

Proactive replacement of poles with fire resistant materials. Project completion: 2023.

Installation of system automation equipment. Project completion: 2024.

Installation of system automation equipment. Project completion: 2024.

Situational Awareness
Installation of weather stations to evaluate risk and deploy mitigation strategy.

Community Support Programs

PacifiCorp is offering eligible California customers a rebate on the purchase of a portable generator or portable power station to help prepare for potential power outages.

PacifiCorp implemented a program to provide back-up batteries - at no cost - to medical baseline customers who depend on medical equipment powered by electricity. The contracted service provides a battery to the customer along with education and training for longer term operation of the batteries which are wholly owned and operated by the customer.

For more information go to: Pacific Power.net/outages-safety

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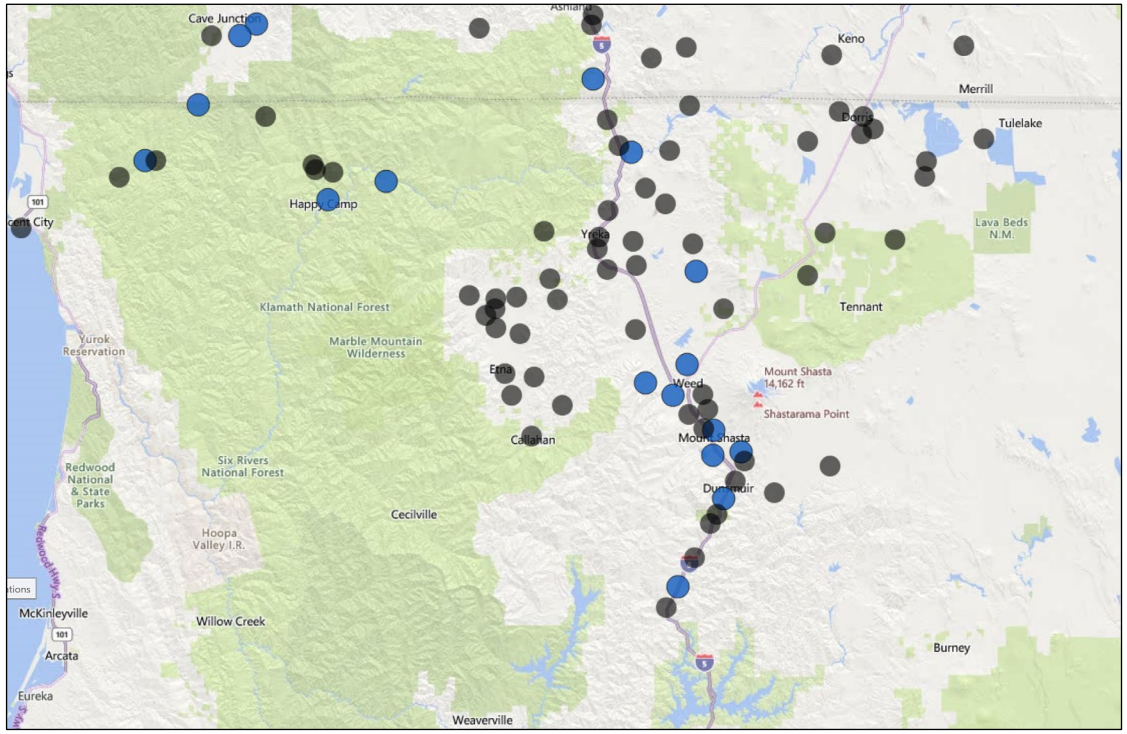
Wildfire Mitigation Investment

PDZ	Investment	Covered Conductor Miles Installed	Covered Conductor Miles Under Construction	Equipment Upgrade Complete	Equipment Upgrade Under Construction
Dunsmuir	$20M	1.4	29.5	4 Locations	
Happy Camp	$25M		41.4	3 Location	
Mt. Shasta	$50M	2.4	79.7	7 Locations	
Snowbrush	$3M	4.2			1 Location
Weed	$55M	3.8	95.1	6 Locations	

Meteorological Resources

Installed	Total
Alturas	1
Crescent City	4
Happy Camp	2
Mt. Shasta	6
Snowbrush	2
Tulelake	1
Weed	1
Yreka	19
Grand Total	**36**

Planned	Total
Alturas	3
Crescent City	7
Happy Camp	2
Mt. Shasta	10
Snowbrush	2
Tulelake	11
Weed	1
Yreka	47
Grand Total	**83**



http://pacificpowerweather.com

PACIFICORP StormGeo WEATHER AWARENESS SYSTEM All Stations Map

Filter by State All Region All Company Rocky Mountain Power Service Area All Station Type All

Station	Region	Wind	Gust	Direction	Temp	Humidity
UT-191 @ Monticello	UT - East	33 mph	47 mph	SSW	52°F	29%
Blanding Municipal Airport	UT - East	37 mph	46 mph	S	61°F	24%
US-491 at MP 2 Monticello POE	UT - East	29 mph	45 mph	SSE	54°F	30%
Big Indian Valley	UT - East	23 mph	43 mph	SSW	54°F	26%
Winter Ridge	UT - East	24 mph	41 mph	SW	46°F	45%
I80/US189 - Evanston	WY - Southwest	21 mph	37 mph	SSW	39°F	77%
I80/US189 - Evanston POE	UT - North	9 mph	19 mph	SSE	37°F	84%
Rawlins Municipal Airport	WY - Southeast	30 mph	48 mph	SSW	63°F	16%
Bryson Canyon	UT - East	30 mph	46 mph	SSW	65°F	18%
SR-143 at MP 13.5 Brian Head Tripod	UT - Southwest	22 mph	42 mph	SSW	31°F	79%
I80/US287/US30 - Sinclair	WY - Central	17 mph	42 mph	SW	64°F	14%
Signal Peak	UT - Southwest	22 mph	41 mph	SW	39°F	43%
US-191 at MP 369 Windy Point	UT - East	23 mph	41 mph	S	49°F	40%
I-15 at MP 62.5 North Cedar City	UT - Southwest	27 mph	40 mph	SW	42°F	71%
Moab - Canyonlands Field	UT - East	29 mph	40 mph	SW	63°F	24%
Milford Municipal Airport	UT - Southwest	25 mph	40 mph	SSW	54°F	38%
Diamond Rim	UT - North	16 mph	39 mph	SSW	48°F	38%
Cedar City Municipal Airport	UT - Southwest	29 mph	39 mph	SW	47°F	52%

● = Existing stations ● = Stations slated for installation

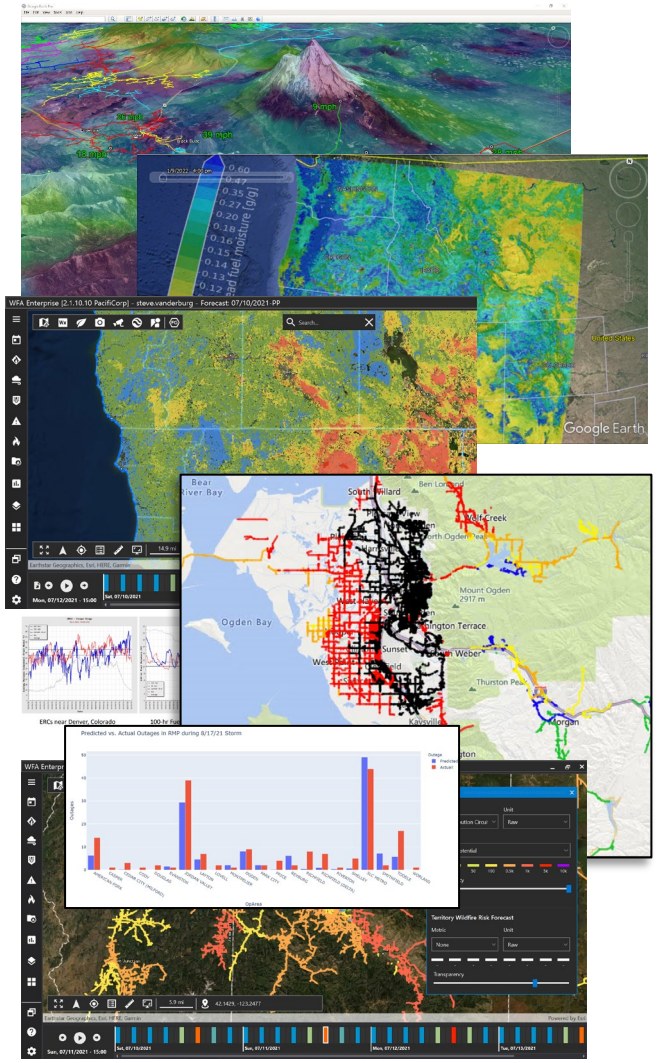
How Do We Assess Weather and Wildfire Related Risk?

Simply put, a Public Safety Power Shutoff (PSPS) is considered when…

1) The environment (fuels conditions & fire weather) will contribute to extreme fire behavior should an ignition occur

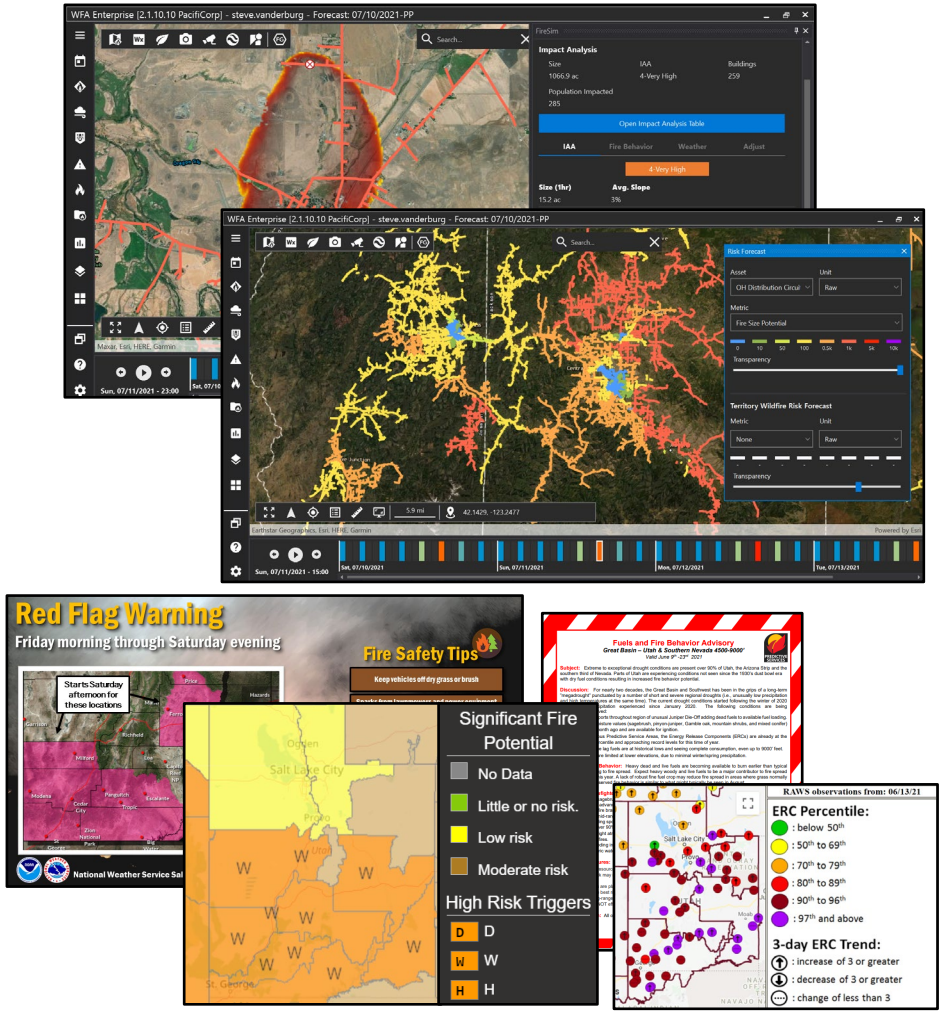
and

2) Windspeeds have reached, or are forecast to reach, levels that are associated with power outages (location specific)



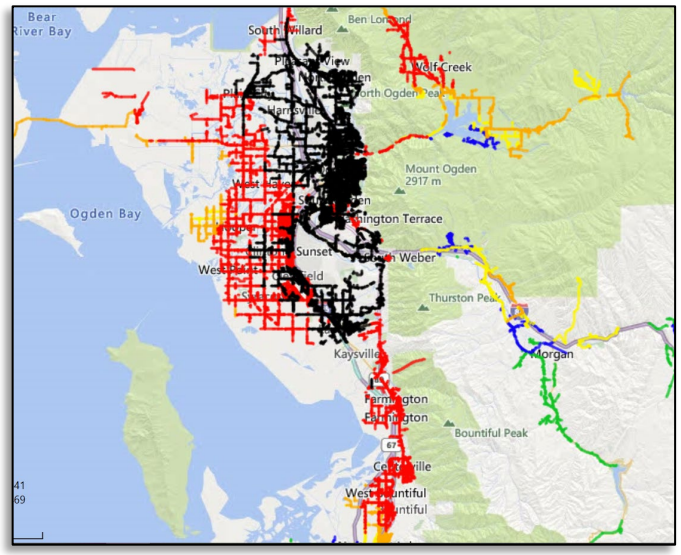
Assessing Wildfire Potential

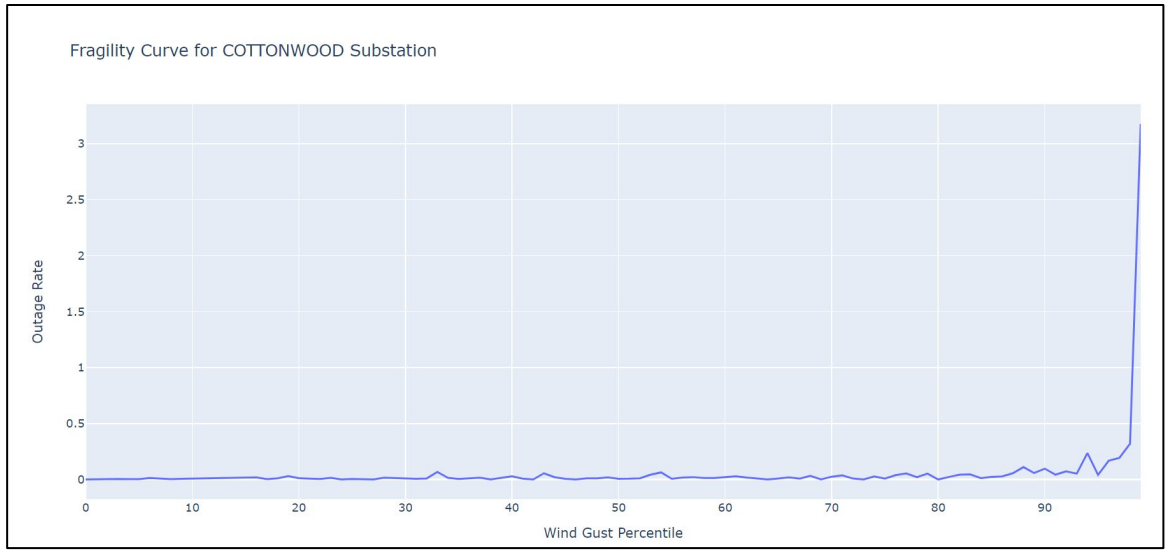
- The Great Basin Geographic Area Coordination Center (GACC)
  - 7-Day Significant Fire Potential & Discussion
- Fuels Assessment and Considerations
  - Energy Release Component (ERC)
  - Dead Fuel Moisture (1, 10, 100, & 1,000 hr)
  - Woody and Herbaceous Live Fuel Moistures
  - Fuels & Fire Behavior Advisory (Issued by GACC)
- Fire Weather Assessment and Considerations
  - Red Flag Warnings
  - Fire Weather Indices
  - Drought Indices
- Wildfire Consequence Modeling
  - Technosylva's Wildfire Analyst-Enterprise simulates millions of wildfires daily using current and forecasted fuels and weather conditions.
  - Provides a high-resolution wildfire potential and consequence forecast

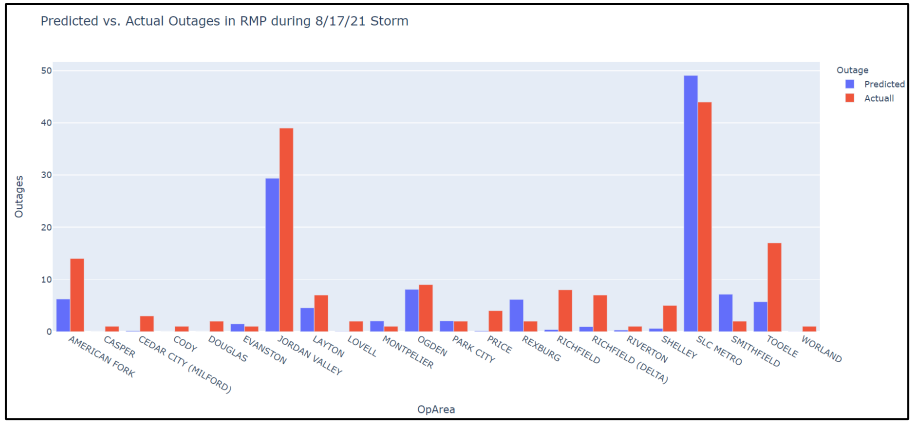


Assessing the Risk of Wind-Related Power Outages

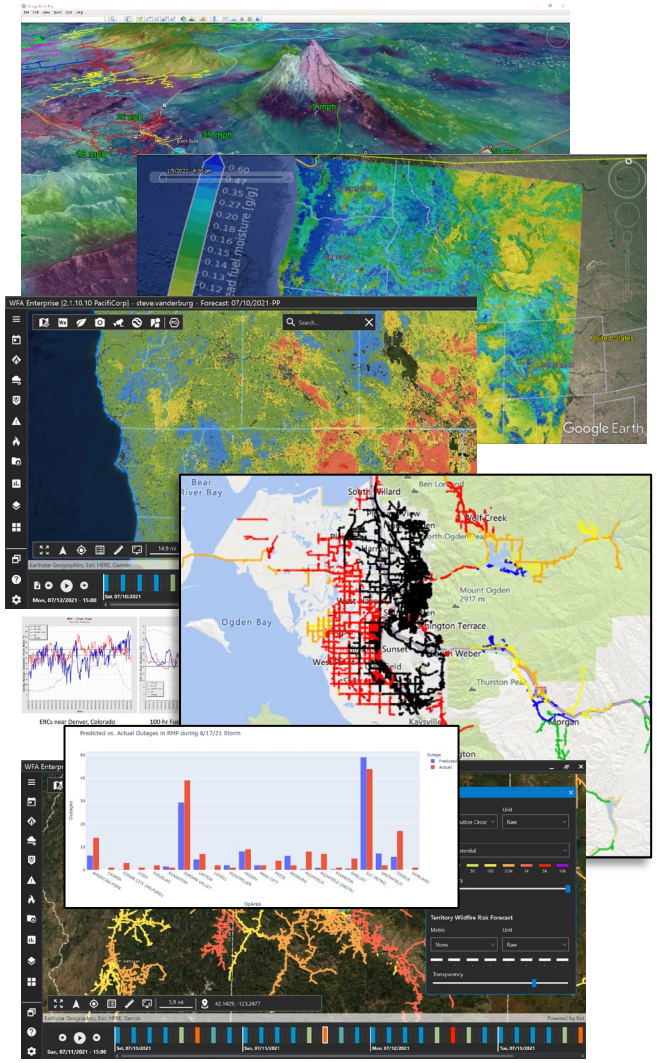
- PacifiCorp runs its own high-resolution weather forecast models
- Historical wind conditions have been correlated with power outages
- Wind-related outages become increasingly likely when gusts are unusually strong (in the top 1%) for a given location
  - Typically experienced 2-4 days per year
  - Thresholds vary by location







Internal Forecast Products



Weather-Related System Impacts / Fire Risk Potential / Operational Response

Pacific Power	Tue 17-Aug			Wed 18-Aug			Thu 19-Aug			Fri 20-Aug			Sat 21-Aug		
WASHINGTON															
Sunnyside															
Walla Walla															
Yakima	W														
OREGON															
Albany															
Central Oregon															
Clatsop															
Coos Bay															
Corvallis															
Cottage Grove															
Dallas															
Enterprise															
Grants Pass															
Hermiston															
Hood River	W														
Junction City															
Klamath Falls															
Lakeview															
Lebanon															
Lincoln City															
Medford															
Pendleton															
Portland															
Roseburg															
Stayton															
CALIFORNIA															
Alturas		W			F			F			F			F	
Crescent City		W			W			F			F			F	
Tulelake		W			F			F			F			F	
Yreka	W	W			W			F			F			F	

Weather-Related System Impacts (Wx)

Outage Potential
- Widespread Outages with Extended Restoration
- Scattered to Widespread Outages
- Isolated to Scattered Outages
- No System Impacts Expected

Hazards
- (W) Wind
- (L) Lightning / Thunderstorms
- (I) Freezing Rain or Ice
- (S) Snow
- (H) Extreme Heat
- (R) Heavy Rain or Flooding

Fire Risk Potential (F)

GACC Risk Level (Significant Fire Potential)
- HIGH RISK (Windy and Dry - *OR* - Extremely Dry Fuels)
- Moderate Risk - *OR* - High Risk for Non-Windy Weather
- Low Risk

Reason for High Risk
- (W) Wind
- (L) Lightning
- (F) Extremely Dry Fuels
- (H) Hot with Low Humidity

Operational Response
- System Patrol
- PSPS Watch
- Fire Settings
- PSPS Event
- No Reclose Settings

PACIFIC POWER

WEATHER FORECAST FOR AUG. 17-21

KEY TAKEAWAYS
- Gusty north winds to near the 99th percentile, low humidity, and extremely dry fuels will contribute to a high wildfire risk in Dunsmuir today and tonight.
  - A PSPS MAY BE NECESSARY.

FIRE WEATHER
- Gusty north winds, low humidity, and very dry fuels will bring a HIGH RISK for significant wildfire potential today and tonight in Northern CA, especially along I-5 in and south of Dunsmuir.
  - VPD, KBDI, and FFWI thresholds to be met
  - Wind gusts may reach the 99th percentile (30-35 mph)
  - Fuels are critically dry and PSPS may be necessary
- Red Flag Warning for areas of south-central Oregon and northern California from 2 to 10 PM PDT today due to strong gusty winds and low humidity. The warning covers the districts of Crescent City, Yreka, Tulelake, Alturas, Klamath Falls and Lakeview.

WIND
- Gusty north winds at or near the 99th percentile is likely late this afternoon and evening along I-5 in and south of Dunsmuir.
  - Wind-related system impacts possible.
- Gusty west to northwest winds near the 95th percentile through the Gorge and along the east slopes of the northern Cascades this afternoon and evening.

THUNDERSTORM / LIGHTNING
- No thunderstorms expected.

EXCESSIVE HEAT
- Ne excessive heat expected.

HEAVY RAIN / FLOODING
- No flooding expected.

A1 | OpArea

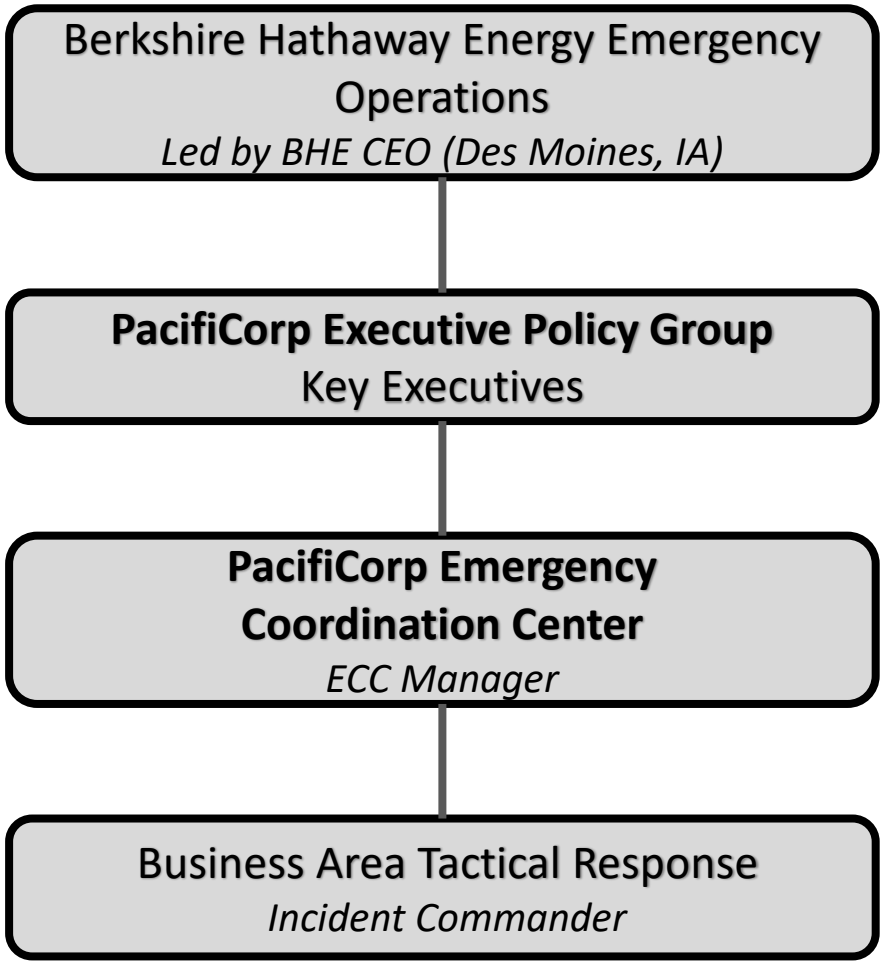
	A	B	C	D	E	F	G	H	I
1	OpArea	Substation	Circuit	Date	Max Gu	Gust Av	Max Gu	Average	Max FF
3395	MT SHAST	NORTH DUNSMUIR	7G73	8/17/2021	41.75194	30.61893	0.99887	0.917638	47
3404	MT SHAST	NORTH DUNSMUIR	7G71	8/17/2021	41.731	30.67574	0.998866	0.917414	46.86433
3413	MT SHAST	NUTGLADE	8G95	8/17/2021	42.4372	28.31868	0.997376	0.774662	46.00094
3422	MT SHAST	CASTELLA	8G65	8/17/2021	40.47465	22.74159	0.993844	0.569115	42.16056
3431	MT SHAST	SOUTH DUNSMUIR	7G75	8/17/2021	42.27025	30.64736	0.991804	0.803471	48
3440	MT SHAST	NORTH DUNSMUIR	5G69	8/17/2021	39.38086	29.75753	0.98951	0.854675	43.50419
3449	MT SHAST	MT SHASTA	7G81	8/17/2021	34.28674	27.08955	0.974658	0.831716	42.0637
3458	MT SHAST	MT SHASTA	7G82	8/17/2021	34.21434	27.23643	0.97404	0.83711	42.48006
3467	MT SHAST	SHOTGUN CREEK	5G97	8/17/2021	33.26445	18.11592	0.964342	0.419011	47.30233
3476	MT SHAST	SHOTGUN CREEK	5G99	8/17/2021	27.42705	13.34788	0.89431	0.316844	47.37567
6113									

Response and Recovery

PACIFIC POWER

POWERING YOUR GREATNESS

PacifiCorp Emergency Response Structure



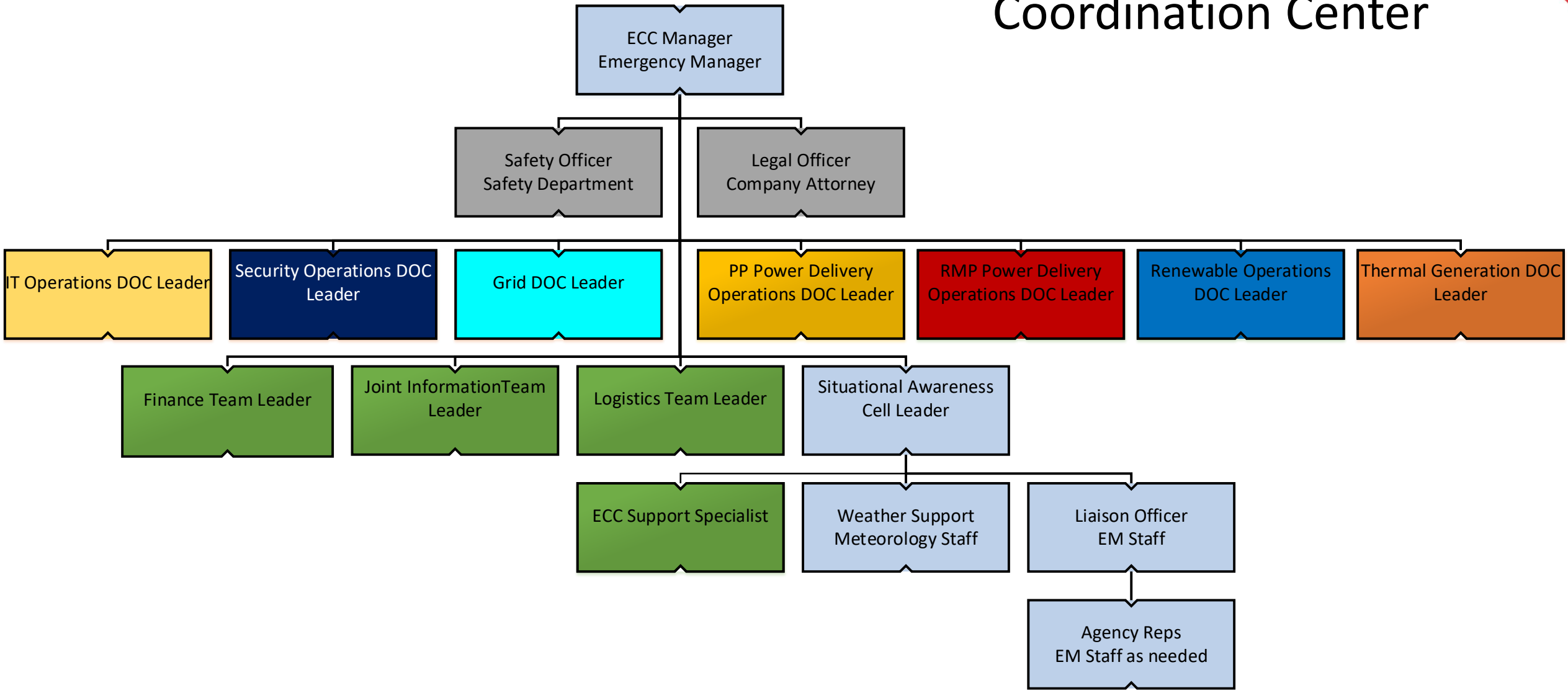
Strategic high-level support for cross-company and federal coordination

Strategic policy making and support for multiple business unit, state and federal coordination

Operational support for on-scene resources and state, county and local emergency management agency coordination

Tactical control of response and coordination with Pacific Power Emergency Operations Center as needed

PacifiCorp Emergency Coordination Center



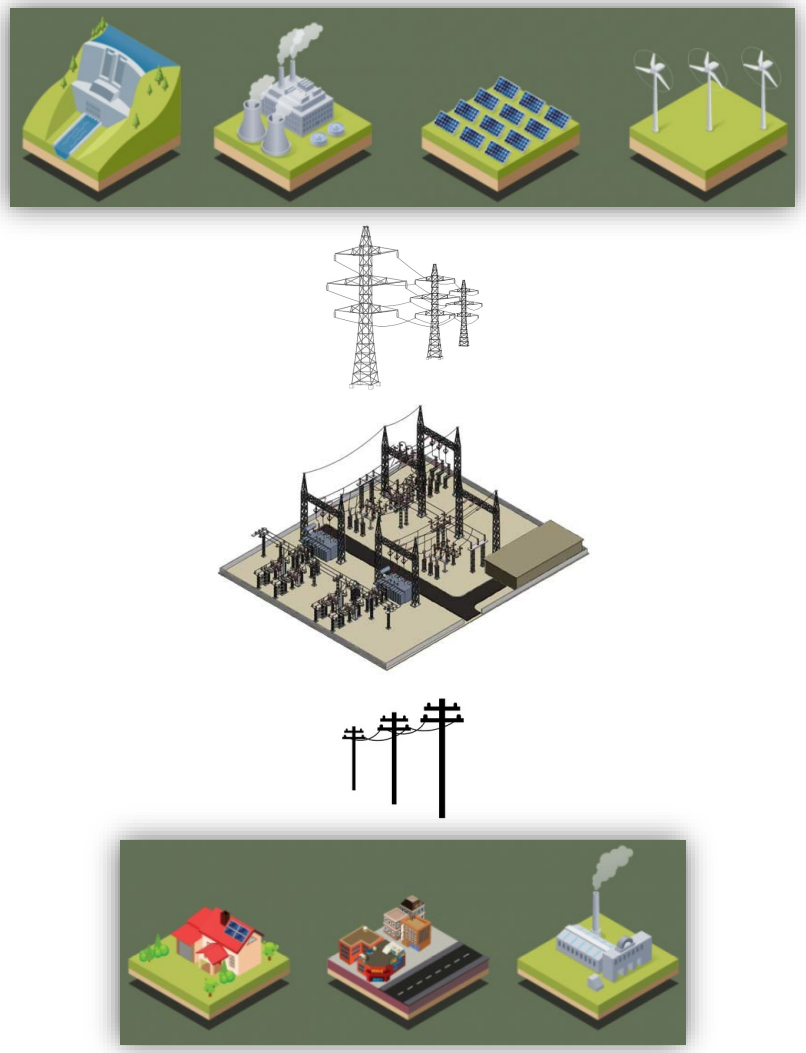
Response Experience

- Wildland Fire
- Tsunami
- Windstorm
- Flooding
- Winter storm
- Dam safety incident
- Landslides
- Substation fire
- Man-made incidents
- Regional Mutual Assistance Incidents

Restoration Response

1. Pinpoint the outage and formulate solutions to restore power.
2. Dispatch crew closest with the right type of equipment.
3. Assess conditions for public and crew safety and develop a restoration plan.
4. Patrol lines and check substations.
5. Clear downed power lines & other hazards
6. Fix/replace damaged equipment & lines

7. Restore power to:
   - Transmission lines
     - Carries high voltage power to hundreds of substations
   - Substations
     - Converts high-voltage power to lower levels for home use
   - Distribution lines
     - Carry power from substations to neighborhoods (serving 1,000-3,000 customers)
   - Tap lines
     - Carry power to pockets of 20-30 homes
   - Individual homes & businesses
     - Usually suburban or rural



PSPS Timeline

- **72, Potential PSPS:** Forecast received. Contact emergency management agencies followed by state regulatory authority, and community-based organizations. Pacific Power Emergency Coordination Center activation likely
- **48 Hours, Potential PSPS:** Forecast received. Contact media, social media, customers (according to chosen method) and community-based organizations. Pacific Power Emergency Manager to initiate Community Resource Center process. Pacific Power to provide customer communication scripts to Emergency Management Team.
- **24 Hours, Potential PSPS:** Monitor and communicate to emergency management and customers. All customers receive a call, in addition to other methods of notification. All social media platforms updated including website. Notification to identified life support customers.
- **2 Hours, Imminent PSPS:** Two-hour imminent alert calls placed to all customers. List of uncontacted life support customers is provided to the incident commander. All social media platforms updated including website. Emergency management, the media, and community-based organizations are updated.
- **1 Hour, Imminent PSPS:** One-hour imminent alert calls placed to all customers. All social media platforms updated including website. Emergency management and the media are updated.
- **Event Begins:** Event begins calls are placed to all customers. All social media platforms updated including website. Emergency management and the media are updated.
- **Restoration begins:** Event begins calls are placed to all customers. All social media platforms updated including website. Emergency management and the media are updated.
- **Restoration complete:** Event begins calls are placed to all customers. All social media platforms updated including website. Emergency management and the media are updated.

Community Resource Center

- **Capabilities**
  - Shelter from environment
  - Climate Controlled area
  - Air purifiers
  - Air quality monitors
  - Ice and Potable Water
  - Non-perishable snacks
  - Seating and tables
  - Restroom facilities
  - Refrigeration and heating for medicine or baby needs
  - Interior and area lighting
  - On-site security
  - Televisions
  - Communications capability such as Wi-Fi, SatPhone, Radio, Cellular Phone
  - On site medical staff (Paramedic or EMT-A)
  - Personal device charging stations
  - Small pet crates
  - AFN population support
  - Portable ADA ramp
  - Personal protective equipment

Tabletop Exercise

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Exercise Execution

- No fault environment
- This is the time to find any issues
- Mistakes are expected, better to make them in this environment than during an actual response
- Provide input to roles and responsibilities section of plan
- Improvement will come from your input
- Review plan as exercise progresses looking for holes
- Attempted to keep scenario realistic, however some variances are taken for exercise purposes
- Surveys have been provided, please make notes and return to Emergency Management at the end of the event

Past Event Lessons Learned

Date	Observation	Action Item/Recommendation	Responsible Person
5/25/2021 TTX	AFN outreach remains a topic for improvement, the county and Pacific Power continue to strive to conduct outreach to the entire AFN population.	Coordinate AFN population outreach	Customer Service
5/25/2021 TTX	Ensuring Joint Information System has timely and accurate information for distribution is a key concern	Continue planning JIS procedures	Public Information Officer
5/25/2021 TTX	Communications capability for direct customer outreach prior to event has limited bandwidth and channels need confirmed	Communications companies in coordination with the county will advise on any solutions	Siskiyou County
8/17/21 PSPS	Confirmation of notifications was delayed and inconsistent	Delays in the detection of notification errors resulted in a deviation from the notification plan.	Customer Service/ Telecommunications Providers
8/17/21 PSPS	AFN and Medical Baseline notifications were not confirmed. In person notification procedures were ad hoc and need refined.	Coordinate roles and responsibilities for AFN/MBL in person customer notification	PacifiCorp EM and County EM
8/17/21 PSPS	CRC information can be communicated better to customers.	Incorporating scripts for automated phone calls to customers providing CRC information will be helpful.	Customer Service and Regional Business Managers
8/17/21 PSPS	Real time production of GIS mapping data was more challenging to produce and distribute than anticipated.	Challenges delayed the ability to share with public safety partners; ability to expedite this process in the future will allow for better planning.	PacifiCorp GIS team

Definitions & Abbreviations

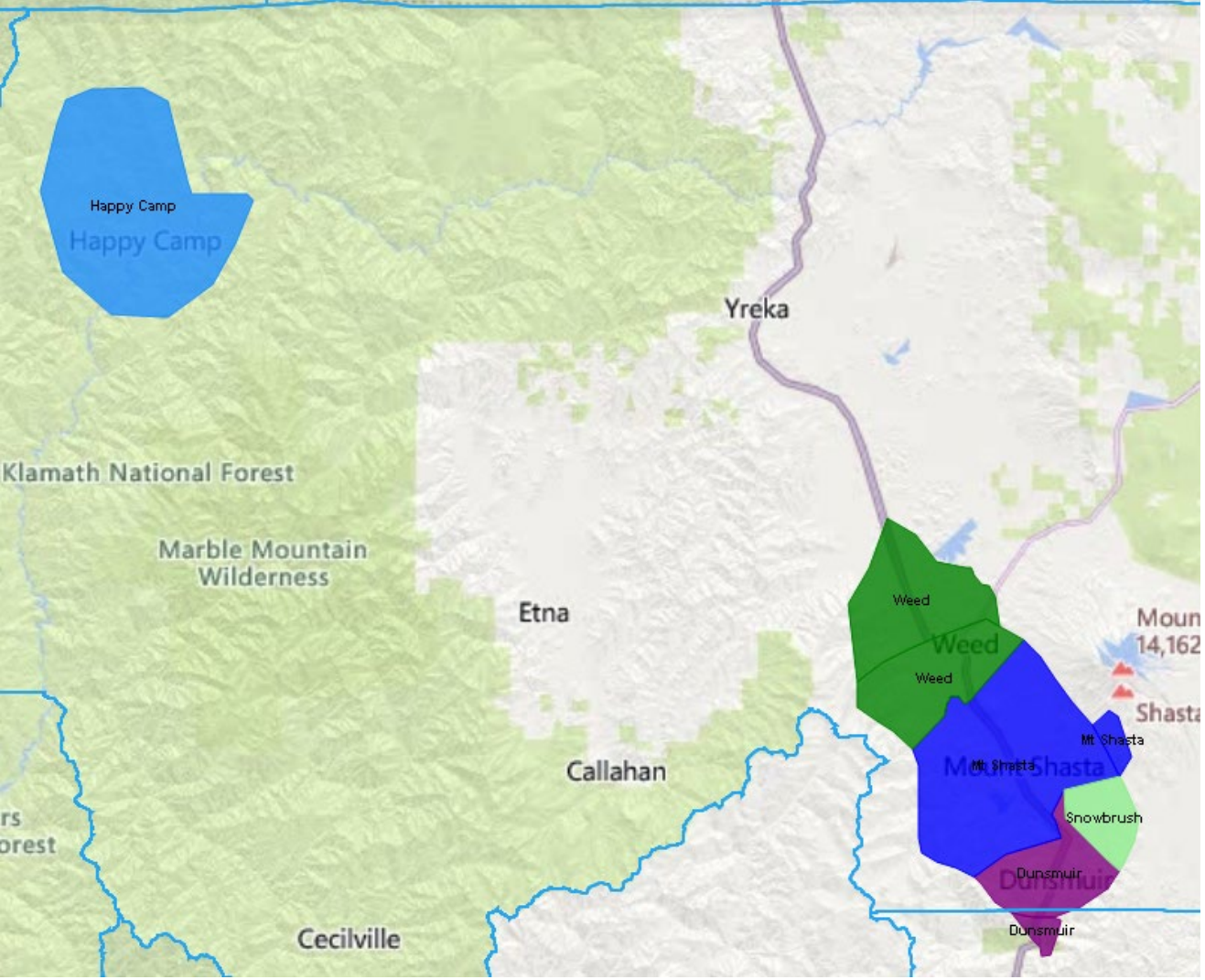
- **PDZ -** Proactive De-energization Zones
- **PSPS** – Public Safety Power Shutoff
- **CRC** – Community Resource Center
- **HSEEP** – Homeland Security Exercise & Evaluation Program
- **AFN Individuals** - Individuals having access and functional needs may include, but are not limited to, individuals with disabilities, seniors, and populations having limited English proficiency, limited access to transportation, and/or limited access to financial resources to prepare for, respond to, and recover from the emergency.

Exercise Goals and Objectives

Exercise Goals
Enhance general awareness of PacifiCorp Public Safety Power Shutoff plans
Enhance understanding roles and responsibilities
Validate plans and procedures
Discuss concepts and/or assess types of systems in a defined incident

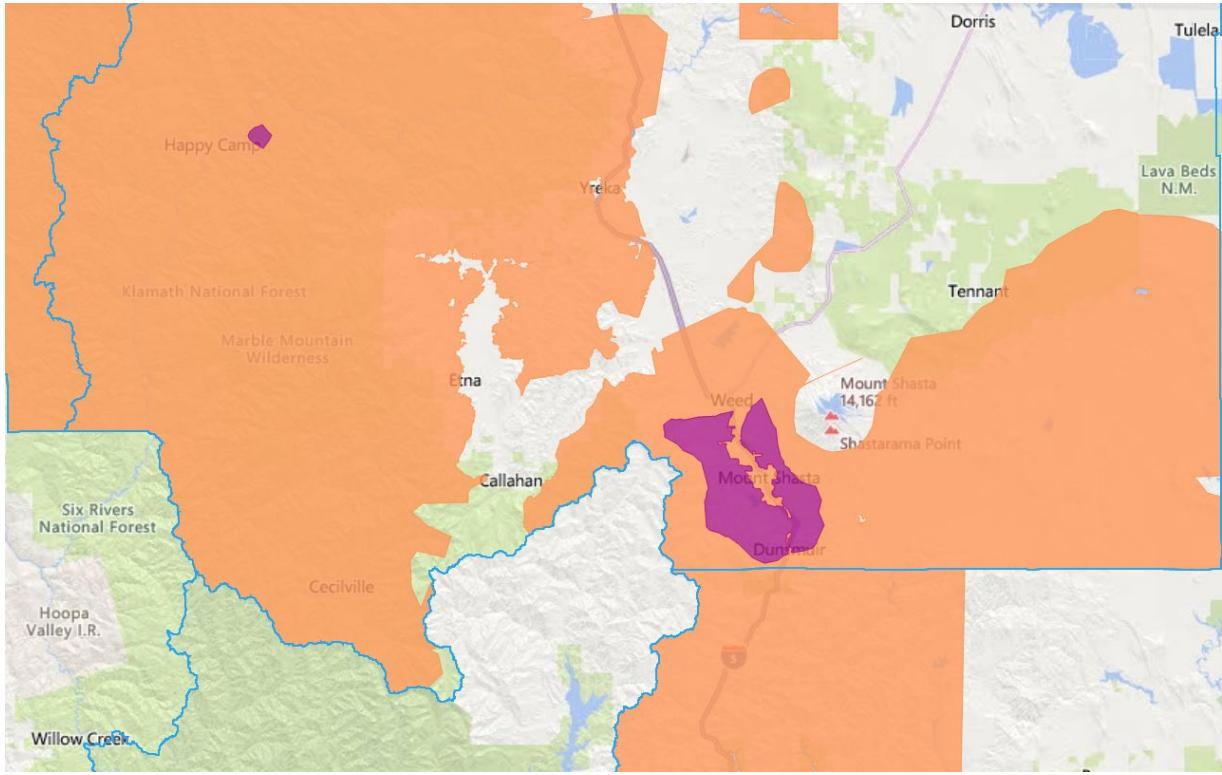
Exercise Objectives
1. Ensure communications channels are viable during PSPS event
2. Evaluate AFN/MBL customer notification process to include in person notification
3. Explain Community Resource Center scope & purpose in a PSPS event and compare plans to support impacted community members.
4. Explore Pacific Powers plans for allocating resources during PSPS events.
5. Outline current options and capabilities for supporting individuals with access and functional needs.

Exercise Affected Area



Potential affected households or businesses:

- Happy Camp 865
- Weed 2,589
- Mt Shasta 5,074
- Dunsmuir 1,806
- Snowbrush 17



5 Day Forecast

PACIFIC POWER
SYSTEM IMPACTS FORECAST MATRIX

Weather-Related System Impacts (Wx) / Fire Risk Potential (F) / Operational Response

CALIFORNIA	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response
Alturas		F			F			F			F			F	
Crescent City															
Tulelake		F			F			F			F			F	
Yreka		F			F			F			F		W	F	

Weather-Related System Impacts (Wx)

Outage Potential

- Widespread Outages with Extended Restoration
- Scattered to Widespread Outages
- Isolated to Scattered Outages
- No System Impacts Expected

Hazards

- (W) Wind
- (L) Lightning / Thunderstorms
- (I) Freezing Rain or Ice
- (S) Snow
- (H) Extreme Heat
- (R) Heavy Rain or Flooding

Fire Risk Potential (F)

GACC Risk Level (Significant Fire Potential)

- **HIGH RISK** (Windy and Dry - *OR* - Extremely Dry Fuels)
- Moderate Risk - *OR* - High Risk for Non-Windy Weather
- Low Risk

Reason for High Risk

- (W) Wind
- (L) Lightning
- (F) Extremely Dry Fuels
- (H) Hot with Low Humidity

Operational Response

- SP: System Patrol
- FS: Fire Settings
- NR: No Reclose Settings
- PW: PSPS Watch
- PS: PSPS Event

Fire Weather

- ERCs are at 97th percentile values, KBDI and Fosberg indices are also at critical levels.
- The GACC has issued a fuels and fire behavior advisory. Grasses are fully cured.
- Increasing offshore winds and low RH are forecast for Friday-Saturday. Poor overnight RH recovery is also expected.

Wind

- Strong NE-SE winds may gust to 50+ mph Friday and Saturday across the Yreka district. System impacts are possible with these wind speeds.

Thunderstorm / Lightning

- Thunderstorms are not expected in the next 5 days.

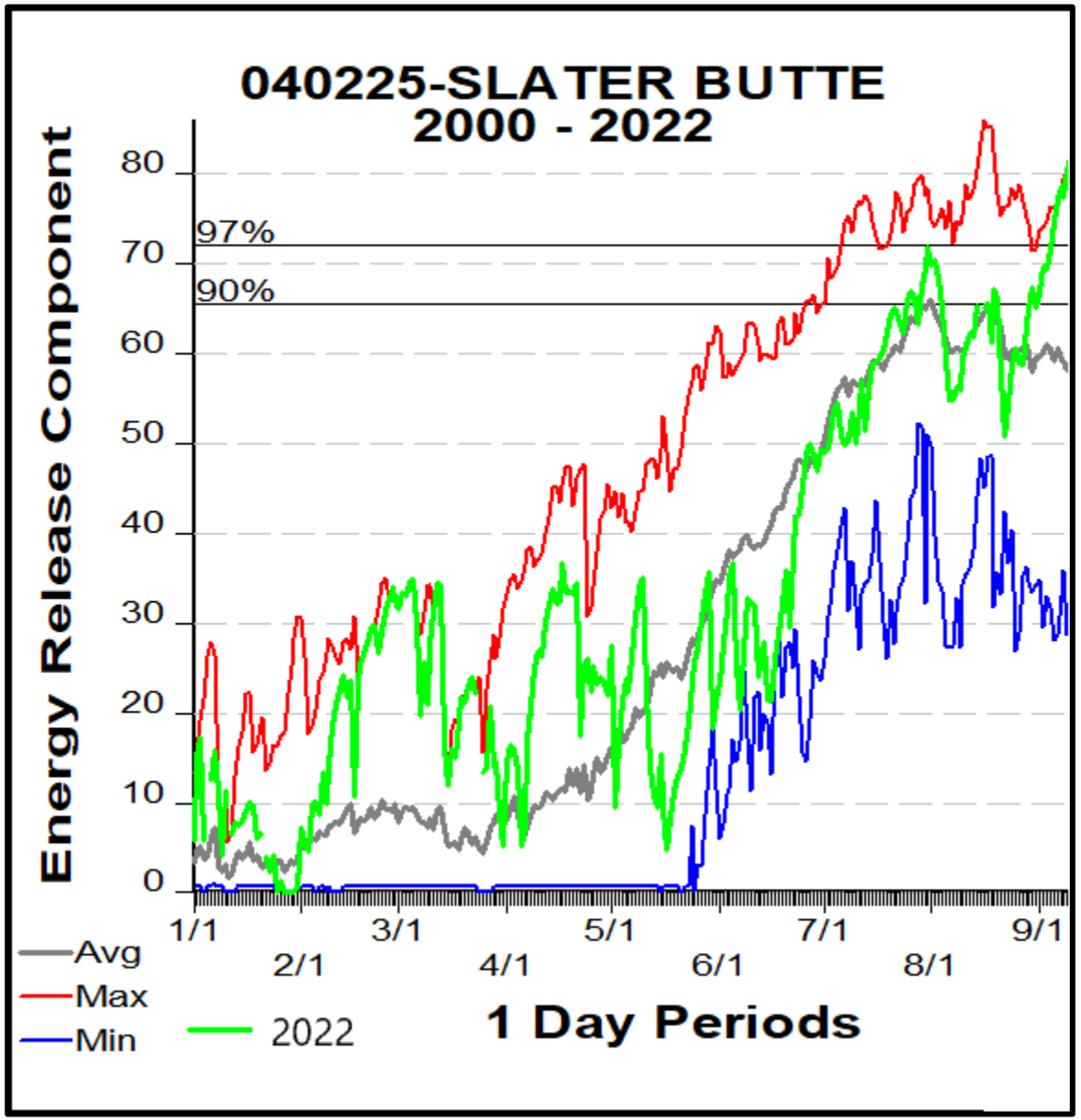
Excessive Heat

- Morning low temperatures will be 15-20 degrees warmer than average beginning Friday, leading to poor overnight RH recovery and the potential for active nighttime burning with any fires in the Yreka district.
- Afternoon temperatures will be 10-15 degrees above average.

PSPS Watch | PSPS Warning | PSPS Execution

Fuels and Fire Weather Discussion

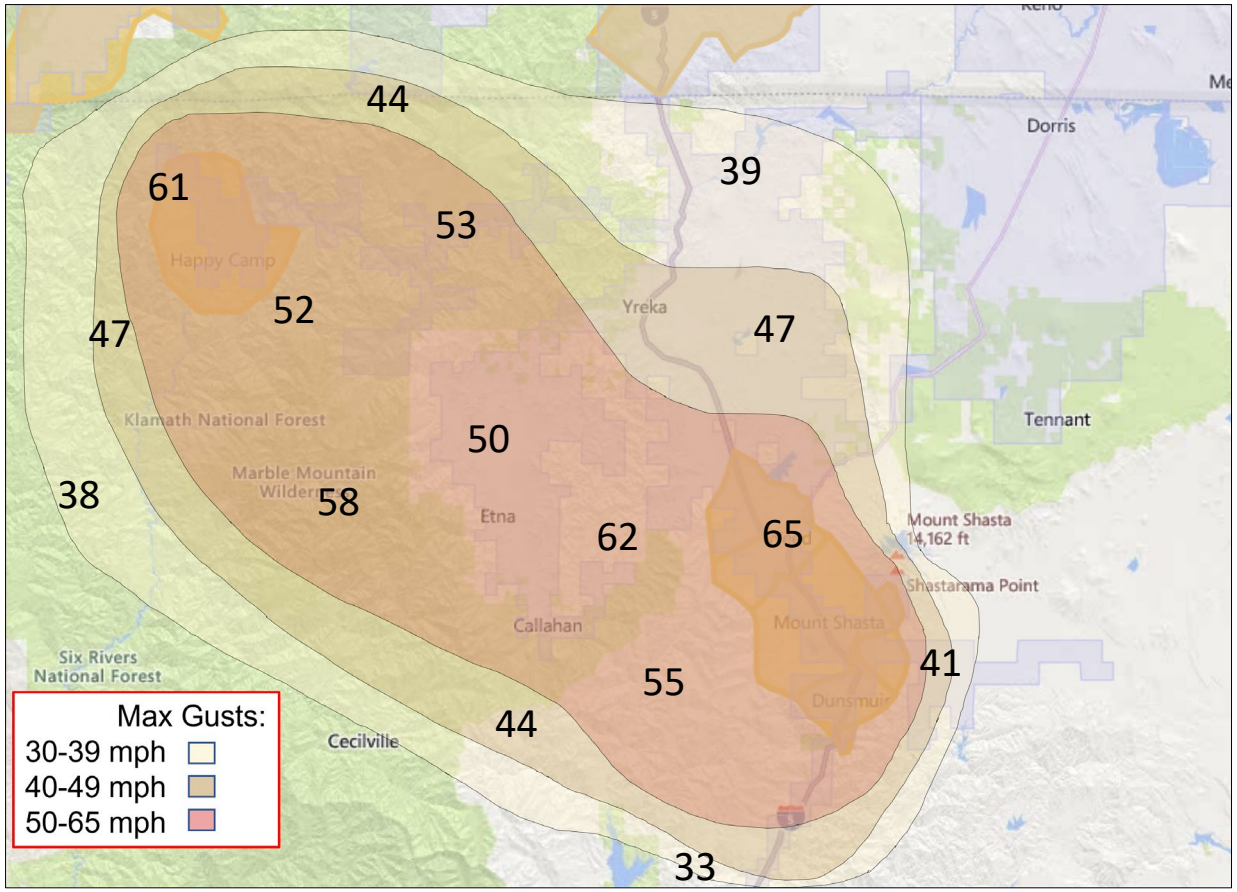
- Fuels in the Yreka District are critically dry. Fuels indices are beyond peak season values.
- Any new ignition will be difficult to control in these conditions. During windy weather fires will spread rapidly and exhibit extreme fire behavior.
- A Fuels and Fire Behavior Advisory is in effect for Siskiyou County.
- Computer models are showing a period of potentially strong dry gusty winds and low RH Friday-Saturday. This pattern is also being mentioned by the NWS and North Ops GACC.

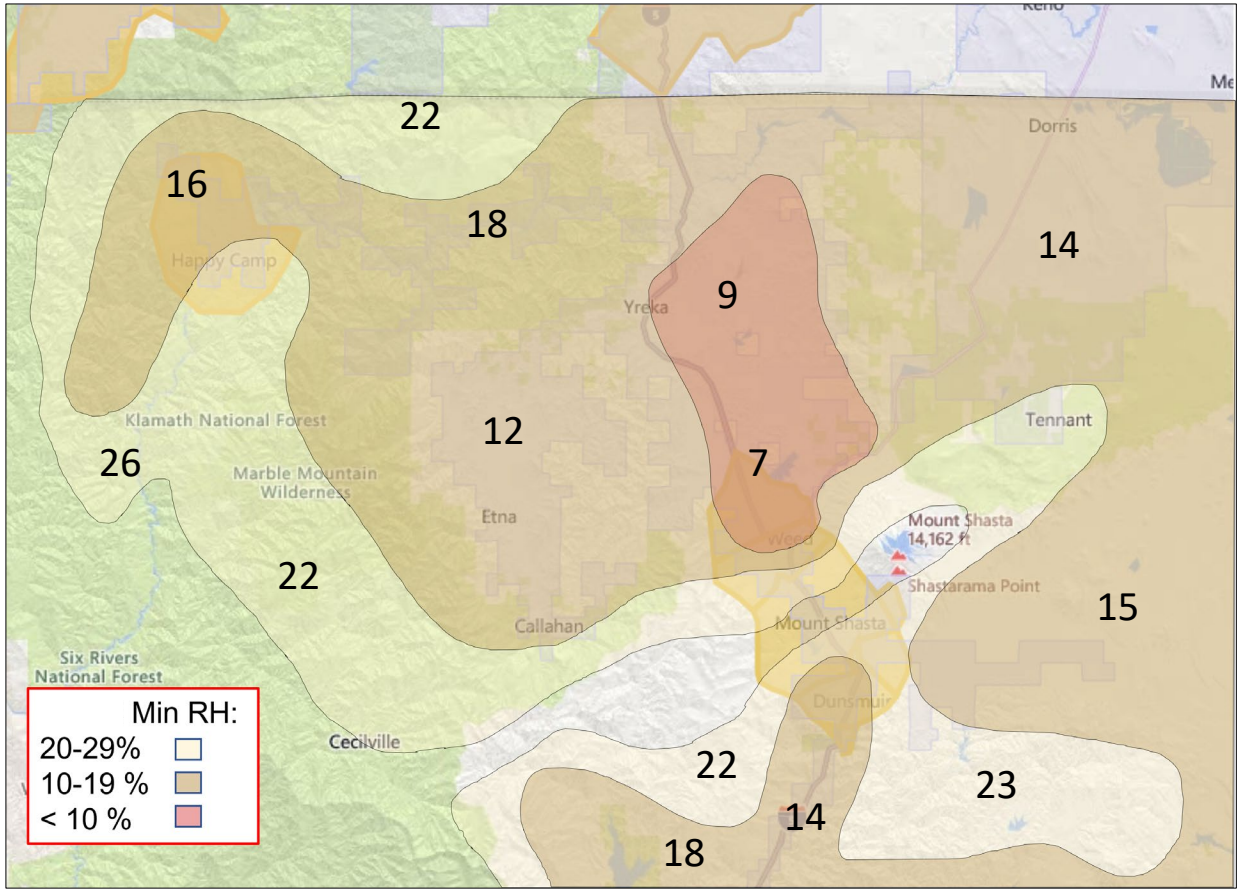


5-DAY FORECAST – *Siskiyou County, CA*

8 AM

FORECAST FOR 12:00-10:00 PM



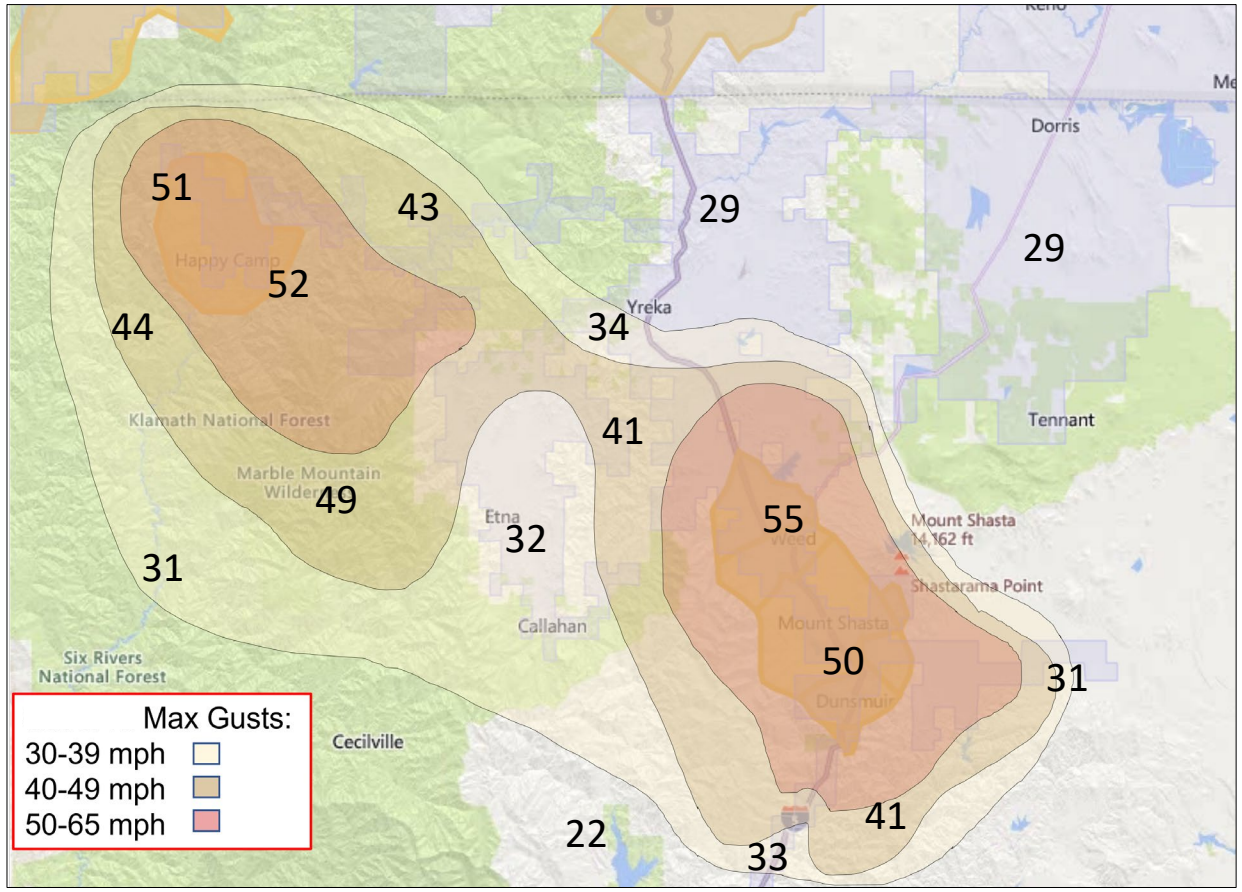


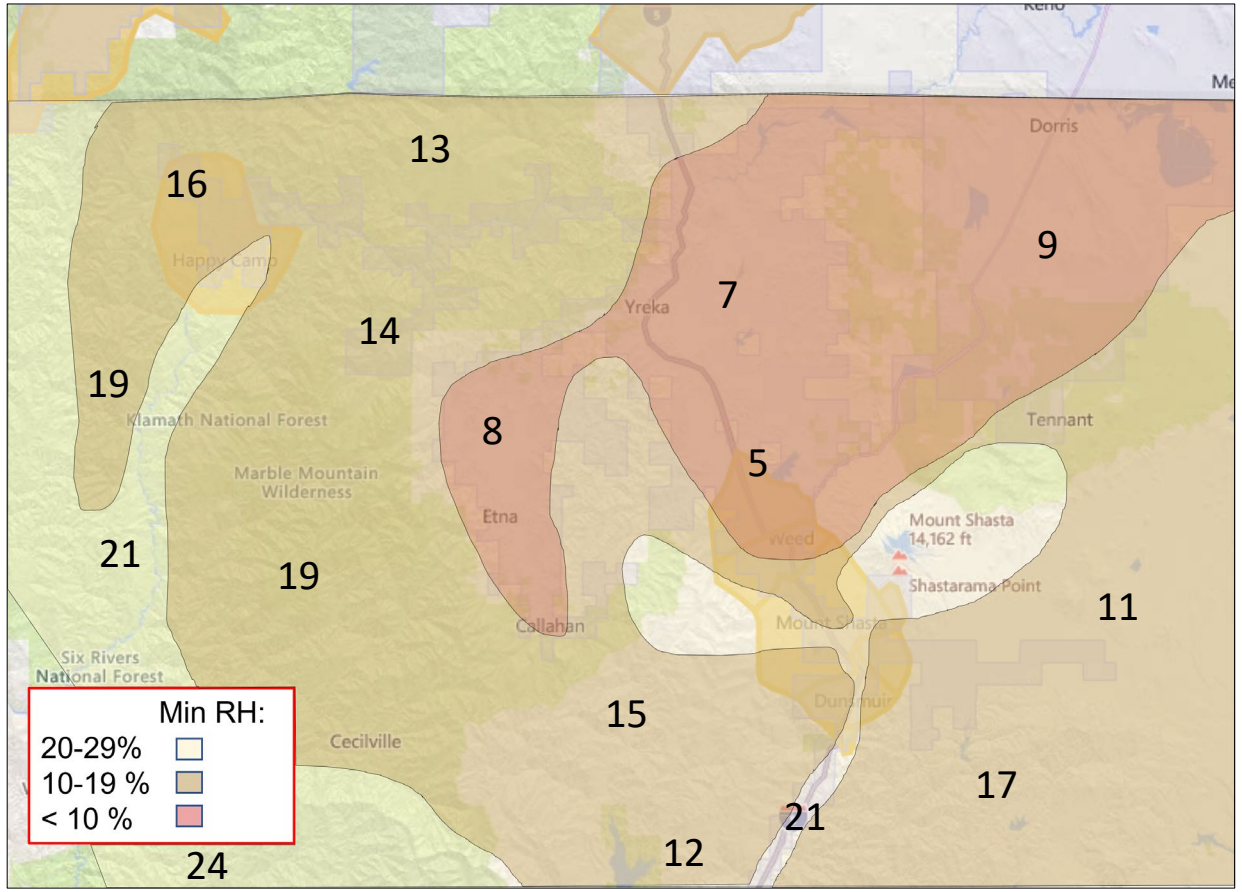
PSPS Watch | PSPS Warning | PSPS Execution

5-DAY FORECAST – *Siskiyou County, CA*

8 AM

FORECAST FOR 9:00 AM - 2:00 PM





PSPS Watch | PSPS Warning | PSPS Execution

72-Hour Forecast

PACIFIC POWER
SYSTEM IMPACTS FORECAST MATRIX

Weather-Related System Impacts (Wx) / Fire Risk Potential (F) / Operational Response

CALIFORNIA	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response
Alturas		F			F			F			F			F	
Crescent City															
Tulelake		F			F			F			F			F	
Yreka		F			F			F		W	W		W	W	

Weather-Related System Impacts (Wx)

Outage Potential

- Widespread Outages with Extended Restoration
- Scattered to Widespread Outages
- Isolated to Scattered Outages
- No System Impacts Expected

Hazards

- (W) Wind
- (L) Lightning / Thunderstorms
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Fire Risk Potential (F)

GACC Risk Level (Significant Fire Potential)

- **HIGH RISK** (Windy and Dry - *OR* - Extremely Dry Fuels)
- Moderate Risk - *OR* - High Risk for Non-Windy Weather
- Low Risk

Reason for High Risk

- (W) Wind
- (L) Lightning
- (F) Extremely Dry Fuels
- (H) Hot with Low Humidity

Operational Response

- SP: System Patrol
- FS: Fire Settings
- NR: No Reclose Settings
- PW: PSPS Watch
- PS: PSPS Event

Fire Weather

- ERCs are at 97th percentile values, KBDI and Fosberg indices are also at critical levels.
- The GACC has issued a Fuels and Fire Behavior Advisory and grasses are fully cured.
- Increasing offshore winds and low RH are forecast for Friday-Saturday. Poor overnight RH recovery is also expected.

Wind

- Strong NE-SE winds may gust to 60+ mph Friday and Saturday across the Yreka District. System impacts are possible with these wind speeds.

Thunderstorm / Lightning

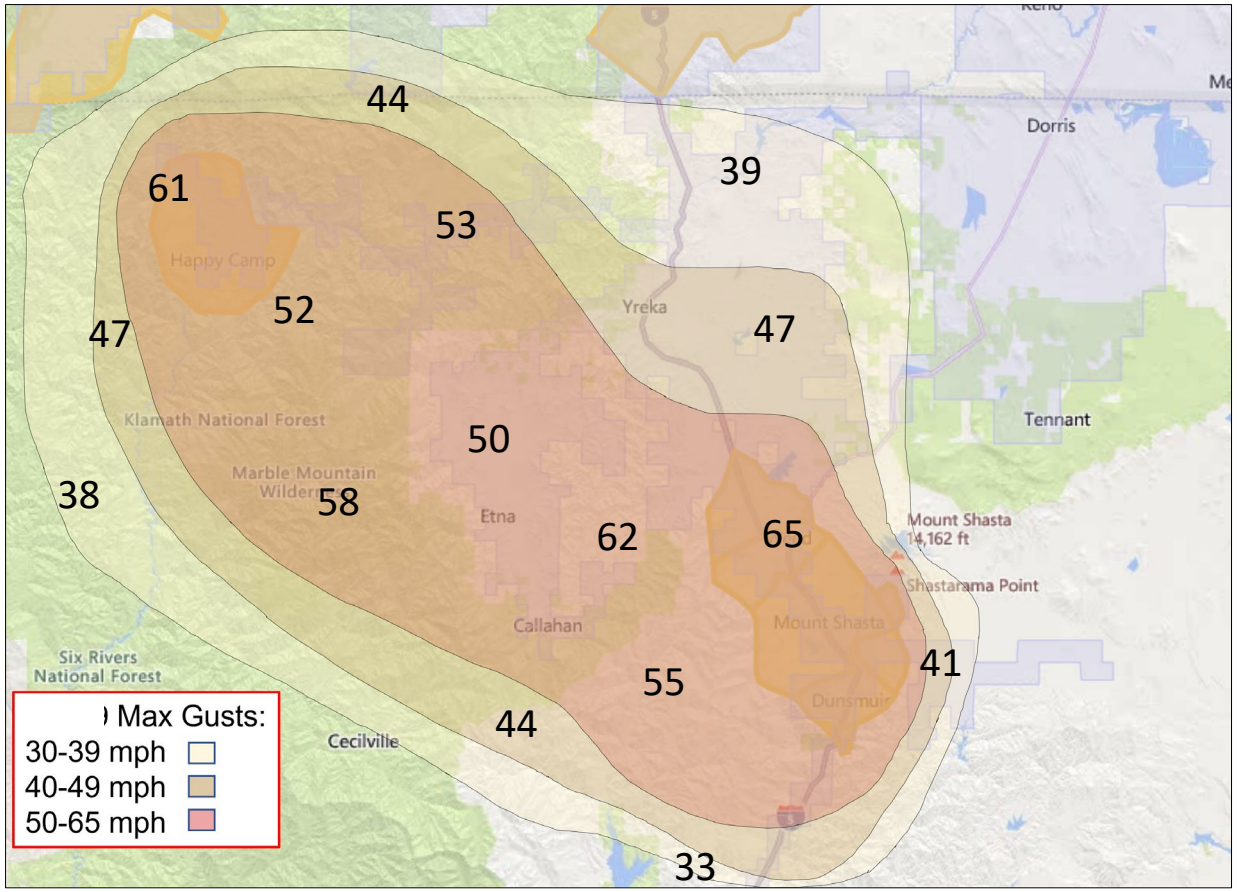
- Thunderstorms are not expected in the next 5 days.

Excessive Heat

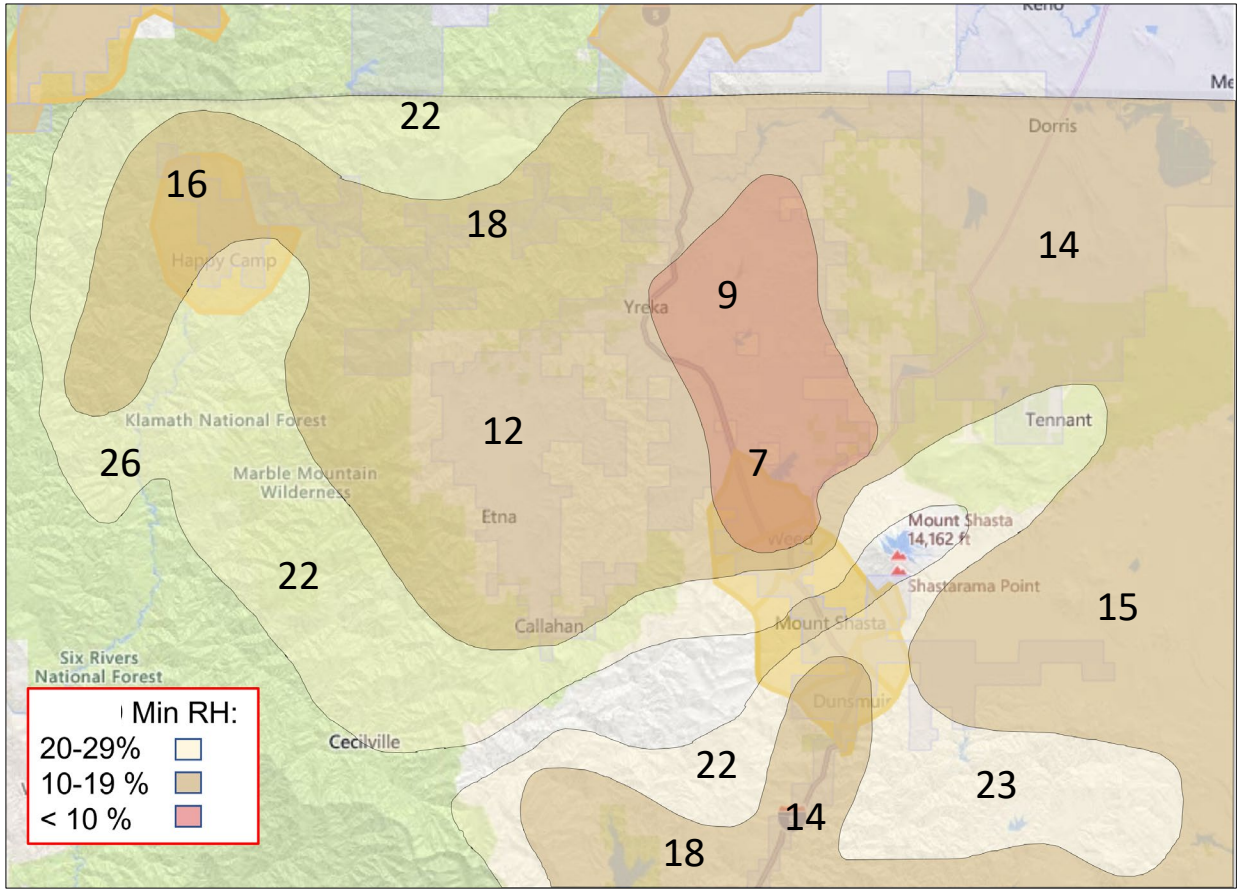
- Morning low temperatures will be 15-20 degrees warmer than average beginning Friday, leading to poor overnight RH recovery and the potential for active nighttime burning with any fires in the district.
- Afternoon temperatures will be 10-15 degrees above average.

72-hr FORECAST – *Siskiyou County, CA*

8 AM



FORECAST FOR 12:00-10:00 PM

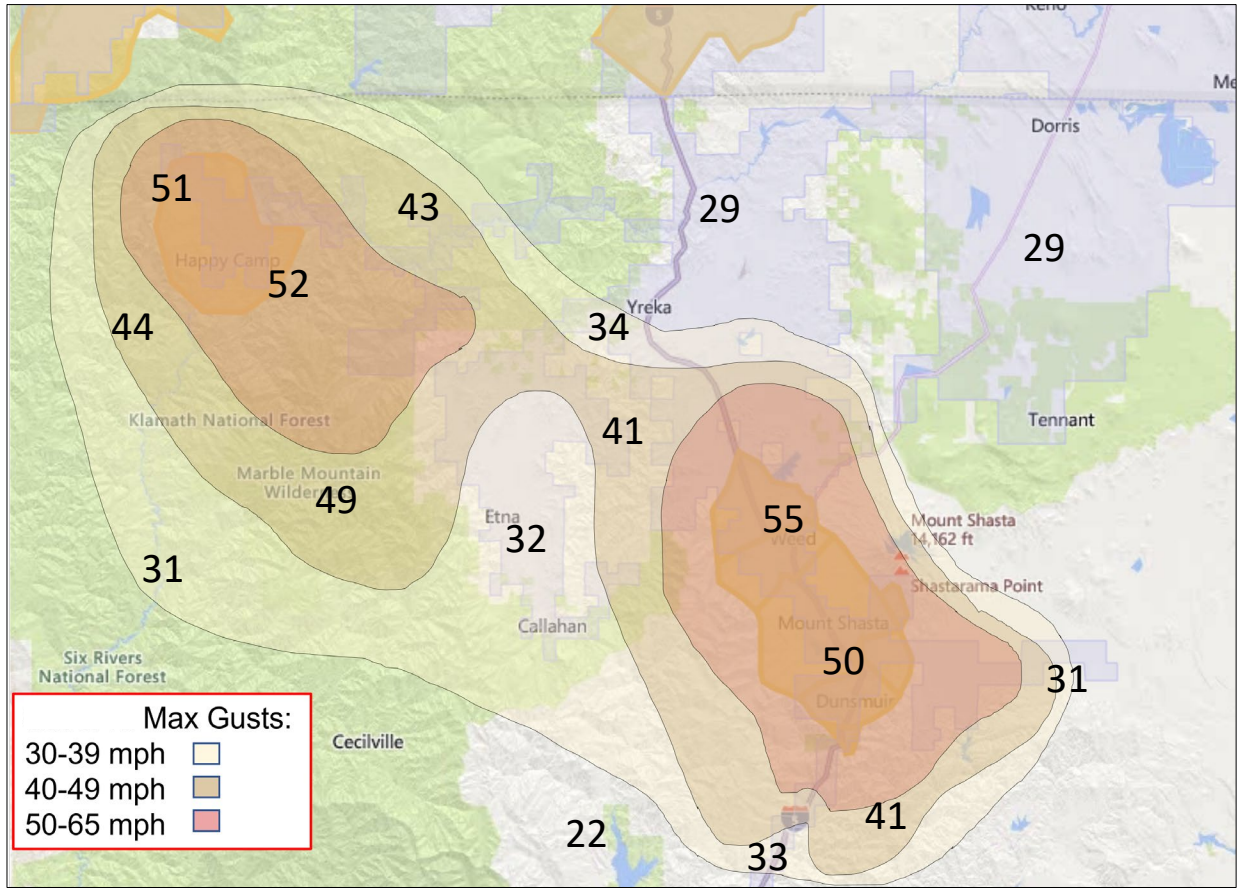


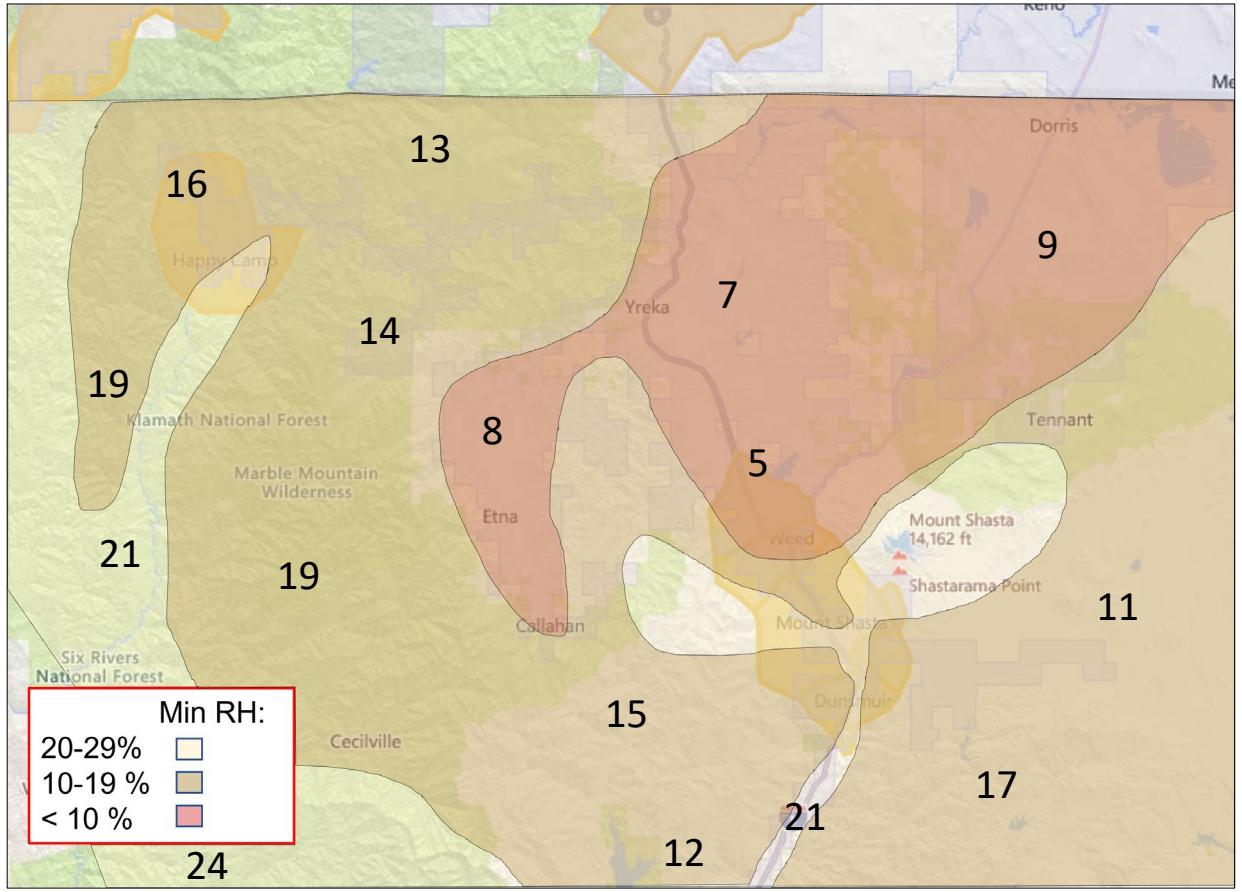
PSPS Watch | **PSPS Warning** | PSPS Execution

72-hr FORECAST – *Siskiyou County, CA*

8 AM

FORECAST FOR 9:00 AM - 2:00 PM





PSPS Watch | PSPS Warning | PSPS Execution

48-Hour Forecast

PACIFIC POWER
SYSTEM IMPACTS FORECAST MATRIX

Weather-Related System Impacts (Wx) / Fire Risk Potential (F) / Operational Response

CALIFORNIA	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response
Alturas		F			F			F			F			F	
Crescent City															
Tulelake		F			F			F			F			F	
Yreka		F			F		W	W		W	W			F	

Weather-Related System Impacts (Wx)

Outage Potential

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Fire Weather

- ERCs are at 97th percentile values, KBDI and Fosberg indices are also at critical levels.
- The GACC has issued a Fuels and Fire Behavior Advisory and grasses are fully cured.
- Increasing offshore winds and low RH are forecast for Friday-Saturday. Poor overnight RH recovery is also expected.

Wind

- Strong NE-SE winds may gust to 55-65 mph Friday and 45-55 mph Saturday across the Yreka District. System impacts are likely with these wind speeds.

Thunderstorm / Lightning

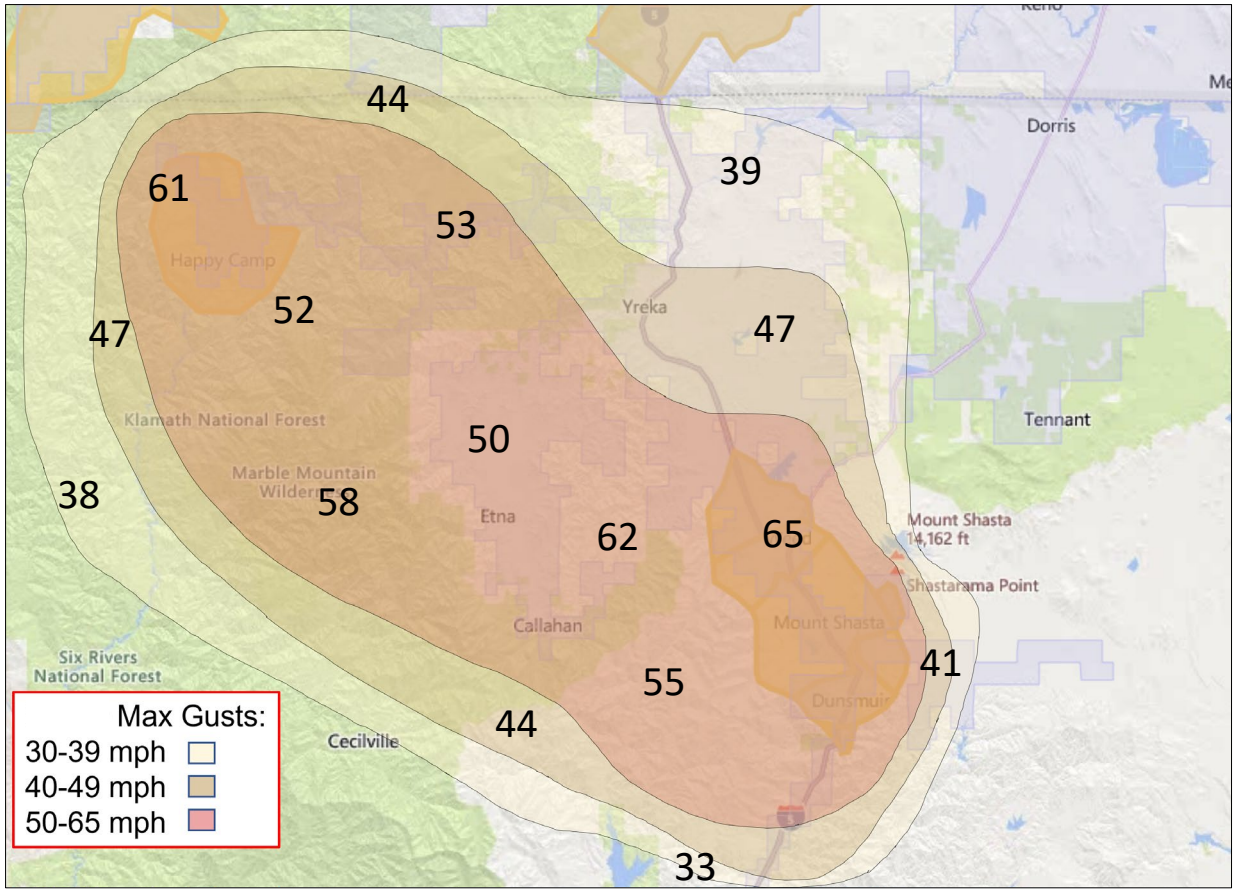
- Thunderstorms are not expected in the next 5 days.

Excessive Heat

- Morning low temperatures will be 15-20 degrees warmer than average beginning Friday, leading to poor overnight RH recovery and the potential for active nighttime burning with any fires in the district.
- Afternoon temperatures will be 10-15 degrees above average.

48-hr FORECAST – *Siskiyou County, CA*

8 AM



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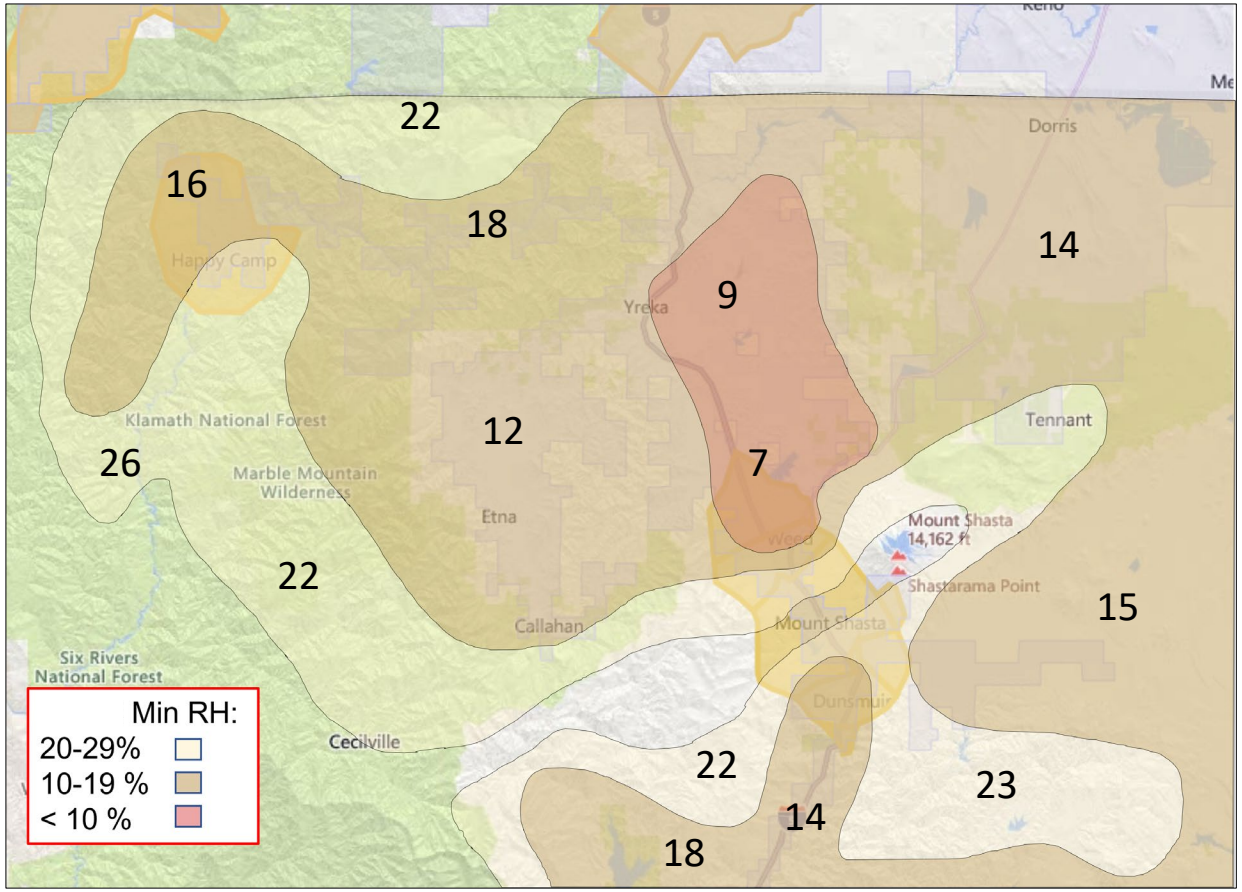
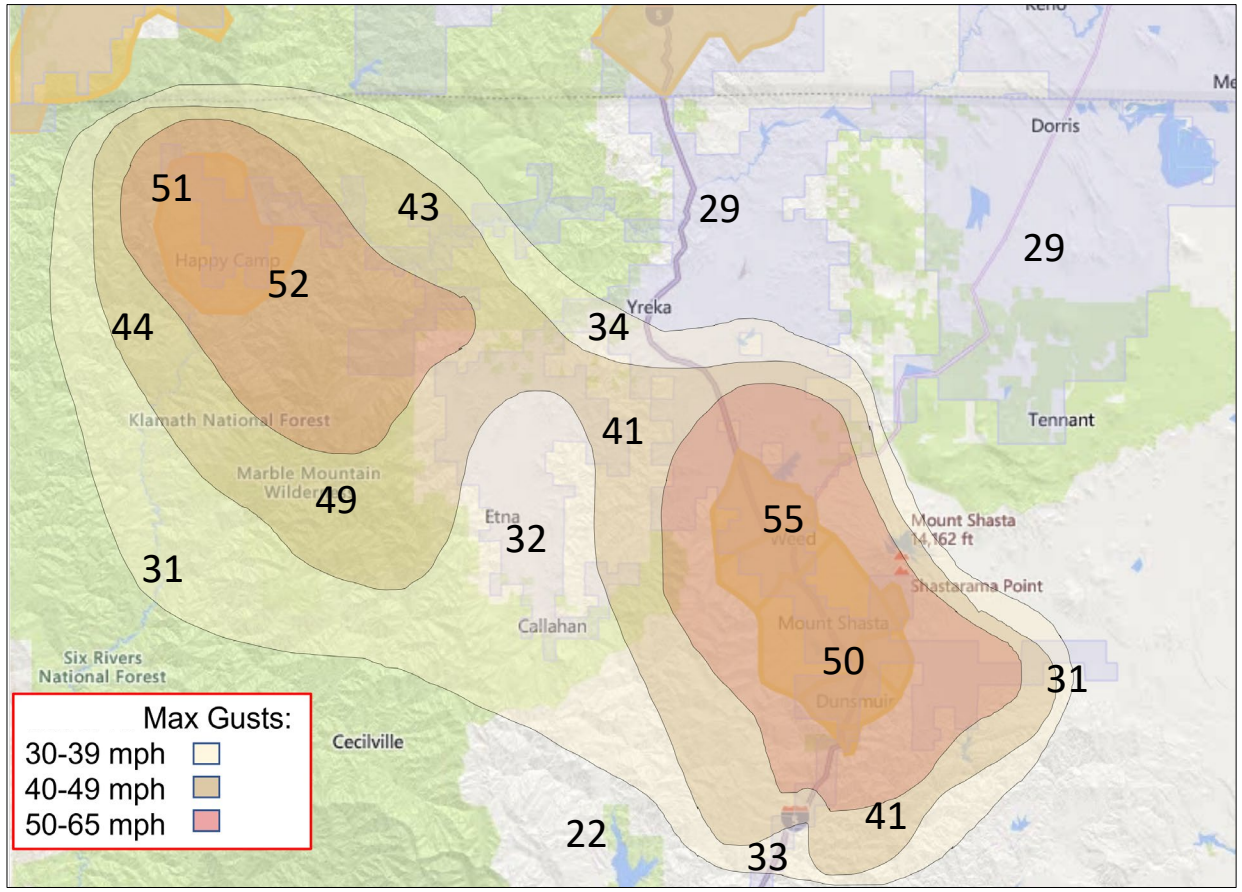


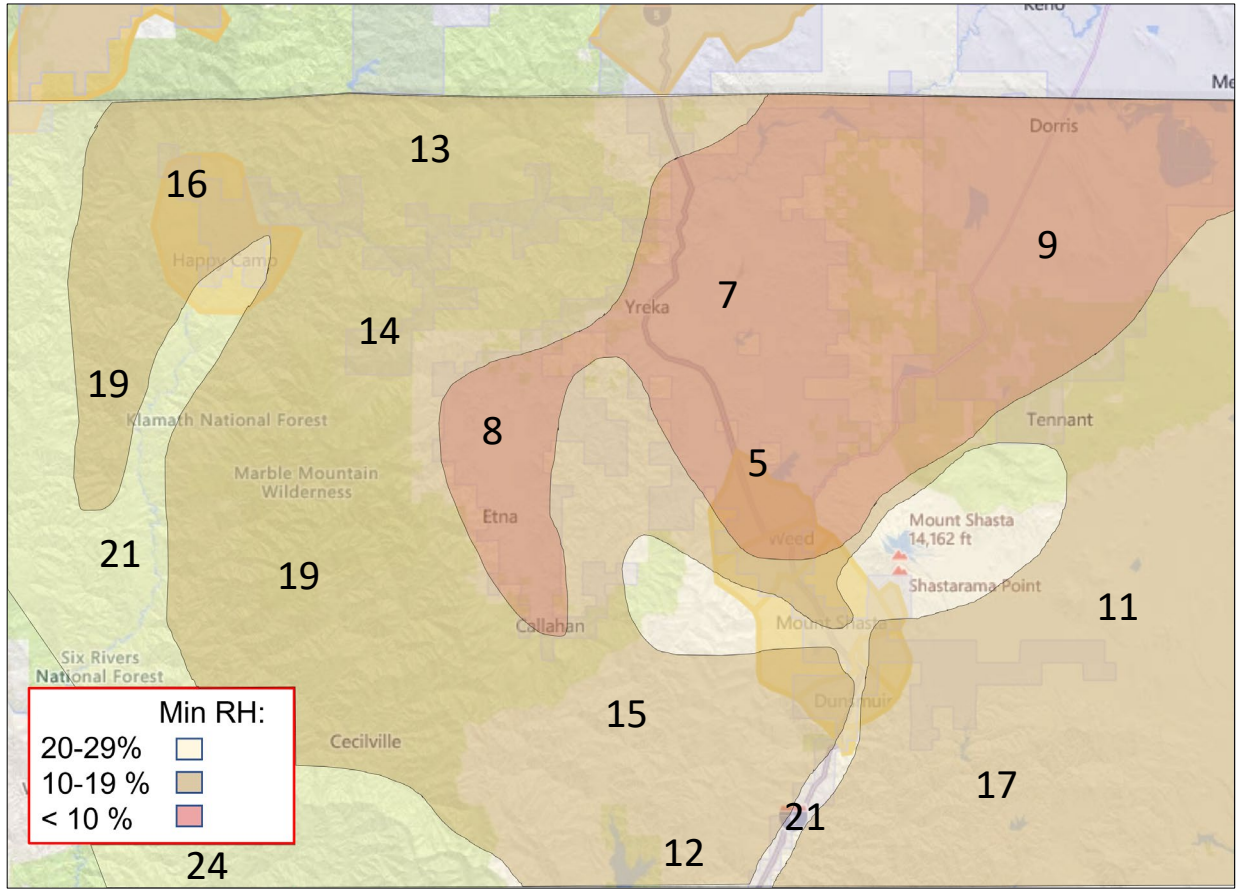
PSPS Watch | **PSPS Warning** | PSPS Execution

48-hr FORECAST – *Siskiyou County, CA*

8 AM



FORECAST FOR 9:00 AM - 2:00 PM



PSPS Watch | **PSPS Warning** | PSPS Execution

POWERING YOUR GREATNESS

24-Hour Forecast

PACIFIC POWER
SYSTEM IMPACTS FORECAST MATRIX

Weather-Related System Impacts (Wx) / Fire Risk Potential (F) / Operational Response

CALIFORNIA	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response
Alturas		F			F			F			F			F	
Crescent City															
Tulelake		F			F			F			F			F	
Yreka		F		W	W		W	W			F			F	

Weather-Related System Impacts (Wx)

Outage Potential

- Widespread Outages with Extended Restoration
- Scattered to Widespread Outages
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Fire Weather

- ERCs are at 97th percentile values, KBDI and Fosberg indices are also at critical levels.
- The GACC has issued a Fuels and Fire Behavior Advisory and grasses are fully cured.
- Strong offshore winds and low RH are forecast for Friday-Saturday. Poor overnight RH recovery is also expected.

Wind

- Strong NE-SE winds may gust to 55-65 mph Friday and 45-55 mph Saturday across the Yreka District. System impacts are likely with these wind speeds.

Thunderstorm / Lightning

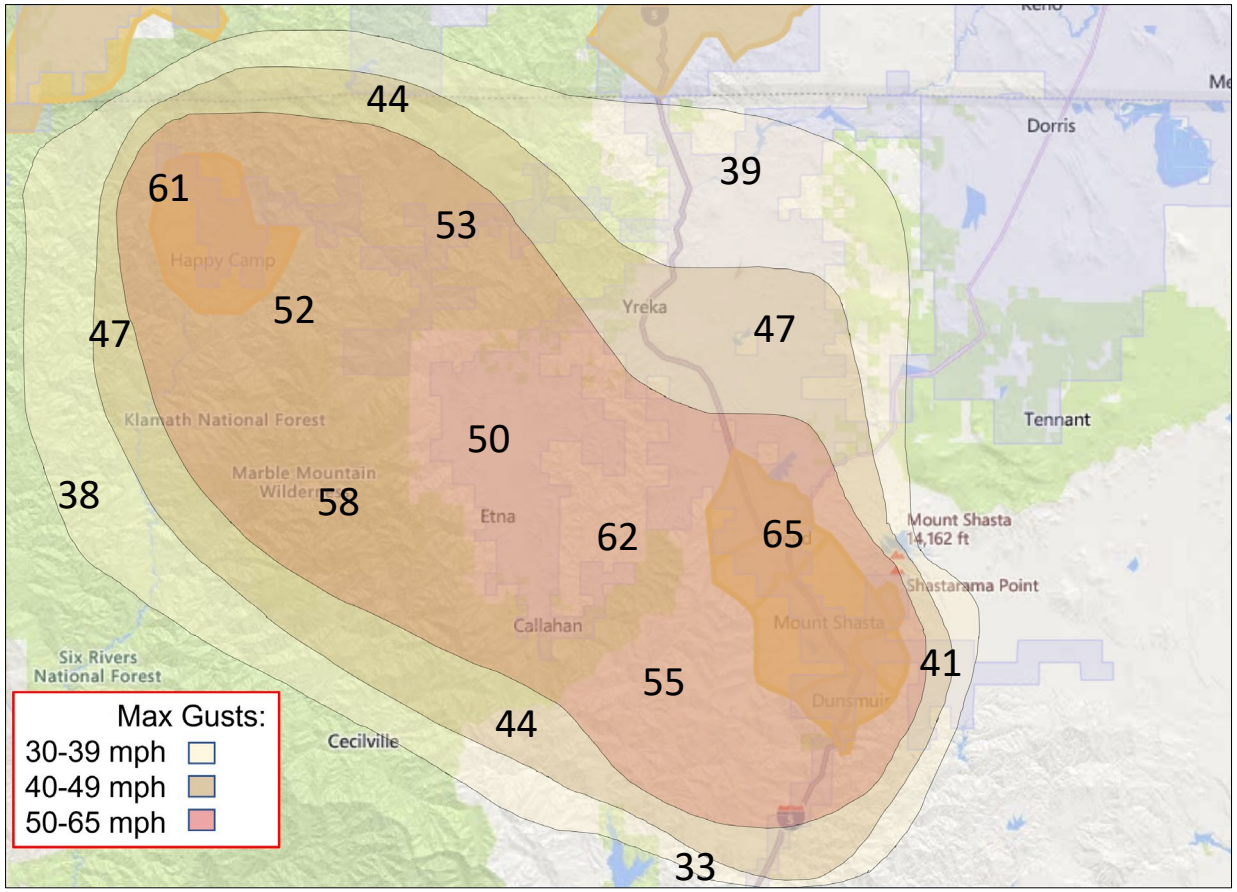
- Thunderstorms are not expected in the next 5 days.

Excessive Heat

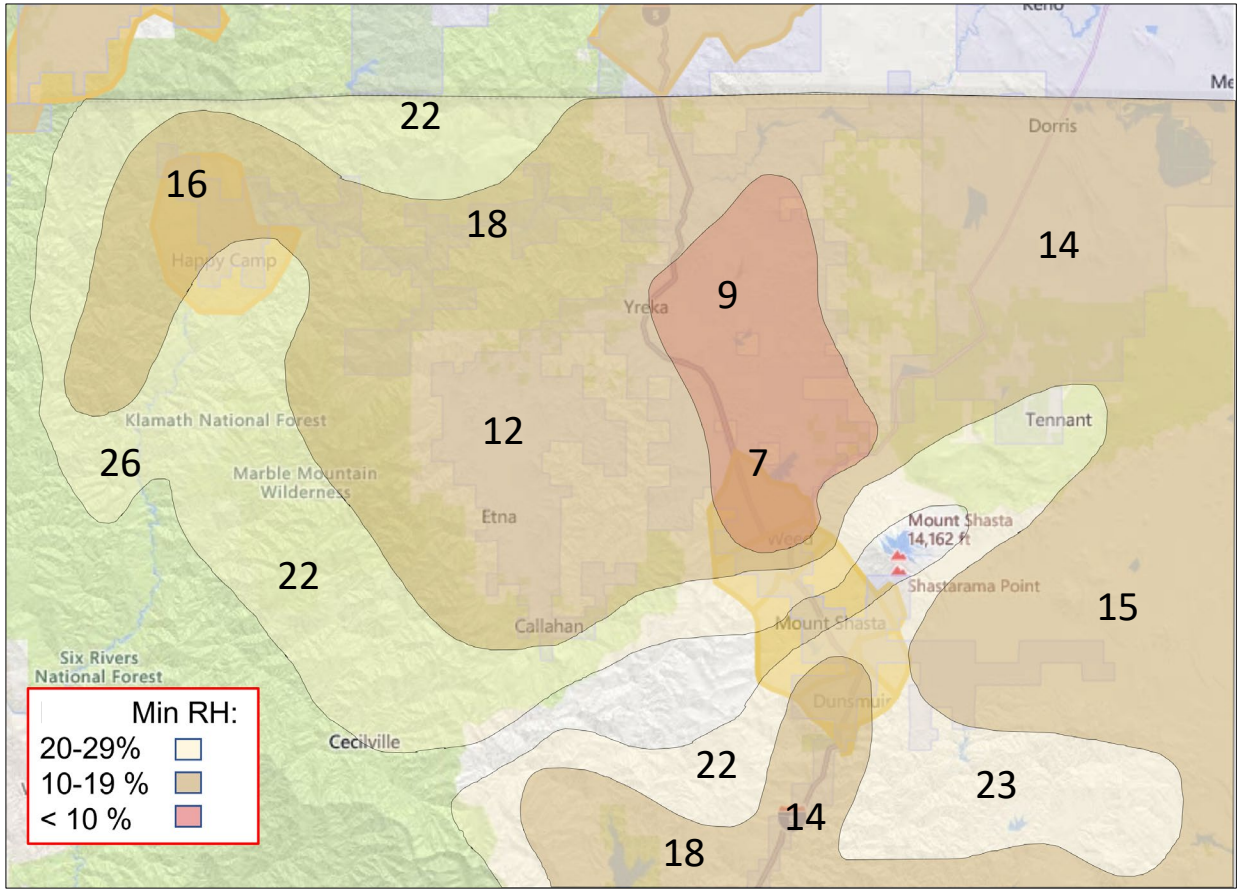
- Morning low temperatures will be 15-20 degrees warmer than average beginning Friday, leading to poor overnight RH recovery and the potential for active nighttime burning with any fires in the district.
- Afternoon temperatures will be 10-15 degrees above average.

24-hr FORECAST – *Siskiyou County, CA*

8 AM



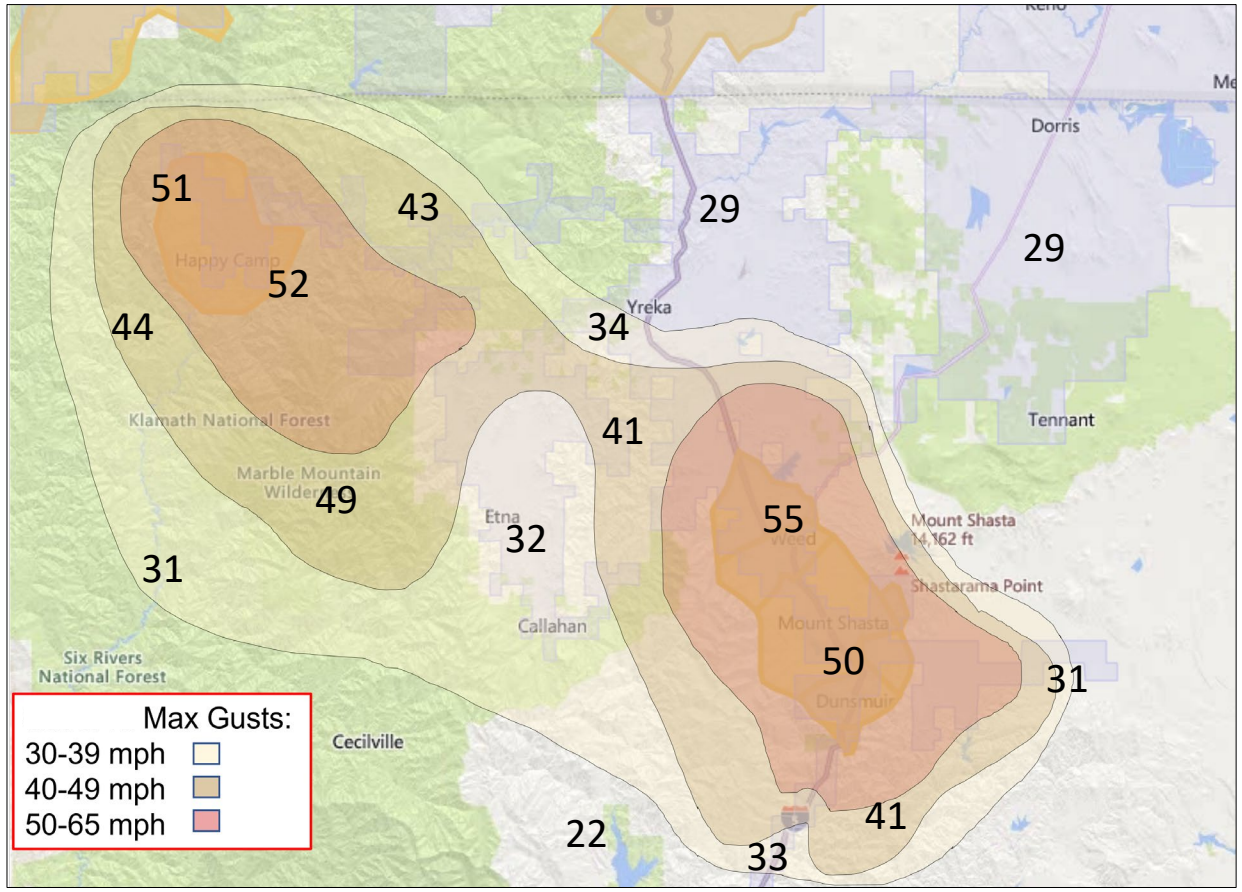
FORECAST FOR 12:00-10:00 PM



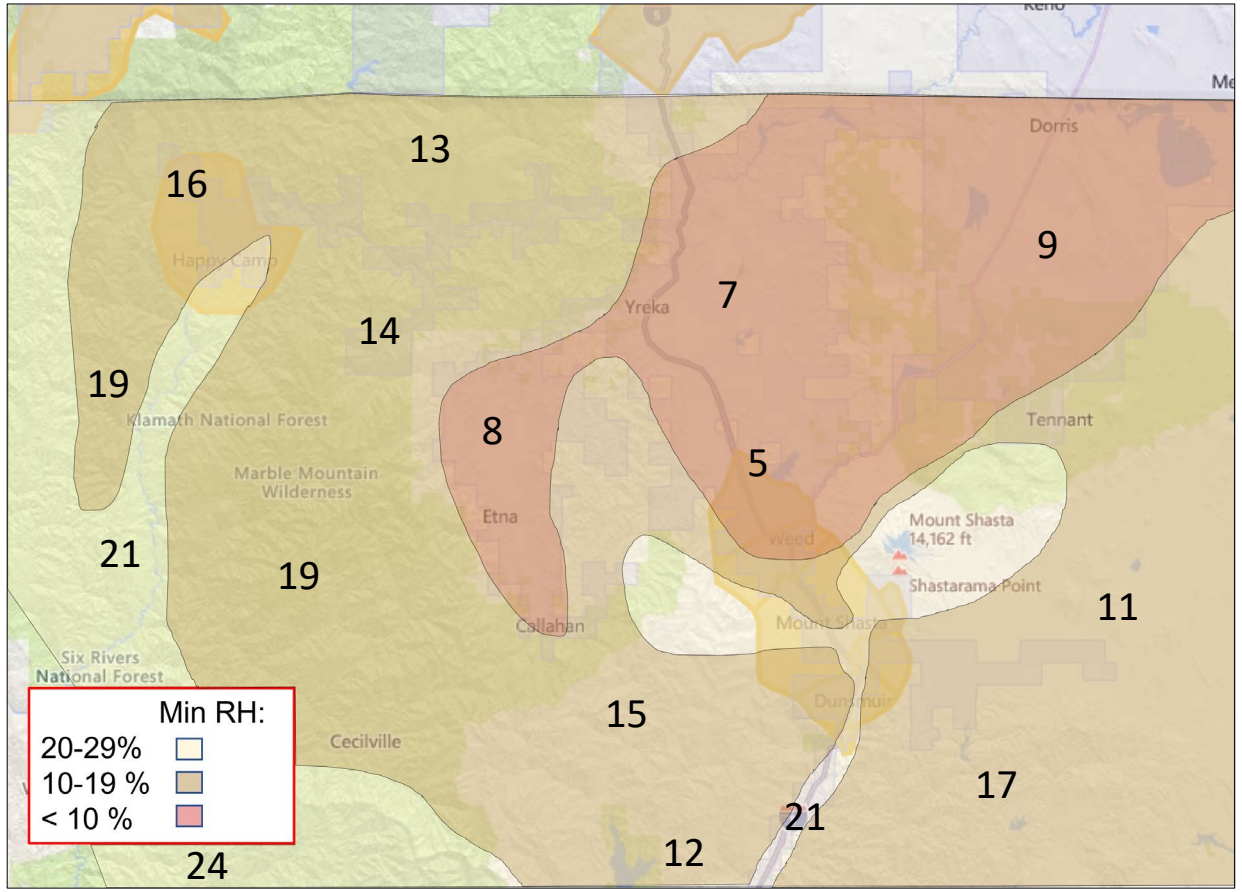
PSPS Watch | **PSPS Warning** | PSPS Execution

24-hr FORECAST – *Siskiyou County, CA*

8 AM



FORECAST FOR 9:00 AM - 2:00 PM



PSPS Watch | **PSPS Warning** | PSPS Execution

Day 1 of PSPS Event

PACIFIC POWER
SYSTEM IMPACTS FORECAST MATRIX

Weather-Related System Impacts (Wx) / Fire Risk Potential (F) / Operational Response

CALIFORNIA	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response
Alturas		F			F			F			F			F	
Crescent City															
Tulelake		F			F			F			F			F	
Yreka	W	W		W	W			F			F			F	

Weather-Related System Impacts (Wx)

Outage Potential

- Widespread Outages with Extended Restoration
- Scattered to Widespread Outages
- Isolated to Scattered Outages
- No System Impacts Expected

Hazards

- (W) Wind
- (L) Lightning / Thunderstorms
- (I) Freezing Rain or Ice
- (S) Snow
- (H) Extreme Heat
- (R) Heavy Rain or Flooding

Fire Risk Potential (F)

GACC Risk Level (Significant Fire Potential)

- **HIGH RISK** (Windy and Dry - *OR* - Extremely Dry Fuels)
- Moderate Risk - *OR* - High Risk for Non-Windy Weather
- Low Risk

Reason for High Risk

- (W) Wind
- (L) Lightning
- (F) Extremely Dry Fuels
- (H) Hot with Low Humidity

Operational Response

- SP: System Patrol
- FS: Fire Settings
- NR: No Reclose Settings
- PW: PSPS Watch
- PS: PSPS Event

Fire Weather

- ERCs are at 97th percentile values, KBDI and Fosberg indices are also at critical levels.
- The GACC has issued a Fuels and Fire Behavior Advisory and grasses are fully cured.
- Low RH and strong offshore winds are expected today, with somewhat lighter winds tonight and Saturday. Poor overnight RH recovery is also expected. Fire weather conditions will remain critical Saturday, however.

Wind

- NE-SE gusts 55-65 mph expected today will likely lead to system impacts/damage in the Medford, Roseburg, and Grants Pass Districts.
- NE-SE gusts 35-45 mph tonight and Saturday could lead to isolated system impacts in vulnerable locations.

Thunderstorm / Lightning

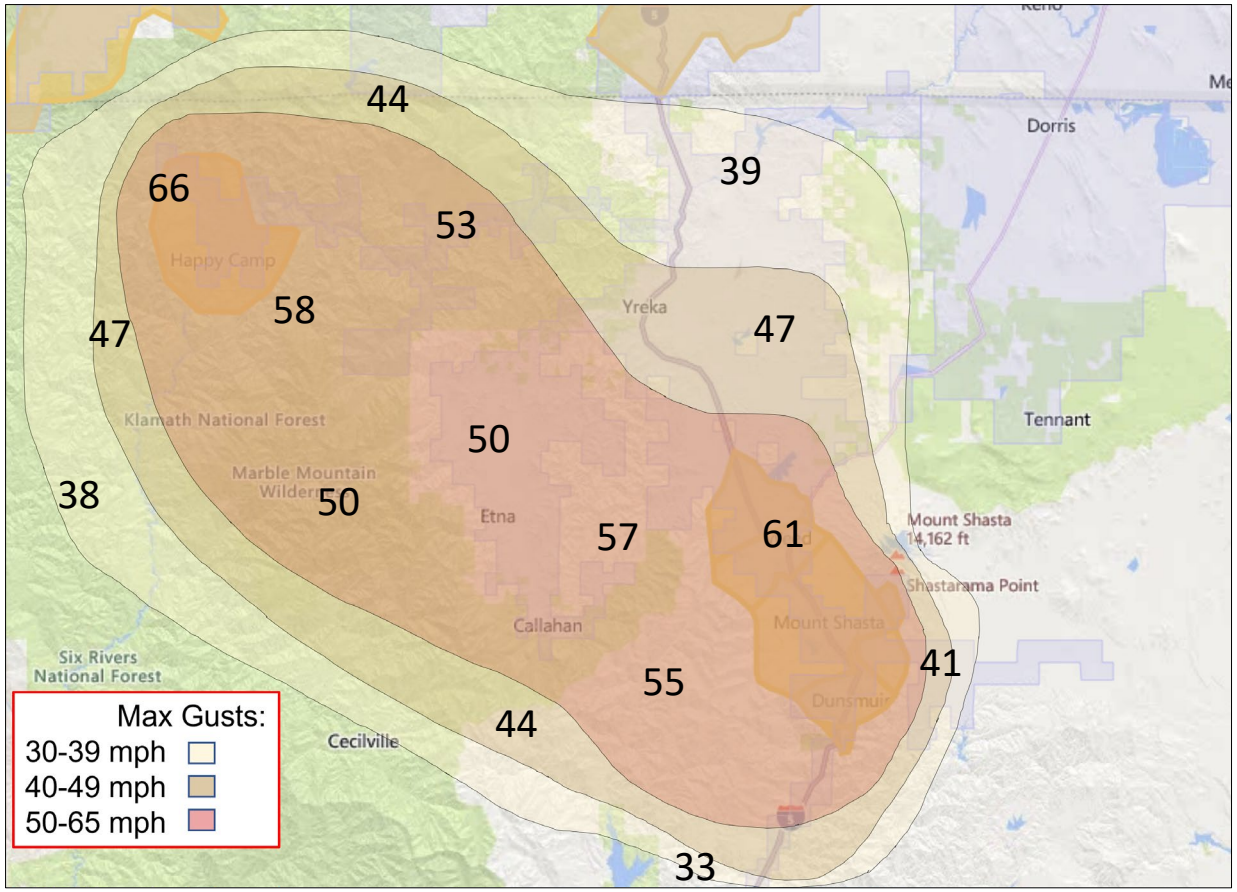
- Thunderstorms are not expected in the next 5 days.

Excessive Heat

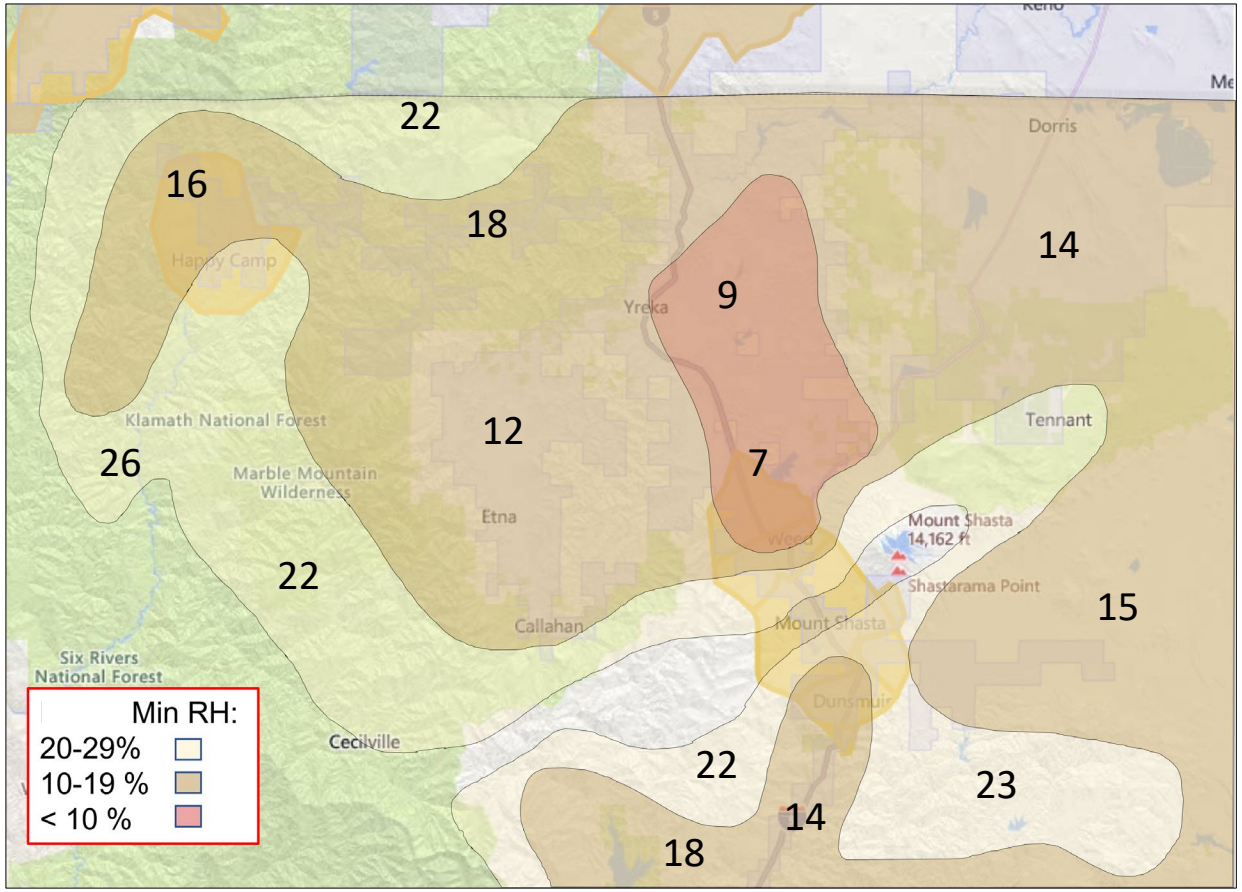
- Morning low temperatures will be 15-20 degrees warmer than average beginning today, leading to poor overnight RH recovery.
- Afternoon temperatures will be 10-15 degrees above average.

Day 1 FORECAST – *Siskiyou County, CA*

8 AM



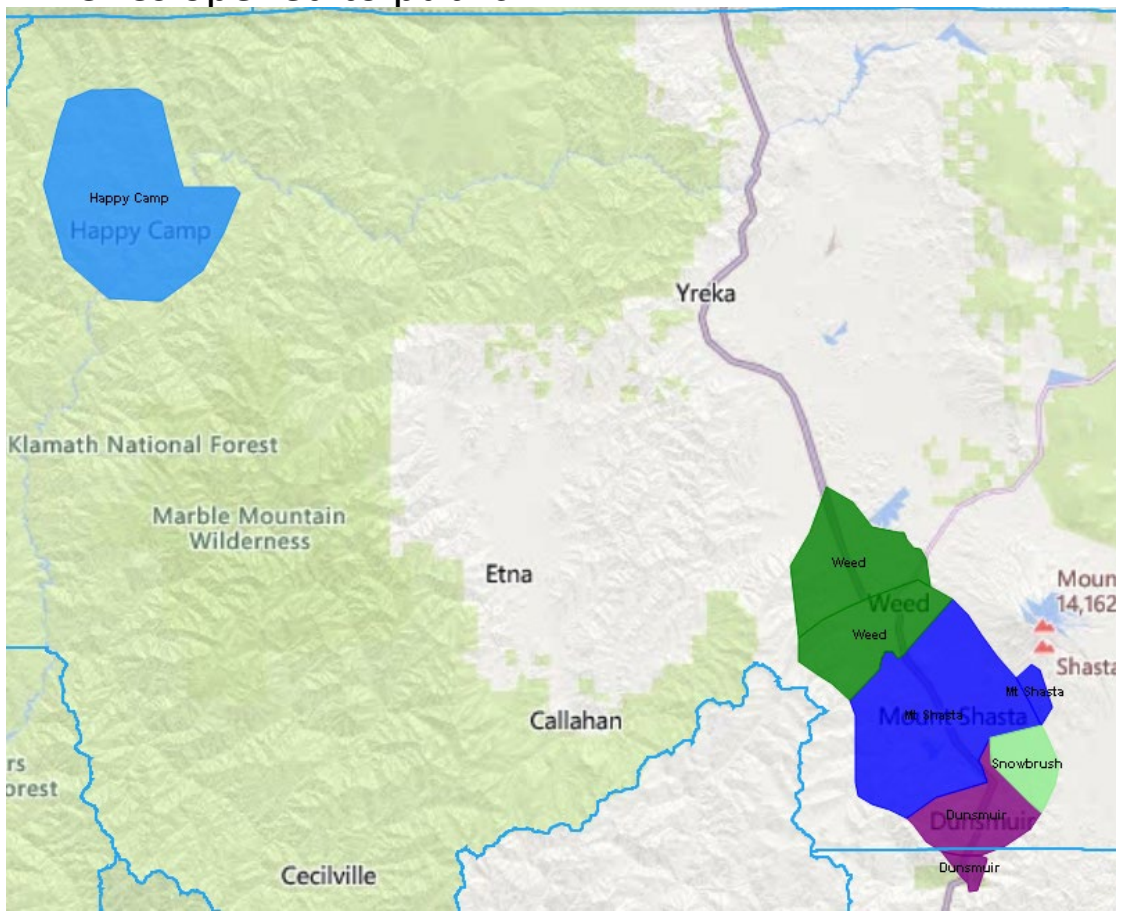
FORECAST FOR 12:00-10:00 PM

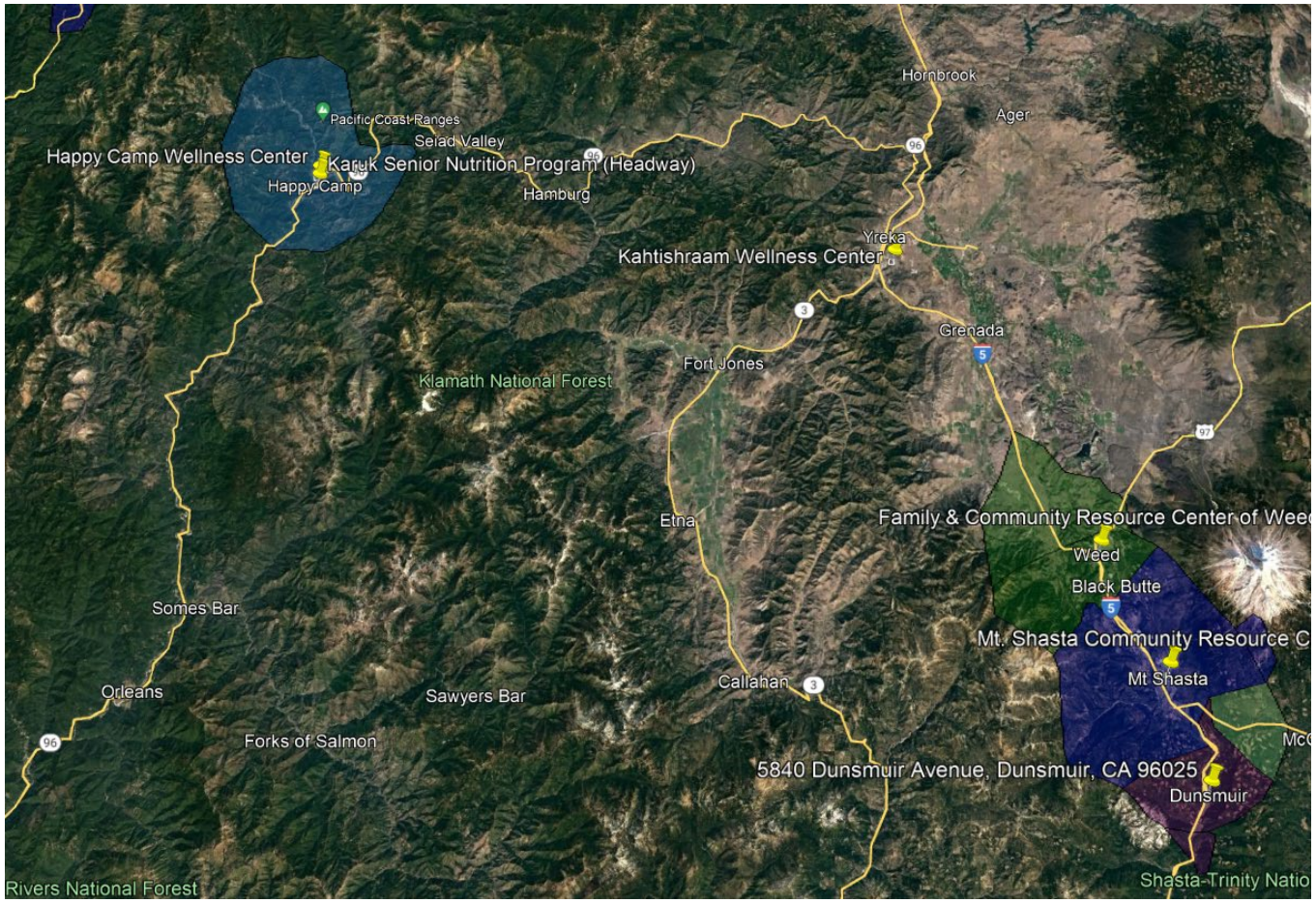


PSPS Execution

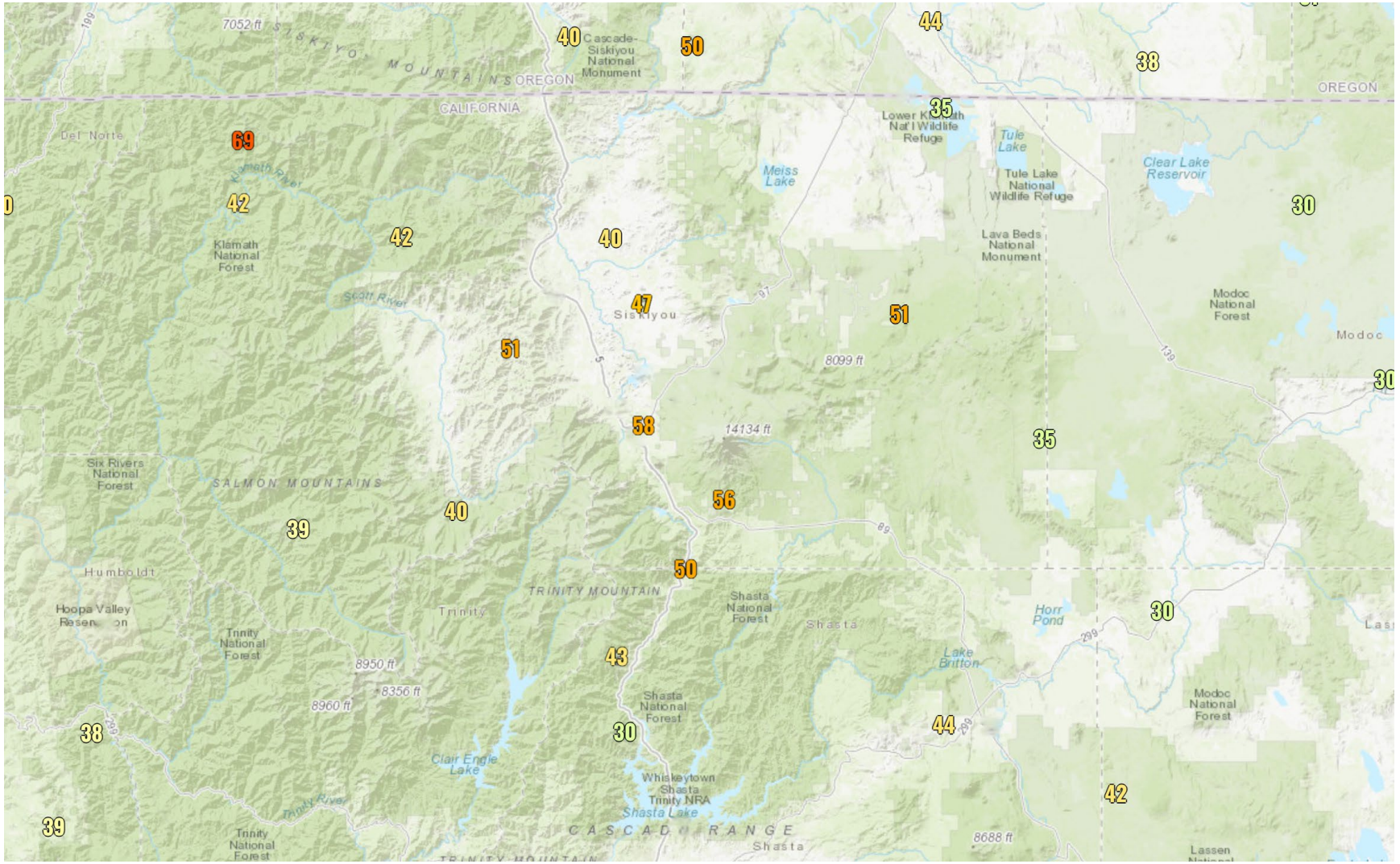
Pacific Power Response

- Approximately 10,351 customers de-energized
- CRCs opened to public





Peak Gusts Recorded Day of Event



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Evening Forecast

- Conditions
  - Time: 9:00pm
  - Winds have subsided to NE 10 gusting to 18
  - Red Flag Warning Issued for area expires at 11:00pm
  - Geographic Coordination Center: High Risk for Significant Fire Potential
  - Forecast shows potential PSPS conditions tomorrow starting at 2:00pm

Overnight Care

- CRC closes at 10
- Security on-site & signage posted relaying information on de-energization zone and EV charging

Day 2 of Wind Event

PACIFIC POWER
SYSTEM IMPACTS FORECAST MATRIX

Weather-Related System Impacts (Wx) / Fire Risk Potential (F) / Operational Response

CALIFORNIA	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response
Alturas		F			F			F			F			F	
Crescent City															
Tulelake		F			F			F			F			F	
Yreka		F			F			F			F			F	

Weather-Related System Impacts (Wx)

Outage Potential

- Widespread Outages with Extended Restoration
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Hazards

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Fire Risk Potential (F)

GACC Risk Level (Significant Fire Potential)

- HIGH RISK (Windy and Dry - *OR* - Extremely Dry Fuels)
- Moderate Risk - *OR* - High Risk for Non-Windy Weather
- Low Risk

Reason for High Risk

- (W) Wind
- (L) Lightning
- (F) Extremely Dry Fuels
- (H) Hot with Low Humidity

Operational Response

- SP: System Patrol
- FS: Fire Settings
- NR: No Reclose Settings
- PW: PSPS Watch
- PS: PSPS Event

Fire Weather

- Fuels indices are critically dry. A Fuels and Fire Behavior Advisory is in effect for the Yreka District and grasses are fully cured.
- Latest forecasts show wind speeds remaining below PSPS criteria today. Red Flag Warnings have been cancelled.

Wind

- NE-SE winds may gust to 25-40 mph over higher exposed wind-prone areas today.
- Gusts at lower elevation populated areas will reach near 25-33 mph across the district. No system impacts are expected from these wind speeds.

Thunderstorm / Lightning

- Thunderstorms are not expected in the next 5 days.

Excessive Heat

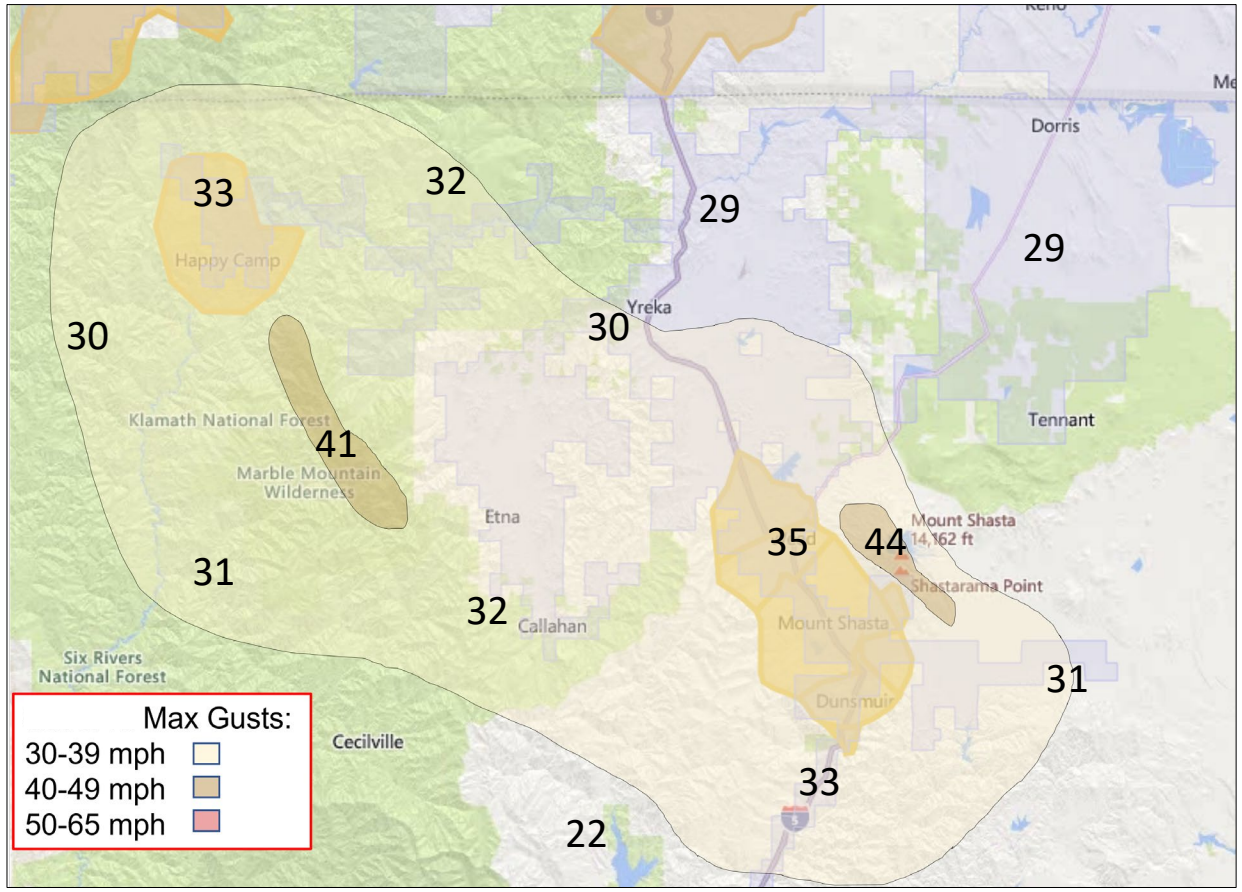
- Morning low temperatures are 15-20 degrees warmer than average this morning. RH will be critically low all day.
- Afternoon temperatures will be 10-15 degrees above average.
- Onshore flow will bring increasing RH and lower temperatures beginning this evening.

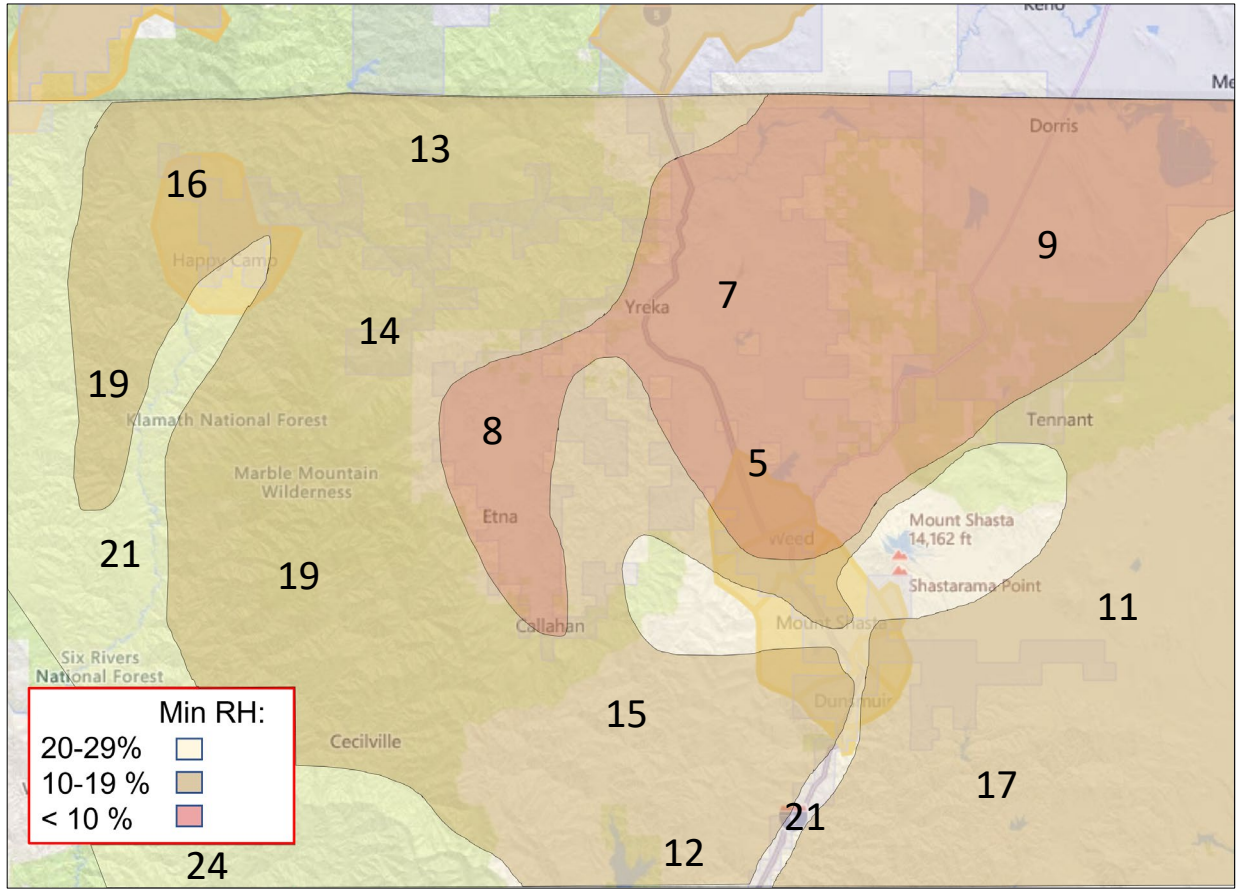
PSPS Watch | PSPS Warning | PSPS Execution

Day 2 FORECAST – *Siskiyou County, CA*

8 AM

FORECAST FOR 9:00 AM - 2:00 PM





PSPS Watch | PSPS Warning | PSPS Execution

Restoration

- Crews restored power
- Re-energize notifications sent

Hotwash

- What went well?
- What challenges do we have?
- What if this had affected generation assets?
- How can we help you prepare for outages in the future?
- Potential solutions?
- Who owes what?
- Surveys

Questions and Comments

For more information about our emergency management program please contact:

Jeff Bolton
Emergency Manager
Pacific Power
503-260-7782 (c)

Tyler Averyt
Emergency Manager
Pacific Power
503-319-6901 (c)

Emergency Management Duty Officer 503-331-4498

Report a power outage
1-877-508-5088

Customer service
1-888-221-7070

PACIFIC POWER
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Wildfire Mitigation Program






PACIFIC POWER

POWERING YOUR GREATNESS

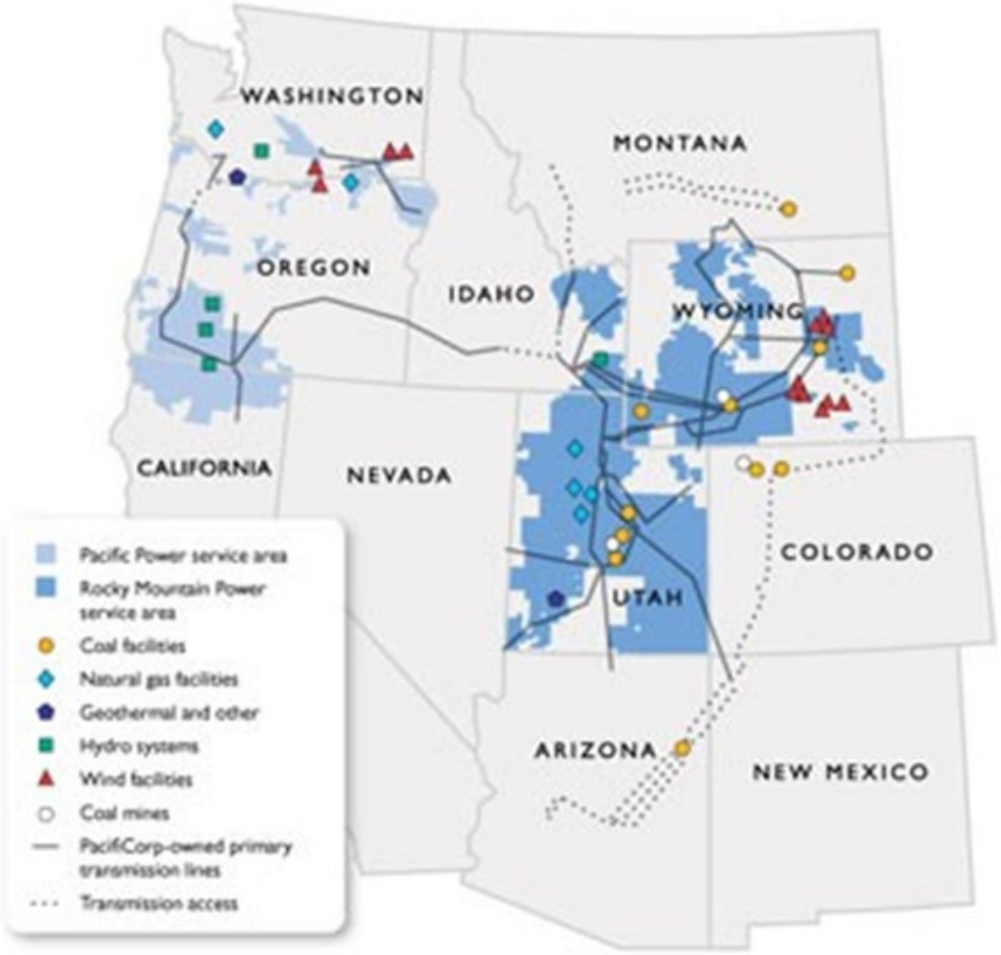
Company Overview and Organization

PACIFIC POWER

POWERING YOUR GREATNESS

PacifiCorp

(a *Berkshire Hathaway Energy Company)*



- **Serving 1.8 million** customers in 6 states.
  - Pacific Power (CA, OR, WA)
  - Rocky Mountain Power (UT, WY, ID)
- 143,000 square miles of service area
- 5,700 employees
- 80,300 miles of transmission and distribution lines
- 10,800 megawatts of company-owned net generation capacity
- 900 substations

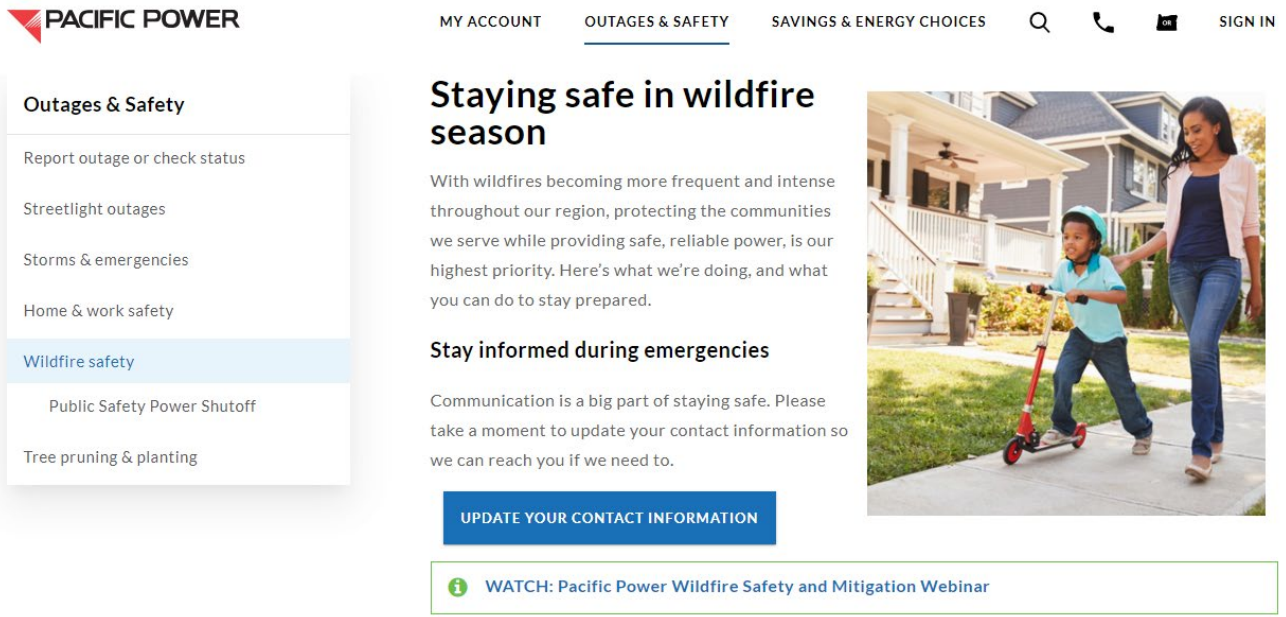
Pacific Power

- *Proudly serving the Pacific Northwest for more than 100 years*
- 785,000 customers
- 35,313 square miles of service area
- 4,392 transmission line miles
- 50,154 transmission poles
- 117 transmission substations
- 26,642 distribution line miles
- 525,453 distribution poles
- 281 distribution substations
- 294,669 service transformers

Pacific Power

- Expanded Emergency Management
  - Director of Emergency Management in place
  - Meteorology Manager in place
  - Additional Meteorology and Emergency Management Staff recruitment in process
    - Projected to be hired in next few months
    - Increased staff = increased support
    - Utility-specific weather forecasts
- Emergency Management Program
  - Hosting several Tabletop Exercises
  - Hosting three Functional Exercises at Hydroelectric sites this year
  - Ongoing outreach to county, state and local jurisdictions Leveraging opportunities identified during exercises
  - Mutual assistance agreements allows us to bring resources to affected areas

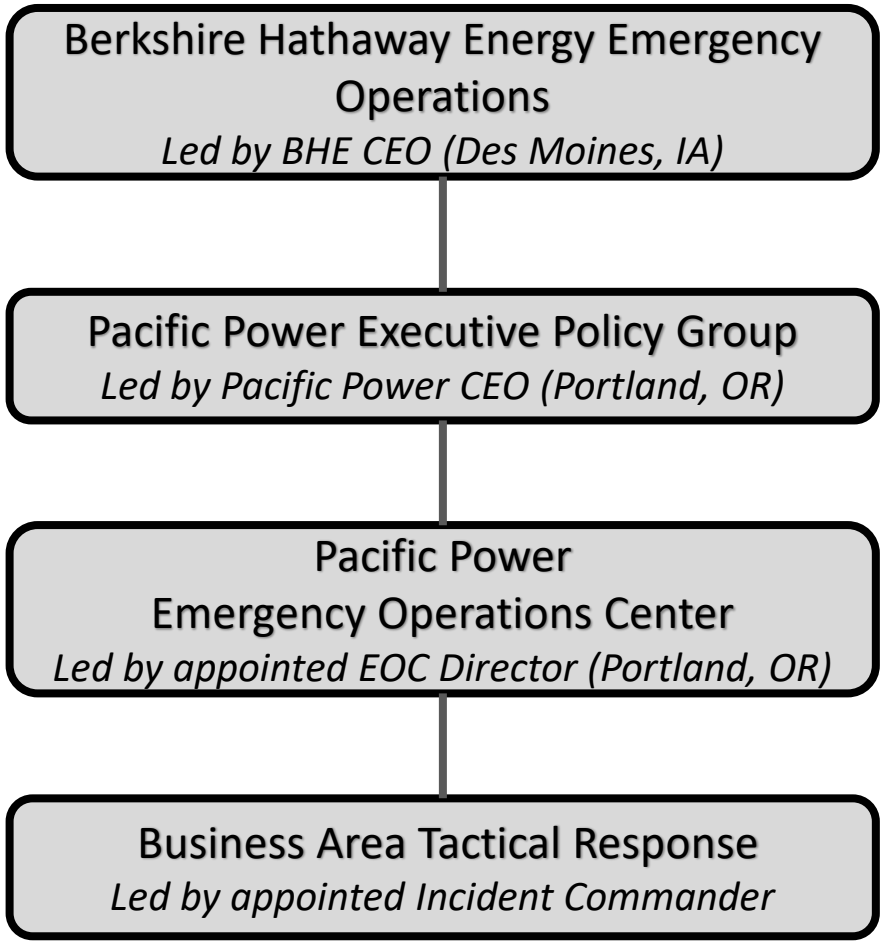
- Wildfire Mitigation and Response
  - Continue to support response as requested by the Incident Commander
  - Details on our Wildfire Planning are available at www.pacificpower.net/wildfiresafety
  - Public Safety Power Shutoff details are available at https://www.pacificpower.net/outages-safety/wildfire-safety/public-safety-power-shutoff.html



Mutual Assistance

- Mutual assistance agreements:
    - California Utility Emergency Association
    - Western Energy Institute
    - Edison Electric Institute
    - Oregon Municipal Electric Utilities
    - Oregon Rural Electric Cooperative Association
    - Inter-Company Agreement
- Regional Mutual Assistance Group.
- National Mutual Assistance Resource Team.
- National Resource Executive Committee.

Company Emergency Management Structure



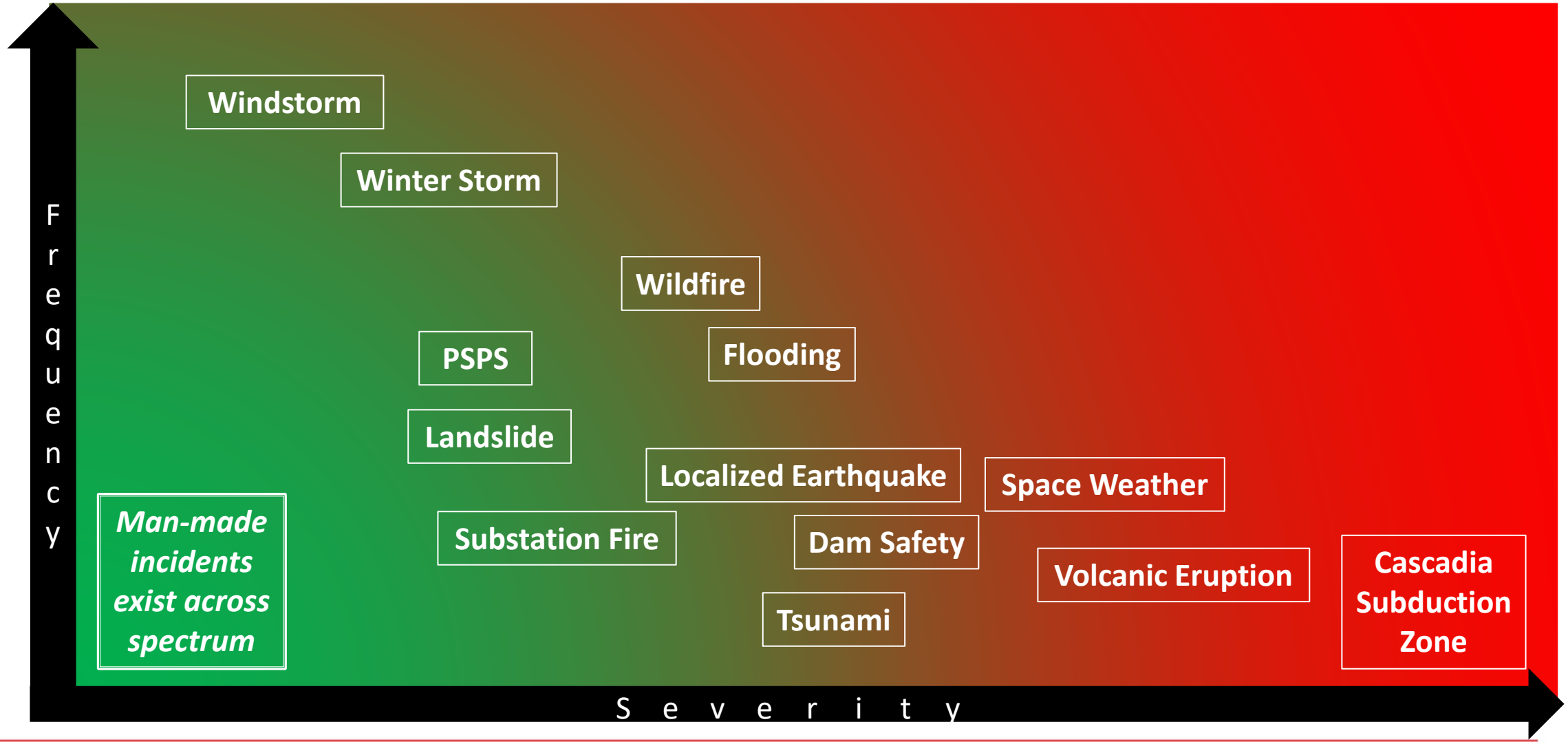
Strategic high level support for cross-company and federal coordination

Strategic policy making and support for multiple business unit, state and federal coordination

Operational support for on-scene resources and state, county and local emergency management agency coordination

Tactical control of response and coordination with Pacific Power Emergency Operations Center as needed

Incident Planning Spectrum



Exercise and Evaluation

- Specific risk based exercises
  - Cascadia Subduction Zone
  - Dam Failure
  - Landslide
  - Fuel allocation
  - Man-made disaster
  - Cyber/Physical Security
- Homeland Security Exercise and Evaluation Program used as guidance
- Identified improvements from exercise are tracked through completion

2017	2018 Schedule
Functional Exercises • Cascadia Subduction Zone incident with governance transfer to Rocky Mountain Power • Ashton and Bear River Dam failure Tabletop Exercises • Viva Naughton Dam failure Drills • All other high hazard hydro locations	Functional Exercises • National Mutual Assistance Exercise Drills • All high hazard hydro locations Documentation Refresh • Updated Emergency Response Plan

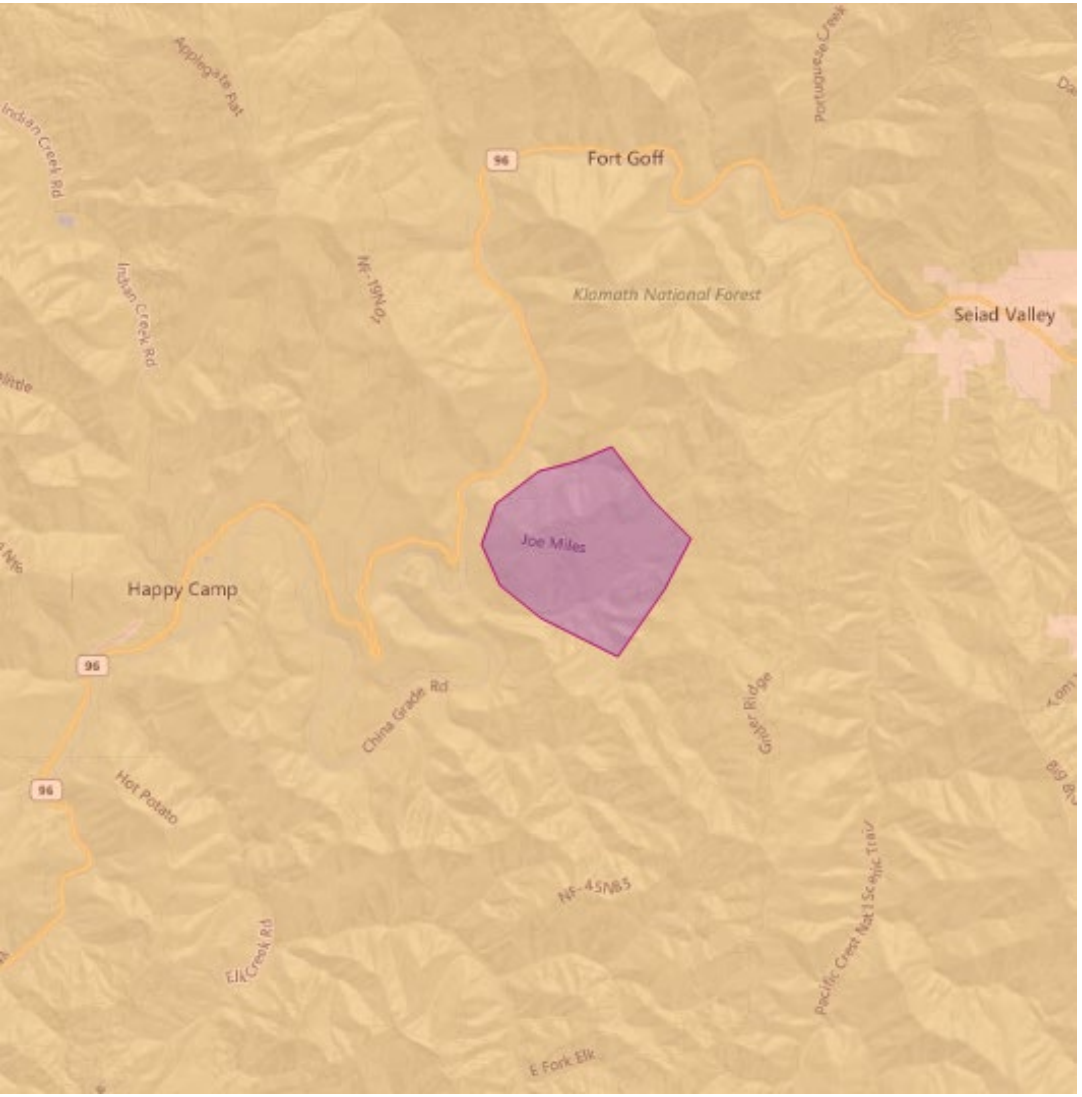
Wildfire Mitigation Program

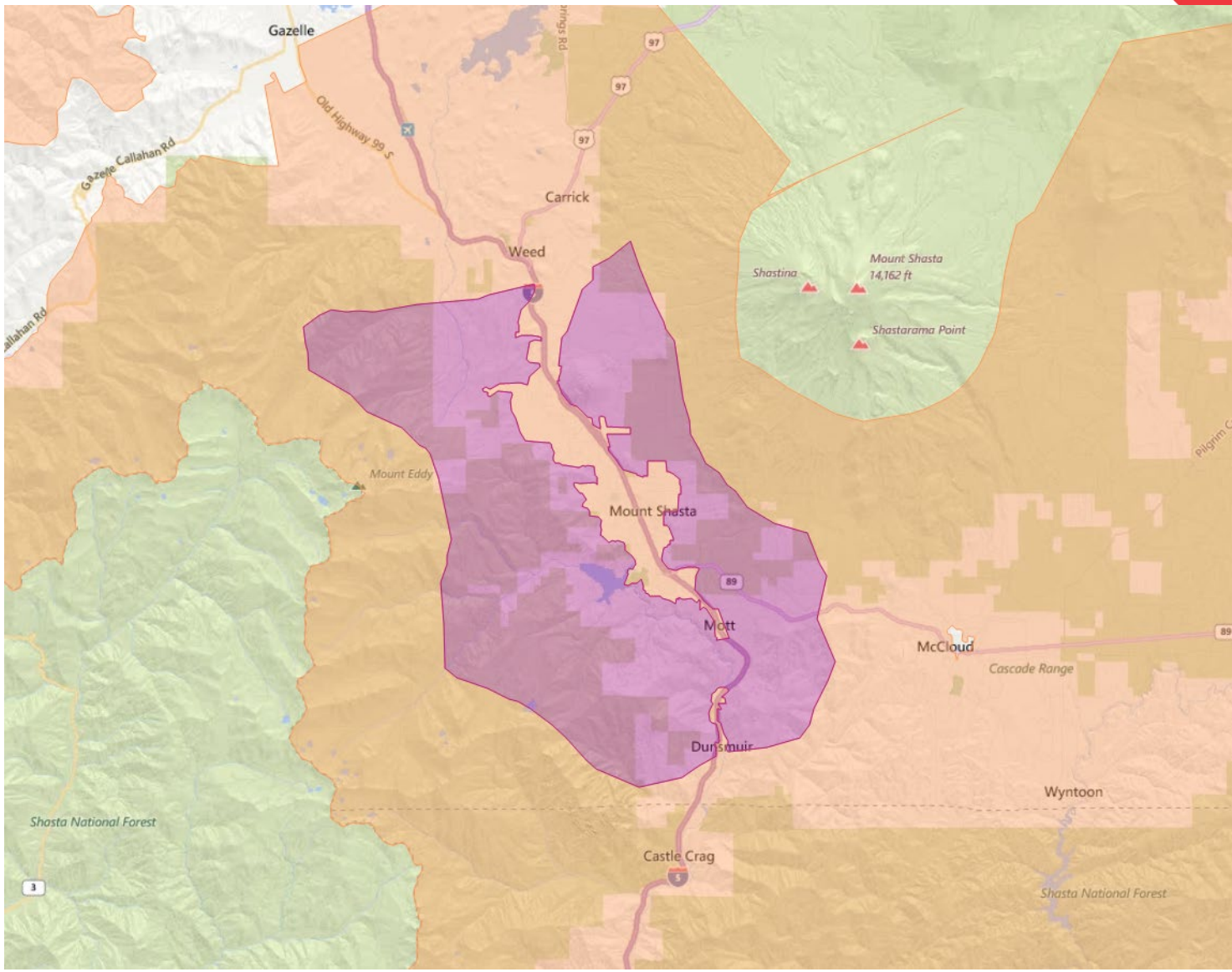
- High fire threat areas determination include
  - population density
  - structure density
  - fuel loading
  - accessibility
  - climatology
- Mitigation plans developed to minimize risk from electrical assets
- Modified reclosing procedures during fire season
- Vegetation management crews will work in coordination with public sector authorities
- De-Energization for all areas - real time potential damage or fire risk is assessed by emergency response or emergency action center

Key objectives of PacifiCorp's plan

- More resilient systems with lower likelihood of fault events
- Better response when faults occur, including equipment and personnel plans to minimize scope and duration of the fault event
- Situation awareness and operational readiness designed to mitigate impacts to the system
- Maintenance of the plan, assessment of its effectiveness and review of impacts on stakeholders

High Fire Threat Areas





Wildfire Mitigation Plan Components

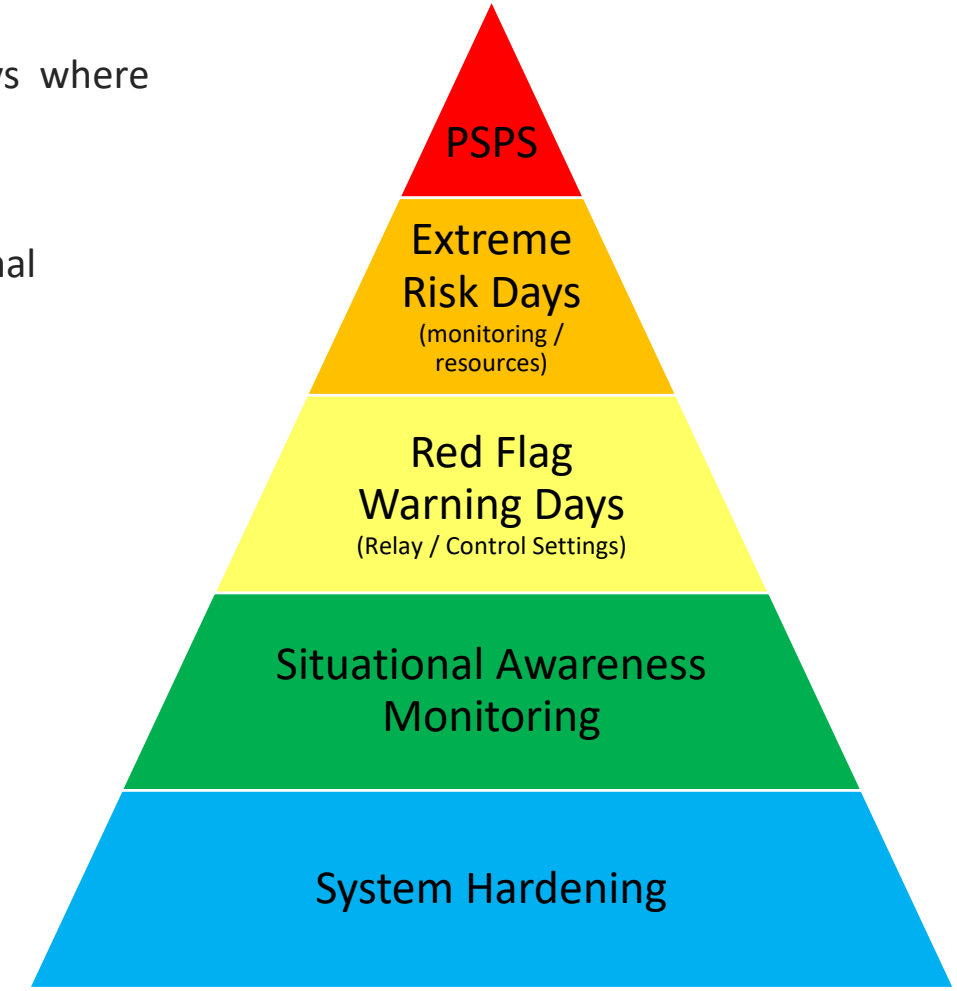
Public Safety Power Shutoff (PSPS) during Extreme Risk Days where thresholds for wind and low precipitation have been exceed

During Extreme Risk Days, in identified areas, deploy additional resources to area for assessment / monitoring at a local level

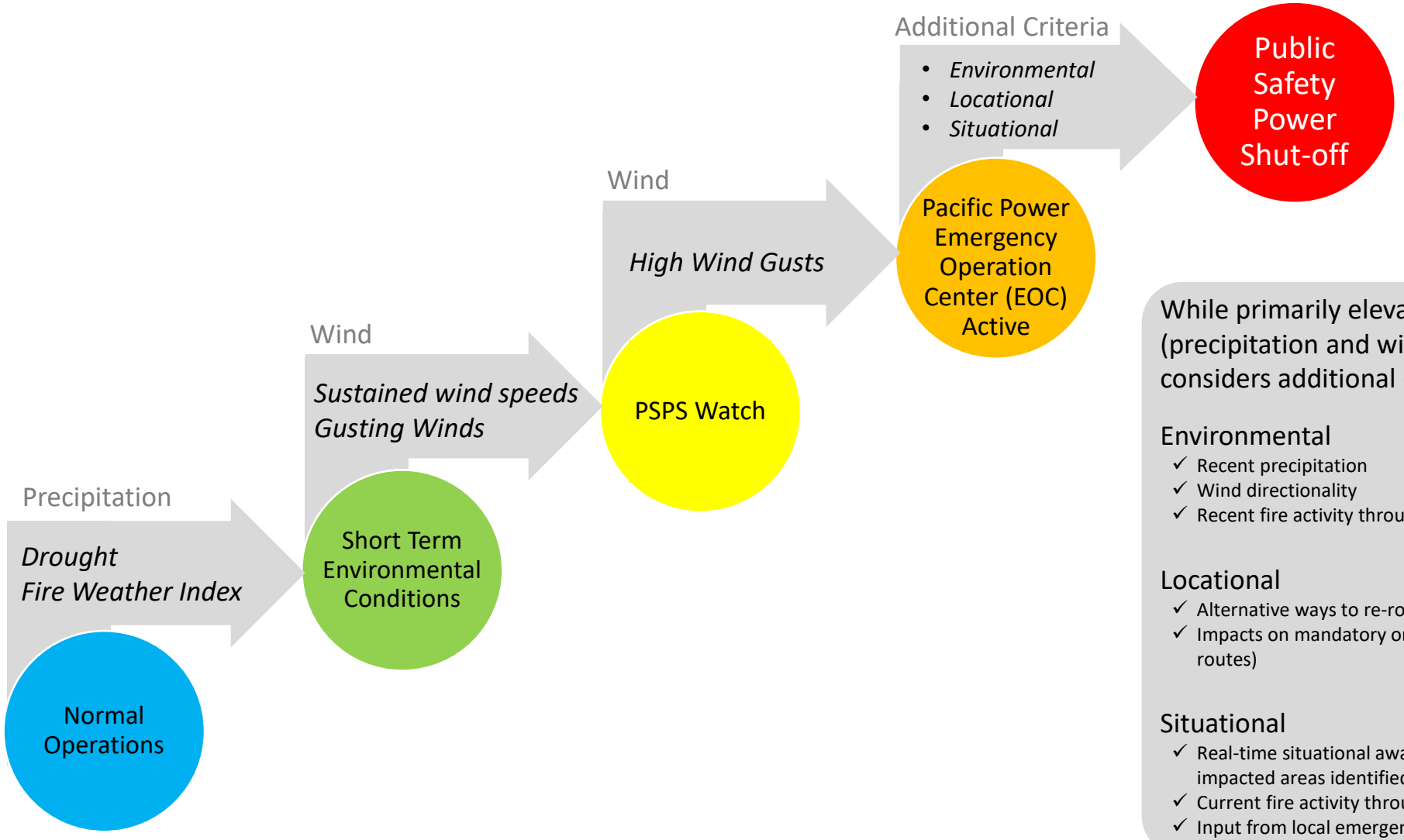
Utilization of enhanced protection and control settings during High Risk Days, which require additional field patrols before re-energizing lines after a fault event

Implementation of enhanced weather monitoring and weather forecasting in localized areas, including installation of weather monitoring stations

System modifications to minimize risk and impact to customers, including installation of insulated conductor, relays, and sectionalizing equipment



Public Safety Power Shut-off (PSPS) Criteria



While primarily elevated through environmental conditions (precipitation and wind); the decision to implement PSPS considers additional criteria:

Environmental

- ✓ Recent precipitation
- ✓ Wind directionality
- ✓ Recent fire activity throughout service territory

Locational

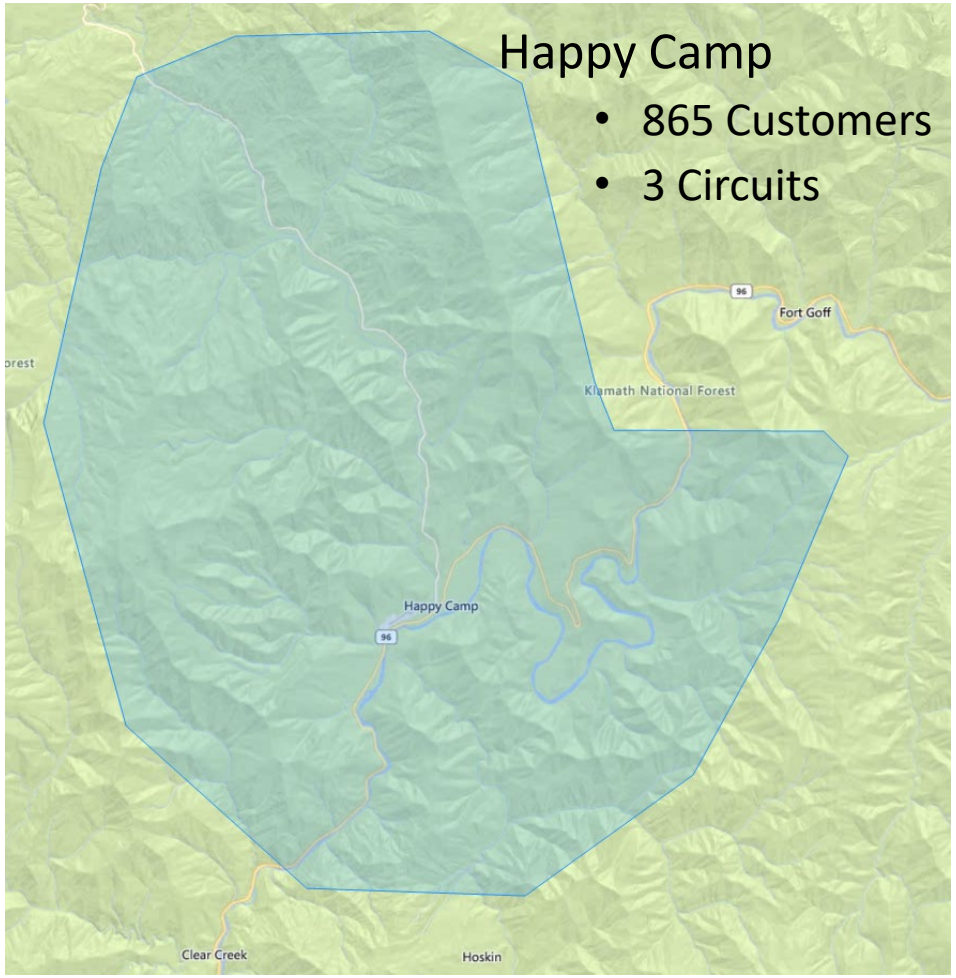
- ✓ Alternative ways to re-route power to affected areas
- ✓ Impacts on mandatory or voluntary evacuation orders in place (ingress / egress routes)

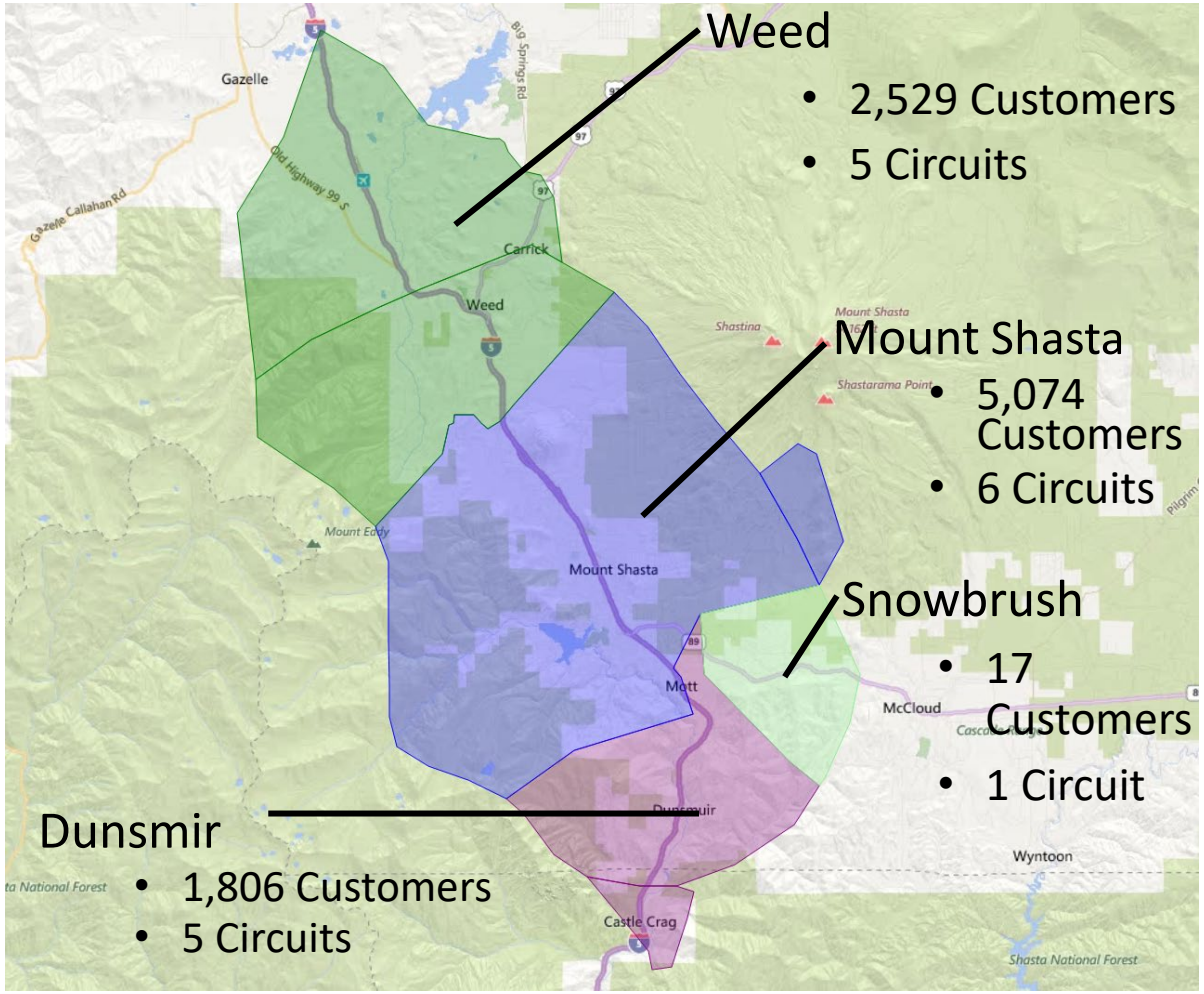
Situational

- ✓ Real-time situational awareness information from personnel positioned in the impacted areas identified as potentially at risk
- ✓ Current fire activity throughout service territory
- ✓ Input from local emergency services and response authorities

Proactive De-energization Zones

- Zones give us the ability to customize de-energized areas as appropriate
- Possible to limit effects of power losses
- Identified Critical facilities will be mapped within each zone





PSPS Timeline

Pacific Power EOC monitors situation and communication

- **72, Potential PSPS:** Forecast received. Contact emergency management agencies followed by state regulatory authority, and community based organizations. Pacific Power Emergency Operations Center activation likely

- **48 Hours, Potential PSPS:** Forecast received. Contact media, social media, customers (according to chosen method) and community based organizations. Pacific Power Emergency Manager to initiate Community Resource Center process. Pacific Power to provide customer communication scripts to Emergency Management Team.

- **24 Hours, Potential PSPS:** Monitor and communicate to emergency management and customers. All customers receive a call, in addition to other methods of notification. All social media platforms updated including website. Notification to identified life support customers.

- **2 Hours, Imminent PSPS:** Two hour imminent alert calls placed to all customers. List of uncontacted life support customers is provided to the incident commander. All social media platforms updated including website. Emergency management, the media, and community based organizations are updated.

- **1 Hour, Imminent PSPS:** One hour imminent alert calls placed to all customers. All social media platforms updated including website. Emergency management and the media are updated.

- **Event Begins:** Event begins calls are placed to all customers. All social media platforms updated including website. Emergency management and the media are updated.

Tabletop Exercise

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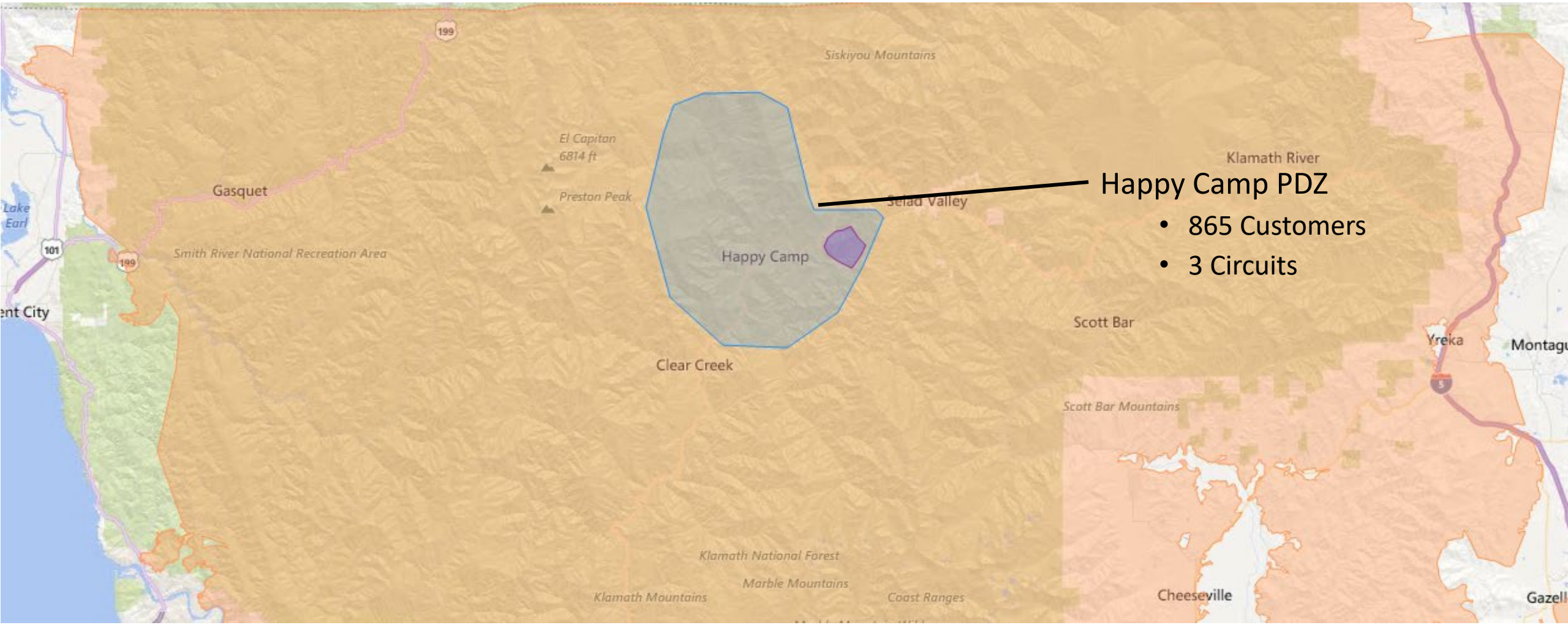
Exercise Execution

- No retribution environment
- This is the time to find any issues
- Mistakes are expected, better to make them in this environment than during an actual response
- Provide input to roles and responsibilities section of plan
- Improvement will come from your input
- Review plan as exercise progresses looking for holes
- Attempted to keep scenario realistic, however some variances are taken for exercise purposes
- Surveys have been provided, please make notes and return to Emergency Management at the end of the event

Exercise Goals and Objectives

Goals	Objectives
Hone working relationships within the public private partnership	• Confirm public communications interface • Confirm Incident Command Structure for event response • Confirm Emergency Operations Center liaison capability during event
Validate communications protocols	• Confirm timing and appropriateness for public communications • Confirm communications timing and viability for emergency management agency communication • Confirm internal communication capabilities and processes
Verify capability to support community during mitigation actions	• Verify ability to deploy and operate Community Resource Centers prior to and during event • Verify ability to interface with vulnerable populations within appropriate event timelines

Exercise Affected Area

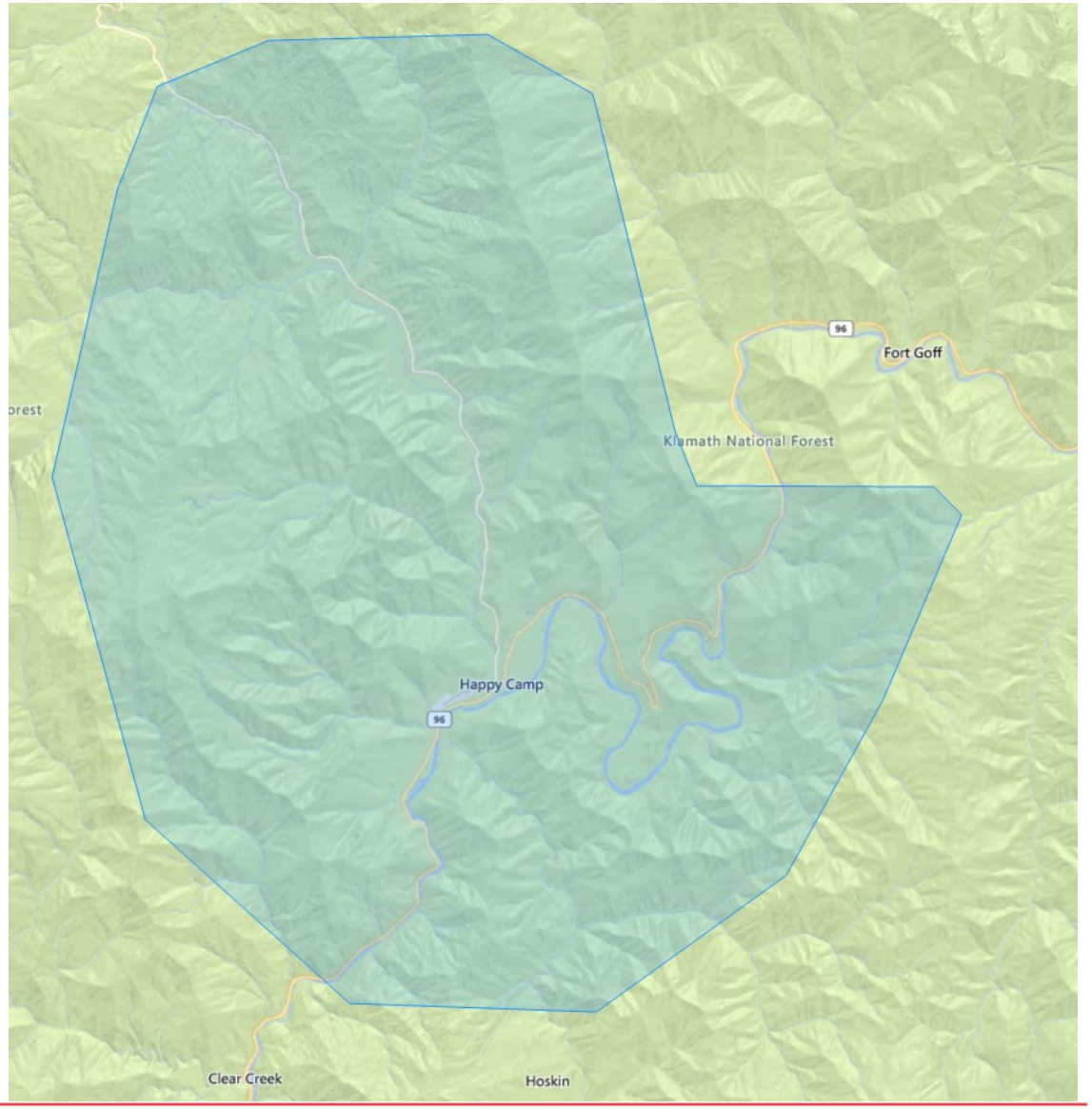


Exercise Weather Forecast

- 96 hour forecast:
  - FFWI6: 30
  - KBDI: 682
  - Wind: NE 15 gusting to 25
  - Geographic Coordination Center: Moderate Risk for Significant Fire Potential

De-Energization Watch

- What actions are being taken in preparation for any event
  - Pacific Power
  - Tribal Community
  - County
  - State
  - Other Utilities
  - Telecommunications
  - Any others

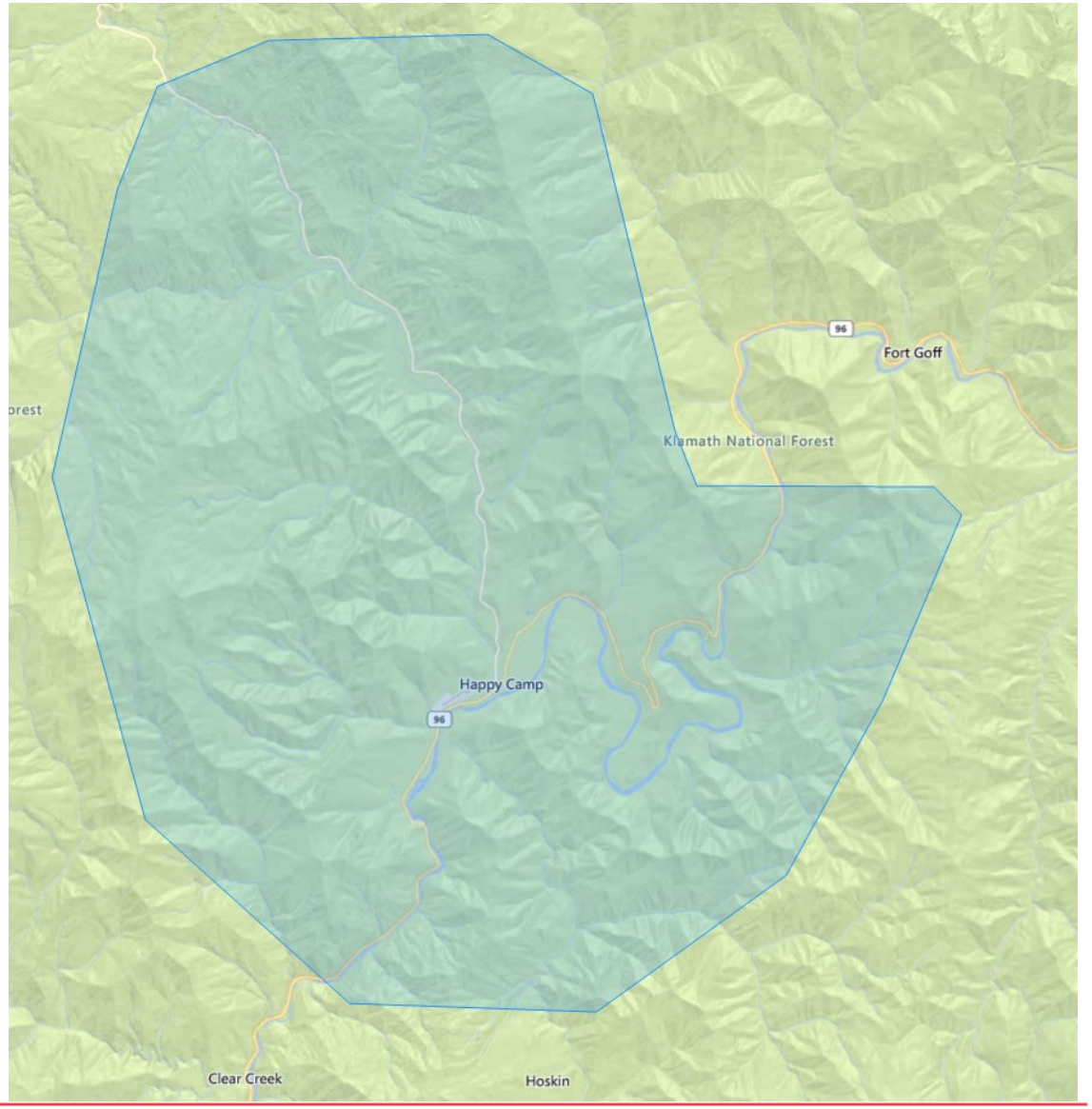


Exercise Weather Forecast

- 72 hour forecast:
  - FFWI6: 31
  - KBDI: 683
  - Wind: NE 17 gusting to 25
  - Geographic Coordination Center: High Risk for Significant Fire Potential
  - CalFire has sent resources to the Weaverville area for initial attack on new ignitions
  - Expected duration of weather is 6 hours

De-Energization Warning

- What actions are being taken in preparation for any event
  - Pacific Power
  - Tribal Community
  - County
  - State
  - Other Utilities
  - Telecommunications
  - Any others

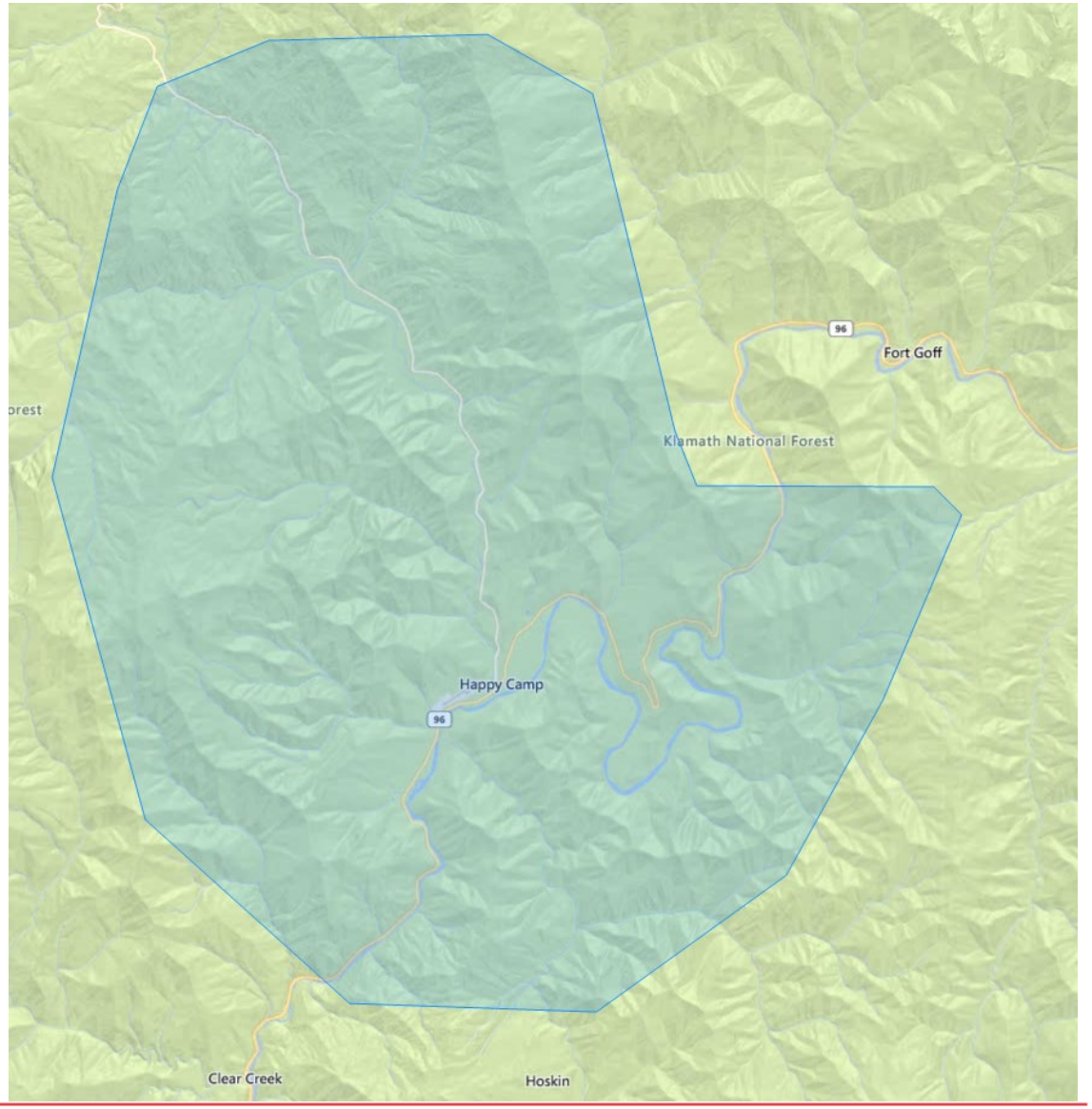


Exercise Weather Forecast

- 48 hour forecast:
  - FFWI6: 31
  - KBDI: 683
  - Wind: NE 17 gusting to 30
  - Red Flag Warning Issued for area
  - Geographic Coordination Center: High Risk for Significant Fire Potential
  - CalFire has sent resources to the Weaverville area for initial attack on new ignitions
  - Expected duration of high winds is 6 hours

De-Energization Warning

- What actions are being taken in preparation for any event
  - Pacific Power
  - Tribal Community
  - County
  - State
  - Other Utilities
  - Telecommunications
  - Any others

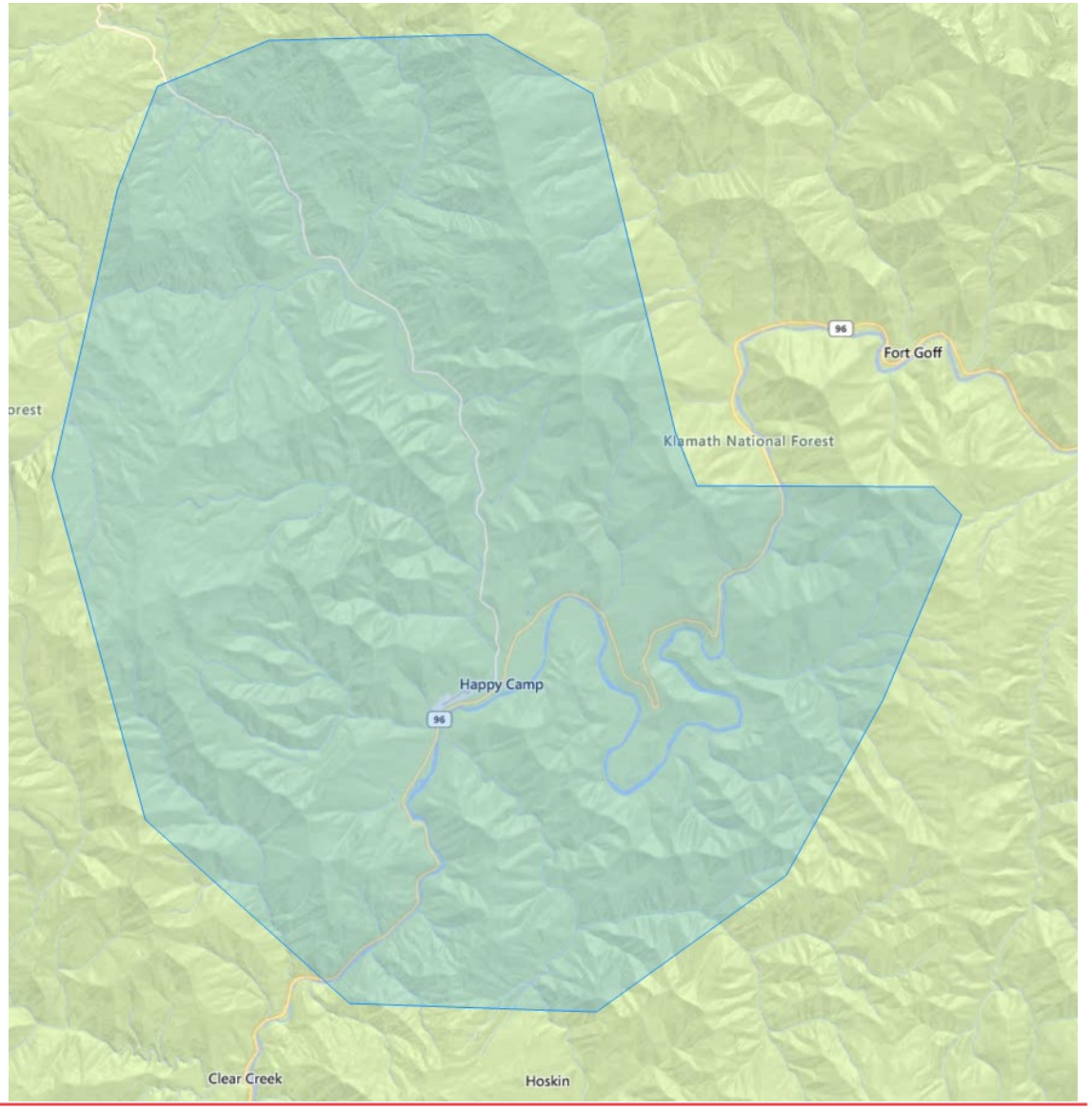


Exercise Weather Forecast

- 24 hour forecast:
  - FFWI6: 31
  - KBDI: 683
  - Wind: NE 17 gusting to 30
  - Red Flag Warning Issued for area
  - Geographic Coordination Center: High Risk for Significant Fire Potential
  - CalFire has sent resources to the Weaverville area for initial attack on new ignitions
  - Expected duration of high winds is 6 hours

De-Energization Warning

- What actions are being taken in preparation for any event
  - Pacific Power
  - Tribal Community
  - County
  - State
  - Other Utilities
  - Telecommunications
  - Any others

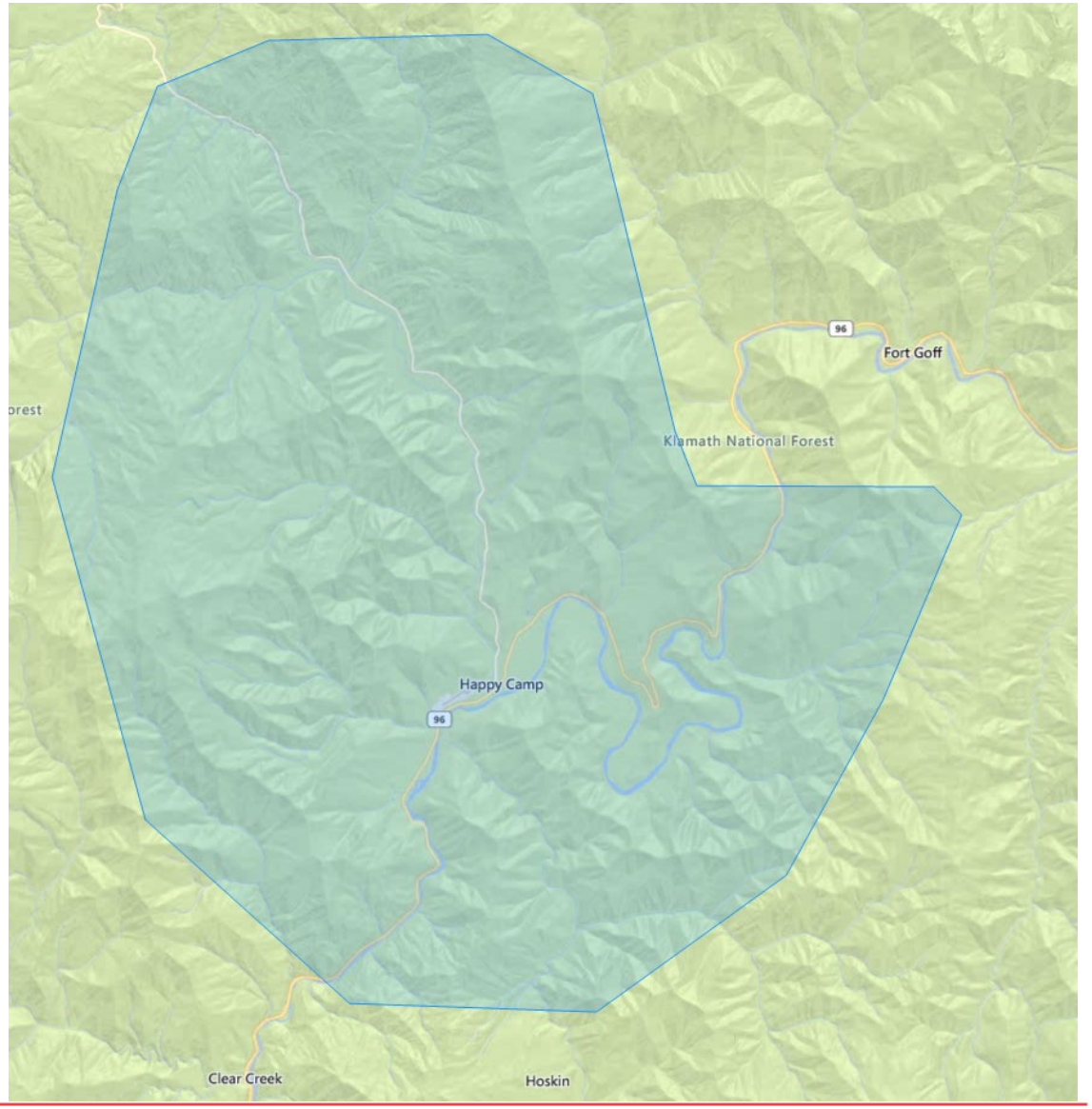


Exercise Weather Forecast

- 1 hour forecast:
  - FFWI6: 31
  - KBDI: 683
  - Wind: NE 17 gusting to 30
  - Red Flag Warning Issued for area
  - Geographic Coordination Center: High Risk for Significant Fire Potential
  - CalFire has sent resources to the Weaverville area for initial attack on new ignitions
  - Pacific Power Crews have surged the area and are providing real time observations

De-Energization Warning

- What actions are being taken in preparation for any event
  - Pacific Power
  - Tribal Community
  - County
  - State
  - Other Utilities
  - Telecommunications
  - Any others

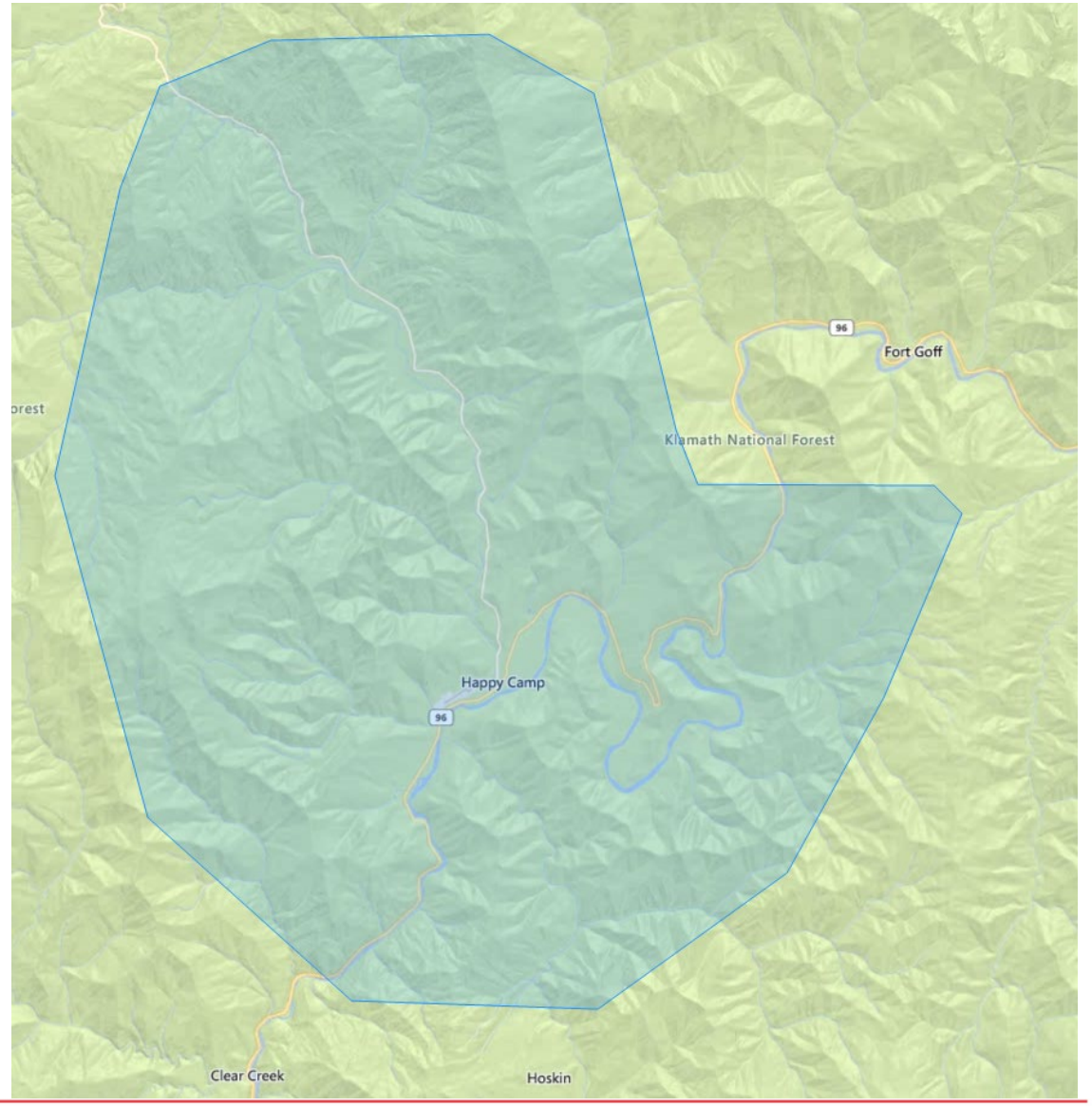


Exercise Weather Forecast

- De-energization:
  - Pacific Power Crews have surged the area and are providing real time observations
  - Observations show potential for system damage
  - Crews are maintaining constant patrol of system
  - 865 Customers are without power

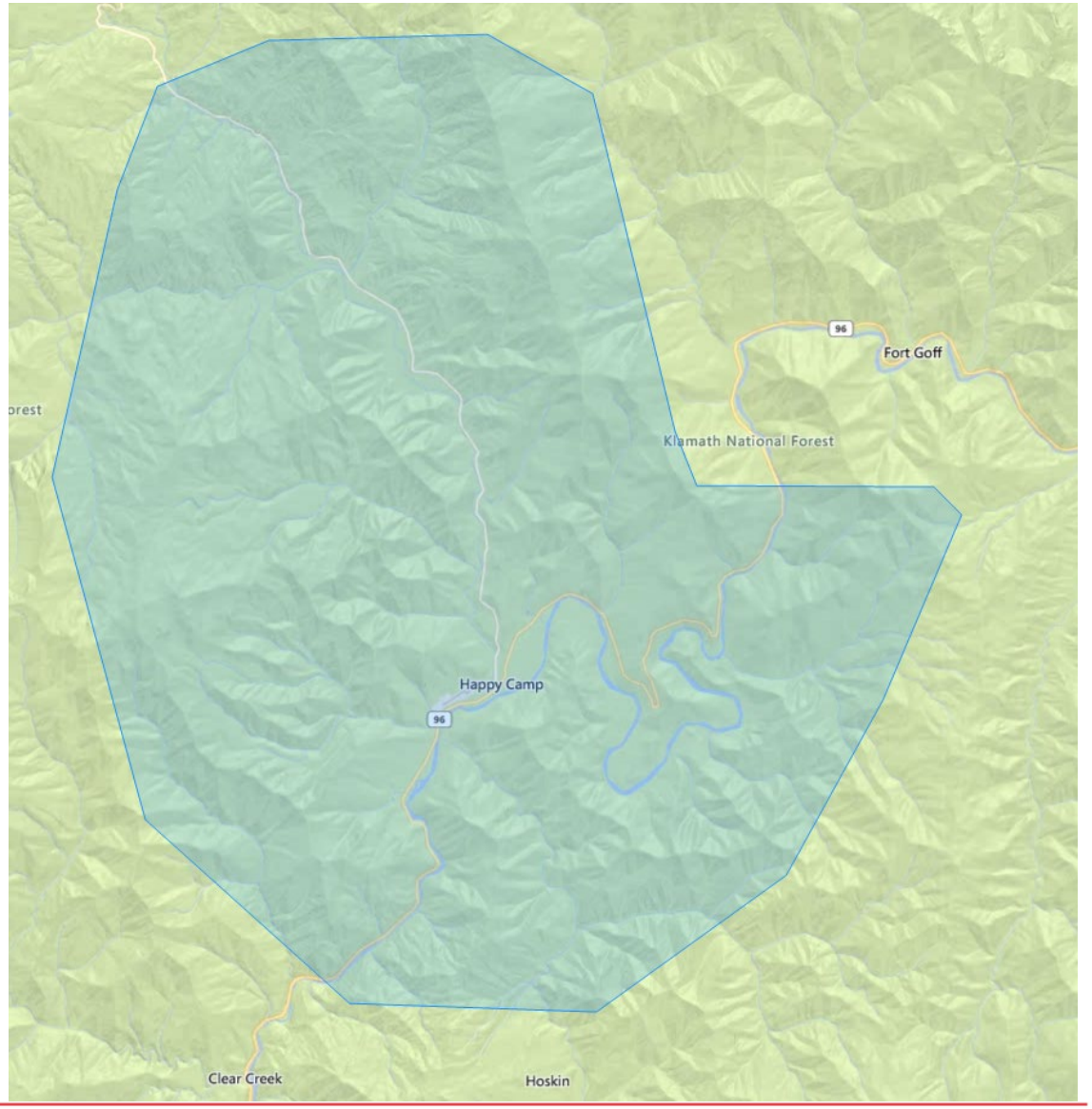
De-Energization Warning

- What actions are being taken
  - Pacific Power
  - Tribal Community
  - County
  - State
  - Other Utilities
  - Telecommunications
  - Any others



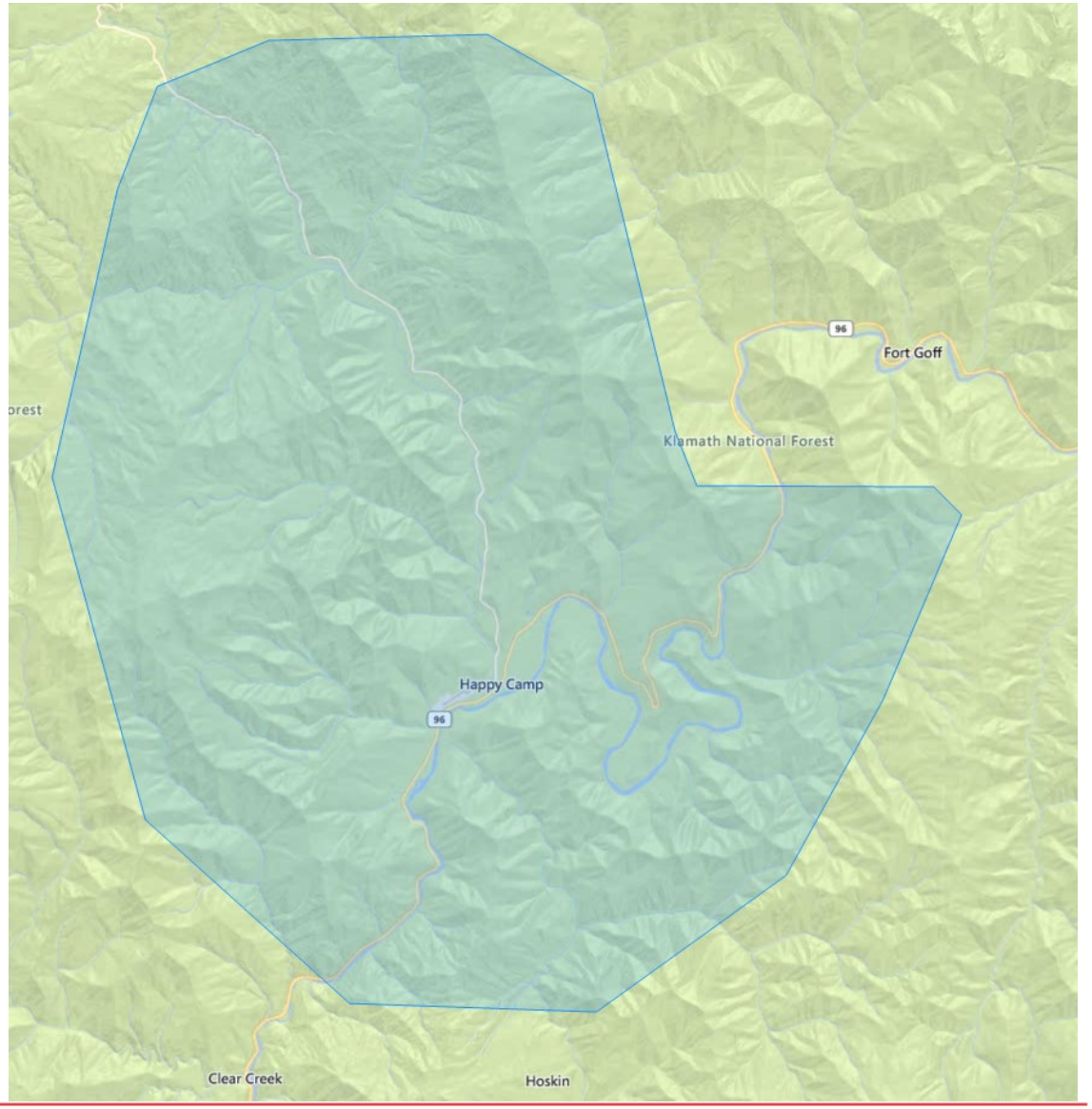
Exercise Weather Forecast

- 5 hours after deenergization:
  - Winds have subsided to NE 10 gusting to 18
  - Red Flag Warning Issued for area has been allowed to expire
  - Geographic Coordination Center: High Risk for Significant Fire Potential
  - Crews are reporting minor damage to system
  - Estimated time for repairs is 3 hours
  - Patrolling of undamaged areas is ongoing
- What actions are being taken
  - Pacific Power
  - Tribal Community
  - County
  - State
  - Other Utilities
  - Telecommunications
  - Any others



Exercise Weather Forecast

- Restoration complete:
  - Winds have subsided to NE 10 gusting to 18
  - Red Flag Warning Issued for area has been allowed to expire
  - Geographic Coordination Center: High Risk for Significant Fire Potential
- What actions are being taken
  - Pacific Power
  - Tribal Community
  - County
  - State
  - Other Utilities
  - Telecommunications
  - Any others



Hotwash

- What went well?
- What challenges do we have?
- What if this had affected generation assets?
- Potential solutions?
- Who owes what?
- Surveys

Questions and Comments

For more information about our emergency management program please contact:

Justin Bukartek
Director of Emergency Management
Pacific Power
503-251-5253 (w)
971-930-9582 (c)

Jeff Bolton
Emergency Manager
Pacific Power
503-251-6512 (w)
503-260-7782 (c)

Report a power outage
1-877-508-5088

Customer service
1-888-221-7070

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Siskiyou County EM Meeting and TTX

Post-Exercise Review / Corrective Action Plan
Tabletop Exercise
May 27, 2021

The Post-Exercise Review and Corrective Action Plan align exercise objectives with incident management team performance and business requirements. Additional exercise information may be included or referenced as needed.

EXERCISE OVERVIEW

Exercise Name	Siskiyou County PSPS Tabletop Exercise
Exercise Dates, Times and Locations	May 25, 2021 Siskiyou County Emergency Operation Center
Scope	A tabletop exercise was used to facilitate the exercise scenario. The scope of the exercise was limited to specific actions prior to and during a PSPS activation.
Objectives	The business objectives for the exercise were as follows. Other participating internal or external groups may have had additional objectives not cited here. 1. Confirm public communications interface 2. Confirm Incident Command Structure for event response 3. Confirm Emergency Operations Center liaison capability during event 4. Confirm timing and appropriateness for public communications 5. Confirm communications timing and viability for emergency management agency communication 6. Confirm internal communication capabilities and processes 7. Confirm timing and appropriateness for public communications 8. Confirm communications timing and viability for emergency management agency communication 9. Confirm internal communication capabilities and processes
Threat or Hazard	Fire weather which necessitated the activation of PSPS actions
Scenario	Fire weather forecasts showed potential for PSPS activation and required the appropriate notifications and actions by all responding agencies. PSPS activation was executed, area was de-energized and ultimately restored.
Sponsor	Pacific Power
Participating Organizations	PacifiCorp, Siskiyou County, Karuk Tribe, CalTrans, CPUC, CalOES
Point of Contact (POC)	Jeff Bolton, Pacific Power Emergency Manager

The objectives of the exercise were evaluated to assess the performance of the incident management team.

No.	Objectives	Performed without Challenges (P)	Performed with Some Challenges (S)	Performed with Major Challenges (M)	Unable to be Performed (U)
1	Confirm public communications interface		X		
2	Confirm Incident Command Structure for event response	X			
3	Confirm Emergency Operations Center liaison capability during event	X			
4	Confirm timing and appropriateness for public communications	X			
5	Confirm communications timing and viability for emergency management agency communication	X			
6	Confirm internal communication capabilities and processes		X		
7	Confirm timing and appropriateness for public communications	X			
8	Confirm communications timing and viability for emergency management agency communication		X		
9	Confirm internal communication capabilities and processes	X			

* Place an X in the box identifying the appropriate rating for each objective

Table 1: Summary of Core Capability Performance

Ratings Definitions

Performed without Challenges (P): The targets and critical tasks associated with the objective were completed in a manner that achieved the objective and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws.

Performed with Some Challenges (S): The targets and critical tasks associated with objective were completed in a manner that achieved the objective and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws. However, opportunities to enhance effectiveness and/or efficiency were identified.

Performed with Major Challenges (M): The targets and critical tasks associated with the objective were completed in a manner that achieved the objective, but some or all of the following were observed: demonstrated performance had a negative impact on the performance of other activities; contributed to additional health and/or safety risks; and/or was not conducted in accordance with applicable plans, policies, procedures, regulations, and laws.

Unable to be Performed (U): The targets and critical tasks associated with the objective were not performed in a manner that achieved the objective.

POST-EXERCISE SUMMARY

This was the annual presentation and exercise for Siskiyou County, CA. Response and coordination between public and private agencies went well. Some communications gaps will need to be addressed and the county is aiding in additional AFN outreach which is an ongoing project

SUMMARY BY DEPARTMENT

T&D

- Provided input regarding operational capabilities within affected areas

Customer Service and External Communications

- Joint Information System coordination and planning was completed

Emergency Management

- Participated as Emergency Operations Center and Pacific Power response element

Public Sector

- Participated as a supporting EOC and public safety sector entities.

LESSONS LEARNED

This "lessons learned" section provides information on processes, training and tools (e.g., forms and plans) that worked well and observations which occurred which provide opportunities for improvement.

Successes

- Expanding PacifiCorp EM team
- The multi-layers of communication and outreach triggered as the event drew closer.
- The existence of the Community Response Center in the affected area.
- The depth of the availability of resources (line crews) prepared to restore area after the
- event.

Observations

- AFN outreach remains a topic for improvement, the county and Pacific Power continue to strive to conduct outreach to the entire AFN population.
- Ensuring Joint Information System has timely and accurate information for distribution is a key concern
- Communications capability for direct customer outreach prior to event has limited bandwidth and channels need confirmed

Appendix A: Corrective Action Plan

Requirements

The goal of the corrective action plan is to continually improve business response capabilities and incident management team performance. At a minimum, the corrective action plan must identify the lessons learned, correlate them with exercise objectives, state the corrective actions that will be initiated, describe the expected results, and identify the person or entity responsible for completion of the action items in addition to the completion date. Sample formats are provided below. The formats may be modified to accommodate business or exercise requirements.

Berkshire Hathaway Energy corporate and business exercise program owners are responsible for sharing key exercise issues, lessons learned and corrective action plans with each other and the chief security officer where broader application of the information may benefit all or some of the businesses.

Format

The following corrective action plan was developed by Pacific Power following evaluation of Siskiyou County PSPS Tabletop Exercise conducted 05/25/2021

This format is based on the U.S. Federal Emergency Management Agency (FEMA) National Incident Management System (NIMS) Incident Command System (ICS).

Action Item No.	Business Unit / Department	Issue / Area for Improvement	Corrective Action / Remediation Plan	Related Exercise Objective	Organization POC / Responsible Party	Due Date	Status	Comments
1	Customer Service	AFN outreach remains a topic for improvement, the county and Pacific Power continue to strive to conduct outreach to the entire AFN population.	Coordinate AFN population outreach	1	Customer Service			
2	PIO	Ensuring Joint Information System has timely and accurate information for distribution is a key concern	Continue planning JIS procedures	1	PIO			
3	Siskiyou County	Communications capability for direct customer outreach prior to event has limited bandwidth and channels need confirmed	Communications companies in coordination with the county will advise on any solutions	1	Siskiyou County			

APPENDIX B: EXERCISE PARTICIPANTS

Name	Agency
Bryan Schehone	Siskiyou County
Randy White	Karuk Tribe
Konopa, Isral	CalTrans
Angell, Jennifer	PacifiCorp
Rondi Johnson	Karuk Tribe
Hanson, Drew	PacifiCorp
Sullivan, Allison	CalTrans
Josh Saxon	Karuk Tribe
Bukartek, Justin	PacifiCorp
Ooten, Chad	PacifiCorp
Jahami, Mahdi	CPUC
Constancio, Sherry	CalTrans
Caswell, Heide	PacifiCorp
Vanderburg, Steven	PacifiCorp
Tunnell, Grady	CPUC
Nottingham, Melissa	PacifiCorp
Chase, Shelby	CPUC
Sara Spence	Karuk Tribe
Safvi, Anwar "Syed"	CPUC
Wu, Mabel	CPUC
Regino, Jenny	CUEA
Lai, Stephen	
Naveed Paydar	CPUC
Cho, James	
Ryan Sandler	NWS Medford
Trujillo, Anthony	
Dru Dunton	CPUC
Meyer Jr, Alan	PacifiCorp
Jeff Bolton	PacifiCorp
Richard Harris	PacifiCorp
Adam Heilman	Siskiyou County
Bob Parker	PacifiCorp
Dan Baker	PacifiCorp
Robert Goyeneche	CalOES
Mike Weaver	PG&E
Rob Cone	PG&E
Jeff Lee	PG&E
Jasen Vela	CalOES
Todd Andres	PacifiCorp

APPENDIX C: CORRECTIVE ACTION PLAN APPROVAL

As the designated authority for Pacific Power Emergency Management, I certify that this Corrective Action Plan has been approved for completion, and that the deliverables accurately represent the lessons learned during the exercise.

Name / Title	Date

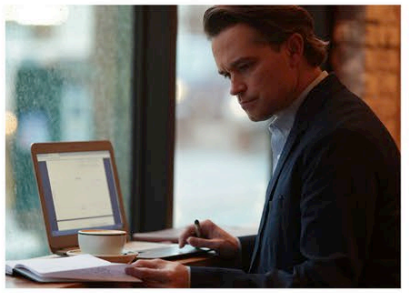
Siskiyou County

Public Safety Power Shutoff TTX FPM and Functional Exercise MPM

April 28, 2022





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Agenda

- Past Event Lessons Learned
- Goals and Objectives
- Tabletop Exercise Development
  - PSPS worst case scenario
- Functional Exercise Development
  - Communications
  - AFN Notification and Confirmation

Past Event Lessons Learned

Date	Observation	Action Item/Recommendation	Responsible Person
5/25/2021 TTX	AFN outreach remains a topic for improvement, the county and Pacific Power continue to strive to conduct outreach to the entire AFN population.	Coordinate AFN population outreach	Customer Service
5/25/2021 TTX	Ensuring Joint Information System has timely and accurate information for distribution is a key concern	Continue planning JIS procedures	Public Information Officer
5/25/2021 TTX	Communications capability for direct customer outreach prior to event has limited bandwidth and channels need confirmed	Communications companies in coordination with the county will advise on any solutions	Siskiyou County
8/17/21 PSPS	Confirmation of notifications was delayed and inconsistent	Delays in the detection of notification errors resulted in a deviation from the notification plan.	Customer Service/ Telecommunications Providers
8/17/21 PSPS	AFN and Medical Baseline notifications were not confirmed. In person notification procedures were ad hoc and need refined.	Coordinate roles and responsibilities for AFN/MBL in person customer notification	PacifiCorp EM and County EM
8/17/21 PSPS	CRC information can be communicated better to customers.	Incorporating scripts for automated phone calls to customers providing CRC information will be helpful.	Customer Service and Regional Business Managers
8/17/21 PSPS	Real time production of GIS mapping data was more challenging to produce and distribute than anticipated.	Challenges delayed the ability to share with public safety partners; ability to expedite this process in the future will allow for better planning.	PacifiCorp GIS team

PacifiCorp TTX Exercise Goals and Objectives

Exercise Goals
Enhance general awareness of PacifiCorp Public Safety Power Shutoff plans
Enhance understanding roles and responsibilities
Validate plans and procedures
Discuss concepts and/or assess types of systems in a defined incident

Exercise Date: Thurs 4/28/2022

EM Plan review 9am

Lunch

TTX 1pm (4 hour duration)

Exercise Objectives
1. Build confidence in Pacific Powers Public Safety Power Shutoff decision making process utilizing current situational awareness tools.
2. Provide detailed overview of Pacific Powers notification processes and identify external partners notification procedures.
3. Explain Community Resource Center scope & purpose in a PSPS event and compare plans to support impacted community members.
4. Explore Pacific Powers plans for allocating resources during PSPS events.
5. Outline current options and capabilities for supporting individuals with access and functional needs.

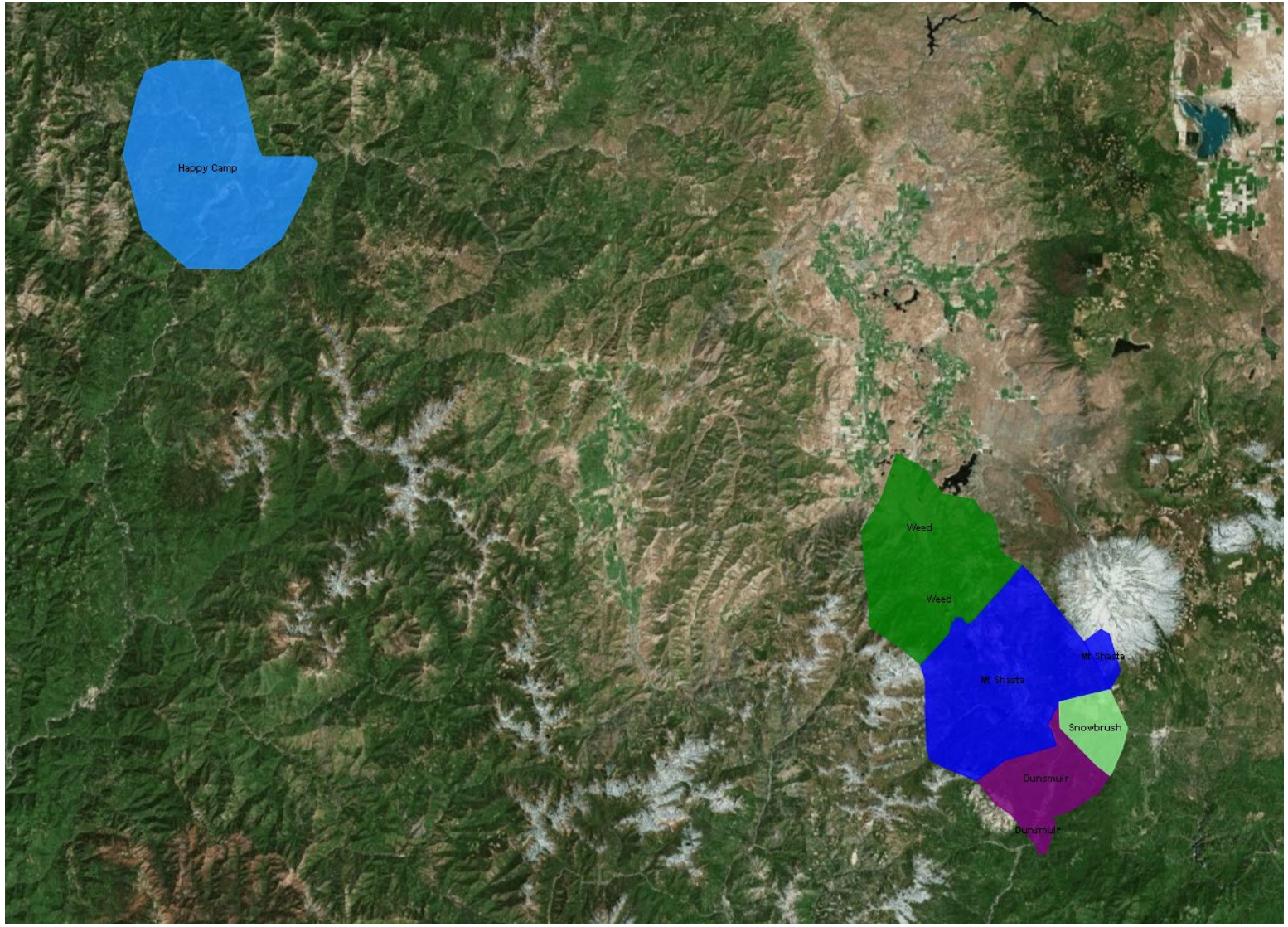
PacifiCorp FX Exercise Goals and Objectives

Exercise Goals
Validate communications procedures

Exercise Date: Wed 5/18/2022
From normal work locations
Initiation 9AM

Exercise Objectives
1. Ensure communications channels are viable during PSPS event
2. Evaluate AFN/MBL customer notification process to include in person notification

Exercise Scope



- Siskiyou County, CA PDZs

PSPS Timeline

Pacific Power ECC monitors situation and communication

- **72, Potential PSPS:** Forecast received. Contact emergency management agencies followed by state regulatory authority, and community-based organizations. Pacific Power Emergency Coordination Center activation likely

- **48 Hours, Potential PSPS:** Forecast received. Contact media, social media, customers (according to chosen method) and community-based organizations. Pacific Power Emergency Manager to initiate Community Resource Center process. Pacific Power to provide customer communication scripts to Emergency Management Team.

- **24 Hours, Potential PSPS:** Monitor and communicate to emergency management and customers. All customers receive a call, in addition to other methods of notification. All social media platforms updated including website. Notification to identified life support customers.

FX Time period

- **2 Hours, Imminent PSPS:** Two-hour imminent alert calls placed to all customers. List of uncontacted life support customers is provided to the incident commander. All social media platforms updated including website. Emergency management, the media, and community-based organizations are updated.

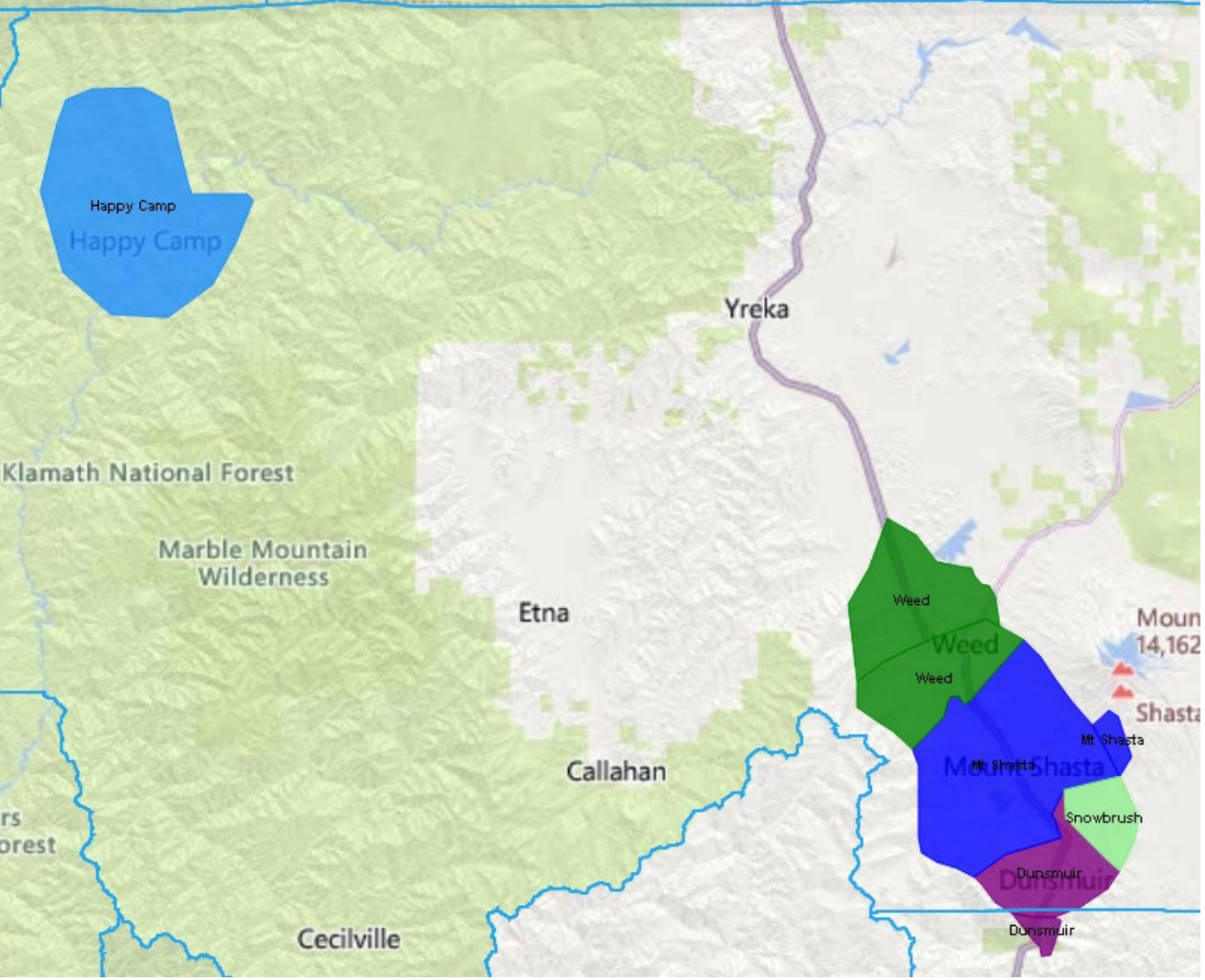
- **1 Hour, Imminent PSPS:** One-hour imminent alert calls placed to all customers. All social media platforms updated including website. Emergency management and the media are updated.

- **Event Begins:** Event begins calls are placed to all customers. All social media platforms updated including website. Emergency management and the media are updated.

TTX Scenario Development

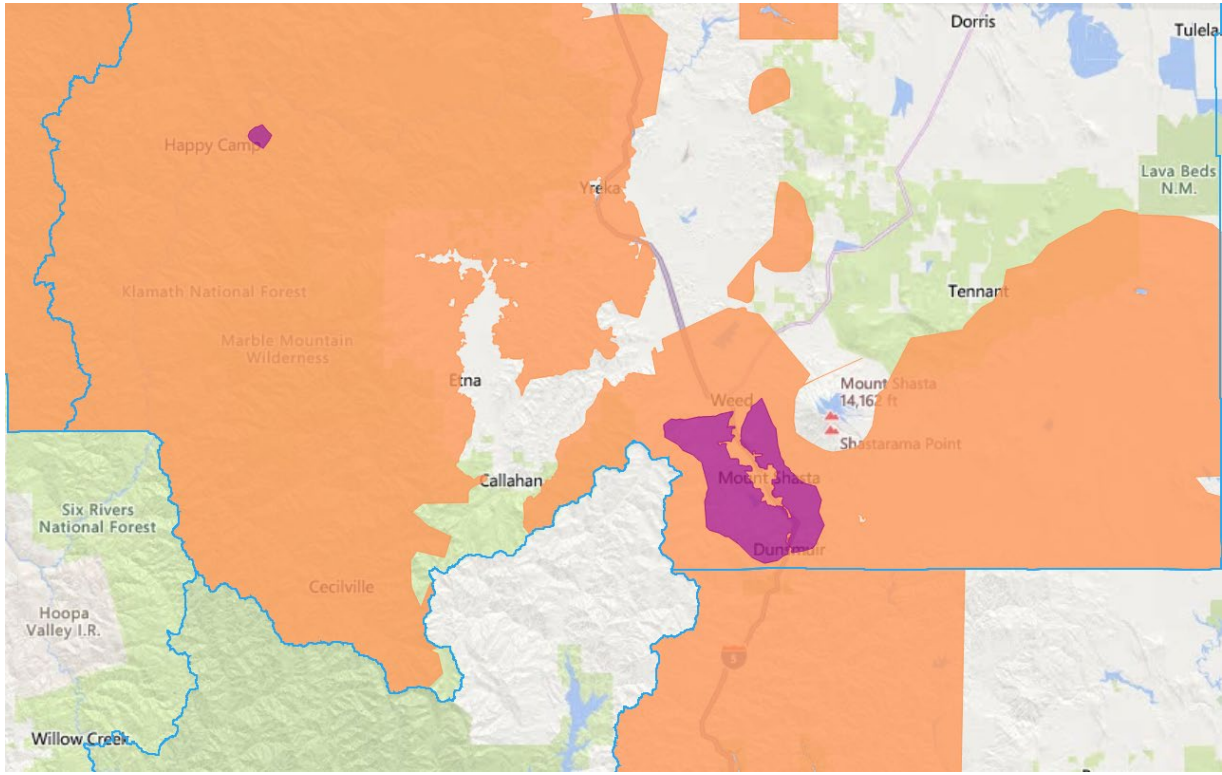
- Tabletop Exercise
  - Validate county specific appendix to PacifiCorp PSPS Plan
  - PSPS all PDZs
  - Notification procedures
  - AFN outreach
  - Overnight restoration, or not
  - CRC deployment
  - What to do with public in non CRC hours
  - Tribal community participation

Exercise Affected Area



Potential affected households or businesses:

- Happy Camp 865
- Weed 2,589
- Mt Shasta 5,074
- Dunsmuir 1,806
- Snowbrush 17



5 Day Forecast – Issued Monday Sept 5th

PACIFIC POWER
SYSTEM IMPACTS FORECAST MATRIX

Weather-Related System Impacts (Wx) / Fire Risk Potential (F) / Operational Response

	Mon. Sep. 5			Tue. Sep. 6			Wed. Sep. 7			Thu. Sep. 8			Fri. Sep. 9		
CALIFORNIA	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response	Wx	F	Response
Alturas		F			F			F			F			F	
Crescent City															
Tulelake		F			F			F			F			F	
Yreka		F			F			F			F		W	F	

Weather-Related System Impacts (Wx)

Outage Potential
- Widespread Outages with Extended Restoration
- Scattered to Widespread Outages
- Isolated to Scattered Outages
- No System Impacts Expected

Hazards
- (W) Wind
- (L) Lightning / Thunderstorms
- (I) Freezing Rain or Ice
- (S) Snow
- (H) Extreme Heat
- (R) Heavy Rain or Flooding

Fire Risk Potential (F)

GACC Risk Level (Significant Fire Potential)
- HIGH RISK (Windy and Dry - *OR* - Extremely Dry Fuels)
- Moderate Risk - *OR* - High Risk for Non-Windy Weather
- Low Risk

Reason for High Risk
- (W) Wind
- (L) Lightning
- (F) Extremely Dry Fuels
- (H) Hot with Low Humidity

Operational Response
- SP: System Patrol
- FS: Fire Settings
- NR: No Reclose Settings
- PW: PSPS Watch
- PS: PSPS Event

Fire Weather

- ERCs are at 97th percentile values, KBDI and Fosberg indices are also at critical levels.
- The GACC has issued a fuels and fire behavior advisory. Grasses are fully cured.
- Increasing offshore winds and low RH are forecast for Friday-Saturday. Poor overnight RH recovery is also expected.

Wind

- Strong NE-SE winds may gust to 50+ mph Friday and Saturday across the Yreka district. System impacts are possible with these wind speeds.

Thunderstorm / Lightning

- Thunderstorms are not expected in the next 5 days.

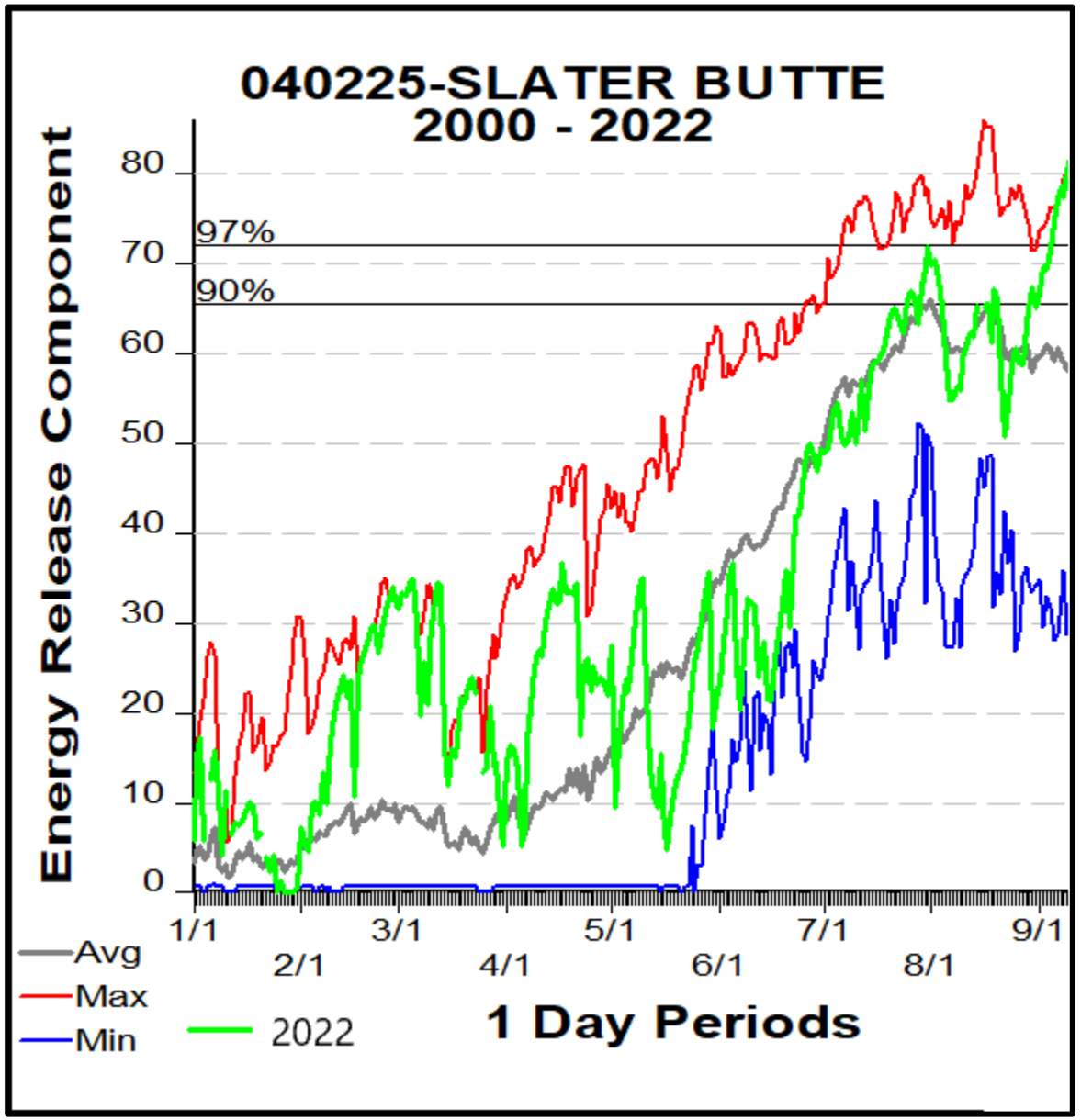
Excessive Heat

- Morning low temperatures will be 15-20 degrees warmer than average beginning Friday, leading to poor overnight RH recovery and the potential for active nighttime burning with any fires in the Yreka district.
- Afternoon temperatures will be 10-15 degrees above average.

PSPS Watch | PSPS Warning | PSPS Execution

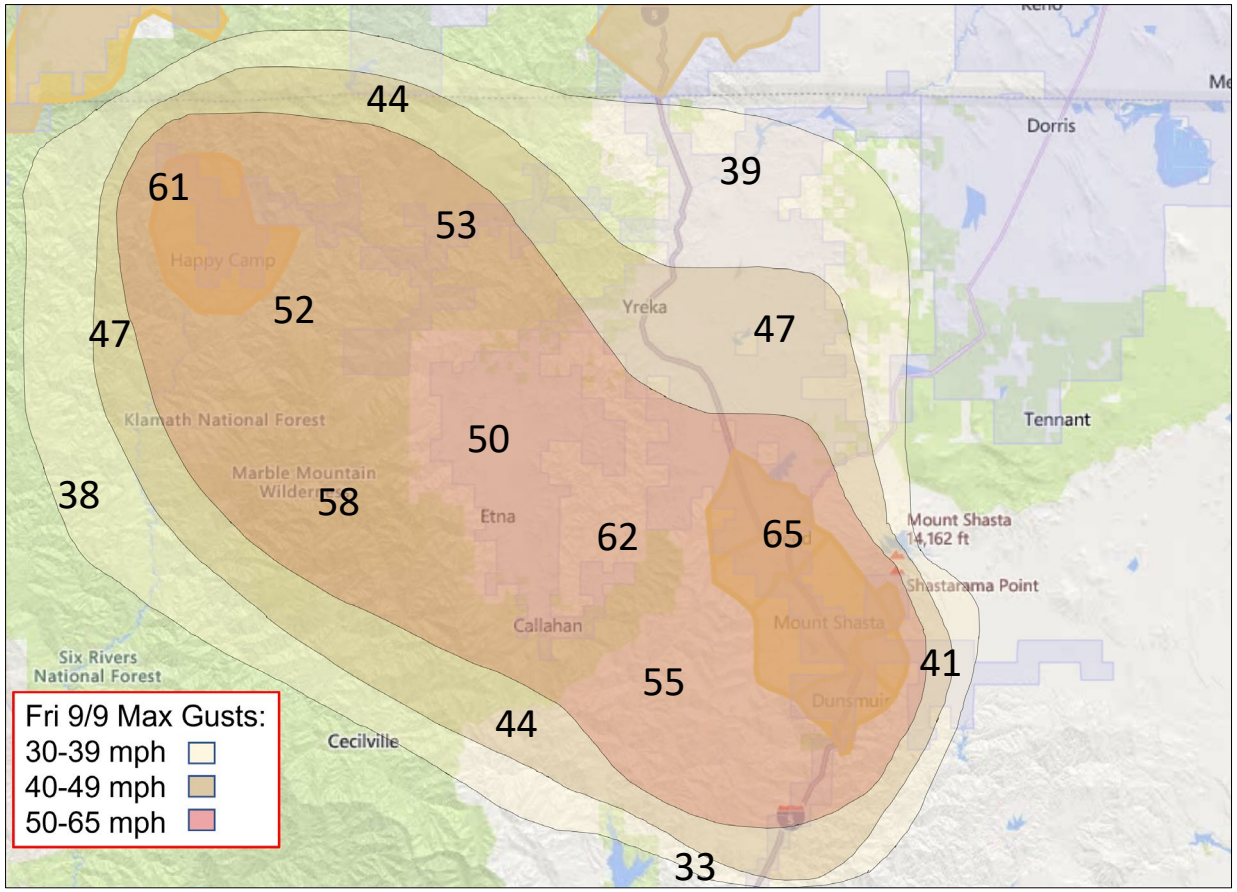
Fuels and Fire Weather Discussion

- Fuels in the Yreka District are critically dry. Fuels indices are beyond peak season values.
- Any new ignition will be difficult to control in these conditions. During windy weather fires will spread rapidly and exhibit extreme fire behavior.
- A Fuels and Fire Behavior Advisory is in effect for Siskiyou County.
- Computer models are showing a period of potentially strong dry gusty winds and low RH Friday-Saturday. This pattern is also being mentioned by the NWS and North Ops GACC.

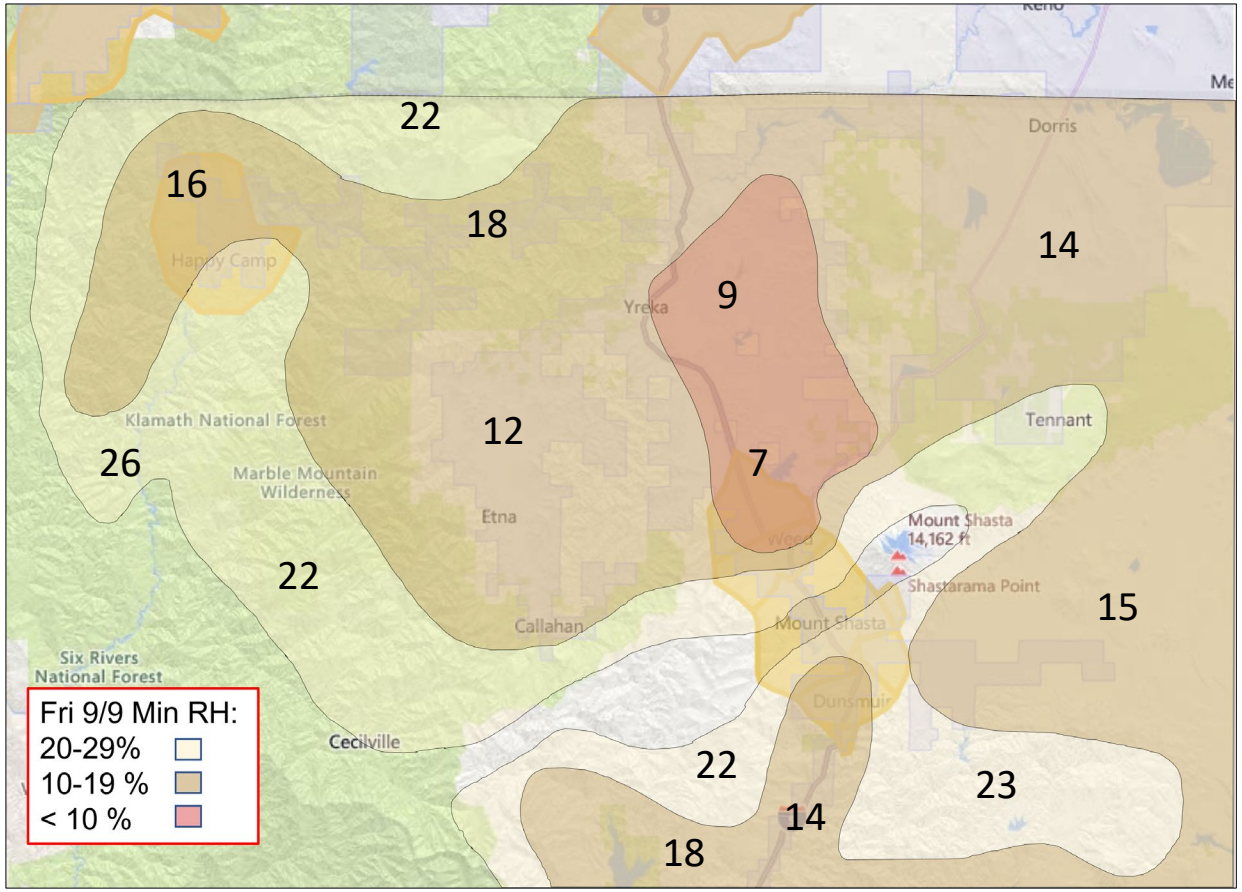


5-DAY FORECAST – *Siskiyou County, CA*

Monday, September 5, 2022 @ 8 AM



FORECAST FOR FRIDAY, SEPTEMBER 9, 12:00-10:00 PM

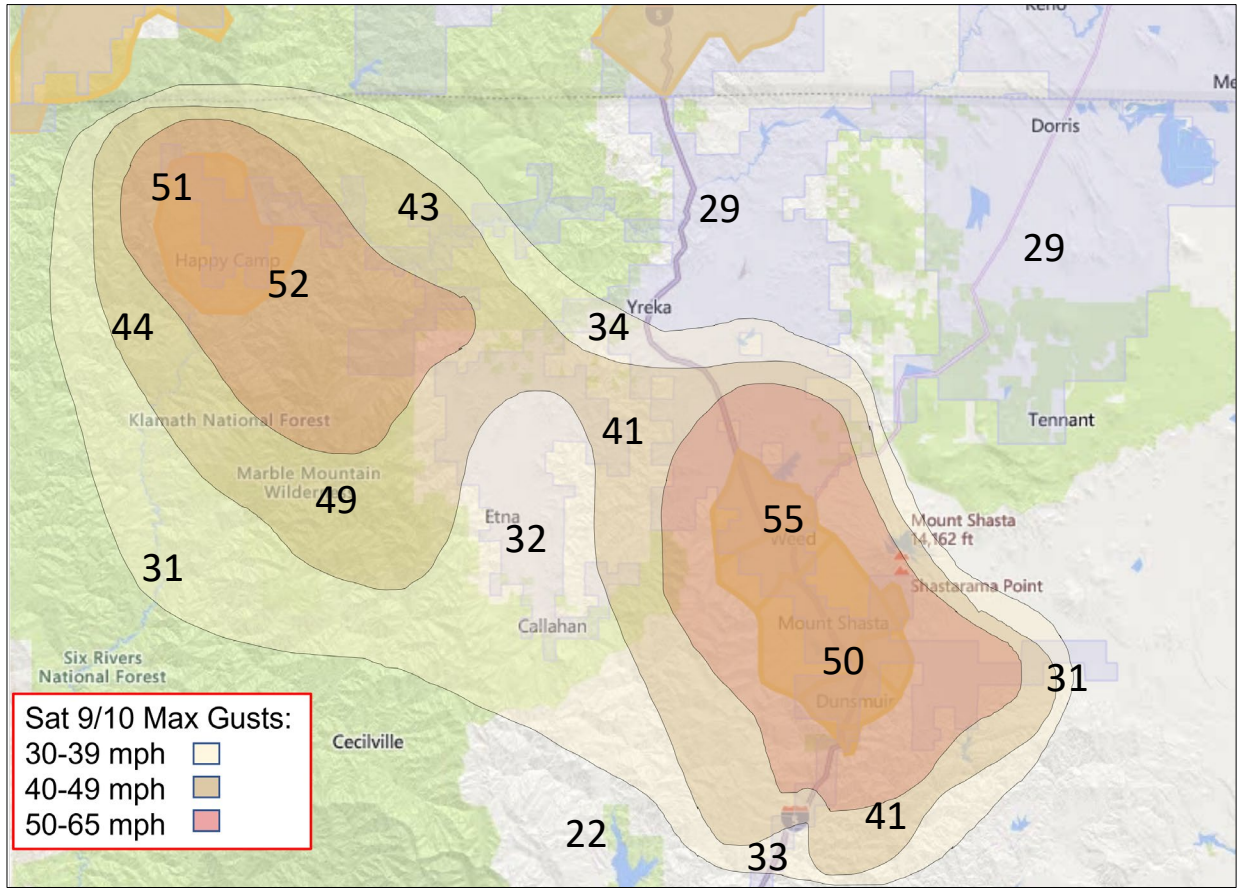


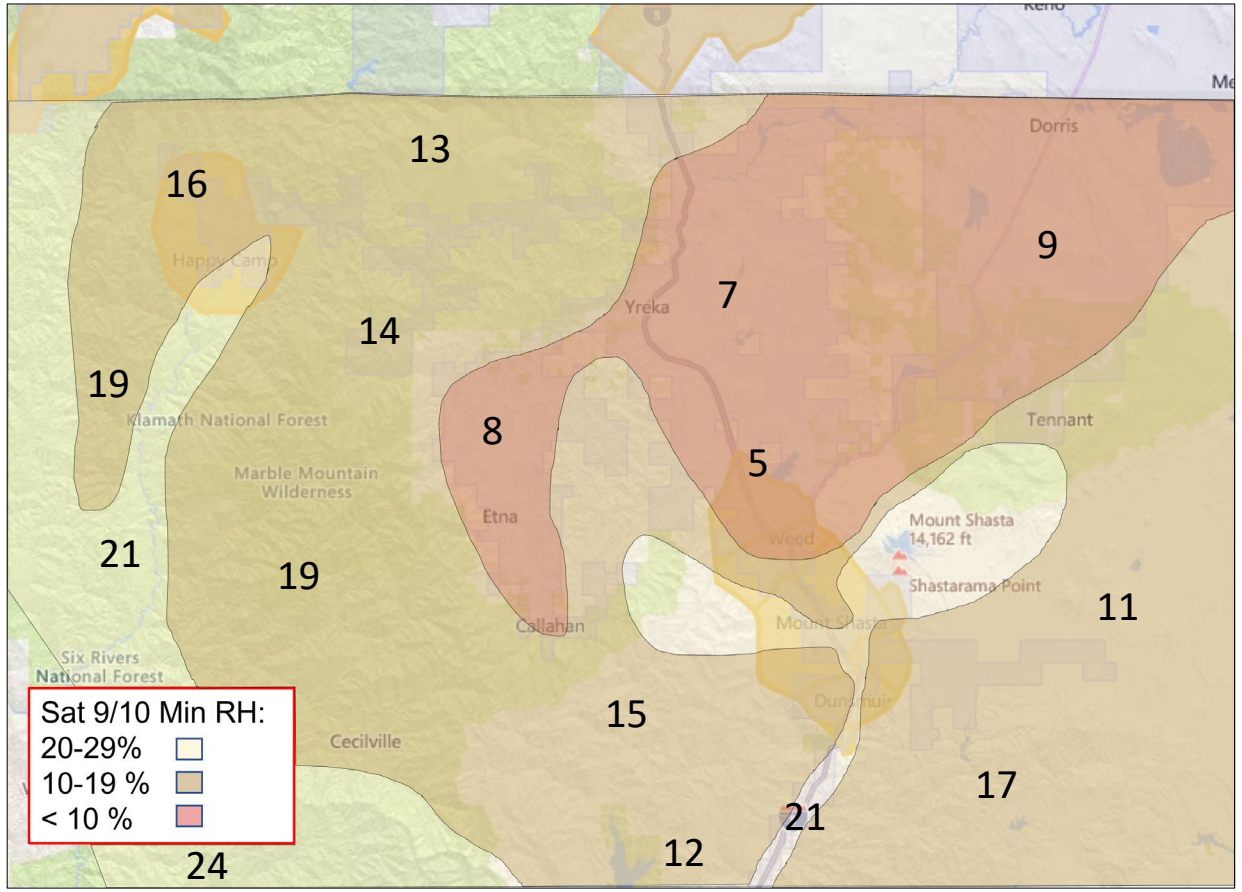
PSPS Watch | PSPS Warning | PSPS Execution

5-DAY FORECAST – *Siskiyou County, CA*

Monday, September 5, 2022 @ 8 AM

FORECAST FOR SATURDAY, SEPTEMBER 10, 9:00 AM - 2:00 PM





PSPS Watch | PSPS Warning | PSPS Execution

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5 days prior

Pacific Power Response

- Initiate initial decision-making call
- Initiate and coordinate decision making conference call
- Notify county emergency management agencies, as appropriate

Response Partner Actions

72 Hours prior

Pacific Power Response

- Activate Emergency Coordination Center (ECC)
- Update appropriate county emergency management agencies
- Monitor weather forecasts
- Provide operational support to field resources
- Provide resources as requested
- Contact emergency logistical support (i.e., Community support centers) vendor for deployment details and timing
- Notify state regulatory authority
- Manage assets within and outside affected area
- Issuing press releases & posting on website/social media

Response Partner Actions

48 Hours prior

Pacific Power Response

- Assess current weather and ground truth situation and analyze if remaining in a watch or moving to a De-energization Warning is appropriate.
- Initiate appropriate customer, community-based organization, media and business outreach
- Initiate appropriate Emergency Management Agency outreach
- Contact Critical Infrastructure partners
- Coordinate with local emergency management/public health on CRC location and public health guidelines
- Contact CRC location to ensure availability
- Notify Reliability Coordinator
- Notify state regulatory authority
- Update website/social media

Response Partner Actions

24 hours prior

Pacific Power Response

- Continue situational analysis
- Initiate resource gathering for de-energization and restoration tasks
- Continue customer, community-based organization, media, and business outreach
- Update Emergency Management Agencies
- Finalize emergency logistical support dispatch, if requested
- Create appropriate emergency switching orders
- Pre-position resources to appropriate circuits for potential de-energization and restoration

Response Partner Actions

12 hours prior

Pacific Power Response

- Continue situational analysis
- Ensure staffing levels are appropriate for actions
- Assign resources to appropriate circuits for potential de-energization and restoration
- Continue outreach via media, social media and direct customer contact
- Continuously update Emergency Management Agencies
- Final balancing authority notification

Response Partner Actions

2 hours prior

Pacific Power Response

- Continue situational analysis
- Continuing direct customer notification
- Any medical customers that couldn't be reached is turned over to emergency services.
- Initiation of real time social media updates
- Updated media release prior to weather arrival
- Employee all call for affected area

Response Partner Actions

1 hour prior

Pacific Power Response

- Continue situational analysis
- Dispatch crews to switching areas
- Emergency Management Agency update

Response Partner Actions

PSPS Execution

Pacific Power Response

- Approximately 10,351 customers de-energized
- CRCs opened to public
- Monitor local public safety needs

Evening Forecast

- Conditions
  - Time: 9:00pm
  - Winds have subsided to NE 10 gusting to 18
  - Red Flag Warning Issued for area expires at 11:00pm
  - Geographic Coordination Center: High Risk for Significant Fire Potential
  - Forecast shows potential PSPS conditions tomorrow starting at 2:00pm

Overnight Care

- CRC closes at 10
- Security on-site & signage posted relaying information on de-energization zone and EV charging

Restoration

- Crews staged before sunrise and deployed
- Tree leaning on distro line

- **[ADD MAP]**

Restoration

- Crews restored power
- Re-energize notifications sent

Hotwash

- What went well?
- What challenges do we have?
- What if this had affected generation assets?
- How can we help you prepare for outages in the future?
- Potential solutions?
- Who owes what?
- Surveys

Functional Exercise Scenario Development

- Use lessons learned from TTX to enhance functional play
- Conduct functional exercise from work locations
- Primary goal is validation of communications plans for PSPS notification

Questions and Comments

For more information about our emergency management program please contact:

Jeff Bolton
Emergency Manager
Pacific Power
503-260-7782 (c)

Tyler Averyt
Emergency Manager
Pacific Power
503-319-6901 (c)

Emergency Management Duty Officer 503-331-4498

Report a power outage
1-877-508-5088

Customer service
1-888-221-7070

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Function	ETA/Deadline	Responsible Party
Concept & Objectives	2/11/22	All
Exercise template completion	2/23/22	Horace, Tyler, Jeff
Internal Exercise template review	3/4/22	All
Initial Planning Meetings • Siskiyou County • Southern OR Counties & Del Norte County, CA • Hood River/Wasco Counties • Yakima County	 3/3/22 3/10/22 3/25/22 3/25/22	 Jeff/Tyler Jeff/Tyler Horace Horace
Exercise scenario specifics (Wx)	3/16/22	Meteorology
Final Planning Meetings • Siskiyou County • Southern OR Counties & Del Norte County, CA • Hood River/Wasco Counties • Yakima County	 3/31/22 3/31/22 4/30/22 4/30/22	 Jeff/Tyler Jeff/Tyler Horace Horace
Exercise Date • Southern OR Counties & Del Norte County, CA • Siskiyou County • Hood River/Wasco Counties • Yakima County	 4/14/22 4/28/22 5/4/22 5/11/22	 Jeff/Tyler Tyler/Jeff Horace Horace

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MEETING SIGN-IN SHEET

Project:	Pacific Power PSPS TTX (Siskiyou County)	**Meeting Date:**	04/28/2022
Facilitator:	Jeff Bolton	**Place/Room:**	Siskiyou County EOC

Name	Agency	Phone	E-Mail
Todd Andres	Pacific Power	541-591-9617	todd.andres@pacificorp.com
Stephen Leach	Pacificorp	530 572 8050	stephen.Leach@pacificorp.com
Emily Tuholski	Siskiyou County HHSA	530 841 2753	etuholski@co.siskiyou.ca.us
Joan Hoy	Siskiyou County HHSA	530 841-4024	Jhoy@co.siskiyou.ca.us
Jacqueline Nushi	KARUK TRIBE	530-493-1600 Ext 2004	jnushi@karuk.us
Corey Watson	Siskiyou Co HHSA	841-4814	cwatson@co.siskiyou.ca.us
Coleman Fitzgerald	Public Health	841-2141	cjfitzgerald@co.siskiyou.ca.us
ROBERT GOYENECHE	Cal OES	916-694-9906	robert.goyenechee caloes.ca.gov
COURTNEY KREIDER	SISKIYOU PIO	(530)598-9375	ckreider@co.Siskiyou.ca.us
Jason Vela	Cal OES	916-539-2185	jason.vela@caloes.ca.gov
Susan Cervelli	Sisk Co HHSA	5305985593	scervelli@co.siskiyou.ca.us
Richard Harris	Pacific Power	530-598-9589	Richard.harris@pacificorp.com
DAN BAKER	PACIFIC POWER	(530)643-6080	daniel.baker@pacificorp.com
Adam Heilman	Sisk Co OES	(530)841-2147	aheilman@co.siskiyou.CA.US
Catherine Kitchen	Pacific Power	503.202-2451	Catherine.kitchen@pacificpower.com
Carrie Laird	Pacificorp		
Tyler Avery	Pacificorp		
Jeff Bolton	Pacificorp		

MEETING SIGN-IN SHEET (VIRTUAL PARTICIPANTS)

Project:	Pacific Power PSPS TTX (Siskiyou County)	**Meeting Date:**	04/28/2022
Facilitator:	Jeff Bolton	**Place/Room:**	Siskiyou County EOC

Name	Agency	Phone	E-Mail
Horace Ward	PacifiCorp		Horace.Ward@pacificorp.com
Traci Schultz	PacifiCorp		Traci.Schultz@pacificorp.com
Adrian Wright	PacifiCorp		Adrian.Wright@pacificorp.com
Stephanie Beall	PacifiCorp		Stephanie.Beall@pacificorp.com
Henry Sweat	CPUC		Henry.Sweat@cpuc.ca.gov
Erik Brookhouse	PacifiCorp		Erik.Brookhouse@pacificorp.com
Amy Hoskins	PacifiCorp		Amy.Hoskins@pacificorp.com
Desmond Lew	CPUC		Desmond.Lew@cpuc.ca.gov
David VanDyken	CPUC		David.VanDyken@cpuc.ca.gov
Hassan Jahami	CPUC		Hassan.Jahami@cpuc.ca.gov
Hope Christman	CPUC		Hope.Christman@cpuc.ca.gov
Mabel Wu	CPUC		Mabel.Wu@cpuc.ca.gov
Jeff Fuentes	CalFire		Jeff.Fuentes@fire.ca.gov
Drew Hanson	PacifiCorp		Drew.Hanson@PacifiCorp.com
Thomas Turman	Frontier Communications		tst531@ftr.com
Tim Watts	Frontier Communications		timwatts@ftr.com
Will Dundon	CPUC		will.dundon@cpuc.ca.gov
Ben Menzies	CPUC		Benjamin.Menzies_cpuc.ca.gov
Cindy Chen	CPUC		

Name	Agency	Phone	E-Mail
Lea Haro	CPUC		Lea.Haro@cpuc.ca.gov
Devla Singh	CPUC		devla.singh@cpuc.ca.gov
Josh Mathisen	AT&T		jm6347@att.com
Joan Weber	CPUC		Joan.Weber_cpuc.ca.gov
Shelby Chase	CPUC		Shelby.Chase@cpuc.ca.gov
Junaid Rahman	CPUC		junaid.rahman@cpuc.ca.gov
Wade Skinner	PacifiCorp		Wade.Skinner@PacifiCorp.com
Paul Magoolaghan	AT&T		pm3094@att.com
Naveed Paydar	CPUC		Naveed.Paydar@cpuc.ca.gov
Adam Bensaid	AT&T		ab8947@att.com
Jeff MacDonnell	Frontier Communications		jtm304@ftr.com

Meeting Summary

Total Number of Participants	41
Meeting Title	Siskiyou County CA Tabletop Exercise
Meeting Start Time	4/28/2022, 8:22:10 AM
Meeting End Time	4/28/2022, 1:17:21 PM
Meeting Id	7a8b30c9-a8ac-4104-87f1-8269418557f3

Full Name	Join Time	Leave Time	Duration	Email	Role	Participant ID (UPN)
Bolton, Jeff (PacifiCorp)	4/28/2022, 8:22:10 AM	4/28/2022, 12:52:08 PM	4h 29m	Jeffrey.Bolton@pacificorp.com	Organizer	Jeffrey.Bolton@pacificorp.com
Ward, Horace (PacifiCorp)	4/28/2022, 8:23:10 AM	4/28/2022, 8:24:06 AM	56s	Horace.Ward@pacificorp.com	Presenter	Horace.Ward@pacificorp.com
Ward, Horace (PacifiCorp)	4/28/2022, 8:50:00 AM	4/28/2022, 9:54:07 AM	1h 4m	Horace.Ward@pacificorp.com	Presenter	Horace.Ward@pacificorp.com
Ward, Horace (PacifiCorp)	4/28/2022, 10:02:44 AM	4/28/2022, 10:51:54 AM	49m 9s	Horace.Ward@pacificorp.com	Presenter	Horace.Ward@pacificorp.com
Ward, Horace (PacifiCorp)	4/28/2022, 11:01:59 AM	4/28/2022, 11:55:16 AM	53m 16s	Horace.Ward@pacificorp.com	Presenter	Horace.Ward@pacificorp.com
Ward, Horace (PacifiCorp)	4/28/2022, 12:12:01 PM	4/28/2022, 12:52:11 PM	40m 9s	Horace.Ward@pacificorp.com	Presenter	Horace.Ward@pacificorp.com
Averyt, Tyler (PacifiCorp)	4/28/2022, 8:48:55 AM	4/28/2022, 12:52:31 PM	4h 3m	Tyler.Averyt@pacificorp.com	Presenter	Tyler.Averyt@pacificorp.com
Schultz, Traci (PacifiCorp)	4/28/2022, 8:49:29 AM	4/28/2022, 9:54:20 AM	1h 4m	Traci.Schultz@pacificorp.com	Presenter	Traci.Schultz@pacificorp.com
Schultz, Traci (PacifiCorp)	4/28/2022, 10:04:16 AM	4/28/2022, 12:51:53 PM	2h 47m	Traci.Schultz@pacificorp.com	Presenter	Traci.Schultz@pacificorp.com
Wright, Adrian (PacifiCorp)	4/28/2022, 8:50:56 AM	4/28/2022, 11:13:22 AM	2h 22m	Adrian.Wright@pacificorp.com	Presenter	Adrian.Wright@pacificorp.com
Wright, Adrian (PacifiCorp)	4/28/2022, 11:15:51 AM	4/28/2022, 12:52:21 PM	1h 36m	Adrian.Wright@pacificorp.com	Presenter	Adrian.Wright@pacificorp.com
Beall, Stephanie (PacifiCorp)	4/28/2022, 8:51:03 AM	4/28/2022, 12:47:27 PM	3h 56m	Stephanie.Beall@pacificorp.com	Presenter	Stephanie.Beall@pacificorp.com
Sweat, Henry	4/28/2022, 8:51:16 AM	4/28/2022, 12:51:12 PM	3h 59m	Henry.Sweat@cpuc.ca.gov	Presenter	Henry.Sweat@cpuc.ca.gov
15032515153	4/28/2022, 8:52:10 AM	4/28/2022, 11:54:05 AM	3h 1m		Attendee	
Brookhouse, Erik (PacifiCorp)	4/28/2022, 8:52:12 AM	4/28/2022, 11:54:08 AM	3h 1m	Erik.Brookhouse@pacificorp.com	Presenter	Erik.Brookhouse@pacificorp.com
Hoskins, Amy (PacifiCorp)	4/28/2022, 8:52:44 AM	4/28/2022, 12:52:14 PM	3h 59m	Amy.Hoskins@pacificorp.com	Presenter	Amy.Hoskins@pacificorp.com
Lew, Desmond	4/28/2022, 8:54:49 AM	4/28/2022, 10:46:37 AM	1h 51m	Desmond.Lew@cpuc.ca.gov	Presenter	Desmond.Lew@cpuc.ca.gov
Lew, Desmond	4/28/2022, 11:09:08 AM	4/28/2022, 12:54:04 PM	1h 44m	Desmond.Lew@cpuc.ca.gov	Presenter	Desmond.Lew@cpuc.ca.gov
Van Dyken, David	4/28/2022, 8:57:01 AM	4/28/2022, 12:52:15 PM	3h 55m	David.VanDyken@cpuc.ca.gov	Presenter	David.VanDyken@cpuc.ca.gov
Ryan Sandler (NWS Medford) (Guest)	4/28/2022, 8:58:49 AM	4/28/2022, 11:54:04 AM	2h 55m		Presenter	
Jahami, Hassan	4/28/2022, 8:59:23 AM	4/28/2022, 12:51:53 PM	3h 52m	Hassan.Jahami@cpuc.ca.gov	Presenter	Hassan.Jahami@cpuc.ca.gov
Christman, Hope	4/28/2022, 8:59:30 AM	4/28/2022, 10:38:31 AM	1h 39m	Hope.Christman@cpuc.ca.gov	Presenter	Hope.Christman@cpuc.ca.gov
Wu, Mabel	4/28/2022, 9:00:08 AM	4/28/2022, 12:51:57 PM	3h 51m	Mabel.Wu@cpuc.ca.gov	Presenter	Mabel.Wu@cpuc.ca.gov
Fuentes, Jeff@CALFIRE	4/28/2022, 9:00:19 AM	4/28/2022, 9:54:41 AM	54m 22s	Jeff.Fuentes@fire.ca.gov	Presenter	Jeff.Fuentes@fire.ca.gov
Fuentes, Jeff@CALFIRE	4/28/2022, 12:44:15 PM	4/28/2022, 12:52:46 PM	8m 30s	Jeff.Fuentes@fire.ca.gov	Presenter	Jeff.Fuentes@fire.ca.gov
Hanson, Drew (PacifiCorp)	4/28/2022, 9:01:12 AM	4/28/2022, 12:51:49 PM	3h 50m	Drew.Hanson@pacificorp.com	Presenter	Drew.Hanson@PacifiCorp.com
Turman, Thomas	4/28/2022, 9:01:12 AM	4/28/2022, 10:53:43 AM	1h 52m	Thomas.Turman@FTR.com	Presenter	tst531@ftr.com
Watts, Tim	4/28/2022, 9:01:30 AM	4/28/2022, 10:54:24 AM	1h 52m	Tim.Watts@FTR.com	Presenter	timwatts@ftr.com
Watts, Tim	4/28/2022, 11:14:33 AM	4/28/2022, 11:20:09 AM	5m 35s	Tim.Watts@FTR.com	Presenter	timwatts@ftr.com
Dundon, Will	4/28/2022, 9:02:41 AM	4/28/2022, 12:51:58 PM	3h 49m	Will.Dundon@cpuc.ca.gov	Presenter	will.dundon@cpuc.ca.gov
Menzies, Benjamin	4/28/2022, 9:02:42 AM	4/28/2022, 12:51:42 PM	3h 48m	Benjamin.Menzies@cpuc.ca.gov	Presenter	Benjamin.Menzies_cpuc.ca.gov#EXT#@cawater.onmicrosoft.com
Fuentes, Jeff@CALFIRE	4/28/2022, 9:03:15 AM	4/28/2022, 9:57:19 AM	54m 3s	Jeff.Fuentes_fire.ca.gov#EXT#@cawater.onmicrosoft.com	Presenter	Jeff.Fuentes_fire.ca.gov#EXT#@cawater.onmicrosoft.com
Cindy Chen (Guest)	4/28/2022, 9:03:18 AM	4/28/2022, 12:51:57 PM	3h 48m		Presenter	
Haro, Lea	4/28/2022, 9:03:20 AM	4/28/2022, 12:51:46 PM	3h 48m	Lea.Haro@cpuc.ca.gov	Presenter	Lea.Haro@cpuc.ca.gov
19164135558	4/28/2022, 9:04:05 AM	4/28/2022, 10:30:07 AM	1h 26m		Attendee	
19164135558	4/28/2022, 10:48:55 AM	4/28/2022, 12:51:48 PM	2h 2m		Attendee	
MATHISEN, JOSHUA A	4/28/2022, 9:04:18 AM	4/28/2022, 12:35:03 PM	3h 30m	jm6347@att.com	Presenter	jm6347@att.com
Singh, Devla	4/28/2022, 9:06:18 AM	4/28/2022, 11:53:16 AM	2h 46m	devla.singh@cpuc.ca.gov	Presenter	devla.singh@cpuc.ca.gov
12132642337	4/28/2022, 9:09:57 AM	4/28/2022, 9:12:01 AM	2m 4s		Attendee	
Weber, Joan E.	4/28/2022, 9:10:29 AM	4/28/2022, 11:01:28 AM	1h 50m	Joan.Weber@cpuc.ca.gov	Presenter	Joan.Weber_cpuc.ca.gov#EXT#@cawater.onmicrosoft.com
Chase, Shelby	4/28/2022, 9:13:08 AM	4/28/2022, 10:56:45 AM	1h 43m	Shelby.Chase@cpuc.ca.gov	Presenter	Shelby.Chase@cpuc.ca.gov
Kitchen, Catherine (PacifiCorp)	4/28/2022, 9:17:35 AM	4/28/2022, 11:59:33 AM	2h 41m	Catherine.Kitchen@pacificorp.com	Presenter	Catherine.Kitchen@pacificorp.com
Kitchen, Catherine (PacifiCorp)	4/28/2022, 12:32:32 PM	4/28/2022, 12:39:52 PM	7m 19s	Catherine.Kitchen@pacificorp.com	Presenter	Catherine.Kitchen@pacificorp.com
Rahman, Junaid	4/28/2022, 9:21:17 AM	4/28/2022, 12:14:58 PM	2h 53m	junaid.rahman@cpuc.ca.gov	Presenter	junaid.rahman@cpuc.ca.gov
Walsh, Christopher (PacifiCorp)	4/28/2022, 9:34:22 AM	4/28/2022, 12:05:30 PM	2h 31m	Christopher.Walsh@pacificorp.com	Presenter	Christopher.Walsh@pacificorp.com
18019554281	4/28/2022, 9:45:33 AM	4/28/2022, 12:52:05 PM	3h 6m		Attendee	
Skinner, Wade (PacifiCorp)	4/28/2022, 9:47:50 AM	4/28/2022, 11:54:11 AM	2h 6m	Wade.Skinner@PacifiCorp.com	Presenter	Wade.Skinner@PacifiCorp.com
MAGOOLAGHAN, PAUL G	4/28/2022, 9:55:05 AM	4/28/2022, 10:54:31 AM	59m 26s	pm3094@att.com	Presenter	pm3094@att.com
19162919025	4/28/2022, 9:56:11 AM	4/28/2022, 10:54:36 AM	58m 25s		Attendee	
Paydar, Naveed	4/28/2022, 10:01:25 AM	4/28/2022, 1:17:21 PM	3h 15m	Naveed.Paydar@cpuc.ca.gov	Presenter	Naveed.Paydar@cpuc.ca.gov
BENSAID, ADAM S	4/28/2022, 11:11:44 AM	4/28/2022, 11:54:11 AM	42m 26s	ab8947@att.com	Presenter	ab8947@att.com
BENSAID, ADAM S	4/28/2022, 12:32:49 PM	4/28/2022, 12:51:49 PM	19m	ab8947@att.com	Presenter	ab8947@att.com
MacDonnell, Jeff	4/28/2022, 11:19:18 AM	4/28/2022, 11:23:49 AM	4m 30s	Jeff.MacDonnell@FTR.com	Presenter	jtm304@ftr.com

Meeting Summary

Total Number of Participants	22
Meeting Title	PSPS Functional Exercise PacifiCorp ECC
Meeting Start Time	5/26/2022, 9:56:17 AM
Meeting End Time	5/26/2022, 12:33:23 PM
Meeting Id	135ae017-a507-4c7c-b30d-fefe72867d67

Full Name	Join Time	Leave Time	Duration	Email	Role	Participant ID (UPN)
Yotsov, Eleonore (PacifiCorp)	5/26/2022, 9:56:17 AM	5/26/2022, 12:27:02 PM	2h 30m	Eleonore.Yotsov@pacificorp.com	Presenter	Eleonore.Yotsov@pacificorp.com
Yotsov, Eleonore (PacifiCorp)	5/26/2022, 12:28:53 PM	5/26/2022, 12:29:25 PM	31s	Eleonore.Yotsov@pacificorp.com	Presenter	Eleonore.Yotsov@pacificorp.com
Walsh, Christopher (PacifiCorp)	5/26/2022, 9:56:31 AM	5/26/2022, 10:10:38 AM	14m 7s	Christopher.Walsh@pacificorp.com	Presenter	Christopher.Walsh@pacificorp.com
Walsh, Christopher (PacifiCorp)	5/26/2022, 10:43:12 AM	5/26/2022, 11:14:59 AM	31m 47s	Christopher.Walsh@pacificorp.com	Presenter	Christopher.Walsh@pacificorp.com
Walsh, Christopher (PacifiCorp)	5/26/2022, 11:45:46 AM	5/26/2022, 12:26:27 PM	40m 41s	Christopher.Walsh@pacificorp.com	Presenter	Christopher.Walsh@pacificorp.com
15032515218	5/26/2022, 9:57:33 AM	5/26/2022, 12:26:13 PM	2h 28m		Attendee	
Ward, Horace (PacifiCorp)	5/26/2022, 10:00:01 AM	5/26/2022, 12:26:11 PM	2h 26m	Horace.Ward@pacificorp.com	Presenter	Horace.Ward@pacificorp.com
Harris, Richard (PacifiCorp)	5/26/2022, 10:01:03 AM	5/26/2022, 10:02:45 AM	1m 41s	Richard.Harris@pacificorp.com	Presenter	Richard.Harris@pacificorp.com
Harris, Richard (PacifiCorp)	5/26/2022, 10:29:40 AM	5/26/2022, 12:26:25 PM	1h 56m	Richard.Harris@pacificorp.com	Presenter	Richard.Harris@pacificorp.com
15308423522	5/26/2022, 10:02:17 AM	5/26/2022, 10:02:47 AM	30s		Attendee	
Estep, Mari (PacifiCorp)	5/26/2022, 10:02:25 AM	5/26/2022, 10:03:32 AM	1m 7s	Mari.Estep@pacificorp.com	Presenter	Mari.Estep@pacificorp.com
Estep, Mari (PacifiCorp)	5/26/2022, 10:36:04 AM	5/26/2022, 12:33:23 PM	1h 57m	Mari.Estep@pacificorp.com	Presenter	Mari.Estep@pacificorp.com
Lee, Jasen (PacifiCorp)	5/26/2022, 10:03:31 AM	5/26/2022, 10:03:36 AM	4s	Jasen.Lee@pacificorp.com	Presenter	Jasen.Lee@pacificorp.com
Lee, Jasen (PacifiCorp)	5/26/2022, 10:30:51 AM	5/26/2022, 12:26:48 PM	1h 55m	Jasen.Lee@pacificorp.com	Presenter	Jasen.Lee@pacificorp.com
Eide, Thomas (PacifiCorp)	5/26/2022, 10:12:22 AM	5/26/2022, 10:13:44 AM	1m 22s	Thomas.Eide@pacificorp.com	Presenter	Thomas.Eide@pacificorp.com
Eide, Thomas (PacifiCorp)	5/26/2022, 10:30:59 AM	5/26/2022, 12:26:29 PM	1h 55m	Thomas.Eide@pacificorp.com	Presenter	Thomas.Eide@pacificorp.com
Wright, Adrian (PacifiCorp)	5/26/2022, 10:28:32 AM	5/26/2022, 11:01:39 AM	33m 7s	Adrian.Wright@pacificorp.com	Presenter	Adrian.Wright@pacificorp.com
Wright, Adrian (PacifiCorp)	5/26/2022, 11:45:40 AM	5/26/2022, 12:29:26 PM	43m 45s	Adrian.Wright@pacificorp.com	Presenter	Adrian.Wright@pacificorp.com
Schultz, Traci (PacifiCorp)	5/26/2022, 10:29:19 AM	5/26/2022, 11:02:24 AM	33m 4s	Traci.Schultz@pacificorp.com	Presenter	Traci.Schultz@pacificorp.com
Schultz, Traci (PacifiCorp)	5/26/2022, 11:13:28 AM	5/26/2022, 12:26:24 PM	1h 12m	Traci.Schultz@pacificorp.com	Presenter	Traci.Schultz@pacificorp.com
Kitchen, Catherine (PacifiCorp)	5/26/2022, 10:29:56 AM	5/26/2022, 12:26:21 PM	1h 56m	Catherine.Kitchen@pacificorp.com	Presenter	Catherine.Kitchen@pacificorp.com
Hanson, Drew (PacifiCorp)	5/26/2022, 10:30:48 AM	5/26/2022, 12:26:34 PM	1h 55m	Drew.Hanson@pacificorp.com	Presenter	Drew.Hanson@PacifiCorp.com
Beall, Stephanie (PacifiCorp)	5/26/2022, 10:31:00 AM	5/26/2022, 11:02:58 AM	31m 58s	Stephanie.Beall@pacificorp.com	Presenter	Stephanie.Beall@pacificorp.com
Beall, Stephanie (PacifiCorp)	5/26/2022, 11:14:15 AM	5/26/2022, 11:41:49 AM	27m 34s	Stephanie.Beall@pacificorp.com	Presenter	Stephanie.Beall@pacificorp.com
15308423523	5/26/2022, 10:32:42 AM	5/26/2022, 12:26:28 PM	1h 53m		Attendee	
Vanderburg, Steven (PacifiCorp)	5/26/2022, 10:33:12 AM	5/26/2022, 12:26:16 PM	1h 53m	Steven.Vanderburg@PacifiCorp.com	Presenter	Steven.Vanderburg@PacifiCorp.com
Farr, William (PacifiCorp)	5/26/2022, 10:34:00 AM	5/26/2022, 11:01:41 AM	27m 41s	William.Farr@pacificorp.com	Presenter	William.Farr@pacificorp.com
Skinner, Wade (PacifiCorp)	5/26/2022, 10:34:38 AM	5/26/2022, 11:21:03 AM	46m 25s	Wade.Skinner@PacifiCorp.com	Presenter	Wade.Skinner@PacifiCorp.com
Averyt, Tyler (PacifiCorp)	5/26/2022, 10:37:02 AM	5/26/2022, 11:03:16 AM	26m 13s	Tyler.Averyt@pacificorp.com	Presenter	Tyler.Averyt@pacificorp.com
Averyt, Tyler (PacifiCorp)	5/26/2022, 11:23:09 AM	5/26/2022, 12:26:17 PM	1h 3m	Tyler.Averyt@pacificorp.com	Presenter	Tyler.Averyt@pacificorp.com
Andres, Todd (PacifiCorp)	5/26/2022, 10:37:13 AM	5/26/2022, 12:26:19 PM	1h 49m	Todd.Andres@pacificorp.com	Presenter	Todd.Andres@pacificorp.com
Leach, Stephen (PacifiCorp)	5/26/2022, 10:39:57 AM	5/26/2022, 11:02:04 AM	22m 6s	Stephen.Leach@pacificorp.com	Presenter	Stephen.Leach@pacificorp.com
Leach, Stephen (PacifiCorp)	5/26/2022, 11:13:42 AM	5/26/2022, 12:26:02 PM	1h 12m	Stephen.Leach@pacificorp.com	Presenter	Stephen.Leach@pacificorp.com
Roholt, Brent (PacifiCorp)	5/26/2022, 12:01:21 PM	5/26/2022, 12:03:06 PM	1m 45s	Brent.Roholt@pacificorp.com	Presenter	Brent.Roholt@pacificorp.com
Roholt, Brent (PacifiCorp)	5/26/2022, 12:10:55 PM	5/26/2022, 12:26:22 PM	15m 26s	Brent.Roholt@pacificorp.com	Presenter	Brent.Roholt@pacificorp.com

Meeting Summary

Total Number of Participants	11
Meeting Title	Siskiyou County PSPS Functional Exercise Final Planning Meeting and MSEL Review
Meeting Start Time	5/17/2022, 12:53:08 PM
Meeting End Time	5/17/2022, 1:18:22 PM
Meeting Id	28285ed0-323c-4135-a6f1-4401cd6d8036

Full Name	Join Time	Leave Time	Duration	Email	Role	Participant ID (UPN)
Bolton, Jeff (PacifiCorp)	5/17/2022, 12:53:08 PM	5/17/2022, 1:18:22 PM	25m 13s	Jeffrey.Bolton@pacificorp.com	Organizer	Jeffrey.Bolton@pacificorp.com
Harkins, Lisa (PacifiCorp)	5/17/2022, 12:53:30 PM	5/17/2022, 1:18:15 PM	24m 44s	Lisa.Harkins@pacificorp.com	Presenter	Lisa.Harkins@pacificorp.com
Schultz, Traci (PacifiCorp)	5/17/2022, 12:54:32 PM	5/17/2022, 1:18:20 PM	23m 47s	Traci.Schultz@pacificorp.com	Presenter	Traci.Schultz@pacificorp.com
Bryan Schenone	5/17/2022, 12:56:30 PM	5/17/2022, 1:18:15 PM	21m 45s	bschenone@co.siskiyou.ca.us	Presenter	bschenone@co.siskiyou.ca.us
Averyt, Tyler (PacifiCorp)	5/17/2022, 12:58:01 PM	5/17/2022, 1:18:17 PM	20m 16s	Tyler.Averyt@pacificorp.com	Presenter	Tyler.Averyt@pacificorp.com
19165392185	5/17/2022, 1:00:06 PM	5/17/2022, 1:18:12 PM	18m 6s		Attendee	
19166949906	5/17/2022, 1:00:12 PM	5/17/2022, 1:10:21 PM	10m 8s		Attendee	
Fuentes, Jeff@CALFIRE	5/17/2022, 1:00:33 PM	5/17/2022, 1:18:13 PM	17m 39s	Jeff.Fuentes@fire.ca.gov	Presenter	Jeff.Fuentes@fire.ca.gov
Dunton, Drucilla "Dru"	5/17/2022, 1:00:40 PM	5/17/2022, 1:18:12 PM	17m 32s	Drucilla.Dunton@cpuc.ca.gov	Presenter	drucilla.dunton@cpuc.ca.gov
Vela, Jasen@CalOES	5/17/2022, 1:02:03 PM	5/17/2022, 1:18:07 PM	16m 3s	Jasen.Vela@CalOES.ca.gov	Presenter	VelaJ@caloes.ca.gov
Goyeneche, Robert@CalOES	5/17/2022, 1:10:06 PM	5/17/2022, 1:18:14 PM	8m 8s	Robert.Goyeneche@CalOES.ca.gov	Presenter	GoyenecheR@CalOES.ca.gov

Meeting Summary

Total Number of Participants	52
Meeting Title	PacifiCorp Functional PSPS Exercise
Meeting Start Time	5/26/2022, 9:49:39 AM
Meeting End Time	5/26/2022, 1:27:47 PM
Meeting Id	047d579a-fb15-4475-9e54-71f036e25f9b

Full Name	Join Time	Leave Time	Duration	Email	Role	Participant ID (UPN)
Vela, Jasen@CalOES	5/26/2022, 9:49:39 AM	5/26/2022, 12:36:18 PM	2h 46m	Jasen.Vela@CalOES.ca.gov	Presenter	VelaJ@caloes.ca.gov
Coleman J. Fitzgerald	5/26/2022, 9:49:58 AM	5/26/2022, 12:36:24 PM	2h 46m	cjfitzgerald@co.siskiyou.ca.us	Presenter	cjfitzgerald@co.siskiyou.ca.us
Leach, Stephen (PacifiCorp)	5/26/2022, 9:50:00 AM	5/26/2022, 10:39:48 AM	49m 48s	Stephen.Leach@pacificorp.com	Presenter	Stephen.Leach@pacificorp.com
Leach, Stephen (PacifiCorp)	5/26/2022, 11:02:19 AM	5/26/2022, 11:13:31 AM	11m 11s	Stephen.Leach@pacificorp.com	Presenter	Stephen.Leach@pacificorp.com
Leach, Stephen (PacifiCorp)	5/26/2022, 12:26:15 PM	5/26/2022, 12:36:25 PM	10m 10s	Stephen.Leach@pacificorp.com	Presenter	Stephen.Leach@pacificorp.com
Wright, Adrian (PacifiCorp)	5/26/2022, 9:50:18 AM	5/26/2022, 10:30:34 AM	40m 16s	Adrian.Wright@pacificorp.com	Presenter	Adrian.Wright@pacificorp.com
Wright, Adrian (PacifiCorp)	5/26/2022, 11:01:51 AM	5/26/2022, 12:36:21 PM	1h 34m	Adrian.Wright@pacificorp.com	Presenter	Adrian.Wright@pacificorp.com
Goyeneche, Robert@CalOES	5/26/2022, 9:50:51 AM	5/26/2022, 12:36:19 PM	2h 45m	Robert.Goyeneche@CalOES.ca.gov	Presenter	GoyenecheR@CalOES.ca.gov
Bolton, Jeff (PacifiCorp)	5/26/2022, 9:52:16 AM	5/26/2022, 12:36:27 PM	2h 44m	Jeffrey.Bolton@pacificorp.com	Organizer	Jeffrey.Bolton@pacificorp.com
Schultz, Traci (PacifiCorp)	5/26/2022, 9:52:42 AM	5/26/2022, 10:30:40 AM	37m 57s	Traci.Schultz@pacificorp.com	Presenter	Traci.Schultz@pacificorp.com
Schultz, Traci (PacifiCorp)	5/26/2022, 11:02:03 AM	5/26/2022, 11:13:51 AM	11m 48s	Traci.Schultz@pacificorp.com	Presenter	Traci.Schultz@pacificorp.com
Schultz, Traci (PacifiCorp)	5/26/2022, 12:13:25 PM	5/26/2022, 12:36:25 PM	22m 59s	Traci.Schultz@pacificorp.com	Presenter	Traci.Schultz@pacificorp.com
Ward, Horace (PacifiCorp)	5/26/2022, 9:53:01 AM	5/26/2022, 12:44:03 PM	2h 51m	Horace.Ward@pacificorp.com	Presenter	Horace.Ward@pacificorp.com
15032515169	5/26/2022, 9:53:26 AM	5/26/2022, 12:17:13 PM	2h 23m		Attendee	
15032515169	5/26/2022, 12:27:09 PM	5/26/2022, 12:36:33 PM	9m 24s		Attendee	
Beall, Stephanie (PacifiCorp)	5/26/2022, 9:54:55 AM	5/26/2022, 10:30:40 AM	35m 44s	Stephanie.Beall@pacificorp.com	Presenter	Stephanie.Beall@pacificorp.com
Beall, Stephanie (PacifiCorp)	5/26/2022, 11:03:07 AM	5/26/2022, 11:41:51 AM	38m 44s	Stephanie.Beall@pacificorp.com	Presenter	Stephanie.Beall@pacificorp.com
Harris, Richard (PacifiCorp)	5/26/2022, 9:55:15 AM	5/26/2022, 10:00:54 AM	5m 38s	Richard.Harris@pacificorp.com	Presenter	Richard.Harris@pacificorp.com
Harris, Richard (PacifiCorp)	5/26/2022, 10:03:01 AM	5/26/2022, 10:29:35 AM	26m 34s	Richard.Harris@pacificorp.com	Presenter	Richard.Harris@pacificorp.com
Harris, Richard (PacifiCorp)	5/26/2022, 12:26:37 PM	5/26/2022, 12:36:21 PM	9m 43s	Richard.Harris@pacificorp.com	Presenter	Richard.Harris@pacificorp.com
Lew, Desmond	5/26/2022, 9:56:08 AM	5/26/2022, 12:36:43 PM	2h 40m	Desmond.Lew@cpuc.ca.gov	Presenter	Desmond.Lew@cpuc.ca.gov
Eide, Thomas (PacifiCorp)	5/26/2022, 9:56:13 AM	5/26/2022, 10:12:36 AM	16m 23s	Thomas.Eide@pacificorp.com	Presenter	Thomas.Eide@pacificorp.com
Eide, Thomas (PacifiCorp)	5/26/2022, 10:15:00 AM	5/26/2022, 10:29:43 AM	14m 42s	Thomas.Eide@pacificorp.com	Presenter	Thomas.Eide@pacificorp.com
Eide, Thomas (PacifiCorp)	5/26/2022, 12:27:14 PM	5/26/2022, 12:36:19 PM	9m 4s	Thomas.Eide@pacificorp.com	Presenter	Thomas.Eide@pacificorp.com
Andres, Todd (PacifiCorp)	5/26/2022, 9:56:13 AM	5/26/2022, 10:37:36 AM	41m 22s	Todd.Andres@pacificorp.com	Presenter	Todd.Andres@pacificorp.com
Andres, Todd (PacifiCorp)	5/26/2022, 12:28:05 PM	5/26/2022, 12:36:18 PM	8m 13s	Todd.Andres@pacificorp.com	Presenter	Todd.Andres@pacificorp.com
Dunton, Drucilla "Dru"	5/26/2022, 9:56:41 AM	5/26/2022, 10:30:46 AM	34m 4s	Drucilla.Dunton@cpuc.ca.gov	Presenter	drucilla.dunton@cpuc.ca.gov
Dunton, Drucilla "Dru"	5/26/2022, 12:15:39 PM	5/26/2022, 12:36:18 PM	20m 39s	Drucilla.Dunton@cpuc.ca.gov	Presenter	drucilla.dunton@cpuc.ca.gov
Naveed Paydar (CPUC) (Guest)	5/26/2022, 9:56:53 AM	5/26/2022, 10:35:07 AM	38m 13s		Presenter	
15419557911	5/26/2022, 9:56:56 AM	5/26/2022, 10:14:47 AM	17m 51s		Attendee	
15419557911	5/26/2022, 10:16:02 AM	5/26/2022, 10:29:55 AM	13m 52s		Attendee	
15419557911	5/26/2022, 12:27:29 PM	5/26/2022, 12:36:19 PM	8m 50s		Attendee	
Ryan Sandler (NWS Medford) (Guest)	5/26/2022, 9:57:21 AM	5/26/2022, 12:45:27 PM	2h 48m		Presenter	
Hanson, Drew (PacifiCorp)	5/26/2022, 9:57:21 AM	5/26/2022, 12:36:13 PM	2h 38m	Drew.Hanson@pacificorp.com	Presenter	Drew.Hanson@PacifiCorp.com
Vanderburg, Steven (PacifiCorp)	5/26/2022, 9:57:50 AM	5/26/2022, 12:36:33 PM	2h 38m	Steven.Vanderburg@PacifiCorp.com	Presenter	Steven.Vanderburg@PacifiCorp.com
Mark Apland	5/26/2022, 9:58:04 AM	5/26/2022, 12:36:25 PM	2h 38m	m.apland@SiskiyouTelephone.onmicro	Presenter	m.apland@SiskiyouTelephone.onmicrosoft.com
Howard, Tristan@CALFIRE	5/26/2022, 9:58:16 AM	5/26/2022, 12:36:33 PM	2h 38m	Tristan.Howard@fire.ca.gov	Presenter	Tristan.Howard@fire.ca.gov
15032515153	5/26/2022, 9:58:30 AM	5/26/2022, 12:49:01 PM	2h 50m		Attendee	
Dundon, Will	5/26/2022, 9:58:32 AM	5/26/2022, 11:03:13 AM	1h 4m	Will.Dundon@cpuc.ca.gov	Presenter	will.dundon@cpuc.ca.gov
Dundon, Will	5/26/2022, 11:06:05 AM	5/26/2022, 11:15:27 AM	9m 22s	Will.Dundon@cpuc.ca.gov	Presenter	will.dundon@cpuc.ca.gov
OVERTON, JOSHUA D	5/26/2022, 9:58:33 AM	5/26/2022, 12:34:10 PM	2h 35m	jo2147@att.com	Presenter	jo2147@att.com
Brookhouse, Erik (PacifiCorp)	5/26/2022, 9:58:35 AM	5/26/2022, 12:49:04 PM	2h 50m	Erik.Brookhouse@pacificorp.com	Presenter	Erik.Brookhouse@pacificorp.com
Averyt, Tyler (PacifiCorp)	5/26/2022, 9:59:05 AM	5/26/2022, 10:36:56 AM	37m 51s	Tyler.Averyt@pacificorp.com	Presenter	Tyler.Averyt@pacificorp.com
Averyt, Tyler (PacifiCorp)	5/26/2022, 11:03:27 AM	5/26/2022, 11:22:08 AM	18m 40s	Tyler.Averyt@pacificorp.com	Presenter	Tyler.Averyt@pacificorp.com
Averyt, Tyler (PacifiCorp)	5/26/2022, 11:51:23 AM	5/26/2022, 12:36:23 PM	45m	Tyler.Averyt@pacificorp.com	Presenter	Tyler.Averyt@pacificorp.com
19166283294	5/26/2022, 9:59:10 AM	5/26/2022, 10:30:27 AM	31m 17s		Attendee	
19166283294	5/26/2022, 12:30:20 PM	5/26/2022, 12:36:23 PM	6m 3s		Attendee	
15308427890	5/26/2022, 9:59:49 AM	5/26/2022, 10:00:54 AM	1m 4s		Attendee	
15308427890	5/26/2022, 12:27:30 PM	5/26/2022, 12:36:22 PM	8m 51s		Attendee	
Lee, Jasen (PacifiCorp)	5/26/2022, 10:00:18 AM	5/26/2022, 10:30:46 AM	30m 27s	Jasen.Lee@pacificorp.com	Presenter	Jasen.Lee@pacificorp.com
Lee, Jasen (PacifiCorp)	5/26/2022, 12:26:58 PM	5/26/2022, 12:36:20 PM	9m 21s	Jasen.Lee@pacificorp.com	Presenter	Jasen.Lee@pacificorp.com
Wu, Mabel	5/26/2022, 10:00:20 AM	5/26/2022, 12:36:23 PM	2h 36m	Mabel.Wu@cpuc.ca.gov	Presenter	Mabel.Wu@cpuc.ca.gov
19255133456	5/26/2022, 10:01:06 AM	5/26/2022, 10:14:33 AM	13m 27s		Attendee	
Farr, William (PacifiCorp)	5/26/2022, 10:01:15 AM	5/26/2022, 10:30:34 AM	29m 19s	William.Farr@pacificorp.com	Presenter	William.Farr@pacificorp.com
Farr, William (PacifiCorp)	5/26/2022, 11:07:53 AM	5/26/2022, 11:44:00 AM	36m 6s	William.Farr@pacificorp.com	Presenter	William.Farr@pacificorp.com

Skinner, Wade (PacifiCorp)	5/26/2022, 10:02:08 AM	5/26/2022, 11:21:05 AM	1h 18m	Wade.Skinner@PacifiCorp.com	Presenter	Wade.Skinner@PacifiCorp.com
Noll, Anthony	5/26/2022, 10:03:19 AM	5/26/2022, 12:36:19 PM	2h 33m	Anthony.Noll@cpuc.ca.gov	Presenter	Anthony.Noll@cpuc.ca.gov
Estep, Mari (PacifiCorp)	5/26/2022, 10:03:42 AM	5/26/2022, 12:33:16 PM	2h 29m	Mari.Estep@pacificorp.com	Presenter	Mari.Estep@pacificorp.com
15308423523	5/26/2022, 10:03:56 AM	5/26/2022, 10:29:37 AM	25m 41s		Attendee	
Sweat, Henry	5/26/2022, 10:04:55 AM	5/26/2022, 10:33:10 AM	28m 15s	Henry.Sweat@cpuc.ca.gov	Presenter	Henry.Sweat@cpuc.ca.gov
Sweat, Henry	5/26/2022, 11:06:08 AM	5/26/2022, 11:15:43 AM	9m 34s	Henry.Sweat@cpuc.ca.gov	Presenter	Henry.Sweat@cpuc.ca.gov
BENSAID, ADAM S	5/26/2022, 10:05:52 AM	5/26/2022, 10:30:54 AM	25m 1s	ab8947@att.com	Presenter	ab8947@att.com
Walsh, Christopher (PacifiCorp)	5/26/2022, 10:10:47 AM	5/26/2022, 11:04:39 AM	53m 51s	Christopher.Walsh@pacificorp.com	Presenter	Christopher.Walsh@pacificorp.com
Walsh, Christopher (PacifiCorp)	5/26/2022, 11:15:09 AM	5/26/2022, 12:53:25 PM	1h 38m	Christopher.Walsh@pacificorp.com	Presenter	Christopher.Walsh@pacificorp.com
Born, Charles	5/26/2022, 10:12:20 AM	5/26/2022, 12:07:25 PM	1h 55m	Charlie.Born@ftr.com	Presenter	cborn@ftr.com
Hoskins, Amy (PacifiCorp)	5/26/2022, 10:13:19 AM	5/26/2022, 10:28:44 AM	15m 24s	Amy.Hoskins@pacificorp.com	Presenter	Amy.Hoskins@pacificorp.com
14155164346	5/26/2022, 10:14:18 AM	5/26/2022, 10:32:14 AM	17m 56s		Attendee	
Chen, Xuan "Cindy"	5/26/2022, 10:15:06 AM	5/26/2022, 11:36:05 AM	1h 20m	Xuan.Chen@cpuc.ca.gov	Presenter	Xuan.Chen@cpuc.ca.gov
Kitchen, Catherine (PacifiCorp)	5/26/2022, 10:18:20 AM	5/26/2022, 10:29:42 AM	11m 21s	Catherine.Kitchen@pacificorp.com	Presenter	Catherine.Kitchen@pacificorp.com
Kitchen, Catherine (PacifiCorp)	5/26/2022, 12:26:32 PM	5/26/2022, 12:36:23 PM	9m 51s	Catherine.Kitchen@pacificorp.com	Presenter	Catherine.Kitchen@pacificorp.com
GUESS, ROBERT C	5/26/2022, 10:27:23 AM	5/26/2022, 10:31:51 AM	4m 28s	rg396a@att.com	Presenter	rg396a@att.com
12132642337	5/26/2022, 10:48:09 AM	5/26/2022, 11:02:25 AM	14m 15s		Attendee	
Whitesides, Jonathan (PacifiCorp)	5/26/2022, 11:16:55 AM	5/26/2022, 11:33:59 AM	17m 3s	Jonathan.Whitesides@pacificorp.com	Presenter	Jonathan.Whitesides@pacificorp.com
16268412996	5/26/2022, 11:18:29 AM	5/26/2022, 12:35:48 PM	1h 17m		Attendee	
Adam Heilman	5/26/2022, 11:34:47 AM	5/26/2022, 1:27:47 PM	1h 53m	aheilman@co.siskiyou.ca.us	Presenter	aheilman@co.siskiyou.ca.us
Roholt, Brent (PacifiCorp)	5/26/2022, 12:04:41 PM	5/26/2022, 12:07:10 PM	2m 29s	Brent.Roholt@pacificorp.com	Presenter	Brent.Roholt@pacificorp.com
Roholt, Brent (PacifiCorp)	5/26/2022, 12:26:25 PM	5/26/2022, 12:36:20 PM	9m 55s	Brent.Roholt@pacificorp.com	Presenter	Brent.Roholt@pacificorp.com
15305989589	5/26/2022, 12:10:43 PM	5/26/2022, 12:16:00 PM	5m 16s		Attendee	

Siskiyou County PSPS

Exercise Plan
Tabletop Exercise

The Exercise Plan (ExPlan) provides key information needed to observe or participate in the exercise. Some exercise material is intended for the exclusive use of exercise planners, controllers, and evaluators, but players may view other materials that are necessary to their performance. All exercise participants may view the ExPlan.

EXERCISE OVERVIEW

Exercise Name	Siskiyou County PSPS
Exercise Dates	April 28, 2022
Scope	Tabletop Exercise, planned for four hours at the Jackson County EOC. Exercise play is limited to the identified affected area. No other incidents
Objectives	• Build confidence in Pacific Powers Public Safety Power Shutoff decision making process utilizing current situational awareness tools • Provide detailed overview of Pacific Powers notification processes and identify external partners notification procedures • Explain Community Resource Center scope & purpose in a PSPS event and compare plans to support impacted community members • Explore Pacific Powers plans for allocating resources during PSPS events • Outline current options and capabilities for supporting individuals with access and functional needs
Threat or Hazard	Extreme fire weather.
Scenario	PSPS activation response and recovery
Point of Contact	Primary, Tyler Averyt Secondary, Jeff Bolton

GENERAL INFORMATION

Participant Roles and Responsibilities

The term *participant* encompasses many groups of people, not just those playing in the exercise. Groups of participants involved in the exercise, and their respective roles and responsibilities, are as follows:

- **Exercise Coordinator** – The exercise coordinator facilitates exercise activities before, during and after the exercise. They are typically involved in development of the exercise, and may manage exercise documentation, communications, logistics and evaluation activities. They often have the authority to modify or stop an exercise due to a real event, unsafe condition, or other concerning situation.
- **Exercise Participants** – Exercise participants are the resources responsible for guiding or contributing to exercise play. They are typically responsible for implementing exercise objectives, identifying exercise issues and opportunities for improvement, and collaborating with other participants to ensure a safe and productive exercise.
- **Exercise Observers** – Observers are supposed to watch the exercise from an impartial viewpoint and are typically not exercise participates. Observers are responsible for evaluating and reporting on specific aspects of the exercise.
- **Safety Officer** – The safety officer ensures that all exercise participants are informed about the related safety protocols. In the event of an emergency condition, the safety officer is responsible for coordinating an orderly response that ensures all participants are relocated or evacuated to a safe location.
- **Stakeholders** – Stakeholders may be internal or external individuals or entities that have a vested interest in the results of the exercise.

Appendix A provides a list of participants and roles.

Communications Plan

- Exercise communication and coordination is limited to participating exercise organizations, venues, or the SimCell. No communications will be conducted outside of the exercise venue and virtual meeting.

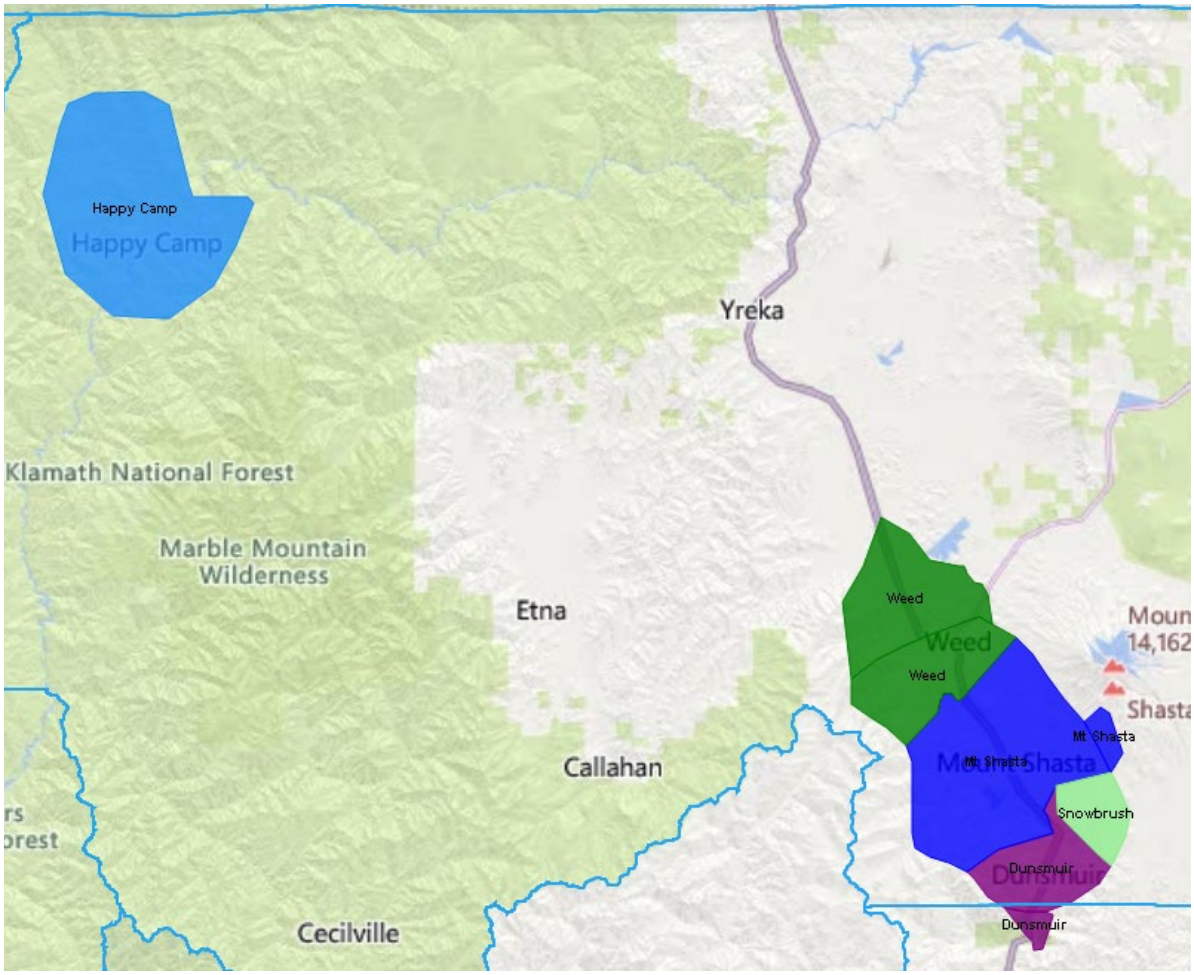
Definitions

- PDZ - Proactive De-energization Zones
- PSPS – Public Safety Power Shutoff
- CRC – Community Resource Center
- HSEEP – Homeland Security Exercise & Evaluation Program
- AFN Individuals - Individuals having access and functional needs may include, but are not limited to, individuals with disabilities, seniors, and populations having limited English proficiency, limited access to transportation, and/or limited access to financial resources to prepare for, respond to, and recover from the emergency.

Scenario

Forecast high winds with low humidity creating fire weather concerns and the potential for catastrophic fire in the event of an ignition.

Potential Affected Area:



Potential affected households or businesses:

- Happy Camp 865
- Weed 2,589
- Mt Shasta 5,074
- Dunsmuir 1,806
- Snowbrush 17

Generic Potential Questions:

- Who should be informed of this event?
- What concerns might you have?
- What actions would you consider taking, if any, at this time?

Hot Wash

Let's take a look at the exercise and see what we learned from this experience and how we can use it to improve our overall response plan. Please provide some feedback on the exercise and how we responded to the scenario. The answers to the questions during the Hot Wash should be based on how the participants in the exercise responded to the active shooter incident, not based on things that happened in the scenario itself.

- How do you think the exercise went overall?
  - What improvements would make this exercise better?

- What did you learn from the scenario?

- What are areas of concern at this point?

- What action steps do we need to take, based on the lessons learned?
  - Plans
  - Procedures
  - Training
  - Other suggestions

APPENDIX A: EXERCISE PARTICIPANTS

Exercise Role	Responsible Resource(s)

APPENDIX B: PARTICIPANT & OBSERVER FEEDBACK FORM

Please enter your responses in the form fields and check the box(es) that identify your role(s).

Name _____ **Date** _____

Title _____

Business or Organization _____

Role Player Facilitator Observer Evaluator Media

Part I: Observations and Recommendations

Please provide your feedback related to the questions below based on your participation in the exercise. Add or delete comment lines as needed.

What areas of strength did you observe? What went well?

_____

_____

_____

_____

_____

What areas for improvement did you identify? What did not go as expected?

_____

_____

_____

_____

_____

For each area for improvement, identify potential corrective actions, if known. Include any policies, plans or procedures that should be reviewed, revised or developed. To the best of your knowledge, indicate the entity, organization, department, group or individual that should be assigned responsibility for the corrective action and if it should be a high, medium or low priority for the team or business.

No.	Recommended Corrective Actions	Recommended Assignment	Priority

Part II: Assessment of Exercise Design and Performance

On a scale of 1 to 5, please rate your assessment of the exercise relative to the statements below, with 1 indicating strong disagreement with the statement and 5 indicating strong agreement. Choose N/A if the question is not applicable to your participation or observations.

Assessment Factor	Strongly Disagree				Strongly Agree	N/A
The exercise was well structured and organized.	1	2	3	4	5	N/A
The exercise scenario was plausible and realistic.	1	2	3	4	5	N/A
The exercise objectives were clearly stated.	1	2	3	4	5	N/A
The exercise facilities were adequate.	1	2	3	4	5	N/A
The presentation materials helped the participants understand and become engaged in the scenario.	1	2	3	4	5	N/A
The exercise documents were relevant and valuable tools.	1	2	3	4	5	N/A
The facilitator(s) was knowledgeable about the scenario and supporting policies, plans and procedures.	1	2	3	4	5	N/A
The facilitator(s) kept the exercise on track or provided justification for a mid-exercise course correction.	1	2	3	4	5	N/A
The facilitator(s) was sensitive to group dynamics.	1	2	3	4	5	N/A
The facilitator(s) communicated well with the exercise participants.	1	2	3	4	5	N/A
The knowledge, skills and abilities of the participants seemed appropriate.	1	2	3	4	5	N/A

The exercise participants seemed fully engaged in the response activities.	1	2	3	4	5	N/A
The response activities were relevant to the scenario.	1	2	3	4	5	N/A
The response activities aligned with the related policies, plans and procedures.	1	2	3	4	5	N/A
There was adequate communication among the exercise participants.	1	2	3	4	5	N/A
My role in the exercise was appropriate based on my knowledge, skills and abilities.	1	2	3	4	5	N/A
The exercise objectives were achieved.	1	2	3	4	5	N/A

Part III: Additional Feedback

Please provide any additional comments or recommendations about how this exercise or future exercises could be improved or enhanced.

Siskiyou County PSPS

Exercise Plan
Functional Exercise

The Exercise Plan (ExPlan) provides key information needed to observe or participate in the exercise. Some exercise material is intended for the exclusive use of exercise planners, controllers, and evaluators, but players may view other materials that are necessary to their performance. All exercise participants may view the ExPlan.

EXERCISE OVERVIEW

Exercise Name	Siskiyou County PSPS
Exercise Dates	May 26, 2022
Scope	Functional Exercise, planned for three hours from everyone's normal work location. Exercise play is limited to the identified affected area. No other incidents are occurring at the time
Objectives	• Execute Pacific Powers notification processes and external partners notification procedures • Complete Pacific Powers plans for allocating resources during PSPS events • Validate capabilities for supporting individuals with access and functional needs
Threat or Hazard	Extreme fire weather.
Scenario	PSPS activation response 24 hours prior to event notification
Point of Contact	Primary, Jeff Bolton Secondary, Tyler Averyt

GENERAL INFORMATION

Participant Roles and Responsibilities

The term *participant* encompasses many groups of people, not just those playing in the exercise. Groups of participants involved in the exercise, and their respective roles and responsibilities, are as follows:

- **Exercise Coordinator** – The exercise coordinator facilitates exercise activities before, during and after the exercise. They are typically involved in development of the exercise, and may manage exercise documentation, communications, logistics and evaluation activities. They often have the authority to modify or stop an exercise due to a real event, unsafe condition, or other concerning situation.
- **Exercise Participants** – Exercise participants are the resources responsible for guiding or contributing to exercise play. They are typically responsible for implementing exercise objectives, identifying exercise issues and opportunities for improvement, and collaborating with other participants to ensure a safe and productive exercise.
- **Exercise Observers** – Observers are supposed to watch the exercise from an impartial viewpoint and are typically not exercise participates. Observers are responsible for evaluating and reporting on specific aspects of the exercise.
- **Safety Officer** – The safety officer ensures that all exercise participants are informed about the related safety protocols. In the event of an emergency condition, the safety officer is responsible for coordinating an orderly response that ensures all participants are relocated or evacuated to a safe location.
- **Stakeholders** – Stakeholders may be internal or external individuals or entities that have a vested interest in the results of the exercise.

Communications Plan

- Exercise communication and coordination is limited to participating exercise organizations, venues, or the SimCell. No communications will be conducted outside of the exercise participants and virtual meeting.

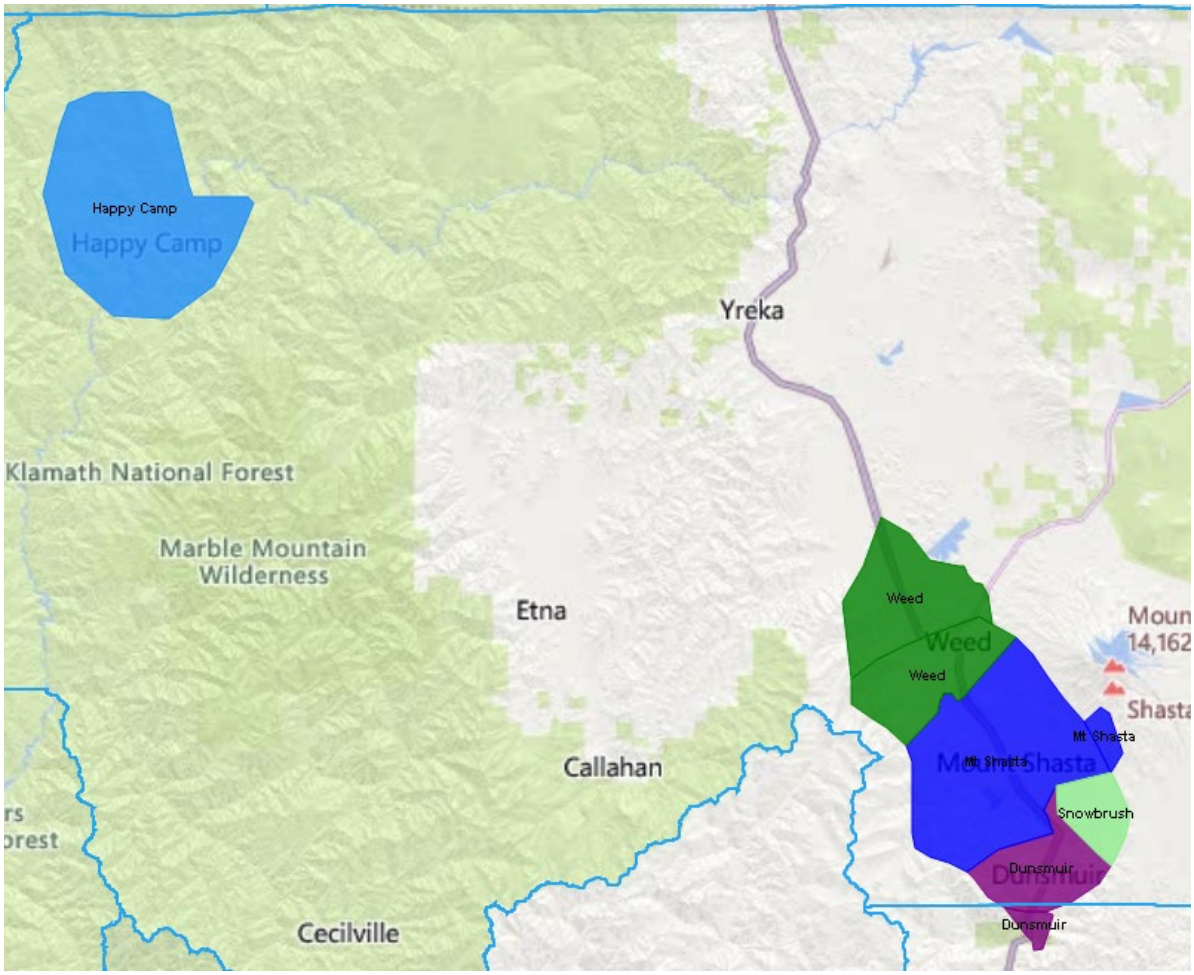
Definitions

- PDZ - Proactive De-energization Zones
- PSPS – Public Safety Power Shutoff
- CRC – Community Resource Center
- HSEEP – Homeland Security Exercise & Evaluation Program
- AFN Individuals - Individuals having access and functional needs may include, but are not limited to, individuals with disabilities, seniors, and populations having limited English proficiency, limited access to transportation, and/or limited access to financial resources to prepare for, respond to, and recover from the emergency.

Scenario

Forecast high winds with low humidity creating fire weather concerns and the potential for catastrophic fire in the event of an ignition.

Potential Affected Area:



Potential affected households or businesses:

- Happy Camp 865
- Weed 2,589
- Mt Shasta 5,074
- Dunsmuir 1,806
- Snowbrush 17

Generic Potential Actions:

- Notification processes
- PacifiCorp Emergency Coordination Center Activation
- AFN population contingencies

Hot Wash

Let's take a look at the exercise and see what we learned from this experience and how we can use it to improve our overall response plan. Please provide some feedback on the exercise and how we responded to the scenario. The answers to the questions during the Hot Wash should be based on how the participants in the exercise responded to the active shooter incident, not based on things that happened in the scenario itself.

- How do you think the exercise went overall?
- What improvements would make this exercise better?
- What did you learn from the scenario?
- What are areas of concern at this point?
- What action steps do we need to take, based on the lessons learned?
    - Plans
    - Procedures
    - Training
    - Other suggestions

APPENDIX A: PARTICIPANT & OBSERVER FEEDBACK FORM

Please enter your responses in the form fields and check the box(es) that identify your role(s).

Name _____ **Date** _____

Title _____

Business or Organization _____

Role Player Facilitator Observer Evaluator Media

Part I: Observations and Recommendations

Please provide your feedback related to the questions below based on your participation in the exercise. Add or delete comment lines as needed.

What areas of strength did you observe? What went well?

_____

_____

_____

_____

_____

What areas for improvement did you identify? What did not go as expected?

_____

_____

_____

_____

_____

For each area for improvement, identify potential corrective actions, if known. Include any policies, plans or procedures that should be reviewed, revised or developed. To the best of your knowledge, indicate the entity, organization, department, group or individual that should be assigned responsibility for the corrective action and if it should be a high, medium or low priority for the team or business.

No.	Recommended Corrective Actions	Recommended Assignment	Priority

Part II: Assessment of Exercise Design and Performance

On a scale of 1 to 5, please rate your assessment of the exercise relative to the statements below, with 1 indicating strong disagreement with the statement and 5 indicating strong agreement. Choose N/A if the question is not applicable to your participation or observations.

Assessment Factor	Strongly Disagree				Strongly Agree	N/A
The exercise was well structured and organized.	1	2	3	4	5	N/A
The exercise scenario was plausible and realistic.	1	2	3	4	5	N/A
The exercise objectives were clearly stated.	1	2	3	4	5	N/A
The exercise facilities were adequate.	1	2	3	4	5	N/A
The presentation materials helped the participants understand and become engaged in the scenario.	1	2	3	4	5	N/A
The exercise documents were relevant and valuable tools.	1	2	3	4	5	N/A
The facilitator(s) was knowledgeable about the scenario and supporting policies, plans and procedures.	1	2	3	4	5	N/A
The facilitator(s) kept the exercise on track or provided justification for a mid-exercise course correction.	1	2	3	4	5	N/A
The facilitator(s) was sensitive to group dynamics.	1	2	3	4	5	N/A
The facilitator(s) communicated well with the exercise participants.	1	2	3	4	5	N/A
The knowledge, skills and abilities of the participants seemed appropriate.	1	2	3	4	5	N/A

The exercise participants seemed fully engaged in the response activities.	1	2	3	4	5	N/A
The response activities were relevant to the scenario.	1	2	3	4	5	N/A
The response activities aligned with the related policies, plans and procedures.	1	2	3	4	5	N/A
There was adequate communication among the exercise participants.	1	2	3	4	5	N/A
My role in the exercise was appropriate based on my knowledge, skills and abilities.	1	2	3	4	5	N/A
The exercise objectives were achieved.	1	2	3	4	5	N/A

Part III: Additional Feedback

Please provide any additional comments or recommendations about how this exercise or future exercises could be improved or enhanced.

Siskiyou County PSPS

Exercise Plan
Tabletop Exercise

The Exercise Plan (ExPlan) provides key information needed to observe or participate in the exercise. Some exercise material is intended for the exclusive use of exercise planners, controllers, and evaluators, but players may view other materials that are necessary to their performance. All exercise participants may view the ExPlan.

EXERCISE OVERVIEW

Exercise Name	Siskiyou County PSPS
Exercise Dates	April 28, 2022
Scope	Tabletop Exercise, planned for four hours at the Jackson County EOC. Exercise play is limited to the identified affected area. No other incidents
Objectives	• Build confidence in Pacific Powers Public Safety Power Shutoff decision making process utilizing current situational awareness tools • Provide detailed overview of Pacific Powers notification processes and identify external partners notification procedures • Explain Community Resource Center scope & purpose in a PSPS event and compare plans to support impacted community members • Explore Pacific Powers plans for allocating resources during PSPS events • Outline current options and capabilities for supporting individuals with access and functional needs
Threat or Hazard	Extreme fire weather.
Scenario	PSPS activation response and recovery
Point of Contact	Primary, Tyler Averyt Secondary, Jeff Bolton

GENERAL INFORMATION

Participant Roles and Responsibilities

The term *participant* encompasses many groups of people, not just those playing in the exercise. Groups of participants involved in the exercise, and their respective roles and responsibilities, are as follows:

- **Exercise Coordinator** – The exercise coordinator facilitates exercise activities before, during and after the exercise. They are typically involved in development of the exercise, and may manage exercise documentation, communications, logistics and evaluation activities. They often have the authority to modify or stop an exercise due to a real event, unsafe condition, or other concerning situation.
- **Exercise Participants** – Exercise participants are the resources responsible for guiding or contributing to exercise play. They are typically responsible for implementing exercise objectives, identifying exercise issues and opportunities for improvement, and collaborating with other participants to ensure a safe and productive exercise.
- **Exercise Observers** – Observers are supposed to watch the exercise from an impartial viewpoint and are typically not exercise participates. Observers are responsible for evaluating and reporting on specific aspects of the exercise.
- **Safety Officer** – The safety officer ensures that all exercise participants are informed about the related safety protocols. In the event of an emergency condition, the safety officer is responsible for coordinating an orderly response that ensures all participants are relocated or evacuated to a safe location.
- **Stakeholders** – Stakeholders may be internal or external individuals or entities that have a vested interest in the results of the exercise.

Appendix A provides a list of participants and roles.

Communications Plan

- Exercise communication and coordination is limited to participating exercise organizations, venues, or the SimCell. No communications will be conducted outside of the exercise venue and virtual meeting.

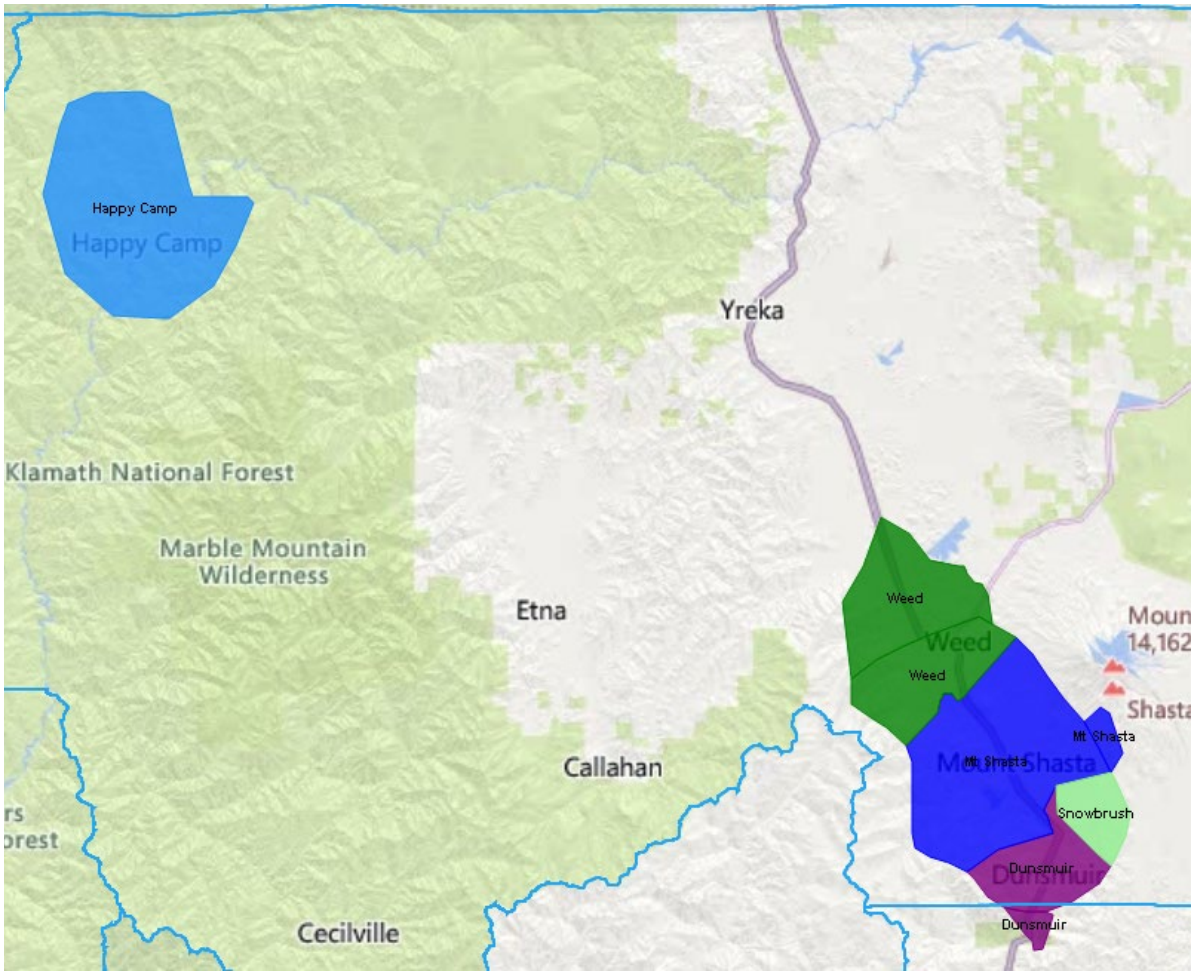
Definitions

- PDZ - Proactive De-energization Zones
- PSPS – Public Safety Power Shutoff
- CRC – Community Resource Center
- HSEEP – Homeland Security Exercise & Evaluation Program
- AFN Individuals - Individuals having access and functional needs may include, but are not limited to, individuals with disabilities, seniors, and populations having limited English proficiency, limited access to transportation, and/or limited access to financial resources to prepare for, respond to, and recover from the emergency.

Scenario

Forecast high winds with low humidity creating fire weather concerns and the potential for catastrophic fire in the event of an ignition.

Potential Affected Area:



Potential affected households or businesses:

- Happy Camp 865
- Weed 2,589
- Mt Shasta 5,074
- Dunsmuir 1,806
- Snowbrush 17

Generic Potential Questions:

- Who should be informed of this event?
- What concerns might you have?
- What actions would you consider taking, if any, at this time?

Hot Wash

Let's take a look at the exercise and see what we learned from this experience and how we can use it to improve our overall response plan. Please provide some feedback on the exercise and how we responded to the scenario. The answers to the questions during the Hot Wash should be based on how the participants in the exercise responded to the active shooter incident, not based on things that happened in the scenario itself.

- How do you think the exercise went overall?
  - What improvements would make this exercise better?

- What did you learn from the scenario?

- What are areas of concern at this point?

- What action steps do we need to take, based on the lessons learned?
  - Plans
  - Procedures
  - Training
  - Other suggestions

APPENDIX A: EXERCISE PARTICIPANTS

Exercise Role	Responsible Resource(s)

APPENDIX B: PARTICIPANT & OBSERVER FEEDBACK FORM

Please enter your responses in the form fields and check the box(es) that identify your role(s).

Name _____ **Date** _____

Title _____

Business or Organization _____

Role Player Facilitator Observer Evaluator Media

Part I: Observations and Recommendations

Please provide your feedback related to the questions below based on your participation in the exercise. Add or delete comment lines as needed.

What areas of strength did you observe? What went well?

_____

_____

_____

_____

_____

What areas for improvement did you identify? What did not go as expected?

_____

_____

_____

_____

_____

For each area for improvement, identify potential corrective actions, if known. Include any policies, plans or procedures that should be reviewed, revised or developed. To the best of your knowledge, indicate the entity, organization, department, group or individual that should be assigned responsibility for the corrective action and if it should be a high, medium or low priority for the team or business.

No.	Recommended Corrective Actions	Recommended Assignment	Priority

Part II: Assessment of Exercise Design and Performance

On a scale of 1 to 5, please rate your assessment of the exercise relative to the statements below, with 1 indicating strong disagreement with the statement and 5 indicating strong agreement. Choose N/A if the question is not applicable to your participation or observations.

Assessment Factor	Strongly Disagree				Strongly Agree	N/A
The exercise was well structured and organized.	1	2	3	4	5	N/A
The exercise scenario was plausible and realistic.	1	2	3	4	5	N/A
The exercise objectives were clearly stated.	1	2	3	4	5	N/A
The exercise facilities were adequate.	1	2	3	4	5	N/A
The presentation materials helped the participants understand and become engaged in the scenario.	1	2	3	4	5	N/A
The exercise documents were relevant and valuable tools.	1	2	3	4	5	N/A
The facilitator(s) was knowledgeable about the scenario and supporting policies, plans and procedures.	1	2	3	4	5	N/A
The facilitator(s) kept the exercise on track or provided justification for a mid-exercise course correction.	1	2	3	4	5	N/A
The facilitator(s) was sensitive to group dynamics.	1	2	3	4	5	N/A
The facilitator(s) communicated well with the exercise participants.	1	2	3	4	5	N/A
The knowledge, skills and abilities of the participants seemed appropriate.	1	2	3	4	5	N/A

The exercise participants seemed fully engaged in the response activities.	1	2	3	4	5	N/A
The response activities were relevant to the scenario.	1	2	3	4	5	N/A
The response activities aligned with the related policies, plans and procedures.	1	2	3	4	5	N/A
There was adequate communication among the exercise participants.	1	2	3	4	5	N/A
My role in the exercise was appropriate based on my knowledge, skills and abilities.	1	2	3	4	5	N/A
The exercise objectives were achieved.	1	2	3	4	5	N/A

Part III: Additional Feedback

Please provide any additional comments or recommendations about how this exercise or future exercises could be improved or enhanced.

PACIFIC POWER
A DIVISION OF PACIFICORP

Siskiyou County PSPS

Post-Exercise Review
Functional Exercise
May 26, 2022

The Post-Exercise Review align exercise objectives with incident management team performance and business requirements. Additional exercise information may be included or referenced as needed.

EXERCISE OVERVIEW

Exercise Name	Siskiyou County PSPS FX
Exercise Dates, Times and Locations	May 26, 2022 9:00 AM from normal work locations
Scope	A functional exercise was used to facilitate the exercise scenario. The scope of the exercise was limited to Public Safety Power Shutoff actions 24 hours in advance of a significant fire weather event.
Objectives	The business objectives for the exercise were as follows. Other participating internal or external groups may have had additional objectives not cited here. 1. Ensure communications channels are viable during PSPS event 2. Evaluate AFN/MBL customer notification process to include in person notification 3. Explore Pacific Powers plans for allocating resources during PSPS events.
Threat or Hazard	Fire weather risks resulting in potential PSPS Execution
Scenario	Weather and fuel conditions such that PSPS actions may be necessary to mitigate catastrophic wildfire risk
Sponsor	PacifiCorp Emergency Management
Participating Organizations	PacifiCorp, Karuk Tribe, Siskiyou County, CalOES, CPUC, CalFire, Telecommunications providers
Point of Contact (POC)	Jeff Bolton, Pacific Power Emergency Manager, 503-251-5162, jeffrey.bolton@pacificorp.com

ANALYSIS OF OBJECTIVES

The objectives of the exercise were evaluated to assess the performance of the incident management team.

No.	Objectives	Performed without Challenges (P)	Performed with Some Challenges (S)	Performed with Major Challenges (M)	Unable to be Performed (U)
1	Ensure communications channels are viable during PSPS event	X			
2	Evaluate AFN/MBL customer notification process to include in person notification		X		
3	Explore Pacific Powers plans for allocating resources during PSPS events.	X			

Table 1: Summary of Core Capability Performance

Ratings Definitions

Performed without Challenges (P): The targets and critical tasks associated with the objective were completed in a manner that achieved the objective and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws.

Performed with Some Challenges (S): The targets and critical tasks associated with objective were completed in a manner that achieved the objective and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws. However, opportunities to enhance effectiveness and/or efficiency were identified.

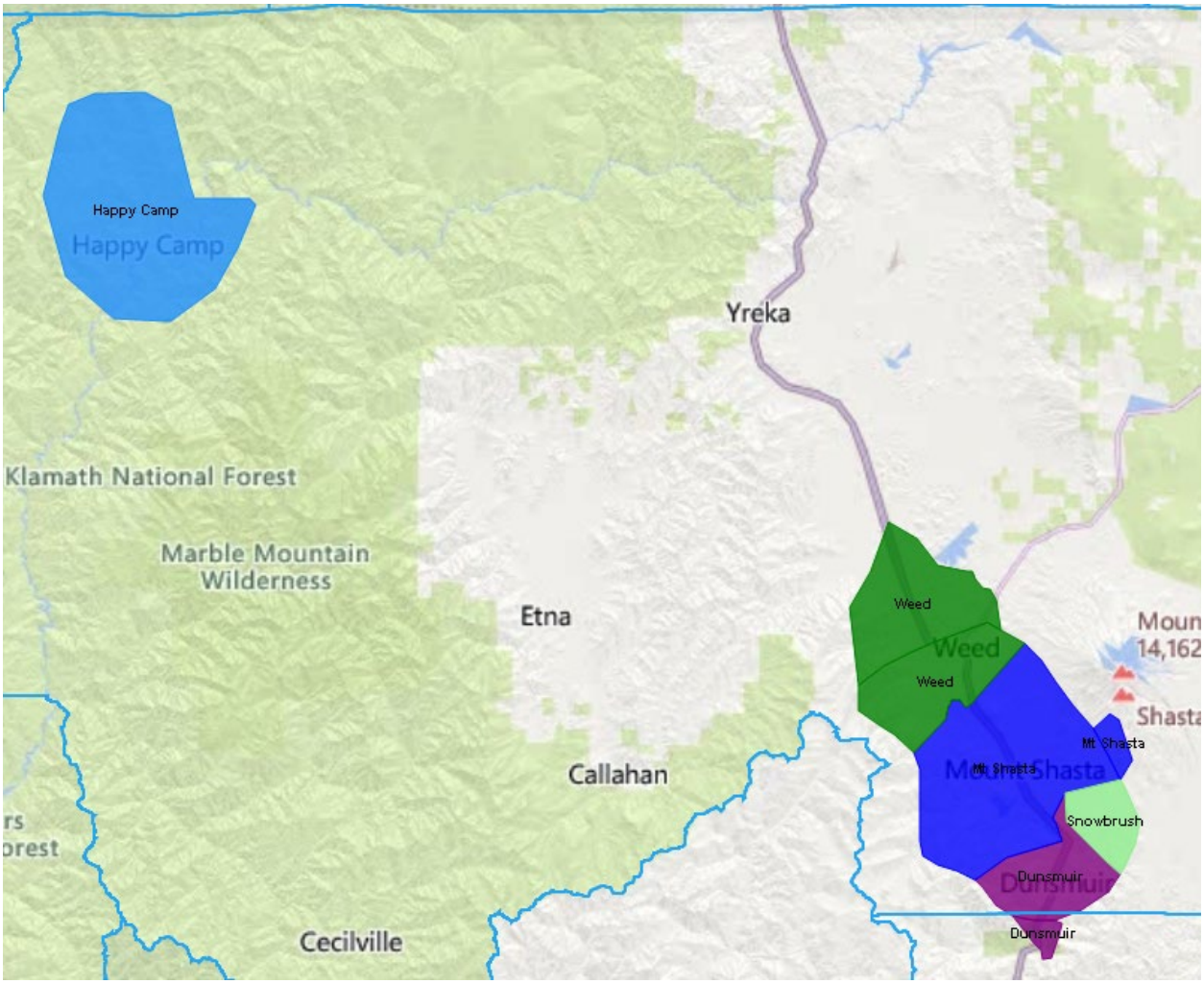
Performed with Major Challenges (M): The targets and critical tasks associated with the objective were completed in a manner that achieved the objective, but some or all of the following were observed: demonstrated performance had a negative impact on the performance of other activities; contributed to additional health and/or safety risks; and/or was not conducted in accordance with applicable plans, policies, procedures, regulations, and laws.

Unable to be Performed (U): The targets and critical tasks associated with the objective were not performed in a manner that achieved the objective.

POST-EXERCISE SUMMARY

Weather forecast showed very high potential for wind related outages with high fire danger which could result in a catastrophic fire in the event of an ignition source. Pacific Power made the

decision to proactively de-energize all customers within the highest fire threat areas resulting in 10,351 customers without power. Community Resource Centers were deployed to the affected areas and sites confirmed with county representatives.



SUMMARY BY DEPARTMENT

T&D

- Provided tactical resources to the response

System Operations

- Coordinated planning of grid and regional operation prior to and during event

Customer Service and External Communications

- Created outreach messaging for public entities and directly with customers, but did not publish messages

Emergency Management

- Coordinated response actions through the Emergency Coordination Center
- Acted as liaison with public sector EM agencies

Public Sector

- Supported response through localized response agencies and tools
- Conducted notification process in accordance with local procedures

LESSONS LEARNED

This "lessons learned" section provides information on processes, training and tools (e.g., forms and plans) that worked well and observations which occurred which provide opportunities for improvement.

Successes

- Think were getting pretty skilled in PSPS steps and what needs to be done.
- Been through several with other companies, status quo for how everything works. Great collaboration with Pacific Power and Counties
- Established communications lines between jurisdictions and Pacific Power.

Observations

- Pacific Power EM: Coordinate with Telecomm participants for site location information
- Pacific Power EM: Throttling potential with communications providers continues to be a potential hurdle. Customer service has a temporary solution in mind, however a more permanent solution may become necessary
- Pacific Power EM: Although AFN notification capability has significantly improved, work continues in order to ensure everyone who needs special notification is identified through partnership with Siskiyou County Public Health and Siskiyou County Health and Human Services

APPENDIX A: EXERCISE PARTICIPANTS

Name	Agency
Jeff Bolton	Pacific Power
Erik Brookhouse	Pacific Power
Todd Andres	Pacific Power
Tyler Averyt	Pacific Power
Steve Leach	Pacific Power
Drew Hanson	Pacific Power
Jasen Lee	Pacific Power
Richard Harris	Pacific Power
Chris Walsh	Pacific Power
Catherine Kitchen	Pacific Power
Steve Vanderburg	Pacific Power
Amy Hoskins	Pacific Power
Traci Schultz	Pacific Power
Horace Ward	Pacific Power
Tom Eide	Pacific Power
Nora Yotsov	Pacific Power
Mari Estep	Pacific Power
Adrian Wright	Pacific Power
Brent Roholt	Pacific Power
Wade Skinner	Rocky Mountain Power
Jonathan Whitesides	Rocky Mountain Power
Will Farr	Rocky Mountain Power
Stephanie Beall	Rocky Mountain Power
Jaqueline Nushi	Karuk Tribe
Robert Goyeneche	CalOES
Jasen Vela	CalOES
Tristan Howard	CalFire
Cindy Chen	California Public Utilities Commission
Dru Dunton	California Public Utilities Commission
Cindy Chen	California Public Utilities Commission
Will Dundon	California Public Utilities Commission
Desmond Lew	California Public Utilities Commission
Naveed Paydar	California Public Utilities Commission
Mbael Wu	California Public Utilities Commission
Adam Heilman	Siskiyou County OES
Coleman Fitzgerald	Siskiyou County Public Health
Ryan Sandler	National Weather Service
Mark Apland	Siskiyou Telephone
Robert Guess	AT&T
Adam Bensaid	AT&T
Josh Overton	AT&T
Jeff MacDonnel	Frontier Communications
Charles Born	Frontier Communications

APPENDIX B: AFTER ACTION REPORT APPROVAL

As the designated authority for Pacific Power Emergency Management, I certify that this After Action Report has been approved, and that the deliverables accurately represent the lessons learned during the exercise.

June 23, 2022

Name / Title

Date

PACIFIC POWER
A DIVISION OF PACIFICORP

Siskiyou County PSPS

Post-Exercise Review
Tabletop Exercise
April 28, 2022

The Post-Exercise Review align exercise objectives with incident management team performance and business requirements. Additional exercise information may be included or referenced as needed.

EXERCISE OVERVIEW

Exercise Name	Siskiyou County PSPS TTX
Exercise Dates, Times and Locations	April 28, 2022 9:00 AM, Siskiyou County Emergency Operations Center
Scope	A tabletop exercise was used to facilitate the exercise scenario. The scope of the exercise was limited to Public Safety Power Shutoff actions in response to significant fire weather event.
Objectives	The business objectives for the exercise were as follows. Other participating internal or external groups may have had additional objectives not cited here. 1. Ensure communications channels are viable during PSPS event 2. Evaluate AFN/MBL customer notification process to include in person notification 3. Explain Community Resource Center scope & purpose in a PSPS event and compare plans to support impacted community members. 4. Explore Pacific Powers plans for allocating resources during PSPS events. 5. Outline current options and capabilities for supporting individuals with access and functional needs.
Threat or Hazard	Fire weather risks resulting in PSPS Execution
Scenario	Weather and fuel conditions such that PSPS actions are necessary to mitigate catastrophic wildfire risk
Sponsor	PacifiCorp Emergency Management
Participating Organizations	PacifiCorp, Karuk Tribe, Siskiyou County, CalOES, CPUC, CalFire, Telecommunications providers
Point of Contact (POC)	Jeff Bolton, Pacific Power Emergency Manager, 503-251-5162, jeffrey.bolton@pacificorp.com

ANALYSIS OF OBJECTIVES

The objectives of the exercise were evaluated to assess the performance of the incident management team.

No.	Objectives	Performed without Challenges (P)	Performed with Some Challenges (S)	Performed with Major Challenges (M)	Unable to be Performed (U)
1	Ensure communications channels are viable during PSPS event	X			
2	Evaluate AFN/MBL customer notification process to include in person notification		X		
3	Explain Community Resource Center scope & purpose in a PSPS event and compare plans to support impacted community members]	X			
4	Explore Pacific Powers plans for allocating resources during PSPS events.	X			
5	Outline current options and capabilities for supporting individuals with access and functional needs		X		

Table 1: Summary of Core Capability Performance

Ratings Definitions

Performed without Challenges (P): The targets and critical tasks associated with the objective were completed in a manner that achieved the objective and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws.

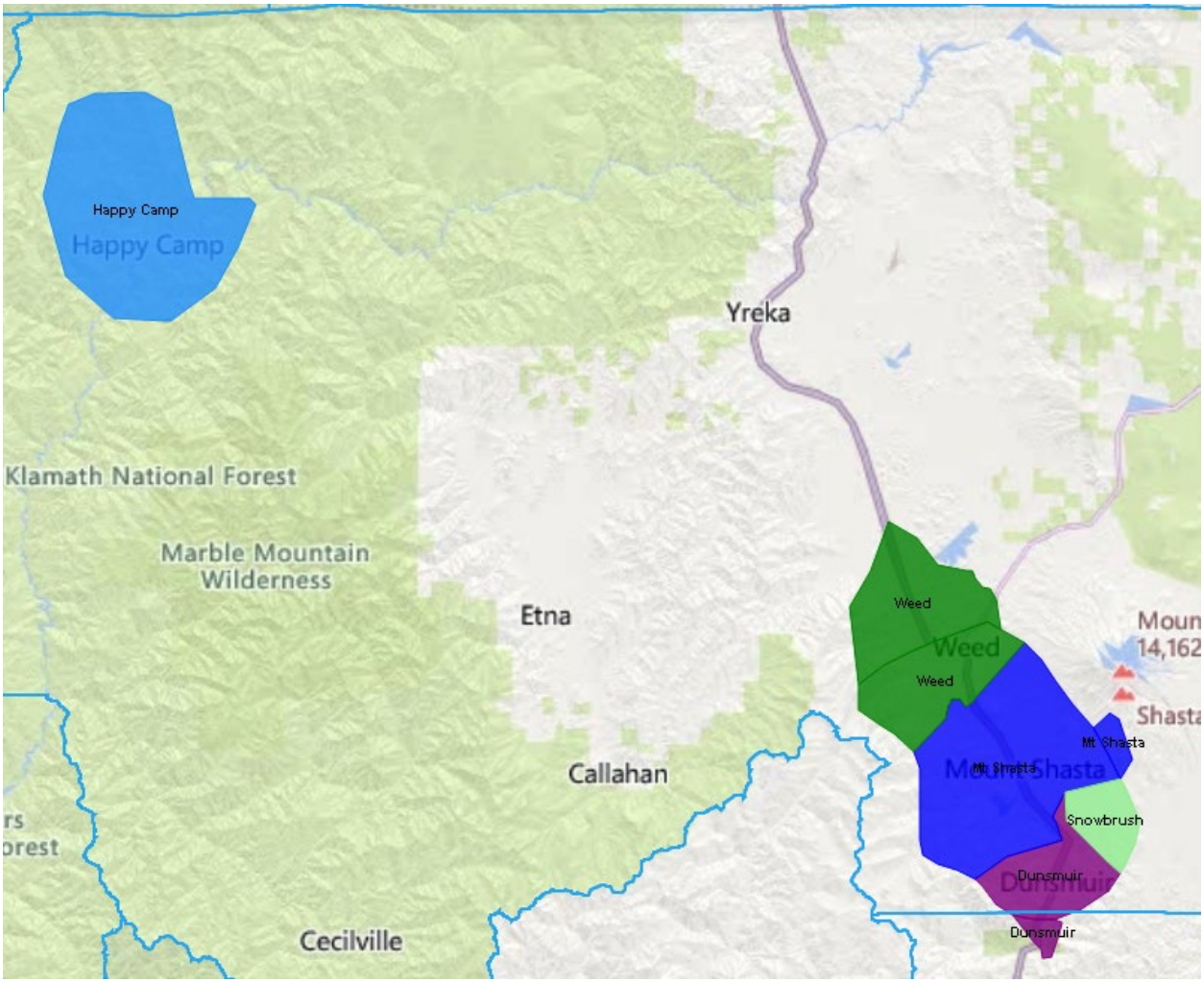
Performed with Some Challenges (S): The targets and critical tasks associated with objective were completed in a manner that achieved the objective and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws. However, opportunities to enhance effectiveness and/or efficiency were identified.

Performed with Major Challenges (M): The targets and critical tasks associated with the objective were completed in a manner that achieved the objective, but some or all of the following were observed: demonstrated performance had a negative impact on the performance of other activities; contributed to additional health and/or safety risks; and/or was not conducted in accordance with applicable plans, policies, procedures, regulations, and laws.

Unable to be Performed (U): The targets and critical tasks associated with the objective were not performed in a manner that achieved the objective.

POST-EXERCISE SUMMARY

Weather forecast showed very high potential for wind related outages with high fire danger which could result in a catastrophic fire in the event of an ignition source. Pacific Power made the decision to proactively de-energize all customers within the highest fire threat areas resulting in 10,351 customers without power. Community Resource Centers were deployed to the affected areas and sites confirmed with county representatives.



SUMMARY BY DEPARTMENT

T&D

- Provided tactical resources to the response

System Operations

- Coordinated planning of grid and regional operation prior to and during event

Customer Service and External Communications

- Conducted outreach with public entities and directly with customers

Emergency Management

- Coordinated response actions through the Emergency Coordination Center
- Acted as liaison with public sector EM agencies

Public Sector

- Supported response through localized response agencies and tools

LESSONS LEARNED

This "lessons learned" section provides information on processes, training and tools (e.g., forms and plans) that worked well and observations which occurred which provide opportunities for improvement.

Successes

- Appreciated the EXPLAN sent out ahead of time, first ones to provide feedback forms for participants according to CPUC.
- Liked discussion with AFN and great dialogue around tribal customers.
- Think were getting pretty skilled in PSPS steps and what needs to be done.
- Appreciated strong technical information.
- Past events have all been short duration, good to put in perspective a longer event that could go a couple days. Brought to light a couple key processes that can be refined and put in place before fire season.
- Learning more about CRCs. Appreciate that Pac is doing work to support sheltering efforts and will have things in place for PSPS
- Great processes for identifying and communicating with AFN customers
- Been through several with other companies, status quo for how everything works. Great collaboration with Pac and Counties
- The more info they have to distribute the more people they believe will receive the message. People generally don't listen until the 24hour mark but getting info out at 48 will help
- Established communications lines with Pac Power. Great to have everyone in the same room. Great to hear from operations.
- Great to build the relationships before the incident

Observations

- Pacific Power EM: Generator planning info from counties including run time, if refueling plans exist, generator age is key
- Pacific Power EM: Coordinate with Telecomm participants for site location information

APPENDIX A: EXERCISE PARTICIPANTS

Name	Agency
Jeff Bolton	Pacific Power
Erik Brookhouse	Pacific Power
Todd Andres	Pacific Power
Tyler Averyt	Pacific Power
Dan Baker	Pacific Power
Drew Hanson	Pacific Power
Richard Harris	Pacific Power
Amy Hoskins	Pacific Power
Catherine Kitchen	Pacific Power
Carrie Laird	Pacific Power
Stephen Leach	Pacific Power
Traci Schultz	Pacific Power
Horace Ward	Pacific Power
Adrian Wright	Pacific Power
Wade Skinner	Rocky Mountain Power
Stephanie Beall	Rocky Mountain Power
Jaqueline Nushi	Karuk Tribe
Robert Goyeneche	CalOES
Jasen Vela	CalOES
Jeff Fuentes	CalFire
Shelby Case	California Public Utilities Commission
Cindy Chen	California Public Utilities Commission
Hope Christman	California Public Utilities Commission
Will Dundon	California Public Utilities Commission
Lea Haro	California Public Utilities Commission
Hassan Jahami	California Public Utilities Commission
Desmond Lew	California Public Utilities Commission
Ben Menzies	California Public Utilities Commission
Naveed Paydar	California Public Utilities Commission
Junaid Rahman	California Public Utilities Commission
Devla Singh	California Public Utilities Commission
Henry Sweat	California Public Utilities Commission
David VanDyken	California Public Utilities Commission
Mbael Wu	California Public Utilities Commission
Joan Weber	California Public Utilities Commission
Adam Heilman	Siskiyou County OES
Courtney Kerider	Siskiyou County OES
Coleman Fitzgerald	Siskiyou County Public Health
Susan Cerelli	Siskiyou County Health and Human Services
Joan Hoy	Siskiyou County Health and Human Services
Emily Tuholski	Siskiyou County Health and Human Services
Coray Watson	Siskiyou County Health and Human Services
Adam Bensaid	AT&T
Paul Magoolaghan	AT&T
Josh Mathisen	AT&T

Jeff MacDonnel	Frontier Communications
Thomas Truman	Frontier Communications
Tim Watts	Frontier Communications

APPENDIX B: AFTER ACTION REPORT APPROVAL

As the designated authority for Pacific Power Emergency Management, I certify that this After Action Report has been approved, and that the deliverables accurately represent the lessons learned during the exercise.

June 23, 2022

Name / Title

Date

Facilitator Guide

[Jurisdiction/Organization]

[Exercise Title]

[This sample template is designed to assist the user in developing a tabletop exercise facilitator guide. The template is meant only as a basic guide and may not apply equally to all systems.]

This document serves as the [Insert Exercise Title] Facilitator Guide. This document is to be used in tandem with the [Insert Exercise Title] Exercise Conduct Brief and Situation Manual.

This document provides guidance to assist the exercise facilitator and should not be given to exercise players. It gives the approximate timing of delivery for each slide, limited talking points, and supplemental questions or issues to raise during tabletop exercise conduct. It provides limited talking points, as well as questions to be raised during discussion. [Content bracketed and highlighted in yellow represents content that will need to be updated based on the scope of the exercise.]

[As a reminder, any changes made to the Conduct Slide Deck or Situation Manual must also be reflected within this Facilitator Guide.]

EXERCISE OVERVIEW

Exercise Name	[Insert the formal name of exercise, which should match the name in the document header]
Exercise Dates	[Indicate the start and end dates of the exercise]
Scope	This exercise is a [exercise type], planned for [exercise duration] at [exercise location]. Exercise play is limited to [exercise parameters].
Focus Area(s)	[Prevention, Protection, Mitigation, Response, and/or Recovery]
Capabilities	[List the core capabilities being exercised]
Objectives	[List exercise objectives]
Threat or Hazard	[List the threat or hazard (e.g. natural/hurricane, technological/radiological release)]
Scenario	[Insert a brief overview of the exercise scenario, including scenario impacts (2-3 sentences)]
Sponsor	[Insert the name of the sponsor organization, as well as any grant programs being utilized, if applicable]
Participating Organizations	[Insert a brief summary of the total number of participants and participation level (i.e., Federal, State, local, Tribal, non-governmental organizations (NGOs), and/or international agencies). Consider including the full list of participating agencies in Appendix B. Delete Appendix B if not required.]
Point of Contact	[Insert the name, title, agency, address, phone number, and email address of the primary exercise POC (e.g., exercise director or exercise sponsor)]

INTRODUCTION

Facilitators guide exercise play and are responsible for ensuring that participant discussions remain focused on the exercise objectives and making sure all issues are explored as thoroughly as possible within the available time.

A key Facilitator role is to encourage all participants to contribute to the discussion, and to remind them that they are discussing hypothetical situations in a no-fault environment. Facilitators also build and maintain an environment where all the participants feel comfortable speaking honestly and where differences of opinion are respected. Facilitators should ensure that everyone feels included in the conversation and has an opportunity to participate. **Facilitators should not lecture or dominate the discussion, but rather keep conversations moving.** Additionally, Facilitators may want to use an issues list or "parking lot" to document valid points that are raised by participants during the exercise but that risk taking the conversation off topic; these items can be assigned for later discussion to the appropriate persons.

AN EFFECTIVE FACILITATOR

- Keeps discussions on track and drives play to meet exercise objectives.
- Controls group dynamics and manages strong personalities.
- Speaks competently and confidently without dominating the conversation.
- Has subject-matter expertise or experience.
- Has an awareness of local plans and procedures.
- Captures key findings and discussion points

Administrative Considerations

Facilitators should discourage side conversations, ensure cellular phones are turned off or made silent, and control group dynamics. Table arrangements for the exercise should try to maximize the interaction between the Facilitator and participants. During the exercise, Facilitators need to constantly be aware of time constraints, notifying participants about progress and moving the discussion toward completion of exercise objectives when time is running short.

OBJECTIVES

The exercise objectives are as follows:

Exercise Objective	Core Capability
[Insert objectives]	[Insert capability aligned to objective]
[Insert objectives]	[Insert capability aligned to objective]
[Insert objectives]	[Insert capability aligned to objective]
[Insert objectives]	[Insert capability aligned to objective]
[Insert objectives]	[Insert capability aligned to objective]

AGENDA

Date	[Insert Date]
Location	[Insert Location]
[Time]	Welcome and Introductions
[Time]	Module 1: [Title]
[Time]	Break
[Time]	Module 2: [Title]
[Time]	Break
[Time]	Module 3: [Title]
[Time]	Break
[Time]	Hotwash
[Time]	Closing Comments

WELCOME AND INTRODUCTIONS [TIME]

Slide	Time	Topic/Issue	Facilitator Notes/Questions
[1]	[Insert time]	Call to Order/Title Slide/Welcome	*When participants are ready:* • Call room and participants to order • Introduce topic of exercise: [Insert Topic or First Phase] • Introduce self and note [organization] support • Provide brief opening remarks and role during exercise
[2]	[Insert time]	Welcome and Introductions	• Introduce [insert senior ranking participant] in exercise and call upon them to offer opening remarks • Introduce [insert senior ranking participant] in exercise and call upon them to offer opening remarks
[3]	[Insert time]	Administrative Remarks	• Provide safety and administrative remarks for participants
[4]	[Insert time]	Exercise Schedule	• Provide overview of each item in the exercise schedule

EXERCISE OVERVIEW [TIME]

Slide	Time	Topic/Issue	Facilitator Notes/Questions
[5]	[Insert time]	Exercise Overview	*Briefly review the exercise purpose with participants:* • Examine [insert capabilities] between [organizations] in the [City, State] in response to [description of incident]. • The exercise will address the following focus area(s): [Prevention, Protection, Mitigation, Response, Recovery]
[6]	[Insert time]	Exercise Structure	*Briefly review the exercise scope with participants:* • An [insert duration] [insert exercise] will be conducted incorporating a scenario with [#] modules to examine the operational response of [insert organizations] to [insert threat/hazard description] • Each Module will consist of two main activities: a scenario overview and facilitated discussions • The scenario overview will include a detailed description of the current scenario • The following activity will include facilitated discussions amongst all players regarding a set of specific discussion questions
[7]	[Insert time]	Exercise Objectives	• **[Insert Objective Name]:** [Insert objective description] ○ **Aligned Capabilities:** [Insert aligned capability] • **[Insert Objective Name]:** [Insert objective description] ○ **Aligned Capabilities:** [Insert aligned capability] • **[Insert Objective Name]:** [Insert objective description] ○ **Aligned Capabilities:** [Insert aligned capability] • **[Insert Objective Name]:** [Insert objective description] ○ **Aligned Capabilities:** [Insert aligned capability(s)]

Slide	Time	Topic/Issue	Facilitator Notes/Questions
[8]	[Insert time]	Exercise Guidelines	*Briefly review the exercise guidelines with participants:* • This is an open **no-fault environment** - varying viewpoints, even disagreements, are expected • Base your responses on **existing plans**, policies, procedures, capabilities, and resources • Please assume the exercise **scenario is plausible**, and events occur as they are presented • Decisions are **not precedent setting**; consider different approaches and suggest improvements • There is **no "hidden agenda"** nor are there any trick questions • Issue identification is not as valuable as suggestions and recommended actions that could improve [focus area] efforts; problem-solving efforts should be the focus.

MODULE 1: [TITLE] AND [TIME]

Slide	Time	Topic/Issue	Facilitator Notes/Questions
[9]	[Insert time]	Module 1: [Title Slide]	• Briefly introduce title slide for Module 1 ([Insert theme title])
[10]	[Insert time]	Module 1: [Key Issues]	[Week day, Month Day, Year] • [Insert scenario events] • [Insert scenario events] • [Insert scenario events] [Weekday, Month Day, Year] • [Insert scenario events] • [Insert scenario events] • [Insert scenario events]
[11]	[Insert time]	Module 1: Discussion Questions	**[Insert Exercise Objective Name]** • [Insert discussion question] • [Insert discussion question] • [Insert discussion question] *Notes: [Insert notes, such as follow-up questions and/or background information]*

MODULE 2: [TITLE] AND [TIME]

Slide	Time	Topic/Issue	Facilitator Notes/Questions
[12]	[Insert time]	Module 2: [Title Slide]	• Briefly introduce title slide for Module 2 ([Insert theme title])
[13]	[Insert time]	Module 2: [Key Issues]	[Weekday, Month Day, Year] • [Insert scenario events] • [Insert scenario events] • [Insert scenario events] [Weekday, Month Day, Year] • [Insert scenario events] • [Insert scenario events] • [Insert scenario events]
[14]	[Insert time]	Module 2: Discussion Questions	[Insert Exercise Objective Name] • [Insert discussion question] • [Insert discussion question] • [Insert discussion question] *Notes: [Insert notes, such as follow-up questions and/or background information]*

MODULE 3: [TITLE] AND [TIME]

Slide	Time	Topic/Issue	Facilitator Notes/Questions
[15]	[Insert time]	Module 3: [Title Slide]	• Briefly introduce title slide for Module 3 ([Insert theme title])
[16]	[Insert time]	Module 3: [Key Issues]	[Weekday, Month Day, Year] • [Insert scenario events] • [Insert scenario events] • [Insert scenario events] [Weekday, Month Day, Year] • [Insert scenario events] • [Insert scenario events] • [Insert scenario events]
[17]	[Insert time]	Module 3: Discussion Questions	[Insert Exercise Objective Name] • [Insert discussion question] • [Insert discussion question] • [Insert discussion question] *Notes: [Insert notes, such as follow-up questions and/or background information]*

HOTWASH [TIME]

Slide	Time	Topic/Issue	Facilitator Notes/Questions
[18]	[Insert time]	Hot Wash	The facilitator should hand out a participant feedback form to capture the responses in writing and aggregate them in the After-Action Report. *Provide a brief overview of the purpose of the Hot Wash:* • The purpose of the Hot Wash is to debrief the exercise and provide participants with the opportunity to discuss their general observations ○ Are there any other issues you would like to discuss that were not raised? ○ What strengths did you observe in relation to meeting exercise objectives? ○ What areas should be examined further or need additional work (areas for improvement)? ○ Was the exercise beneficial? Did it help prepare you for follow-on testing? ○ What did you gain from the exercise? ○ How can we improve future exercises and tests?

CLOSING REMARKS [TIME]

Slide #	Time	Topic/Issue	Facilitator Notes/Questions
[19]	[Insert time]	Closing Remarks	• Call upon [insert senior ranking participant] in exercise to provide closing remarks • Call upon [insert senior ranking participant] in exercise to provide closing remarks

ENDEX [TIME]

Slide	Time	Topic/Issue	Facilitator Notes/Questions
[20]	[Insert time]	EndEx	• Adjourn

PACIFIC POWER
A DIVISION OF PACIFICORP

Siskiyou County PSPS

Post-Exercise Review
Functional Exercise
May 26, 2022

The Post-Exercise Review align exercise objectives with incident management team performance and business requirements. Additional exercise information may be included or referenced as needed.

EXERCISE OVERVIEW

Exercise Name	Siskiyou County PSPS FX
Exercise Dates, Times and Locations	May 26, 2022 9:00 AM from normal work locations
Scope	A functional exercise was used to facilitate the exercise scenario. The scope of the exercise was limited to Public Safety Power Shutoff actions 24 hours in advance of a significant fire weather event.
Objectives	The business objectives for the exercise were as follows. Other participating internal or external groups may have had additional objectives not cited here. 1. Ensure communications channels are viable during PSPS event 2. Evaluate AFN/MBL customer notification process to include in person notification 3. Explore Pacific Powers plans for allocating resources during PSPS events.
Threat or Hazard	Fire weather risks resulting in potential PSPS Execution
Scenario	Weather and fuel conditions such that PSPS actions may be necessary to mitigate catastrophic wildfire risk
Sponsor	PacifiCorp Emergency Management
Participating Organizations	PacifiCorp, Karuk Tribe, Siskiyou County, CalOES, CPUC, CalFire, Telecommunications providers
Point of Contact (POC)	Jeff Bolton, Pacific Power Emergency Manager, 503-251-5162, jeffrey.bolton@pacificorp.com

ANALYSIS OF OBJECTIVES

The objectives of the exercise were evaluated to assess the performance of the incident management team.

No.	Objectives	Performed without Challenges (P)	Performed with Some Challenges (S)	Performed with Major Challenges (M)	Unable to be Performed (U)
1	Ensure communications channels are viable during PSPS event	X			
2	Evaluate AFN/MBL customer notification process to include in person notification		X		
3	Explore Pacific Powers plans for allocating resources during PSPS events.	X			

Table 1: Summary of Core Capability Performance

Ratings Definitions

Performed without Challenges (P): The targets and critical tasks associated with the objective were completed in a manner that achieved the objective and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws.

Performed with Some Challenges (S): The targets and critical tasks associated with objective were completed in a manner that achieved the objective and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws. However, opportunities to enhance effectiveness and/or efficiency were identified.

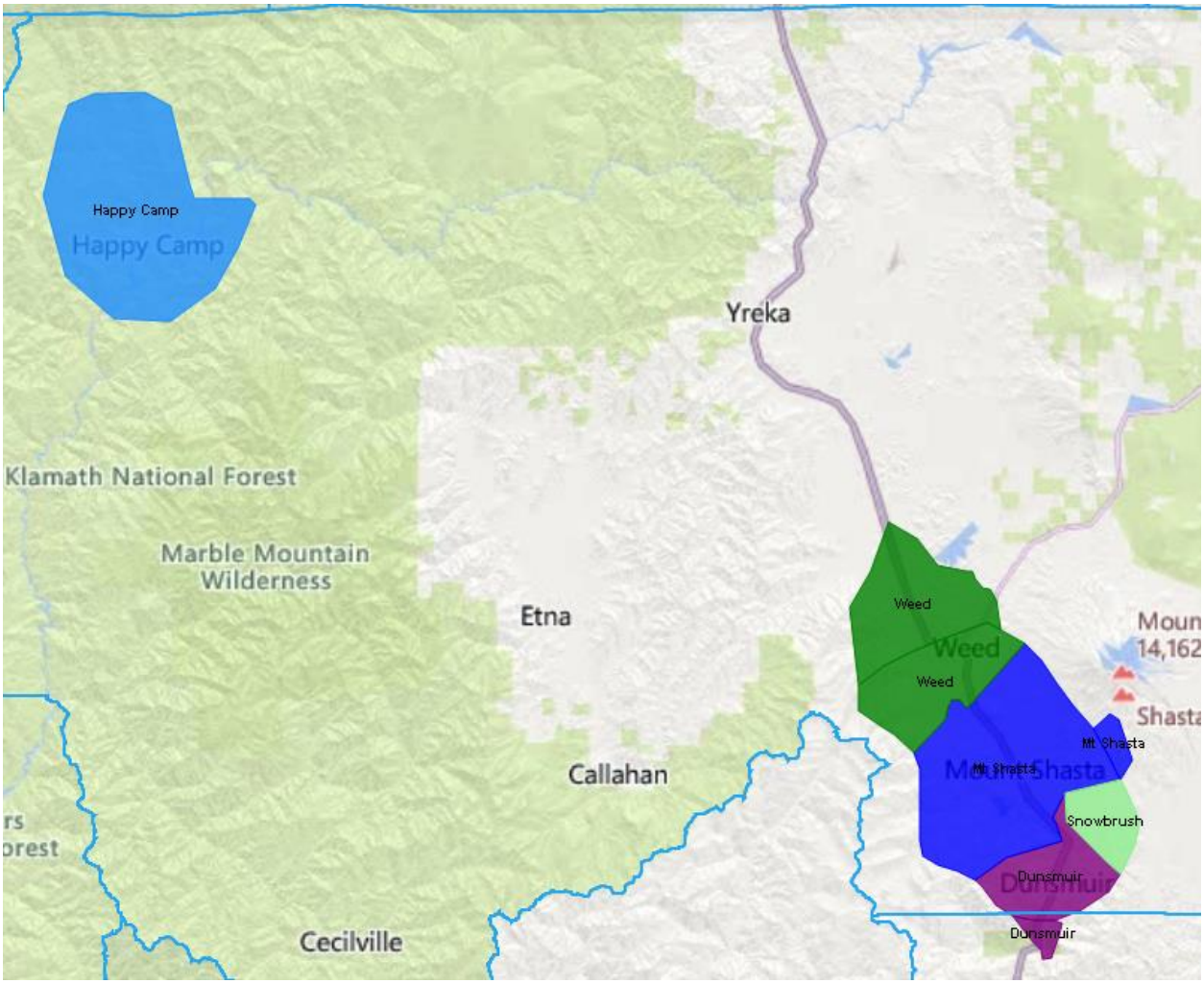
Performed with Major Challenges (M): The targets and critical tasks associated with the objective were completed in a manner that achieved the objective, but some or all of the following were observed: demonstrated performance had a negative impact on the performance of other activities; contributed to additional health and/or safety risks; and/or was not conducted in accordance with applicable plans, policies, procedures, regulations, and laws.

Unable to be Performed (U): The targets and critical tasks associated with the objective were not performed in a manner that achieved the objective.

POST-EXERCISE SUMMARY

Weather forecast showed very high potential for wind related outages with high fire danger which could result in a catastrophic fire in the event of an ignition source. Pacific Power made the

decision to proactively de-energize all customers within the highest fire threat areas resulting in 10,351 customers without power. Community Resource Centers were deployed to the affected areas and sites confirmed with county representatives.



SUMMARY BY DEPARTMENT

T&D

- Provided tactical resources to the response

System Operations

- Coordinated planning of grid and regional operation prior to and during event

Customer Service and External Communications

- Created outreach messaging for public entities and directly with customers, but did not publish messages

Emergency Management

- Coordinated response actions through the Emergency Coordination Center
- Acted as liaison with public sector EM agencies

Public Sector

- Supported response through localized response agencies and tools
- Conducted notification process in accordance with local procedures

LESSONS LEARNED

This "lessons learned" section provides information on processes, training and tools (e.g., forms and plans) that worked well and observations which occurred which provide opportunities for improvement.

Successes

- Think were getting pretty skilled in PSPS steps and what needs to be done.
- Been through several with other companies, status quo for how everything works. Great collaboration with Pacific Power and Counties
- Established communications lines between jurisdictions and Pacific Power.

Observations

- Pacific Power EM: Coordinate with Telecomm participants for site location information
- Pacific Power EM: Throttling potential with communications providers continues to be a potential hurdle. Customer service has a temporary solution in mind, however a more permanent solution may become necessary
- Pacific Power EM: Although AFN notification capability has significantly improved, work continues in order to ensure everyone who needs special notification is identified through partnership with Siskiyou County Public Health and Siskiyou County Health and Human Services

APPENDIX A: EXERCISE PARTICIPANTS

Name	Agency
Jeff Bolton	Pacific Power
Erik Brookhouse	Pacific Power
Todd Andres	Pacific Power
Tyler Averyt	Pacific Power
Steve Leach	Pacific Power
Drew Hanson	Pacific Power
Jasen Lee	Pacific Power
Richard Harris	Pacific Power
Chris Walsh	Pacific Power
Catherine Kitchen	Pacific Power
Steve Vanderburg	Pacific Power
Amy Hoskins	Pacific Power
Traci Schultz	Pacific Power
Horace Ward	Pacific Power
Tom Eide	Pacific Power
Nora Yotsov	Pacific Power
Mari Estep	Pacific Power
Adrian Wright	Pacific Power
Brent Roholt	Pacific Power
Wade Skinner	Rocky Mountain Power
Jonathan Whitesides	Rocky Mountain Power
Will Farr	Rocky Mountain Power
Stephanie Beall	Rocky Mountain Power
Jaqueline Nushi	Karuk Tribe
Robert Goyeneche	CalOES
Jasen Vela	CalOES
Tristan Howard	CalFire
Cindy Chen	California Public Utilities Commission
Dru Dunton	California Public Utilities Commission
Cindy Chen	California Public Utilities Commission
Will Dundon	California Public Utilities Commission
Desmond Lew	California Public Utilities Commission
Naveed Paydar	California Public Utilities Commission
Mbael Wu	California Public Utilities Commission
Adam Heilman	Siskiyou County OES
Coleman Fitzgerald	Siskiyou County Public Health
Ryan Sandler	National Weather Service
Mark Apland	Siskiyou Telephone
Robert Guess	AT&T
Adam Bensaid	AT&T
Josh Overton	AT&T
Jeff MacDonnel	Frontier Communications
Charles Born	Frontier Communications

APPENDIX B: AFTER ACTION REPORT APPROVAL

As the designated authority for Pacific Power Emergency Management, I certify that this After Action Report has been approved, and that the deliverables accurately represent the lessons learned during the exercise.

June 23, 2022

Name / Title

Date

PACIFIC POWER
A DIVISION OF PACIFICORP

Siskiyou County PSPS

Post-Exercise Review
Tabletop Exercise
April 28, 2022

The Post-Exercise Review align exercise objectives with incident management team performance and business requirements. Additional exercise information may be included or referenced as needed.

EXERCISE OVERVIEW

Exercise Name	Siskiyou County PSPS TTX
Exercise Dates, Times and Locations	April 28, 2022 9:00 AM, Siskiyou County Emergency Operations Center
Scope	A tabletop exercise was used to facilitate the exercise scenario. The scope of the exercise was limited to Public Safety Power Shutoff actions in response to significant fire weather event.
Objectives	The business objectives for the exercise were as follows. Other participating internal or external groups may have had additional objectives not cited here. 1. Ensure communications channels are viable during PSPS event 2. Evaluate AFN/MBL customer notification process to include in person notification 3. Explain Community Resource Center scope & purpose in a PSPS event and compare plans to support impacted community members. 4. Explore Pacific Powers plans for allocating resources during PSPS events. 5. Outline current options and capabilities for supporting individuals with access and functional needs.
Threat or Hazard	Fire weather risks resulting in PSPS Execution
Scenario	Weather and fuel conditions such that PSPS actions are necessary to mitigate catastrophic wildfire risk
Sponsor	PacifiCorp Emergency Management
Participating Organizations	PacifiCorp, Karuk Tribe, Siskiyou County, CalOES, CPUC, CalFire, Telecommunications providers
Point of Contact (POC)	Jeff Bolton, Pacific Power Emergency Manager, 503-251-5162, jeffrey.bolton@pacificorp.com

ANALYSIS OF OBJECTIVES

The objectives of the exercise were evaluated to assess the performance of the incident management team.

No.	Objectives	Performed without Challenges (P)	Performed with Some Challenges (S)	Performed with Major Challenges (M)	Unable to be Performed (U)
1	Ensure communications channels are viable during PSPS event	X			
2	Evaluate AFN/MBL customer notification process to include in person notification		X		
3	Explain Community Resource Center scope & purpose in a PSPS event and compare plans to support impacted community members]	X			
4	Explore Pacific Powers plans for allocating resources during PSPS events.	X			
5	Outline current options and capabilities for supporting individuals with access and functional needs		X		

Table 1: Summary of Core Capability Performance

Ratings Definitions

Performed without Challenges (P): The targets and critical tasks associated with the objective were completed in a manner that achieved the objective and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws.

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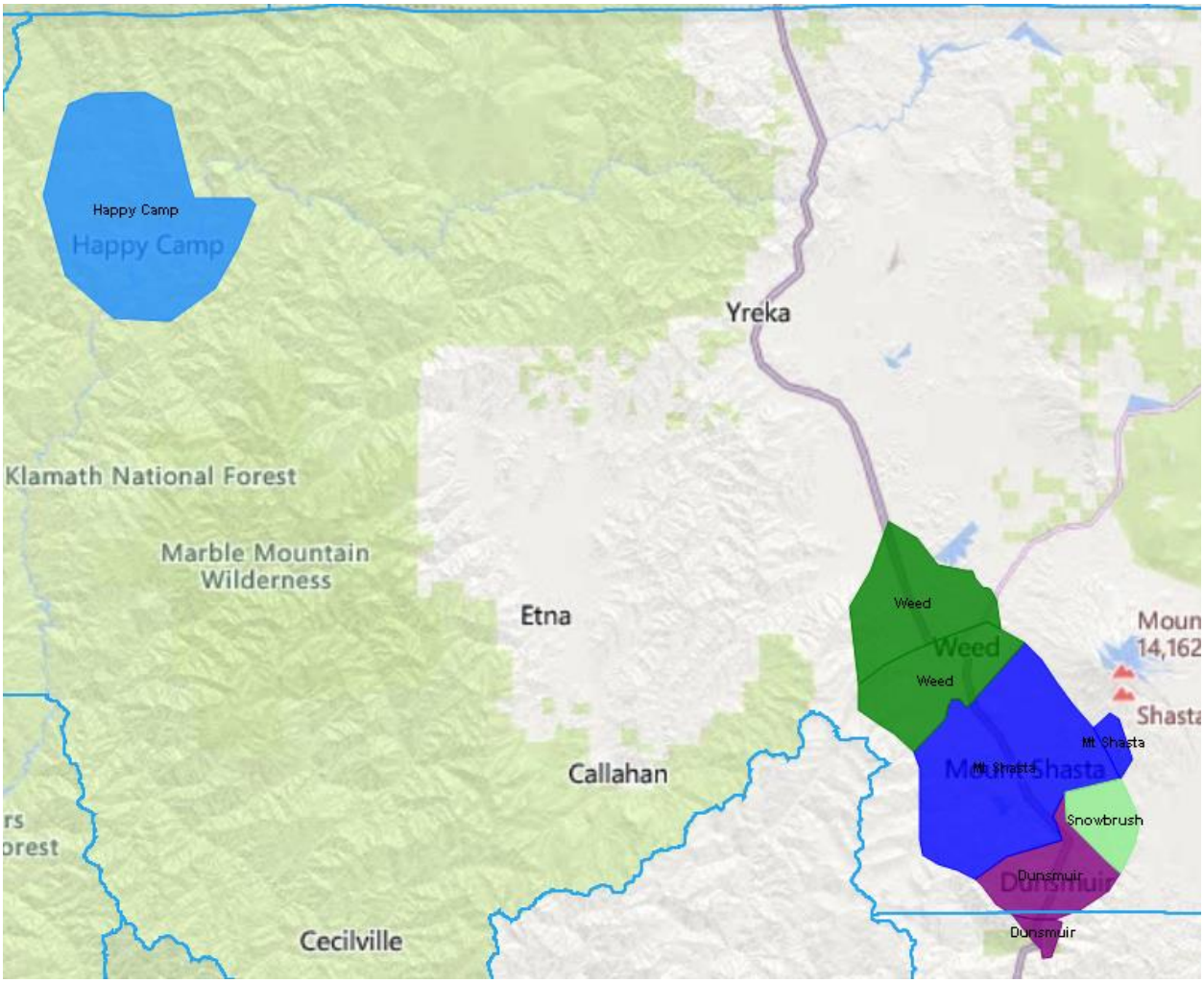
Performed with Major Challenges (M): The targets and critical tasks associated with the objective were completed in a manner that achieved the objective, but some or all of the following were observed: demonstrated performance had a negative impact on the performance of other activities; contributed to additional health and/or safety risks; and/or was not conducted in accordance with applicable plans, policies, procedures, regulations, and laws.

Unable to be Performed (U): The targets and critical tasks associated with the objective were not performed in a manner that achieved the objective.

POST-EXERCISE SUMMARY

Weather forecast showed very high potential for wind related outages with high fire danger which could result in a catastrophic fire in the event of an ignition source. Pacific Power made the decision to proactively de-energize all customers within the highest fire threat areas resulting in 10,351 customers without power. Community Resource Centers were deployed to the affected areas and sites confirmed with county representatives.



SUMMARY BY DEPARTMENT

T&D

- Provided tactical resources to the response

System Operations

- Coordinated planning of grid and regional operation prior to and during event

Customer Service and External Communications

- Conducted outreach with public entities and directly with customers

Emergency Management

- Coordinated response actions through the Emergency Coordination Center
- Acted as liaison with public sector EM agencies

Public Sector

- Supported response through localized response agencies and tools

LESSONS LEARNED

This "lessons learned" section provides information on processes, training and tools (e.g., forms and plans) that worked well and observations which occurred which provide opportunities for improvement.

Successes

- Appreciated the EXPLAN sent out ahead of time, first ones to provide feedback forms for participants according to CPUC.
- Liked discussion with AFN and great dialogue around tribal customers.
- Think were getting pretty skilled in PSPS steps and what needs to be done.
- Appreciated strong technical information.
- Past events have all been short duration, good to put in perspective a longer event that could go a couple days. Brought to light a couple key processes that can be refined and put in place before fire season.
- Learning more about CRCs. Appreciate that Pac is doing work to support sheltering efforts and will have things in place for PSPS
- Great processes for identifying and communicating with AFN customers
- Been through several with other companies, status quo for how everything works. Great collaboration with Pac and Counties
- The more info they have to distribute the more people they believe will receive the message. People generally don't listen until the 24hour mark but getting info out at 48 will help
- Established communications lines with Pac Power. Great to have everyone in the same room. Great to hear from operations.
- Great to build the relationships before the incident

Observations

- Pacific Power EM: Generator planning info from counties including run time, if refueling plans exist, generator age is key
- Pacific Power EM: Coordinate with Telecomm participants for site location information

APPENDIX A: EXERCISE PARTICIPANTS

Name	Agency
Jeff Bolton	Pacific Power
Erik Brookhouse	Pacific Power
Todd Andres	Pacific Power
Tyler Averyt	Pacific Power
Dan Baker	Pacific Power
Drew Hanson	Pacific Power
Richard Harris	Pacific Power
Amy Hoskins	Pacific Power
Catherine Kitchen	Pacific Power
Carrie Laird	Pacific Power
Stephen Leach	Pacific Power
Traci Schultz	Pacific Power
Horace Ward	Pacific Power
Adrian Wright	Pacific Power
Wade Skinner	Rocky Mountain Power
Stephanie Beall	Rocky Mountain Power
Jaqueline Nushi	Karuk Tribe
Robert Goyeneche	CalOES
Jasen Vela	CalOES
Jeff Fuentes	CalFire
Shelby Case	California Public Utilities Commission
Cindy Chen	California Public Utilities Commission
Hope Christman	California Public Utilities Commission
Will Dundon	California Public Utilities Commission
Lea Haro	California Public Utilities Commission
Hassan Jahami	California Public Utilities Commission
Desmond Lew	California Public Utilities Commission
Ben Menzies	California Public Utilities Commission
Naveed Paydar	California Public Utilities Commission
Junaid Rahman	California Public Utilities Commission
Devla Singh	California Public Utilities Commission
Henry Sweat	California Public Utilities Commission
David VanDyken	California Public Utilities Commission
Mbael Wu	California Public Utilities Commission
Joan Weber	California Public Utilities Commission
Adam Heilman	Siskiyou County OES
Courtney Kerider	Siskiyou County OES
Coleman Fitzgerald	Siskiyou County Public Health
Susan Cerelli	Siskiyou County Health and Human Services
Joan Hoy	Siskiyou County Health and Human Services
Emily Tuholski	Siskiyou County Health and Human Services
Coray Watson	Siskiyou County Health and Human Services
Adam Bensaid	AT&T
Paul Magoolaghan	AT&T
Josh Mathisen	AT&T

Jeff MacDonnel	Frontier Communications
Thomas Truman	Frontier Communications
Tim Watts	Frontier Communications

APPENDIX B: AFTER ACTION REPORT APPROVAL

As the designated authority for Pacific Power Emergency Management, I certify that this After Action Report has been approved, and that the deliverables accurately represent the lessons learned during the exercise.

June 23, 2022

Name / Title

Date

Exhibit C

PacifiCorp

Fire Prevention, Preparedness and Response Plan

PACIFIC POWER
A DIVISION OF PACIFICORP

825 NE Multnomah, Suite 2000
Portland, Oregon 97232

July 18, 2022

VIA OEIS E-FILING

Office of Energy Infrastructure Safety
715 P Street, 20th Floor
Sacramento, CA 95814
efiling@energysafety.ca.gov

RE: PacifiCorp 2022 Wildfire Mitigation Plan Update

Dear Director Jacobs:

PacifiCorp d/b/a Pacific Power submits its 2022 Wildfire Mitigation Plan Update in accordance with the June 15, 2022, Office of Energy Infrastructure Safety's Rejection for Incompleteness and Order to Resubmit for PacifiCorp's 2022 Wildfire Mitigation Plan Update. The Company appreciates the opportunity to fill in missing information and expand on referenced materials and sections of the 2022 Plan. This filing includes clean and redline versions of the Company's Revised 2022 Wildfire Mitigation Plan Update.

If you have any questions regarding this request, please contact Pooja Kishore, Regulatory Affairs Manager at (503) 813-7314.

Sincerely,

Shelley McCoy
Director, Regulation

cc: Frank.Bigelow@fire.ca.gov
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2022
Wildfire Mitigation Plan

May 6, 2022
Revised July 15, 2022

PacifiCorp

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ACRONYMS

ACS	American Community Survey
AFN	Access and functional needs
ANSI	American National Standards Institute
CPUC	California Public Utilities Commission
DFA	Distribution fault anticipation
ECC	Emergency Coordination Center
EFR	Elevated fire risk
ERC	Energy release component
FPI	Fire potential index
GACC	Geographic Area Coordination Center
GHG	Greenhouse gas
GO 95	California General Order 95
GRC	General rate case
HWW	High Wind Warning
HFTD	High fire threat district
IOU	Investor-owned utility
IR	Infrared
iUTI	Integrated utility threat index
LRAM	Localized Risk Assessment Model
MARS	Multi-attribute risk score
MAVF	Multi-attribute value function
NLCD	National Land Cover Database
NWS	National Weather Service
PDZ	Power de-energization zone
PSPS	Public Safety Power Shutoff
QA/QC	Quality assurance/quality control
RAMP	Risk assessment mitigation phase
RF	Radio frequency
RSE	Risk-spend efficiency
S-MAP	Safety model and assessment proceeding
SCADA	Supervisory control and data acquisition
SME	Subject matter expert
TCC	Time current characteristic
WFA-E	Wildfire Analyst-Enterprise
WMP	Wildfire mitigation plan
WRF	Weather research and forecast
WRRM	Wildfire Risk Reduction Model
WSAB	Wildfire Safety Advisory Board
WUI	Wildland-urban interface
ZOP	Zone of protection

EXECUTIVE SUMMARY

Despite years of focus on wildfire prevention, particularly in California, wildfires continue to impact communities at a more substantial rate than previously recorded. This has exacerbated the costs of wildfire in terms of both loss of human life and property damage. While electric utilities have always needed to mitigate against the potential of wildfire, the continuing growth of the wildland-urban interface (WUI), climate change and a host of other variables require even greater focus to prevent wildfires.

For decades the California Public Utility Commission (CPUC or Commission) has worked to address the specific risks created by the operation of an electric grid through regulations and programs, with even more substantial and targeted efforts over the past several years. PacifiCorp, which does business as Pacific Power in California, has been an active participant as these efforts have evolved. The CPUC first initiated a decade-long fire safety rulemaking in 2008. The first phase of this rulemaking focused on immediate measures in the highest fire risk area, in the seven counties of southern California. Thereafter, rules (codified in General Orders [GO] 95, 165 and 166) having a longer timeline for implementation were developed to reduce the risk of fire ignition caused by overhead utility systems. These rules culminated at approximately the same time the state was experiencing widespread drought, and the company was directed to identify and implement actions, including these new rules, to address wildfire risk on its system. As a result, a Fire Prevention Plan and a Drought Mitigation Plan were prepared and implemented starting in 2014.

In early 2018, as the multi-phase rulemaking concluded, the state of California experienced catastrophic wildfires in both northern and southern California, spurring greater efforts to augment the Drought Mitigation and Fire Prevention plans. In response to Senate Bill (SB) 901, California took a comprehensive approach to mitigating wildfires while also working to create a more resilient electric grid. A key element of SB 901, Public Utilities Code § 8386 and resolutions WSD-002, WSD-005 and WSD-011, is the requirement for all electric utilities to develop and implement Wildfire Mitigation Plans (WMP or Plan). These WMPs were first filed and approved in 2019, while in 2020 the plans were bolstered with process changes developed by the nascent Wildfire Safety Division (WSD).

Starting in 2020, WMPs are to be filed in a three-year cycle, with annual updates until the planning period terminates. The Plan builds on the company's previous filings, in addition to incorporating substantial changes based on stakeholder feedback and input gained through the WSD review process. The 2021 Update seeks to fill gaps identified in the 2020 WMP and address feedback on the company's Remedial Compliance Plan (RCP) filing and Quarterly Updates. Each of the improvements in this Update represents another incremental step towards identification of wildfire risk, strategic identification of options available to mitigate the risk and prioritization and rationalization for each of these mitigation measures.

The first WMPs were developed and filed pursuant to SB 901 in the Commission's

Rulemaking (R.) 18-10-007. Following approval of the 2019 WMPs and the filing and conditional approval of the 2020 WMP, RCP and Quarterly Report, the company has continued to engage with stakeholders, regulators including the Commission, WSD, public safety partners, fire science experts and other utilities and utility experts, to improve and refine its mitigation and planning process. The end goal of these efforts is to improve wildfire resilience and safety for our customers and the broader public using the most appropriate, timely and cost-effective mitigation measures.

Where possible, this update outlines successes and areas where improvements have been made, as well as areas still ripe for improvement. PacifiCorp has continued to improve upon current and legacy datasets to bolster the accessibility of the data provided and, as analytical methods and discoveries emerge, has rapidly incorporated them into the plan to yield better outcomes. PacifiCorp remains fully committed to the continued development and improvement of the company's risk-based decision-making framework; it should be noted, however, that PacifiCorp does not have the risk assessment mitigation phase (RAMP)/Safety model and assessment proceeding (S-MAP) requirements from proceeding R.20-07-013, as the three larger IOUs have. The company has leveraged lessons learned from its experience and the experience of other utilities, guidance from the Commission's initiatives, and engineering and operational best practices to evolve its approach to managing wildfire risk. This experience includes years of experience implementing safety and reliability risk mitigation programs. As a result, many of the initiatives and programs identified in this plan are an extension or augmentation of scope for already existing programs (e.g., the company's vegetation maintenance inspection and correction programs). This experience was also leveraged with historical data when new programs or activities were necessary (e.g., installation of covered conductor).

To date, PacifiCorp has been able to achieve substantial success through implementation of its plans. Key objectives for 2022 include continued implementation of baseline programs, initiation of new programs such as expulsion fuse replacements and installation of fault indicators, development of new technology pilots in the areas of distribution inspections and wildfire detection, and significant investment and advancement of situational awareness through procurement and implementation of several Technosylva modules. These key investments will advance the maturity of multiple initiatives, including risk mapping, the development of a quantitative risk-spend efficiency (RSE), resource allocation, and operational decision-making. Obtaining Technosylva tools will also allow for more precision in the application of mitigation efforts, such as Public Safety Power Shutoff (PSPS). PacifiCorp also plans to implement two pilot programs, a wildfire detection pilot for enhanced situational awareness and an enhanced overhang reduction pilot.

INTRODUCTION

The California Public Utilities Commission (CPUC) guidance in Decision (D.)19-05-036 included substantive and procedural requirements for future Wildfire Mitigation Plans (WMP) based on lessons learned during the first WMP (2019) evaluation and established an expectation for improvement in the WMPs each year. As such, the Office of Energy Infrastructure Safety (Energy Safety), formerly the CPUC's Wildfire Safety Division, has matured the guidelines and reporting requirements for each WMP and WMP Update.

Overview of WMP Guideline Improvements During the 3-year Plan Cycle (2020 – 2022)

- ***2020 WMP Guideline Improvements*** *– The 2020 WMP submission and review process included substantial changes from earlier guidance, which streamlined the structure and consistency in data submissions, requested additional supporting data earlier in the WMP process, and utilized a more structured and consistent approach to evaluating the WMPs. The 2020 WMPs were the base year in a three-year cycle from 2020-2022.*

- ***2021 WMP Guideline Improvements*** *– The 2021 Guidelines were updated based on several guiding principles from lessons learned, comments from stakeholders, and input from the Wildfire Safety Advisory Board (WSAB) during the 2020 WMP evaluation period. This feedback informed the development of four key elements for the 2021 WMP submission and review process:*

  1. *Frontloaded data collection. Process revisions for this element extended the timeframe for Energy Safety and stakeholder review of relevant utility[1] data in advance of the WMP submission and review period, while also reducing the need for follow-up data requests. In addition, with these revisions, utilities submit some data through Quarterly Reports prior to the development of the annual WMP.*
  2. *Standardized templates for utility WMP submission. The 2021 Guidelines included additional templates to facilitate WMP evaluations and comparisons across utility WMPs and identify relevant supporting information. The guidelines also introduced standardization for narrative sections and additional sub-headings. A specific data schema and automated calculation checklist also now standardize Quarterly Reports.*

[1] The term "utility" is used interchangeably with "electrical corporation."

3. *Systematized qualitative evaluation. The guidelines established an assessment framework to increase objectivity, consistency and efficiency of WMP evaluations.*

4. *Tracked utility progress towards wildfire and Public Safety Power Shutoff (PSPS) risk reduction. The 2021 Guidelines provided instructions and guidance for the first annual WMP Updates to the initial three-year plans submitted by the Utilities in 2020. The 2021 WMP Updates highlighted the progress each utility made since 2020.*

- ***2022 WMP Guideline Improvements** – In a similar spirit of continuous improvement, the 2022 WMP Update Guidelines (2022 Guidelines) include new requirements and updates based on lessons learned and comments received from various stakeholder groups (e.g., the public, utilities, WSAB, and Energy Safety staff) during the 2021 WMP evaluation period. As 2022 is the final year of the 3-year plan cycle (2020 – 2022), the 2022 Guidelines primarily correct errors, address omissions, and inconsistencies, and incorporate minor improvements to structure, process, and data reporting elements. Changes are minimal to enable comparison across 2020-2022 WMPs and are as set forth below.*

Naming Convention

To improve the administrative management of WMP submissions, the electronic file names for the WMPs and associated document/data submissions must follow the standardized electronic naming convention illustrated in Table 1 below. The electronic file name(s) must include, in order, the naming convention identified in each column (without quotation marks), with an underscore between the character string of each column. See examples below.

Table 1: Electronic file naming convention with examples

Date Submitted (Year- Month-Day)	Utility Abbreviated Name	Document Year	Document Type	Revision Number
"2022-02-05"	• *"PGE" (Pacific Gas & Electric Company)* • *"SDGE" (San Diego Gas & Electric)* • *"SCE" (Southern California Edison)* • *"BVES" (Bear Valley Electrical Services)* • *"LU" (Liberty Utility)* • *"PC" (PacifiCorp)* • *"HWT" (Horizon West)* • *"TBC" (Trans Bay Cable)*	*"2022"*	• *"WMP" (Wildfire Mitigation Plan)* • *"WMP-Update" (Wildfire Mitigation Plan Update)* • *"Survey" (Maturity Model Survey)* • *"Metrics" (Performance Metrics Data)* • *"RNR" (Revision Notice Response)* • *"DSSR" (Data Schema Status Report)* • *"COR" (Change Order Report)* • *"PR" (Progress Report)* • *"QDR" (Quarterly Data Report)* • *"QIU" (Quarter Initiative Update)*	• *R0 (First Version)* • *R1 (Revision 1)* • *R2 (Revision 2)*

Examples:

- ***First Version of a WMP Submission:*** *"2022-02-05_PGE_2022_WMP-Update_R0", which refers to the PG&E 2022 WMP Update submitted on Feb 05, 2022, first version*
- ***Updated submission in response to Energy Safety Revision Notices:*** *"2022-06-05_HW_22_RNR_R1", which refers to the Horizon West Revision Notice Response submitted on June 5, 2022, revision 1*
- ***Maturity Model submission:*** *"2022-04-05_TBC_2022_Survey_R0", which refers to the Trans Bay Cable 2022 Maturity Model Survey submitted on April 5, 2022, first version*
- ***Quarter 2 Report data submission:*** *"2022-05-05_LU_2022_Q2-data_R0", which refers to the Liberty Utility 2022 Quarter 2 Report data submitted on May 5, 2022, first version*

***WMP** Structure*

The structure and organization of the 2022 WMP Updates must follow the eight sections and appendix indicated in Table 2 below.

Table 2: Structure of2022 WMP update

Section # and Title	***General Content***
Section 1 *– Persons responsible forexecuting the plan*	*Contact information for responsible executives, program owners, and experts*
Section 2 *– Adherence to statutoryrequirements*	*Checklist for each requirement with associated section and page number for where a requirement is addressed in the WMP*
Section 3 *– Actuals and planned spending*	*Cost summary tables and impacts toratepayers*
Section 4 *– Lessons learned and risk trends*	*1, 3, and 10-year investor-owned utility (IOU) outlook, projected trends in wildfire risk, research reports and proposals, and model and metric calculation methodologies*
Section 5 *– Inputs to the plan and directional vision*	*Goals, objectives, program targets, and worker qualifications*
Section 6 *– Metrics and underlying data*	*Placeholder for quarterly submissions of WMP metrics. To be filled in by data from prior submissions and Quarterly Data Reports (QDR)*
Section 7 *– Mitigation initiatives*	*Reporting of initiative progress, expenditures,and Risk-Spend Efficiency (RSE)*
Section 8 *– Public Safety Power Shutoff*	*PSPS narrative and data, including customer impact and cost*
Section 9 *– Appendix*	*Citations to relevant statutes, Commission directives, proceedings and orders, and detailed discovery log.*

General Instructions

The following subsection provides detailed instructions for preparing the 2022 WMP Update.

Narratives

Each section of the WMP is required to include narrative responses. The narrative responses must provide qualitative descriptions and explanations of the requested information, supported with a variety of visual aids (e.g., maps, summary tables, informatics, diagrams, flow charts, photographs, sample calculations/equations) and other supporting documentation to facilitate communication and substantiation of concepts and strategies. Each narrative must be clear, concise, and include a high-level bulleted summary of key takeaways for the respective section (where appropriate). WMP Updates must be limited in duplication of narratives across different sections.

Cross-Referencing

The WMP Update must include cross-referencing and hyperlinks to minimize duplication of narratives and provide quick referencing to other relevant sections. All figures and tables must incorporate the use of captions with associated references in the main body of the WMP using hyperlinks. PDFs must incorporate the use of electronic bookmarks for all sections, main headings, and sub-headings.

Quantitative Responses

Use the template tables for reporting quantitative data according to the instructions provided in the respective sections. If a table includes comment boxes, the comment boxes may be extended as needed. Some tables, such as those in Section 3, require reporting directly in the WMP alongside the narrative content. Quarterly Data Reports (QDR) must include the required data in a separate spreadsheet document following the standard format in Attachment 3. Completely fill out the data tables including both existing and updated data. Each section must include a narrative identifying updated tables.

Protocols for Inaccessible Data/Information

If any portion of the WMP requires information that the utility cannot collect and/or is not obtainable from peer utilities, the utility is required to work with federal-, state-, and local- agencies, stakeholders, or partners to obtain the necessary information. When requested information is not collected by any stakeholder, then the utility must identify these circumstances and provide a description of an alternative source of information or proxy that most closely fits the original requirement. The WMP shall clearly cite the source(s) of the data used in lieu of the required data.

For example, by the WMP submission deadline, a utility may not have a full accounting of the value of property destroyed by utility-related ignitions each year due to ongoing investigation into the cause of one or more wildfires within its service territory. In this example, the utility is required to indicate: 1) the known sum of the value of property determined by the relevant fire Authorities Having Jurisdiction (AHJs) to have been destroyed by utility-related ignitions in that year, even if this summation is incomplete, and 2) a list of the wildfires in that year, and an estimation of the value of property destroyed by each wildfire, for which utility facilities are being investigated as potential sources of ignition but for which the cause is still undetermined. The utility is required to cite all data sources used in the calculations.

Finally, the utility is required to provide a plan for improving its data collection and/or cooperation with partners for collecting the required information, including a timeline for implementation. If any of the requested information is confidential, the utility is required to submit two versions to Energy Safety – one that includes all the requested information and a second that redacts the confidential information.

GENERAL GLOSSARY OF DEFINED TERMS

Term	*Definition*
10-hour dead fuel moisture content	*Moisture content of small dead vegetation (e.g.., grass, leaves, which burn quickly but not intensely), which can respond to changes in atmospheric moisture content within 10 hours.*
Access and functional needs (AFN) populations	*Per Public Utilities Code (Pub. Util. Code) § 8593.3 and D.19-05-042, individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking, older adults, children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant.*
Authority Having Jurisdiction	*AHJ, party with assigned responsibility, depending on location and circumstance.*
Asset (utility)	*Electric lines, equipment, or supporting hardware.*
At-risk species	*Species of vegetation that have an elevated risk of (1) coming into contact with powerlines, (2) causing an outage or ignition, and/or (3) easily ignitable and within close enough proximity to potential arcing, sparks and/or other utility equipment thermal failures. "At-risk species" must be a function of species-specific characteristics including growth rate, failure rate of limbs, trunk, and/or roots (as compared to other species), height at maturity, flammability, vulnerability to disease or insects, etc.*
Baseline (ignition probability, maturity)	*A measure, typically of the current state, which establishes a starting point for comparison with measures from other states.*
Carbon dioxide equivalent	*Tons of greenhouse gases (GHG) emitted, multiplied by the global warming potential relative to carbon dioxide.*
Circuit mile	*The total length in miles of separate circuits regardless of the number of conductors used per circuit*
Contractor	*Any individual in the temporary and/or indirect employ of the utility whose limited hours and/or time-bound term of employment are not considered as "full-time" for tax and/or any other purposes.*

Critical facilities and infrastructure	*For brevity in the WMP, "critical facilitates and infrastructure" may be shortened to "critical infrastructure" and/or "critical facilities" throughout the WMP. Critical facilities and infrastructure are defined in accordance with the definition adopted in D.19-05-042 and modified in D.20-05- 051: those facilities and infrastructure that are essential to the public safety and that require additional assistance and advance planning to ensure resiliency during de-energization events. Namely:*
	• *Emergency Services Sector*
	  ○ *Police Stations*
	  ○ *Fire Station*
	  ○ *Emergency Operations Centers*
	  ○ *Public safety answering points*
	• *Government Facilities Sector*
	  ○ *Schools*
	  ○ *Jails and prisons*
	• *Healthcare and Public Health Sector*
	  ○ *Public Health Departments*
	  ○ *Medical facilities, including hospitals, skilled nursing facilities, nursing homes, blood banks, health care facilities, dialysis centers and hospice facilities (excluding doctor offices and other non- essential medical facilities)*

Term	*Definition*

	• *Energy Sector*
	  ○ *Public and private utility facilities vital to maintaining or restoring normal service, including, but not limited to, interconnected publicly owned utilities and electric cooperatives*
	• *Water and Wastewater Systems Sector*
	  ○ *Facilities associated with the provision of drinking water or processing of wastewater including facilities used to pump, divert, transport, store, treat and deliver water or wastewater*
	• *Communications Sector*
	  ○ *Communication carrier infrastructure including selective routers, central offices, head ends,*
	  ○ *cellular switches, remote terminals and cellular sites*
	• *Chemical Sector*
	  ○ *Facilities associated with the provision of manufacturing, maintaining, or distributing hazardous materials and chemicals (including Category N-Customers as defined in D.01-06-085)*
	• *Transportation Sector*
	  ○ *Facilities associated with automobile, rail, aviation, major public transportation, and maritime transportation for civilian and military purposes*

Customer hours	*Total number of customers, multiplied by the average number of hours (e.g.., of power outage).*
Data cleaning	*Calibrating raw data to remove errors (including typographical and numerical mistakes).*
Dead fuel moisture content	*Moisture content of dead vegetation, which responds solely to current environmental conditions and is critical in determining fire potential.*
Detailed inspection	*In accordance with GO 165, an inspection where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.*
Enhanced inspection	*Inspection whose frequency and thoroughness exceeds the requirements of the detailed inspection, particularly if driven by risk calculations.*
Enterprise system	*A centralized information system that ensures data may be shared throughout all functional levels and management hierarchies of an organization, as needed.*
Evacuation impact	*Number of people evacuated, with the duration for which they are evacuated, from homes and businesses, due to wildfires.*
Evacuation zone	*Areas designated by CAL FIRE and local fire agency evacuation orders, to include both "voluntary" and "mandatory" in addition to other orders such as "precautionary" and "immediate threat".*
Fire Season	*The time of year that wildfires are most likely to take place for a given geographic region due to historical weather conditions, vegetative characteristics and impacts of climate change. Goals and targets which have milestones related to the onset, duration, or end of "fire season" or "height of fire season" must be accompanied with calendar dates.*
Frequently de-energized circuit	*A circuit which has been de-energized pursuant to a de- energization event to mitigate the risk of wildfire three or more times in a calendar year.*
Fuel density	*Mass of fuel (vegetation) per area which could combust in a wildfire.*

Term	Definition
Fuel management	*Removing thinning, or otherwise altering vegetation to reduce the potential rate of propagation or intensity of wildfires.*
Fuel moisture content	*Amount of moisture in each mass of fuel (vegetation), measured as a percentage of its dry weight.*
Full-time employee	*Any individual in the ongoing and/or direct employ of the utility whose hours and/or term of employment are considered as "full-time" for tax and/or any other purposes.*
GO 95 nonconformance	*Condition of a utility asset that does not meet standards established by General Order 95.*
Greenhouse gas (GHG) emissions	*Health and Safety Code 38505 identifies seven greenhouse gases that ARB is responsible to monitor and regulate to reduce emissions: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF3).*
Grid hardening	*Actions (such as equipment upgrades, maintenance, and planning for more resilient infrastructure) taken in response to the risk of undesirable events (such as outages) or undesirable conditions of the electrical system to reduce or mitigate those events and conditions, informed by an assessment of the relevant risk drivers or factors.*
Grid topology	*General design of an electric grid, whether looped or radial, with consequences for reliability and ability to support de- energization (e.g., being able to deliver electricity from an additional source).*
Hazard tree	*A tree that has a structural defect that makes it likely to fail in whole or in part.*
High Fire Threat District (HFTD)	*Per D.17-01-009, areas of the State designated by the Office of Energy Infrastructure Safety and CAL FIRE to have elevated wildfire risk, indicating where each utility must take additional action (per GO 95, GO 165, and GO 166) to mitigate wildfire risk.*
Highly rural region	*In accordance with 38 CFR 17.701, "highly rural" must be defined as those areas with a population of less than 7 persons per square mile. For the purposes of the WMP, "area" must be defined as census tracts.*
High Wind Warning (HWW)	*Level of wind risk from weather conditions, as declared by the National Weather Service (NWS). For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings.2*
HWW overhead (OH) Circuit Mile Day	*Sum of overhead circuit miles of utility grid subject to High Wind Warnings (HWW, as defined by the NWS) each day within a given time, calculated as the number of overhead circuit miles that are under an HWW multiplied by the number of days those miles are under said HWW. For example, if 100 overhead circuit miles are under an HWW for 1 day, and 10 of those miles are under HWW for an additional day, then the total HWW OH circuit mile days would be 110.*
Ignition probability	*The relative possibility that an ignition will occur, probability is quantified as a number between 0% and 100% (where 0% indicates impossibility and 100% indicates certainty). The higher the probability of an event, the more certainty there is that the event will occur. (Often informally referred to as likelihood or chance).*

[2] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml

Term	*Definition*
Ignition-related deficiency	*Any condition which may result in ignition or has previously resulted in ignition, even if not during the past five years.*
Impact/consequence of ignitions	*The effect or outcome of a wildfire ignition upon objectives, which may be expressed by terms including, although not limited to, maintaining health, and safety, ensuring reliability, and minimizing economic and/or environmental damage.*
Initiative	*Measure or activity proposed or in process designed to reduce the consequences and/or probability of wildfire or PSPS.*
Inspection protocol	*Documented procedures to be followed to validate that a piece of equipment is in good condition and expected to operate safely and effectively.*
Invasive species	*A species that is: 1) non-native (or alien) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health.*
Level 1 finding	*In accordance with GO 95, an immediate safety and/or reliability risk with high probability for significant impact.*
Level 2 finding	*In accordance with GO 95, a variable (non-immediate high to low) safety and/or reliability risk.*
Level 3 finding	*In accordance with GO 95, an acceptable safety and/or reliability risk.*
Life expectancy	*Anticipated years that a piece of equipment can be expected to meet safety and performance requirements.*
Limited English proficiency (LEP)	*Populations with limited English working proficiency based on the International Language Roundtable scale.*
Line miles	*The number of miles of transmission and/or distribution line. Differs from circuit miles because individual circuits, such as the two circuits of a double-circuit line, are not counted separately in circuit miles but are counted as separate total miles of line.*
Live fuel moisture content	*Moisture content within living vegetation, which can retain water longer than dead fuel.*
Lost energy	*Energy that would have been delivered if not for an outage.*
Major roads	*Interstate highways, U.S. highways, state and county routes.*
Match drop simulation	*Wildfire simulation method that takes an arbitrary ignition and forecasts propagation and consequence/impact.*
Medical baseline customers	*Residential customers with qualifying medical conditions and/or depend on power for qualifying medical devices for certain medical needs. For example, customers that have specific heating and cooling or mobility needs.*
Member of the public	*Any individual not employed by the utility.*
Multi-attribute value function	*Risk calculation methodology introduced during CPUC's S- MAP and RAMP proceedings.*
Near miss	*Previously used to define an event with probability of ignition. Redefined under "Risk event."*
Need for PSPS	*When the utility's criteria for utilizing PSPS are met.*

Term	Definition
Noncompliant clearance	*Rights-of-way whose vegetation is not trimmed in accordance with the requirements of GO 95.*
Outages of the type that could ignite a wildfire	*Outages that, in the judgement of the utility, could have ignited a wildfire.*
Outcome metrics	*Measurements of the performance of the utility and its service territory in terms of both leading and lagging indicators of wildfire, PSPS, and other consequences of wildfire risk, including the potential unintended consequences of wildfire mitigation work, such as acreage burned by utility-related ignitions.*
Overcapacity	*When the energy transmitted by utility equipment exceeds that of its nameplate capacity.*
Patrol inspection	*In accordance with GO 165, a simple visual inspection of applicable utility equipment and structures that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out during other company business.*
Percentile conditions	*Top X% of a particular set (e.g.., wind speed), based on a historical data set with sufficient detail. For example, "Top 95 percentile wind speeds in the last 5 years" would refer to the 5% of avg daily wind speeds recorded by each weather station. If 1,000 weather stations recorded average daily wind speeds over 10 days, then the 95th percentile wind speed would be the top 5% of weather station-days. In this example, there will be 10 days each with 1,000 weather station reports and a total of 10,000 weather station-days, so 50 observations will be in the top 5%. The lowest wind speed in this top 5% would be the "95th percentile wind speed".*
Planned outage	*Electric outage announced ahead of time by the utility.*
Preventive maintenance (PM)	*The practice of maintaining equipment on a regular schedule, based on risk, elapsed time, run-time meter readings, or number of operations. The intent of PM is to "prevent" maintenance problems or failures before they take place by following routine and comprehensive maintenance procedures. The goal is to achieve fewer, shorter, and more predictable outages.*
Priority essential services	*Critical first responders, public safety partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water utilities/agencies.*
Program targets	*Quantifiable measurements of activity identified in WMPs and subsequent updates used to show progress towards reaching the objectives.*
Progress metrics	*Measurements that track how much utility wildfire mitigation activity has changed the conditions of utility wildfire risk exposure or utility ability to manage wildfire risk exposure, in terms of leading indicators of ignition probability and wildfire consequences.*
Property	*Private and public property, buildings and structures, infrastructure, and other items of value that are destroyed by wildfire, including both third-party property and utility assets.*
PSPS event	*Defined as the time from the first public safety partner notified of a planned public safety de-energization to the final customer re-energized.*
PSPS risk	*The potential for the occurrence of a PSPS event expressed in terms of a combination of various outcomes of the event and their associated probabilities.*

Term	Definition
PSPS weather	*Weather that exceeds a utility's risk threshold for initiating a PSPS.*
Red Flag Warning (RFW)	*Level of wildfire risk from weather conditions, as declared by the NWS. For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings.3*
RFW OH Circuit Mile Day	*Sum of overhead circuit miles of utility grid subject to Red Flag Warning each day within a given time, calculated as the number of overhead circuit miles that are under an RFW multiplied by the number of days those miles are under said RFW. For example, if 100 overhead circuit miles are under an RFW for 1 day, and 10 of those miles are under RFW for an additional day, then the total RFW OH circuit mile days would be 110.*
Risk event	*An event with probability of ignition, including wires down, contacts with objects, line slap, events with evidence of heat generation, and other events that cause sparking or have the potential to cause ignition. The following risk events all qualify as risk events:* *Ignitions* *Outages not caused by vegetation* *Vegetation-caused outages* *Wire-down events* *Faults* *Other risk events with potential to cause ignitions*
Risk event simulation	*Simulation of what the consequence would have been of an ignition had it occurred.*
Risk-spend efficiency (RSE)	*An estimate of the cost-effectiveness of initiatives, calculated by dividing the mitigation risk reduction benefit by the mitigation cost estimate based on the full set of risk reduction benefits estimated from the incurred costs. For ongoing initiatives, the RSE can be calculated by determining the "marginal benefit" of additional spending in the ongoing initiative. For example, the RSE of an ongoing initiative could be calculated by dividing the mitigation risk reduction benefit from a 5% increase in spend by the cost associated with a 5% increase in spend*
Rule	*Section of public utility code requiring a particular activity or establishing a particular threshold.*
Run-to-failure	*A maintenance approach that replaces equipment only when it fails.*
Rural region	*In accordance with GO 165, "rural" must be defined as those areas with a population of less than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" must be defined as census tracts.*
Safety hazard	*A condition that poses a significant threat to human life or property.*
Simulated wildfire	*Propagation and impact/consequence of a wildfire ignited at a particular point ('match drop'), as simulated by fire spread software.*
Slash	*Branches or limbs less than four inches in diameter, and bark and split products debris left on the ground because of utility vegetation management. This definition is consistent with Public Resources Code Section 4525.7.*

[3] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml

Term	Definition
Span	*The space between adjacent supporting poles or structures on a circuit consisting of electric lines and equipment. "Span level" refers to asset-scale granularity.*
System Average Interruption Duration Index (SAIDI)	*System-wide total number of minutes per year of sustained outage per customer served.*
Third-party contact	*Contact between a piece of electrical equipment and another object, whether natural (tree branch) or human (vehicle).*
Time to expected failure	*Time remaining on the life expectancy of a piece of equipment.*
Top 30% of proprietary fire potential index (FPI)	*Top 30% of FPI or equivalent scale (e.g., "Extreme" on SCE's FPI; "extreme", 15 or greater, on SDG&E's FPI; and 4 or above on PG&E's FPI).*
Tree with strike potential / danger tree	*A tree within or adjacent to the utility right- of-way that has a structural defect or lean that makes it likely to fail in whole or in part and contact electrical equipment or facilities.*[4]
Unplanned outage	*Electric outage that occurs with no advance notice from the utility (e.g.., blackout).*
Urban region	*In accordance with GO 165, "urban" must be defined as those areas with a population of more than 1,000 persons per square mile as determined by the United States Bureau of the Census.*
Utility-related ignition	*Ignitions involving utility infrastructure or employees, including all ignitions determined by AHJ investigation to originate from utility infrastructure.*
Vegetation management	*Trimming, removal, and other remediations of vegetation used to maintain utility ROW and reduce the risk of outages, ignitions, and other disruption and danger.*
Vegetation risk index	*Risk index indicating the probability of vegetation- caused outages and/or ignitions along a particular circuit, based on the vegetation species, density, height, growth rate, etc.*
Weather normalization	*Adjusting metrics based on relative weather risk factors or indices*
Wildfire impact/ consequence	*The effect or outcome of a wildfire affecting objectives, which may be expressed, by terms including, although not limited to health, safety, reliability, economic and/or environmental damage.*
Wildfire risk	*The potential for the occurrence of a wildfire event expressed in terms of ignition probability, wildfire impact/consequence.*
Wildfire-only WMP programs	*Activities, practices, and strategies that are only necessitated by wildfire risk, unrelated to or beyond that required by minimum reliability and/or safety requirements. Such programs are not indicated or in common use in areas where wildfire risk is minimal (e.g., territory with no vegetation or fuel) or under conditions where wildfires are unlikely to ignite or spread (e.g., when rain is falling).*

[4] "Danger tree" is more specifically defined in California Code of Regulation Title 14 § 895.1.

Term	*Definition*
Wildland-urban interface (WUI)	*A geographical area identified by the state as a "Fire Hazard Severity Zone", or other areas designated by the enforcing agency to be a significant risk from wildfires, established pursuant to Title 24, Part 2, Chapter 7A.*
Wire down	*Instance where an electric transmission or distribution conductor is broken and falls from its intended position to rest on the ground or a foreign object.*

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1

PERSONS RESPONSIBLE FOR EXECUTING THE WMP

1 PERSONS RESPONSIBLE FOR EXECUTING THE WMP

Provide an accounting of the responsibilities of the responsible person(s) executing the plan, including:

1. *Executive level with overall responsibility*
2. *Program owners specific to each component of the plan*

Title, credentials, and components of responsible person(s) must be released publicly, but other contact information may be provided in a redacted file attached to the WMP submission.

Executive-level owner with overall responsibility

- *Name and title:*
- *Email:*
- *Phone number:*

Program owners specific to each section of the plan

Note: A program owner may own multiple sections, and multiple components across sections, but each section must have a program owner accountable.

Executive-level owner with overall responsibility

- Name and title: Allen Berreth, Vice President of Transmission and Distribution Operations
- Email: Allen.Berreth@Pacificorp.com
- Phone number: 503-813-6205

Program owners specific to each section of the plan

Section 1: Persons responsible for executing the plan

Program owner

- Name and title: Megan Buckner, Director of Wildfire Program Delivery
- Email: Megan.Buckner@PacifiCorp.com
- Phone number: 503-813-5209
- Component: entire section

Section 2: Adherence to statutory requirements

Program owner

- Name and title: Megan Buckner, Director of Wildfire Program Delivery
- Email: Megan.Buckner@PacifiCorp.com
- Phone number: 503-813-5209
- Component: entire section

Section 3: Actuals and planned spending

Program owner

- Name and title: Scott Liedtke, Director of Operational Performance Management
- Email: Scott.Liedtke@PacifiCorp.com
- Phone number: 503-813-6220
- Component: entire section

Program owner

- Name and title: Jeff Keyser, Director of Investment Delivery
- Email: Jeff.Keyser@PacifiCorp.com
- Phone number: 541-776-5494
- Component: entire section

Section 4: Lessons learned and risk trends

Program owner

- Name and title: Amy McCluskey, Managing Director of Asset Management and Wildfire Safety
- Email: Amy.McCluskey@PacifiCorp.com
- Phone number: 503-813-5493
- Component: entire section

Section 5: Inputs to the plan and directional vision

Program owner

- Name and title: Amy McCluskey, Managing Director of Asset Management and Wildfire Safety
- Email: Amy.McCluskey@PacifiCorp.com
- Phone number: 503-813-5493
- Component: entire section

Section 6: Metrics and underlying data

Program owner

- Name and title: Megan Buckner, Director of Wildfire Program Delivery

- Email: Megan.Buckner@PacifiCorp.com
- Phone number: 503-813-5209
- Component: entire section

Section 7: Mitigation initiatives

Program owner

- Name and title: Amy McCluskey, Managing Director of Asset Management and Wildfire Safety
- Email: Amy.McCluskey@PacifiCorp.com
- Phone number: 503-813-5493
- Component: entire section

- Name and title: Steve Vanderburg, Manager of Meteorology and Emergency Management
- Email: Steven.Vanderburg@PacifiCorp.com
- Phone number: 503-251-5180
- Component: Situational Awareness and Forecasting

- Name and title: Kevin Schiedler, Wildfire Mitigation Delivery Director
- Email: Kevin.Schiedler@PacifiCorp.com
- Phone number: 503-813-5595
- Component: Grid Hardening and System Hardening

- Name and title: Jon Connelly, Director of Asset Management
- Email: Jonathan.Connelly@PacifiCorp.com
- Phone number: 503-813-6152
- Component: Asset Management and Inspection

Section 8: Public Safety Power Shutoff

Program owner

- Name and title: Erik Brookhouse, Vice President of System Operations
- Email: Erik.Brookhouse@PacifiCorp.com
- Phone number: 503-251-5153
- Component: entire section

Section 9: Appendix

Program owner

- Name and title: Megan Buckner, Director of Wildfire Program Delivery
- Email: Megan.Buckner@PacifiCorp.com
- Phone number: 503-813-5209
- Component: entire section

1.1 VERIFICATION

Complete the following verification for the WMP submission:

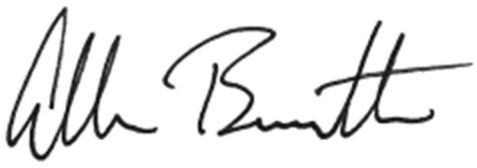
(See Rule 1.11)

(Where Applicant is a Corporation)

I am an officer of the applicant corporation herein and am authorized to make this verification on its behalf. The statements in the foregoing document are true of my own knowledge, except as to matters which are therein stated on information or belief, and as to those matters, I believe them to be true.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 6th at Portland, Oregon



Allen Berreth, Vice President of Transmission & Distribution Operations

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2

ADHERENCE TO STATUTORY REQUIREMENTS

2 ADHERENCE TO STATUTORY REQUIREMENTS

Section 2 comprises a "checklist" of the Pub. Util. Code § 8386 © requirements and subparts. The utility is required to both affirm that the WMP addresses each requirement AND cite the section and page number where statutory compliance is demonstrated fully. Citations are required to use cross-referencing with hyperlinks. ***Note: Energy Safety reserves the right to automatically reject a WMP that does not provide substantiation for statutory compliance or does not provide citations to appropriate sections of the WMP.***

Table 2.1: Illustrative checklist provides an exemplar for the minimum acceptable level of information and citation for the statutory check list.

Table 2.1: Illustrative checklist

Requirement	Description	WMP Section & Page Number
2	The objectives of the plan	Section 4.1, pg. 13
11	Protocols for the de-energization of the electrical corporation's transmission infrastructure, etc.	Section 5 overview, pg. 30-31

Table 2.2: Statutory compliance matrix provides the full list of statutory requirements. A table like Table 2-2 is required with the appropriate citation for each requirement. If multiple WMP sections address a specific requirement, then references to all relevant sections with a brief indication of information provided in each section must be provided. The table must include each section reference separated by semi-colon (e.g., Section 5, pg. 30-32; (workforce); Section 7, pg. 43 (mutual assistance)) where appropriate, and associated hyperlinks to the referenced section.

Table 2.2: Statutory compliance matrix

Requirement	Description	WMP Section &Page Number
1	An accounting of the responsibilities of person(s) responsible for executing the plan	Section 1, pg. 17-20
2	The objectives of the plan	Section 5, pg. 110-127
3	A description of the preventive strategies and programs to be adopted by the electrical corporation to minimize the risk of itselectrical lines and equipment causing catastrophic wildfires, including consideration of dynamic climate change risks	Section 7.3 pg.149-230

Requirement	Description	WMP Section &Page Number
4	A description of the metrics the electrical corporation plans to use to evaluate the plan's performance and the assumptions that underlie the use of those metrics	Section 6, pg. 128-132
5	A discussion of how the application of previously identified metrics to previous plan performances has informed the plan	Section 4.1, pg. 31-34
6	Protocols for disabling reclosers and de-energizing portions of the electrical distribution system that consider the associated impacts on public safety. As part of these protocols, each electrical corporation shall include protocols related to mitigating the public safety impacts of disabling reclosers and de-energizing portions of the electrical distribution system that consider the impacts on all the aspects listed in PU Code 8386c	Section 7.3.6.1, pg. 218 Section 7.3.6.2, pg. 219-220 Section 8.2, pg. 255-261
7	Appropriate and feasible procedures for notifying a customer who may be impacted by the de-energizing of electrical lines, including procedures for those customers receiving a medical baseline allowance as described in paragraph (6). The procedures shall direct notification to all public safety offices, critical first responders, health care facilities, and operators of telecommunications infrastructure with premises within the footprint of potential de-energization for a given event	Sections 7.3.10.1, pg.243; 7.3.9; pg. 235; 8.2; pg. 255
8	Identification of circuits that have frequently been de-energized pursuant to a de-energization event to mitigate the risk of wildfire and the measures taken, or planned to be taken, by the electrical corporation to reduce the need for, and impact of, future de-energization of those circuits, including, but not limited to, the estimated annual decline in circuit de- energization and de-energization impact on customers, and replacing, hardening, or undergrounding any portion of the circuit or of upstream transmission or distribution lines	Section 8.6 pg. 269
9	Plans for vegetation management	Section 7.3.5, pg.193
10	Plans for inspections of the electrical corporation's electrical infrastructure	Section 7.3.4 pg. 181
11	Protocols for the de-energization of the electrical corporation's transmission infrastructure, for instances when the de-energization may impact customers who, or entities that, are dependent upon the infrastructure	Section 8.2, pg. 255-237
12	A list that identifies, describes, and prioritizes all wildfire risks, and drivers for those risks, throughout the electrical corporation's service territory, including all relevant wildfire risk and risk mitigation information that is part of the Safety Model Assessment Proceeding and the Risk Assessment Mitigation Phase filings	Section 4.3 pg. 45-46
13	A description of how the plan accounts for the wildfire risk identified in the electrical corporation's Risk Assessment Mitigation Phase filing	N/A – As an SMJU, PacifiCorp did not file a RAMP. General risk assessment models used are described in Section 4.5.1, pg. 31
14	A description of the actions the electrical corporation will take to ensure its system will achieve the highest level of safety, reliability, and resiliency, and to ensure that its system is prepared for a major event, including hardening and modernizing its infrastructure with improved engineering, system design, standards, equipment, and facilities, such as undergrounding, insulation of distribution wires, and pole replacement	Section 7.3.3, pg. 168

Requirement	Description	WMP Section &Page Number
15	A description of where and how the electrical corporation considered undergrounding electrical distribution lines within those areas of its service territory identified to have the highest wildfire risk in a commission fire threat map	Section 9.4. pg. 283 Section 7.3.3.3, pg. 168
16	A showing that the electrical corporation has an adequately sized and trained workforce to promptly restore service after a major event, considering employees of other utilities pursuant to mutual aid agreements and employees of entities that have entered contracts with the electrical corporation	Section 5.4.4, pg. 124
17	Identification of any geographic area in the electrical corporation's service territory that is a higher wildfire threat than is currently identified in a commission fire threat map, and where the commission must consider expanding the HFTD based on new information or changes in the environment	Section 4.2.1, pg. 38-45
18	A methodology for identifying and presenting enterprise-wide safety risk and wildfire-related risk that is consistent with the methodology used by other electrical corporations unless the commission determines otherwise	Section 7.3.1, pg. 150
19	A description of how the plan is consistent with the electrical corporation's disaster and emergency preparedness plan prepared pursuant to Section 768.6, including plans to restore service and community outreach	Section 7.3.9.4, pg. 240
20	A statement of how the electrical corporation will restore service after a wildfire	Section 7.3.9, pg. 235
21	Protocols for compliance with requirements adopted by the commission regarding activities to support customers during and after a wildfire, outage reporting, support for low-income customers, billing adjustments, deposit waivers, extended payment plans, suspension of disconnection and nonpayment fees, repair processing and timing, access to electrical corporation representatives, and emergency communications	Section 7.3.9.3, pg. 237
22	A description of the processes and procedures the electrical corporation will use to do the following: Monitor and audit the implementation of the plan. Identify any deficiencies in the plan or the plan's implementation and correct those deficiencies. Monitor and audit the effectiveness of electrical line and equipment inspections, including inspections performed by contractors, carried out under the plan and other applicable statutes and commission rules.	Section 7.2, pg. 144-148

3

ACTUALS AND PLANNED SPENDING FOR MITIGATION PLAN

3 ACTUALS AND PLANNED SPENDING FOR MITIGATION PLAN

3.1 SUMMARY OF WMP INITIATIVE EXPENDITURES

Table 3.1 Summary of WMP expenditures – Total summarizes the projected costs (in thousands of US $) per year over the three-year WMP cycle, including actual expenditures for past years. In Table 3.1-2, break out projected costs per category of mitigations, over the three-year WMP plan cycle. In reporting "planned" expenditure, use data from the corresponding year's WMP or WMP Update (i.e., 2020 planned expenditure must use 2020 WMP data). The financials represented in the summary tables below equal the aggregate spending listed in the mitigations financial tables reported quarterly. Nothing in this document is required to be construed as a statement that costs listed are approved or deemed reasonable if the WMP is approved, denied, or otherwise acted upon.

Table 3.1 Summary of WMP expenditures – Total (WMP Table 3.1-1)

Year	Spend in thousands of $USD
2020 Planned	$25,011
2020 Actual	$18,520
2020 Difference	$6,491
2021 Planned	$33,375
2021 Actual	$42,149
2021 Difference	($8,774)
2022 Planned	$91,900
2020-22 Planned (with 2020 and 2021 Actual)	$152,570

Table 3.2. Summary of WMP expenditures by category (WMP Table 3.1-2)

WMP Category	2020			2021			2022	2020-2022 Planned (w/ 2020 and 2021 Actuals)
	Planned	Actual	Change	Planned	Actual	Change	Planned	
Risk and Mapping	$25	$186	($161)	$186	$188	($2)	$186	$560
Situational Awareness	$278	$1,178	($900)	$462	$1,473	($1011)	$3,054	$5,705
Grid Design and System Hardening	$15,403	$8,937	$6,466	$25,035	$23,092	$1,936	$74,603	$106,639
Asset Management and Inspections	$1,219	$1004	$215	$848	$919	($71)	$974	$2,897
Vegetation Management	$5,783	$6,999	($1,215)	$6,561	$16,199	($9,638)	$12,413	$35,610
Grid Operations	$2,000	$0	$2,000	$0	$0	$0	$0	$0
Data Governance	$25	$181	($156)	$210	$215	($5)	$400	$796
Resource Allocation	$278	$0	($278)	$0	$0	$0	$0	$0
Emergency Planning	$0	$0	$0	$0	$0	$0	$210	$210
Stakeholder Cooperation and Community Engagement	$0	$36	($36)	$73	$58	$15	$60	$154
Total	$25,011	$18,520	$6,491	$33,375	$42,149	($8,774)	$91,900	$152,570

3.2 SUMMARY OF RATEPAYER IMPACT

For each of the years in Table 3.3 WMP electricity cost increase to ratepayers, report the actual and projected cost increases to ratepayers due to utility-related ignitions and wildfire mitigation activities engaged. For past years, account for all expenditures incurred in that year due to utility-related ignitions and wildfire mitigation activities. Below the table, describe the methodology behind the calculations.

Table 3.3 WMP electricity cost increase to ratepayers (WMP Table 3.2-1)

Outcome Metric Name	Annual Performance						Unit(s)
	Actual					Projected	
	2017	2018	2019	2020	2021	2022	
Increase in electric costs to ratepayer due to utility-related ignitions. (Total)	0	0	0	0	0	0	Dollar value of average monthly rate increase attributable to utility-related ignitions per year.
Increase in electric costs to ratepayer due to wildfire mitigation activities (total)	0	0	0	0	0	0	Dollar value of average monthly rate increase attributable to WMPs per year.

As the period of Table 3.3 ends in 2022, PacifiCorp does not have any cost increases to customers to report. In the company's 2023 General Rate Case, PacifiCorp is proposing an increase due to incremental wildfire mitigation spending. Pending this proceeding, PacifiCorp anticipates the effective date of this proposed increase will be January 1, 2023, thus the impact to customers will not begin until 2023. As such projected costs and impacts become available, PacifiCorp will provide this information, presumably in the company's 2023 WMP.

4

LESSONS LEARNED AND RISK TRENDS

4 LESSONS LEARNED AND RISK TRENDS

4.1 LESSONS LEARNED: HOW TRACKING METRICS ON THE 2020 AND 2021 PLANS INFORMED THE 2022 PLAN UPDATE

Describe how the utility's plan has evolved since the 2020 WMP and 2021 WMP Update submissions. Outline any major themes and lessons learned from the 2020 and 2021 plans, and subsequent implementation of the initiatives. Focus on how utility performance against the metrics used has informed the 2022 WMP Update. Include an overview map of the utility's service territory. If any of the lessons learned are derived from data, include visual/graphical representations of this/these lesson(s) learned.

PacifiCorp's wildfire mitigation efforts have continued to develop and evolve across all categories since the submission of the 2020 WMP and 2021 WMP Update. Program modifications are made based on customer feedback acquired through surveys, internal analysis and subject matter expertise, external industry collaboration and benchmarking, and feedback from stakeholders and regulators such as the Office of Energy Infrastructure Safety (OEIS). The subsections that follow address these modifications by category. The company's particular areas of focus in 2022 include enhancing data analytics and modeling capabilities, evaluating technologies and efficacy studies to assess wildfire mitigation strategies and PSPS risk, and enhancing PSPS preparedness.

4.1.1 Risk assessment and mapping

PacifiCorp continues to develop and mature models to better understand ignition probability, wildfire risk, and estimations of wildfire consequences along electric lines and equipment. The enhanced understanding and more predictive modeling methods better inform operational decision-making at PacifiCorp.

As an example, during 2021, PacifiCorp learned:

- Developing the Localized Risk Assessment Model (LRAM) with increasing granularity and accuracy advances risk-modeling capabilities. Improvements have been centered around weather granularity, automation of the tool refresh for current forecasts and improvement in specific (pilot) locations with vegetation satellite imagery of canopy density.

4.1.2 Situational awareness

Informed situational awareness is the cornerstone of any operational response to wildfire risk.

For example, during 2021, PacifiCorp learned:

- To have additional time to prepare, plan and execute a PSPS event is important to PSPS success. With the 48-hour forecast available in 2021, there was only a short time to plan and send notifications as per CPUC Resolution ESRB-8.[5]
  - To have data infrastructure and processing redundancy is relevant for added risk modeling tool reliability.
  - To explore the use of Technosylva modeling capabilities, with meteorology team help, and inform future decision-making processes during PSPS events after the full rollout of the software has been completed.
  - Risk-modeling automation can enable more real-time updates and facilitates what-if scenario planning.
  - Portable weather stations, which can be quickly installed at the first sign of concerning weather trends, provide detailed insight into remote areas without the delay required for permanent installations.

4.1.3 Grid design and system hardening

PacifiCorp continues to analyze its electric system to develop longer-term strategies that consider the changing climate and increasing wildfire risk, with a continued focus on mitigating PSPS impacts to customers.

During 2021, PacifiCorp learned:

- Hardening measures reduce system faults over time; this recognition was guided by Grid Design and System Hardening research studies (see Section 4.4.2 Research Findings on page 51).
- Accelerated remedies for expulsion fuse replacement are a relevant factor in system hardening; these remedies were implemented in the HFTD.
- The ability to underground certain areas can rely heavily on effective alignment with landowners.

4.1.4 Asset management inspections

PacifiCorp will continue to enhance its distribution and transmission inspection programs to identify potential issues not visible by traditional ground inspections where terrain or other constraints may limit the ability to perform a detailed ground inspection or where infrared (IR) inspections identify issues not seen during standard inspections.

[5] Updates to S-MAP are currently in deliberation under proceeding R. 20-07-013 – Order Instituting Rulemaking to Further Develop a Risk-based Decision-making Framework for Electric and Gas Utilities.

In 2021, PacifiCorp learned:

- Continued identification of conditions through IR inspections year over year highlights the effectiveness and supports continued implementation on an annual basis.
- Clear identification of fire risk conditions can facilitate prioritization and accelerated correction, consistent with or ahead of General Order timeline requirements.

4.1.5 Vegetation management and inspections

PacifiCorp will continue to enhance vegetation management programs.

In 2021, PacifiCorp learned:

- Identification of separate vegetation-related conditions expedites work completion.
- Performing environmental desktop prescreening expedites approval of vegetation management programs on federally managed land.

4.1.6 Grid operations and protocols

PacifiCorp continued to use alternative work practices in the HFTD during elevated fire risk weather conditions.

In 2021, PacifiCorp learned:

- Separate wildfire mitigation spend tracking enhances work tracking and reporting capabilities.

4.1.7 Data governance

PacifiCorp continued to build out and integrate various systems and data sources to support the WMP metrics tables and the GIS schema with the source systems of record.

In 2021, PacifiCorp learned:

- Internal stakeholder collaboration improves enterprise data governance awareness, policies, processes, and training.
- Development of documentation standards for metric and GIS schema logic promotes auditability of the data.
- A Central Repository reporting strategy that leverages common data sources to meet WMP nonspatial and GIS spatial reporting requirements can improve data reporting quality.

4.1.8 Resource allocation methodology

PacifiCorp has developed programs and tools to help with resource allocation across business units and asset classes for various risks.

In 2021, PacifiCorp learned:

- To collaborate with other utilities through workshops regarding the development and implementation of PacifiCorp's initial risk-spend-efficiency (RSE) framework.

4.1.9 Emergency planning and preparedness

In 2021, PacifiCorp enhanced its emergency preparedness plan in collaboration with key internal business units and external public safety partners. PacifiCorp meets at least annually with state, county and local emergency management agencies such as CalFire, California Office of Emergency Services, county offices of emergency services, community and other organizations, public health authorities, local law enforcement and fire jurisdictions and other interested parties. Through these meeting, PacifiCorp gathers inputs from the community and adjusts plans as needed.

In 2021, PacifiCorp learned:

- Using workflow process tools improves the efficiency of notifications with public safety and other state partners.

4.1.10 Stakeholder cooperation and community engagement

PacifiCorp understands the important role all stakeholders play in achieving wildfire prevention and mitigation.

In 2021, PacifiCorp increased its lines of communication and learned:

- Direct engagement with tribal leaders helps the company target generators to tribal members with the most need. Refer to Section 7.3.10 Stakeholder Cooperation on page 243 and Section 7.3.10.1 Community Engagement on page 243 for additional details on stakeholder cooperation and community engagement initiatives.

- Providing ice at community resource centers supports residents who can pick up ice to keep the food in their fridges cold during an outage.

4.2 UNDERSTANDING MAJOR TRENDS IMPACTING IGNITION PROBABILITYAND WILDFIRE CONSEQUENCE

Describe how the utility assesses wildfire risk in terms of ignition probability and estimated wildfire consequence, including use of Multi-Attribute Risk Score (MARS) and Multi-Attribute Value Function (MAVF) as in the Safety Model and Assessment Proceeding (S-MAP)[6] and Risk Assessment Mitigation Phase (RAMP), highlighting changes since the 2020 WMP and 2021 Update. Include description of how the utility distinguishes between these risks and the risks to safety and reliability. List and describe each "known local condition" that the utility monitors per GO 95, Rule 31.1, including how the condition is monitored and evaluated.

In addition:

A. *Describe how the utility monitors and accounts for the contribution of weather to ignition probability and estimated wildfire consequence in its decision-making, including describing any utility-generated Fire Potential Index or other measure (including input variables, equations, the scale or rating system, an explanation of how uncertainties are accounted for, an explanation of how this index is used to inform operational decisions, and an explanation of how trends in index ratings impact medium-term decisions such as maintenance and longer-term decisions such as capital investments, etc.).*
B. *Describe how the utility monitors and accounts for the contribution of fuel conditions to ignition probability and estimated wildfire consequence in its decision-making, including describing any proprietary fuel condition index (or other measures tracked), the outputs of said index or other measures, and the methodology used for projecting future fuel conditions. Include discussion of measurements and units for live fuel moisture content, dead fuel moisture content, density of each fuel type, and any othervariables tracked. Describe the measures and thresholds the utility uses to determine extreme fuel conditions, including what fuel moisture measurements and threshold values the utility considers "extreme" and its strategy for how fuel conditions inform operational decision-making.*

PacifiCorp leverages information developed by the large investor-owned utilities (IOU) and uses principles of the International Standardization Organization's "Risk Management – Principles and Guidelines" (ISO 31000:2019) to develop the company's risk-based decision-making framework outlined in Figure 4.1.

[6] Updates to S-MAP are currently in deliberation under proceeding R. 20-07-013 – Order Instituting Rulemaking to Further Develop a Risk-based Decision-making Framework for Electric and Gas Utilities.

Figure 4.1 Risk-based decision-making framework

This methodology included an assessment of the company's top categorical equipment risks including, substation transformer failure, substation circuit breaker failure, overhead distribution conductor failure and relay misoperation. In a parallel activity, risks were evaluated against various maintenance and investment programs, including risks related to wildfire within its service territory, and benefits of these programs estimated. Nonetheless, due to the similar but differently constructed process, including RSE, as portrayed within this report may not be appropriately compared to other utility plans and results. Where possible, the intended approach and underlying rationale for the incorporation into future decision-making will be outlined, furthering the company's development toward the longer-term RAMP/S-MAP structure which is anticipated to be addressed in the future proceeding R.20-07-013.

PacifiCorp does not yet have a quantitative risk methodology adopted in the S-MAP and is continuing to review the IOU risk-modeling progress for the future development of RAMP and S-MAP.

A. PacifiCorp monitors and accounts for the contribution of weather and ignition probability an estimated wildfire consequence and its decision-making using situational awareness modeling tools such as WFA-E and WRF, combined with the subject matter expert (SME) meteorologist on staff. At this time PacifiCorp does not currently have a formal combined index, such as the Fire Potential Index (FPI) used by other companies, however development is in progress that aligns with the information learned through workshops. To better understand the weather's contribution to wildfire risk and consequence, PacifiCorp is taking a two-pronged approach that leverages big data analytics as well as existing wildfire modeling technologies.

   Big Data Analytics — PacifiCorp is actively creating a 30-year, 2 km-resolution, hourly

WRF reanalysis of weather variables and fire weather indices across much of the western United States. Once complete, this data will be correlated with historical fire occurrence and consequence to improve the company's weather-related thresholds with respect to wildfire risk. Further, the data will be correlated with historical power outages to build and train machine-learning models to better predict weather-related system impacts. Output from PacifiCorp's operational WRF model will be ingested daily by the company's machine-learning models and GIS tools to forecast and map the intersection of fire weather and outage related risks across its service territory.

Wildfire Modeling — PacifiCorp is investing in Technosylva's WFA-E suite of products to enhance its ability to identify distribution circuits and transmission lines that pose a risk of catastrophic wildfire due to current and forecast conditions. In many ways, WFA-E negates the need for a separate FPI as it directly models wildfire potential and consequence across the landscape daily. That said, PacifiCorp will be using Technosylva's products and SMEs to help create an FPI to complement the WFA-E suite of products. This work will leverage the results of the historical reanalysis and associated data analysis mentioned previously.

B. As was the case with assessing weather-related wildfire risks, PacifiCorp is leveraging big data analytics as well as existing wildfire modeling technologies to understand the fuel's contribution to wildfire risk and consequence.

PacifiCorp relies on a combination of sources including observations and forecasts from the local Geographic Area Coordination Center (GACC), PacifiCorp's in-house WRF model, and Technosylva's WFA-E. This includes one-hour dead fuel moisture, 10-hour dead fuel moisture, 100-hour dead fuel moisture, 1000-hour dead fuel moisture and Energy Release Component (ERC). Dead fuel moisture is expressed as a percent of oven dry weight. Raw ERC values are reported in BTUs per square foot; however, ERC is typically expressed as a percentile relative to the known local climatology. Other fuels considerations include herbaceous and woody live fuel moisture, regional vegetation mortality events and greenness of the seasonal grasses.

Big Data Analytics — In addition to weather variables and fire weather indices, the 30-year reanalysis mentioned previously will also include one-hour dead fuel moisture, 10-hour dead fuel moisture, 100-hour dead fuel moisture, 1000-hour dead fuel moisture and ERC. This data will be correlated with historical fire occurrence to improve the company's fuels-related thresholds with respect to wildfire risk. This data will also be integrated with Technosylva's WFA-E.

Wildfire Modeling — As was stated earlier, PacifiCorp is investing in Technosylva's WFA-E suite of products to enhance its ability to identify distribution circuits and transmission lines that pose a risk of catastrophic wildfire due to current and forecast conditions. This includes all relevant fuels information needed to accurately assess wildfire potential and consequence for both short-term forecasts and long-term planning.

Lastly, PacifiCorp owns and operates a network of weather stations that provide 10-minute observations of temperature, humidity, wind speed, wind direction and wind gusts. Some weather stations also have sensors that report 10-hour dead fuel moisture and fuel temperature. Weather stations are calibrated annually before wildfire season to ensure accuracy of the data throughout fire season.

4.2.1 Service territory fire threat evaluation and ignition risk trends

Present a map of the highest risk areas identified within the current High Fire Threat District (HFTD) tiers of the utility's service territory as a figure in the WMP. Discuss fire threat evaluation of the service territory to determine whether a modification to the HFTD is warranted (i.e., expansion beyond existing Tier 2 and Tier 3 areas). If the utility believes there are areas in its service territory that are not currently included in the HFTD but require prioritization for mitigation efforts, then the utility is required to provide a process outlining the formal steps necessary to have those areas considered for recognition in the CPUC-defined HFTD.[7] *Include a discussion of any fire threat assessment of its service territory performed by the electrical corporation, highlighting any changes since prior WMP submissions. In the event that the utility's assessment determines the fire threat rating for any part of its service territory is insufficient (i.e., the actual fire threat is greater than what is indicated by the CPUC's Fire Threat Map and High Fire Threat District designations), the utility is required to identify those areas for potential HFTD modification, based on the new information or environmental changes, showing the differences on a map in the WMP. To the extent this identification relies upon a meteorological or climatological study, a thorough explanation and copy of the study must be included as an Appendix to the WMP.*

List, describe, and map geospatially (where geospatial mapping is applicable) any macro trends impacting ignition probability and estimated wildfire consequence within utility service territory, highlighting any changes since the 2021 WMP Update:

1. *Change in ignition probability and estimated wildfire consequence due to climate change*
2. *Change in ignition probability and estimated wildfire consequence due to relevant invasive species, such as bark beetles*
3. *Change in ignition probability and estimated wildfire consequence due to other drivers of change in fuel density and moisture*
4. *Population changes (including Access and Functional Needs population) that could be impacted by utility ignition*
5. *Population changes in HFTD that could be impacted by utility ignition*
6. *Population changes in WUI that could be impacted by utility ignition*
7. *Utility infrastructure location in HFTD vs non-HFTD*
8. *Utility infrastructure location in urban vs rural vs highly rural areas*

[7] As there is no formal or standard process for modifying the HFTD maps defined by the CPUC, Utilities may utilize a similar approach adopted by SCE during the 2019 WMP review process described in D.19-05-038, p. 53. For this process, in August 2019 SCE submitted a petition to modify D.17-12-024 to recognize SCE-identified HFRA as HFTD Tier 2 areas.

PacifiCorp is constantly monitoring areas for significant change in ignition risk drivers that may result in a change to fire threat for a specified area. At this time, PacifiCorp has not identified any areas where an HFTD expansion is warranted and maintains the previously established HFTD map (see Figure 4.2 through Figure 4.5).

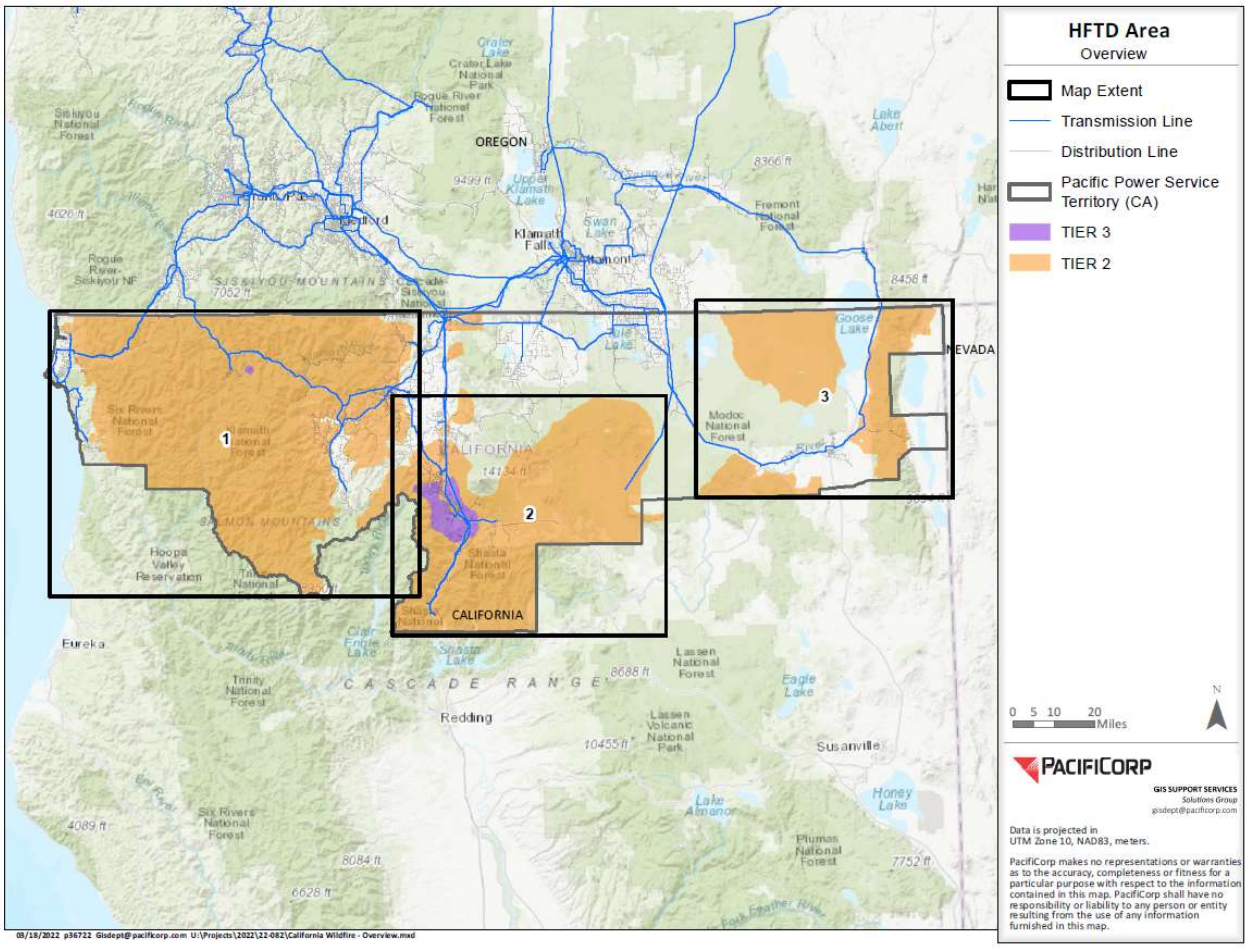

Figure 4.2 HFTD area

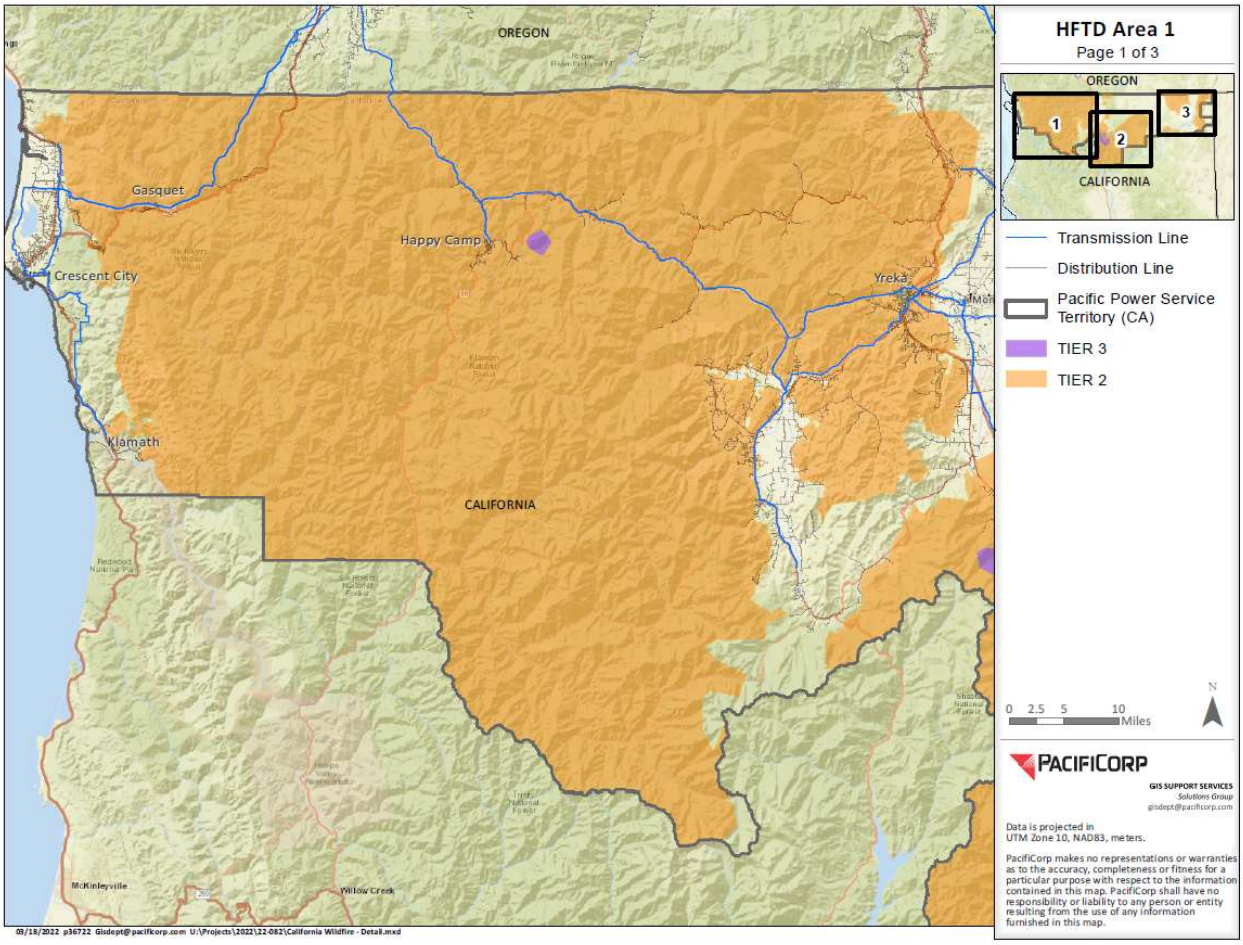

Figure 4.3 HFTD area 1

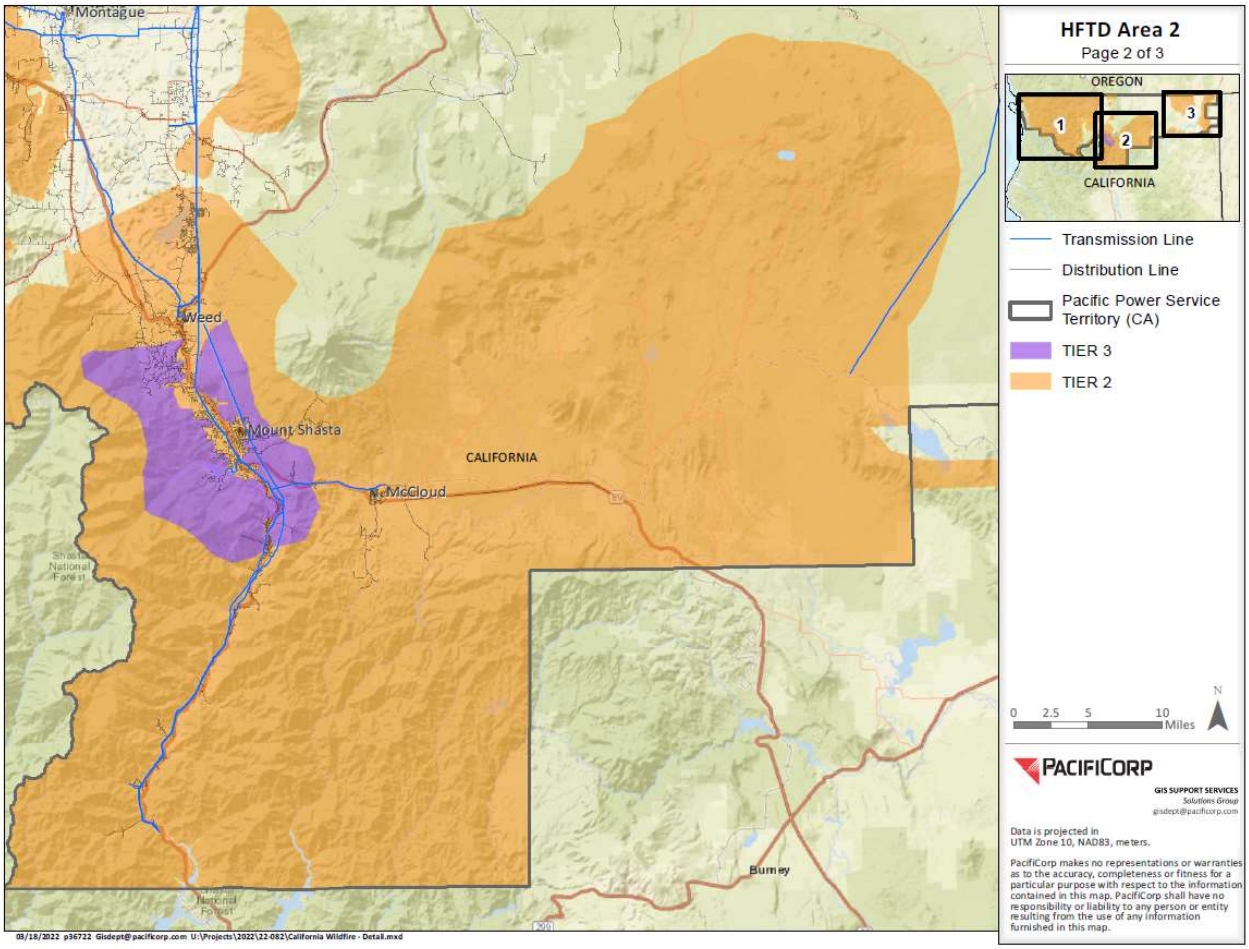

Figure 4.4 HFTD area 2

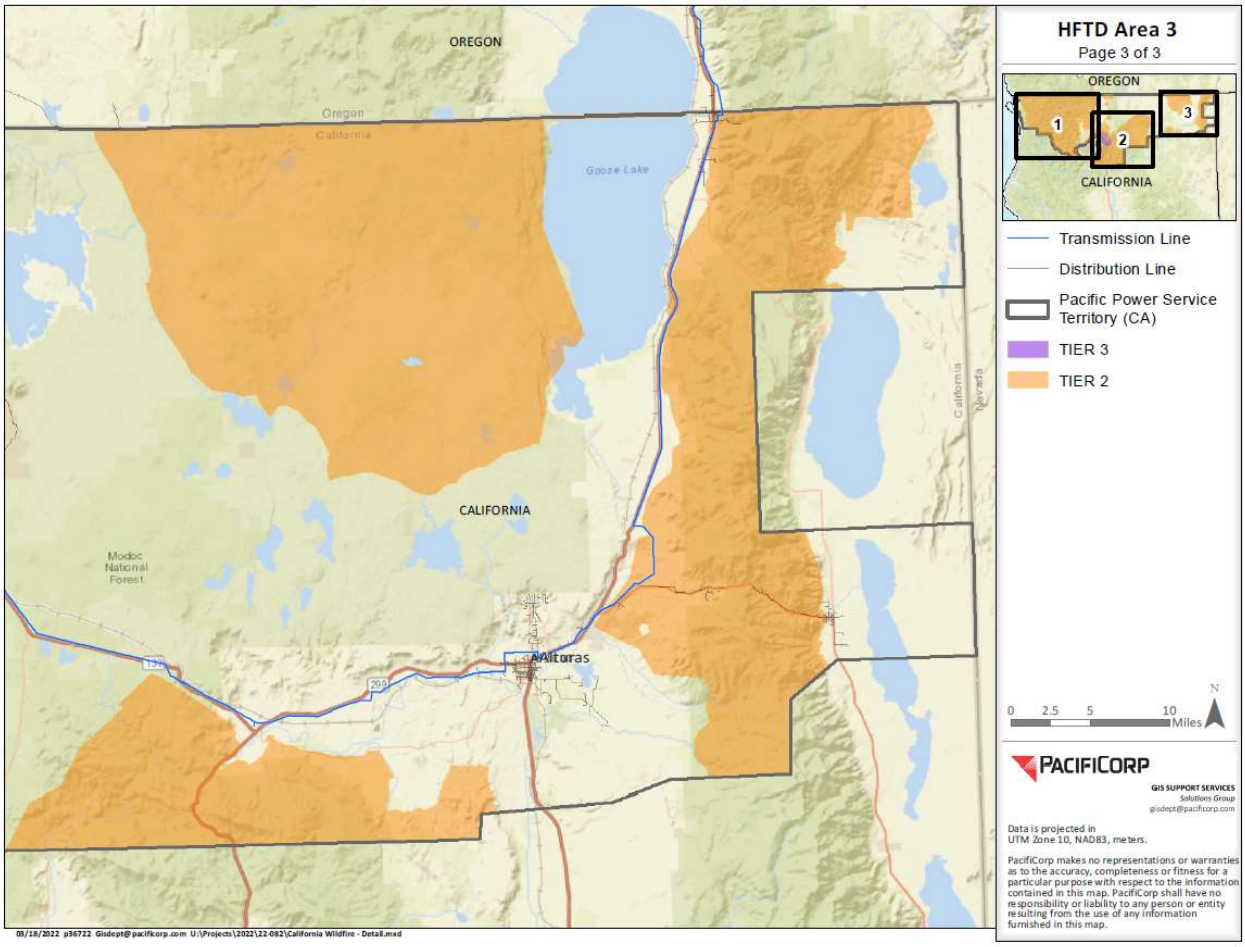

Figure 4.5 HFTD area 3

1. **Change in ignition probability and estimated wildfire consequence due to climate change**

   In 2021, PacifiCorp focused on developing a quantifiable consideration of climate change to address short-term planning gaps. Through this effort, the company engaged climate change experts through the California Energy Commission's Pyregence Project and used materials prepared by the Fourth Climate Change Assessment[8] through CalAdapt to assess climate change. Through this research, PacifiCorp found that fire-affecting climate change — particularly the effect of drying — impacts the company's service territory evenly. Therefore, areas that are higher risk today, such as the HFTD, would continue to be higher risk. Climate models also suggest there may be some decreases in fire weather (e.g., wind gusts). The company will continue analyzing this information and incorporating it into company models.

[8] Pierce, David W., et al. *Climate, Drought, and Sea Level Rise Scenarios for California's Fourth Climate Change Assessment: A Report for California's Fourth Climate Change Assessment*. California Energy Commission, 2018.

This research addresses short-term planning gaps, including a lack climate change-related measurements as they relate to wildfire risk in the company's service territory.

2. **Change in ignition probability and estimated wildfire consequence due to relevant invasive species, such as bark beetles**

   During the period of extreme drought in the company's northern California service territory, from 2014-2017, the company was experiencing substantial impacts from bark beetle invasion, damaging vegetation, for which it conducted hazard tree removal. At this time such invasive species do not appear to be on the rise, however, as noted above, to the extent that extreme drying becomes more normal, the tendency for invasive species such as bark beetle to damage vegetation increases. The company will be watchful of any erosion in tree health due to such impacts and may consider inclusion of these patterns into its risk assessment model.

3. **Change in ignition probability and estimated wildfire consequence due to other drivers of change in fuel density and moisture**

   Since the 2021 WMP update, there have been no significant changes in macrotrends of drivers such as fuel density and moisture. However, PacifiCorp is investing significantly in data and modeling tools to enhance situational awareness capabilities and assess ignition probability and estimated wildfire consequence at a more granular level.

4. **Population changes (including Access and Functional Needs population) that could beimpacted by utility ignition**

   The region the company serves is not a high growth area and no patterns suggesting greater AFN population percentages are anticipated by the company, which could impact areas needing additional support during periods of elevated fire risk.

5. **Population changes in HFTD that could be impacted by utility ignition**

   The company serves a sparse area, much of which is federal, state or tribal lands, which were deemed part of the elevated fire threat areas. While these areas generally are not developed, any changes to their usage could result in expansion of the company's network into areas that are designated HFTD and potentially impact the ratio of elevated fire risk areas the company serves. At this time 41% of its California assets are designated in the HFTD. Additional buildout in those areas would change the ratio and potentially require realignment of mitigation measures and resources. Shown in Table 4.1 is quantitative analysis supporting these conclusions.

- Tract level American Community Survey (ACS) five-year population estimates show a general decline in population within PacifiCorp's California service territory between the 2010 census and 2017. Population began increasing again in 2018 and

2019, but ACS estimates for 2019 are still 3.5% below 2010 population levels for the northernmost areas of California.

- Population changes in the HFTD follow the overall trends of the area. Population estimates for 2019 are roughly 3% below the 2010 population for the HFTD as a whole and roughly 2% below 2010 for the Tier 3 areas.

- Based on these trends, it is unlikely that major population increases will occur inside the HFTD regions of PacifiCorp's service territory.

Table 4.1 Population changes in the high fire threat districts

Data Source	Area	2010	2015	2017	2019
Census and ACS 5-year Tract Est.	Tracts Overlapping PC Territory	89,868	87,455	86,336	86,663
Census and FCC Block Est.	All HFTD	46,247	44,548	44,931	44,745
	Tier 3	4,735	4,499	4,685	4,631

6. Population changes in WUI that could be impacted by utility ignition

The company's service area generally has limited growth and much of it is infill. Limited growth of projects that increase the WUI are expected, based on information the company has from local stakeholders.

ACS estimates are not available at the block level used to determine WUI classifications, but FCC population estimates at the block level also show population decreases in PacifiCorp territory's wildland intermix and interface areas. Population levels estimates from 2019 are roughly 7% below 2010 levels in wildland intermix areas, and roughly 3% below 2010 levels in WUI areas. Populations in WUI areas also decreased between 2017 and 2019, despite modest gains in Northern California more generally. Further, there are zero interface blocks with a population increase of more than 10. Only one intermix block, located in Del Norte County, had a population increase of more than 10 between 2010 and 2019.

Based on these trends, it is unlikely that major population increases will occur inside the WUI regions of PacifiCorp's service territory. See Table 4.2.

Table 4.2 Population changes in WUI that could be impacted by utility ignition

Data Source	Area	2010	2015	2017	2019
Census and ACS 5-year Tract Est.	Tracts Overlapping PC Territory	89,868	87,455	86,336	86,663
Census and FCC Block Est.	Wildland Urban Intermix	22,548	20,918	20,958	20,910
	Wildland Urban Interface	42,115	41,054	41,025	40,942

7. **Utility infrastructure location in HFTD versus non-HFTD**

   When analyzing utility infrastructure location macrotrends, PacifiCorp evaluated if there were any programs to relocate, add or remove a significant amount of utility infrastructure. During this review it was determined that there were no significant updates to the utility infrastructure located inside the HFTD or outside the HFTD.

8. **Utility infrastructure location in urban versus rural versus highly rural areas**

   PacifiCorp does not have any significant infrastructure location changes.

4.3 CHANGE IN IGNITION PROBABILITY DRIVERS

Based on the implementation of the above wildfire mitigation initiatives, explain how the utility sees its ignition probability drivers evolving over the three-year term of the WMP, highlighting any changes since the 2021 WMP Update. Focus on ignition probability and estimated wildfire consequence reduction by ignition probability driver, detailed risk driver, and include a description of how the utility expects to see incidents evolve over the same period, both in total number (of occurrence of a given incident type,whether resulting in an ignition or not) and in likelihood of causing an ignition by type.

Outline methodology for determining ignition probability from events, including data used to determine likelihood of ignition probability, such as past ignition events, number of risk events, and description of events (including vegetation and equipment condition).

Substantial efforts in inspection, vegetation management and situational awareness have occurred and will continue to unfold over the next 10 years. Over the three-year period of the WMP (2020-2022) PacifiCorp has not seen a change in the categories of ignition risk drivers, in that no new drivers have been identified and no drivers have been removed. Much of the three-year term of the WMP has been developing the framework necessary to properly quantify risk in a way that aligns with other utility processes and initiating risk reduction initiatives such as those described in the grid hardening initiatives (Section 7.3.3 on page 168). To this end, PacifiCorp has not had the opportunity to observe a significant change in ignition

risk drivers. During 2022, PacifiCorp has committed to installing a significant portion of the grid hardening plan, after which the company can begin to gather data for evaluating the impact to ignition risk drivers. See Figure 4.6 for overlapping climate change, mitigation initiatives and PSPS risk.

The expectation is that grid hardening initiatives will impact the company's evaluation of risk through situational awareness thresholds by making the system more tolerant of elevated fire risk. Additionally, it is the expectation that ignitions due to ignition drivers such as contact by object will decrease over time as a result of grid hardening initiatives.

Wildfire consequence, which is generally driven by factors such as population, population location, wind speed, wind direction, overall dryness, and time to response, is not typically reduced or impacted by utility-related activities. However, PacifiCorp's initiatives, such as situational awareness, aim to better characterize dynamic risk and inform quick action to control risk, limit consequences, and mitigate escalation where possible. Additionally, in this 2022 WMP update, PacifiCorp is proposing a Wildfire Detection initiative that is expected to reduce the time until fire awareness.

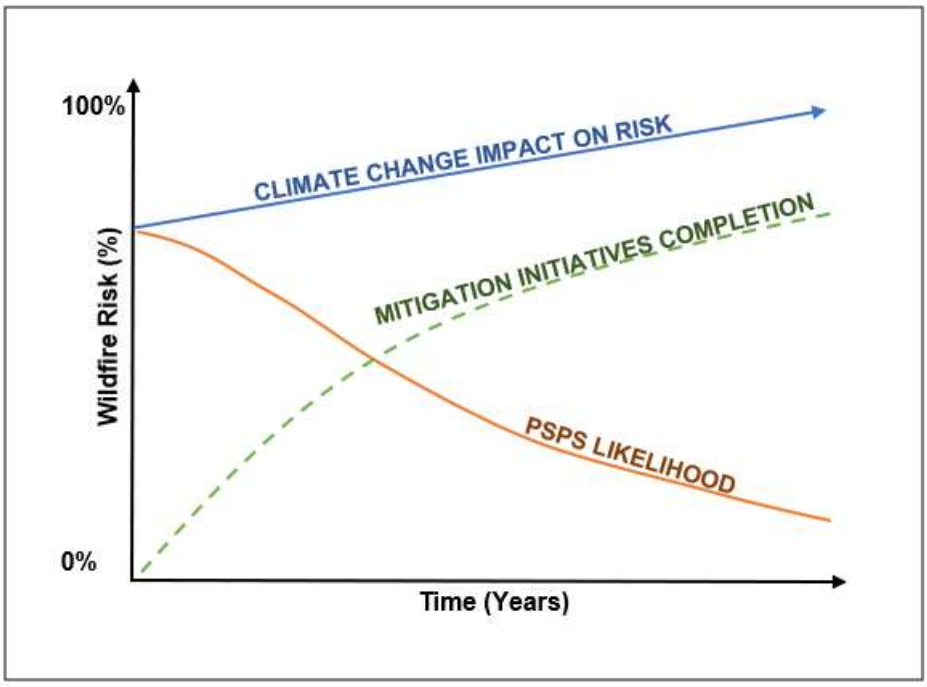

Figure 4.6 Climate change, mitigation initiatives and PSPS

Since the 2021 update, there have been no significant updates to the methodology for determining ignition probability from events, PacifiCorp employs the same process it has used since 2020 with refinement in the data inputs. Please refer to Section 4.3 of PacifiCorp's 2021 WMP for historical reference.

4.4 RESEARCH PROPOSALS AND FINDINGS

Report all utility-sponsored research proposals, findings from ongoing studies and findings from studies completed in 2020 and 2021 relevant to wildfire and Public Safety Power Shutoff(PSPS) mitigations.

4.4.1 Research Proposals

Report proposals for future utility-sponsored studies relevant to wildfire and PSPS mitigation. Organize proposals under the following structure:

1. ***Purpose of research** – brief summary of context and goals of research*
2. ***Relevant terms** - Definitions of relevant terms (e.g., defining "enhanced vegetation management" for research on enhanced vegetation management)*
3. ***Data elements** - Details of data elements used for analysis, including scope and granularity of data in time and location (i.e., date range, reporting frequency and spatial granularity for each data element, see example table below)*
4. ***Methodology** - Methodology for analysis, including list of analyses to perform; section must include statistical models, equations, etc. behind analyses*
5. ***Timeline** - Project timeline and reporting frequency to the Office of Energy Infrastructure Safety*

Example table reporting data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Comments
Ignitions from contact with vegetation in non-enhanced vegetation areas	2014 – 2021+ (ongoing)	Per ignition	Lat/long per ignition	Date, hour of ignition (estimated)	-
Ignitions from contact with vegetation in enhanced vegetation areas	2019 – 2021+ (ongoing)	Per ignition	Lat/long per ignition	Date, hour of ignition (estimated)	-

4.4.1 Research proposals

4.4.1.1 Wildfire Detection Pilot

Purpose of research

A wildfire detection network including equipment elements like cameras and smoke detectors, can assist fire agencies serving in the HFTD respond more quickly to ignition events. Additionally, with improved wildfire location awareness, PacifiCorp can respond quickly to support wildfire-reactive protocols. In 2021, PacifiCorp initiated an ongoing pilot in the company's Utah service territory where 14 ALERT wildfire cameras were installed to validate the technology. Additionally, PacifiCorp has partnered with forest agencies in Oregon to mount cameras on utility infrastructure. PacifiCorp plans to expand on this experience and initiate a pilot to its California service territory, using the lessons learned from the 2021 Alert Wildfire Camera installations in Utah. This pilot seeks to identify technology that can reliably and cost-effectively be used for wildfire detection.

Relevant terms

There are no specific, uncommon terms associated with the wildfire detection pilot.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
Event Video / Data Logs	2023-2025	Per ignition	Lat/lon per ignition	Date, hour of ignition (estimated)

Methodology

In terms of a data set, it will take some time to gather enough data to validate/invalidate the benefits of wildfire detection equipment types. PacifiCorp will evaluate how long it takes to respond to an ignition that is discovered by new wildfire detection equipment versus how long it takes to respond to an ignition discovered by another detection method.

Timeline

2022 — Plan wildfire detection program.

2023 — Complete installation of wildfire detection equipment.

2024 — Gather data.

2025 — Review preliminary results.

4.4.1.2 Enhanced Overhang Reduction Pilot

Purpose of research

The purpose of this enhanced vegetation management activity is to reduce the amount of vegetation and/or limbs overhanging high-voltage power lines and decrease the potential of wildfire ignitions due to vegetation and conductor contact. Current post clearances required by CPUC GO 95 are a minimum of 12 feet. In PacifiCorp's 2019 Standard Operating Procedures (version 6.1.2.) current specification clearance for overhanging limbs is 12 feet for slow-growing trees and 14 feet of clearance for moderate to fast-growing trees. Dead or defective limbs are also being identified to comply with the 2021 CAL FIRE Power Line Fire Prevention Field Guide, (Hazard Trees/Vegetation Clearance section). The purpose of this new effort is to determine efficacy of ground-to-sky pruning. Trees pruned during this effort would have increased overhang clearance, greater than the minimum CPUC required post-clearances, to achieve an anticipated outcome of reducing the potential of overhanging limbs dropping and contacting energized bare conductors. Due to the increased amount of crown removed to achieve increased overhang clearance, the subject trees would be evaluated within one year of work to assess tree health. PacifiCorp uses a Level 1 Assessment, as defined in ANSI A 300 (Part 9), to detect potential dieback, decay or other defects that can be associated with removing more than one third of the crown. PacifiCorp may also conduct additional monitoring as needed in subsequent years based on results and consider alternatives.

Relevant terms

ANSI A 300 Level 1 Assessment — This is a limited visual assessment of an individual tree or population of trees. It can be performed as a drive-by assessment in the case of many trees.

Data elements

Data elements may include:

- Tree location (latitude and longitude)
- Species
- Height
- Diameter at breast height (DBH)
- Date pruned

- Assessment notes (health of tree at time of pruning and subsequent assessment)
- Distance from conductor
- Estimated crown reduction

Methodology

Sections of power lines to be selected will be in HFTD Tier 2 and/or Tier 3 where there is a variety of coniferous and hardwood species. Plots will be completed in areas with noninsulated conductor to reduce ignition where primary bare wire is present. Horizontal construction with multiple phases (two-phase or three-phase) will also be prioritized.

Timeline

2022 — Potential plot areas will be identified after planned vegetation management activities have been conducted on Tier 2 and Tier 3 distribution circuits throughout the calendar year.

2023 — Enhanced overhang reduction work is targeted for implementation and completion.

2023 Post Work — Audit overhang mitigation work will be done to ensure compliance with specifications.

2024 — Tree health will be evaluated to determine the effect of crown removal. Trees will be assessed for dieback or other defects.

2025 — Preliminary results will be reviewed.

4.4.2 Research findings

Report findings from ongoing and completed studies relevant to wildfire and PSPS mitigation. Organize findings reports under the following structure:

1. ***Purpose of research*** *– Brief summary of context and goals of research*
2. ***Relevant terms*** *- Definitions of relevant terms (e.g., defining "enhanced vegetation management" for research on enhanced vegetation management)*
3. ***Data elements*** *- Details of data elements used for analysis, including scope and granularity of data in time and location (i.e., date range, reporting frequency and spatial granularity for each data element, see example table above)*
4. ***Methodology*** *- Methodology for analysis, including list of analyses to perform; section must include statistical models, equations, etc. behind analyses*
5. ***Timeline*** *- Project timeline and reporting frequency to the Office of Energy Infrastructure Safety. Include any changes to timeline since last update*
6. ***Results and discussion*** *– Findings and discussion based on findings, highlighting new results and changes to conclusions since last update*
7. ***Follow-up planned*** *– Follow up research or action planned as a result of the research*

Ongoing pilots

4.4.2.1 Distributed Fault Anticipation Pilot

Purpose of research

PacifiCorp is piloting the use of distribution fault anticipation (DFA) technology with Texas A&M University. The DFA devices are continuously monitoring to detect, classify and alert when high or low current fault conditions are measured. The alerts preemptively identify equipment along distribution circuits that could cause an outage.

Relevant terms

DFA — Distribution fault anticipation; this technology, which was initially tested at Texas A&M University in 2015, provides situational awareness of potential outages by measuring high and low current fault conditions on distribution circuits. Alerts from the DFA devices are communicated through cellular networks preemptively.

SCADA — Supervisory Control and Data Acquisition, which is in reference to the real time data collected by PacifiCorp's energy management system.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
DFA EVENT	Nov 2021-	Once	Distribution	1/100s

Report	Present		circuit	
Amps	Nov 2021 - Present	Continuous	Distribution circuit	1/100s
Voltage	Nov 2021 - Present	Continuous	Distribution circuit	1/100s
Circuit Line Miles	Installation Date	Once	0.01mi	Single Measurement
Wind Speed	Once	Per Event	MPH	Single Measurement
Wind Direction	Once	Per Event	Cardinal or intercardinal direction	Single Measurement
AVG Temperature	Once	Per Event	°C	Single Measurement
Humidity	Once	Per Event	%	Single Measurement

Methodology

PacifiCorp plans to install a sample of DFA devices on distribution circuits located within the HFTD with SCADA. Circuits with SCADA capability were selected so that the DFA data could be compared to SCADA events data. The comparison of these two sources will determine the effectiveness and cost associated with using this technology.

Timeline

Q4 2021 — DFA installation and data gathering initiated.

Q1 2023 — Complete DFA installation (approximately four circuits).

Q4 2023 — Collect a minimum of 12 months of data per device; evaluate program for expansion outside of the pilot.

Results and discussion

Since the first two DFA devices were installed in Q4 of 2021, two potential events were detected uniquely by DFA — the events were not identified by other SCADA equipment. One of the two events required an immediate correction on a jumper located at the capacitor bank. The second event classified a potential failure on a clamp or switch but could not be quickly located and has yet to be confirmed; a methodology is being created on how to locate the identified failure on the 126-mile circuit. The DFA provided insight into an issue that was not detectable with other equipment.

Follow-up planned

Currently, there are too few results to make a recommendation about the DFA technology. PacifiCorp is continuing to analyze the events generated by the DFA devices. If the pilot is successful, PacifiCorp will look to install DFA when replacing substation/circuit relays where there's a cellular or strong communication network connection.

4.4.2.2 Vegetation Management Data Analytics Pilot

Purpose of research

PacifiCorp has used publicly available vegetation data to estimate the amount of tree canopy near company equipment to inform risk management and improve situational awareness. PacifiCorp has evaluated several forms of canopy census approaches, including using public data sources, assessing LiDAR and analyzing satellite data. At this time, these data sets have yet to be operationalized in a manner that reduces or optimizes vegetation inspections (2021 WMP Pilot 3: LiDAR Vegetation Inspection), however they have proven helpful in supporting long-term risk assessment and to a lesser degree short-term situational awareness. The company's canopy census pilot used satellite imagery trained with available LiDAR to produce vegetation and strike tree maps over large areas.

Relevant terms

National Land Cover Database — The National Land Cover Database (NLCD) is a U.S. Geological Service-based resource that provides nationwide data on land cover and land cover change at a 30 meter resolution. The database is designed to provide cyclical updates of United States land cover and associated changes.

Salo — The vendor, Salo Sciences uses an AI model trained on satellite and LiDAR data to create high-resolution maps of vegetation characteristics.

Tree canopy — The branches, leaves or other foliage that form the upper layer of a plant community.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Comments
NLCD Canopy Cover Raster	2016	3-5 years	30m	One year	
Historic Vegetation Outages	2000-present	Daily	by isolation point, ~200m	outage timestamp, ~1 minute	
Salo Canopy Cover Raster	2020	1 year	10 m	One year	Augmenting 30m canopy cover where available
Historic Vegetation Maintenance	2000-present	Weekly	By circuit	weekly	

Methodology

A tree canopy census near PacifiCorp equipment was created by sampling the

NLCD Canopy Cover raster data at the per pixel area, 30 meter resolution. A point layer was then clustered to avoid oversampling at circuit branch points and aggregated according to circuit and subcircuit zones, specifically reconciled to ZOPs. As the Salo Sciences satellite/AI data was added, this process was replicated, with 10 meter resolution, again for each ZOP.

Timeline

2020 — Began pilot.

2021 — Initial proof of concepts was completed.

2022 — Plan the next project phase focusing on prior burn areas and augmenting canopy census data.

2023 — Evaluate the program for expansion or completion.

Results and discussion

Comparison of vegetation area to outages and vegetation maintenance costs showed weak correlations. The dataset was somewhat predictive of vegetation trimming costs, but with large margins of error. The comparison model is limited by the lack of spatial granularity in historic vegetation maintenance and outage records. As new vegetation maintenance records are established with high spatial accuracy, the dataset can be reassessed for its predictive power.

Attempts to use the NLCD Canopy Cover and LANDFIRE data layers for this purpose highlighted some of their inherent limitations: low update frequency, the 30-meter spatial resolution is too high to capture smaller tree stands, and heavy use of masking in some locations. Together, these limitations result in a systematic bias that underestimates tree coverage, with larger discrepancies occurring near roads or in developed areas.

However, satellite imagery was found to produce very usable data. Such data, however, need to be evaluated against two different use cases. First, in evaluating canopy density (to recognize proximity of vegetation to ZOPs for risk estimation), high confidence in canopy density was achieved, radically improving on publicly available data sources, but without the high costs associated with LiDAR. Second, when determining strike tree risk, results very similar to LiDAR were achieved at substantially lower cost and faster delivery.

LiDAR may be an important element to capture targeted areas of risk in future exercises, while satellite data appears to hold promise for systemic and periodic characterization of risk.

Follow-up planned

PacifiCorp is expanding upon this satellite canopy census by augmenting areas of interest studied during 2021, focused primarily on recently burned areas as well as other locales where vegetation outage history coincides with elevated fire threat.

4.4.2.3 Radio Frequency/ Handheld Infrared Pilot

Purpose of research

This pilot uses new radio frequency (RF) and IR tools to support ground-level visual inspections on distribution lines and equipment. The new tools are capturing information that can be used for condition identification that could be missed through the normal visual inspection. PacifiCorp has had success in the enhanced aerial IR inspection program discussed in Section 7.3.4.4 on page 183 and the expectation is these tools will yield similar results for inspectors in the field.

Relevant terms

DoForm — Internal digital form for tracking inspections.

Infrared (IR) — wavelength emitted when objects are heated.

Radio Frequency (RF) — radio waves at certain frequencies.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
Ambient Temperature	2020-present	Per Inspection	Degree Celsius	Date of Inspection
Observation Point Temperature	2020-present	Per Inspection	Degree Celsius	Date of Inspection
Conductor Temperature (Left & Right)	2020-present	Per Inspection	Degree Celsius	Date of Inspection
Nearest Pole Temperature	2020-present	Per Inspection	Degree Celsius	Date of Inspection

Methodology

Lines are selected based on historical records that suggest a high occurrence of splices. Line patrolmen perform the ground-level inspection of the identified lines, gathering specific measurements at key points along the line, including all poles and any splices within spans. The inspection data is uploaded and available through electronic forms.

Timeline

2021 — Completed field personnel training with equipment.

2022 — IR inspections to occur in selected regions of California.

2023 — Expand areas of inspection.

Results and discussion

The RF data collection proved to be an inefficient and an unreliable technology for inspection program purposes at this time. Different weather environments, angle of data collections, and multiple attempts produced unreliable, differing and inaccurate conditions reported.

However, IR inspections have had success in detecting leakage current in aerial inspections. PacifiCorp expects that further use of handheld IR devices will produce similar results that would otherwise be undetected through a normal visual inspection. Early detection of latent conditions will result in avoided fault operations that have a direct impact on ignition probability.

Follow-up planned

Depending on the pilot's results, PacifiCorp may engage in further studies regarding applications on the distribution network.

4.4.2.4 LiDAR Pole Loading Assessment Pilot

Purpose of research

This pilot focuses on reviewing a new technology to expedite the review of pole loading using LiDAR and automated 3D evaluation software. LiDAR data can be gathered via drone or helicopter to provide 3D files on transmission assets. These 3D files can then be used in combination with pole loading assessment software to automate the pole load calculations, expediting the completion of pole load calculations on entire circuits.

Relevant terms

LiDAR — Light detection and ranging.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
LiDAR Point Cloud Data (X, Y, Z)	2019	Once	10 cm	Single date
Pole Locations	2019	Once	0.5 m	Single date
Pole Lean	2019	Once	0.5 m	Single date

Methodology

Lines are identified based on the fire risk, historic fault rates, inspection results and joint-use records that might indicate a pole too weak for its loaded equipment. The lines are then flown with LiDAR and the LiDAR data incorporated into PLS-CADD, a strength modeling program. Varying loading scenarios are modeled on the poles and pole lines to evaluate pole performance; Based on the modeling results, replacements or strengthening would be considered. In 2019 the LiDAR data collected was used to test the accuracy of LiDAR data in pole loading analysis.

Timeline

2019 — Flew test line.

2022 — Evaluate program for expansion or completion.

Results and discussion

This pilot resulted in the recommendation that 187 poles in the HFTD be replaced as a proactive measure to align with existing design and construction standards that may not have been in place during initial line construction. These poles were not an imminent threat and were not as high priority as other poles with Conditions that require more rapid replacement consistent with the California general orders. Additionally, due to the location of these poles within the HFTD, these poles were already in scope for evaluation as a part of the covered conductor projects. Therefore, these efforts are being combined to improve cost effectiveness and the proactive pole replacement is occurring concurrently with covered conductors. If the LiDAR assessment had identified 187 poles for replacement separately from an already occurring replacement, it would have cost approximately $2.2 million to replace all poles. While an equipment upgrade is a proactive action to prevent equipment failures, there is no indication that this work offers significant risk reduction, therefore it is recommended to not continue this pilot at this time.

Follow-up planned

Consistent with other initiatives, PacifiCorp plans to complete the replacement of the 187 poles identified through the pilot and conclude this pilot for the 2020-2022 WMP term.

Completed pilots

4.4.2.5 Advanced Weather Station Modeling and Weather Stations Pilot

Purpose of research

This pilot focuses on exploring of the benefits of remote automatic weather system (RAWS) stations versus micro weather stations (MWS). Additionally, this pilot sought to create a methodology to systematically identify areas with limited data in our weather station network and in the National Interagency Fire Center's (NIFC) datasets. The company is installing multiple RAWS stations, to participate in the RAWS weather network and to calibrate RAWS stations with previously deployed micro stations. Participation in the RAWS weather network may enhance coordination with public safety partners and utility situational awareness. Improved situational awareness may support modifications of system operations in response to risk periods that are weather dependent. Calibration between public and private weather systems may improve correlation between weather systems and their sensitivities to specific patterns, notably improving coordination between NIFC and the U.S. Forest Service (USFS) and utility situational awareness.

Relevant terms

GREATER — Company-designed mapping software used for risk mapping.

Micro weather station (MWS) — An MWS is a low-cost, small, portable, self-contained, wireless sensor that can detect precise meteorological data.

National Interagency Fire Center (NIFC) — The NIFC is a federal government agency that coordinates national resource mobilization for wildland fire and other U.S. fire incidents.

Remote Automatic Weather System (RAWS) — A network of automated weather stations run by the USFS and Bureau of Land Management (BLM) and monitored by the NIFC, mainly to observe potential wildfire conditions.

Zone of Protection (ZOP) — A ZOP is a module, i.e., subsection of a circuit with control, either programmatically, automatically or manually. Figure 4.16 shows the ZOPs of a portion of a circuit beginning at the black dot, representing the substation's circuit breaker.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
RAWS	1/2021	Hourly	Lat/lon per weather station	1min
Micro station	2019-12/2021	10mins	Lat/lon per weather station	1min

Methodology

PacifiCorp leveraged the LRAM (see Section 4.5.1.4 on page 81) to site future weather stations in an objective and quantified manner. Using the LRAM, the company calculated a combined risk score for each ZOP; this risk score summarizes many aspects of wildfire risk including but not limited to fire weather history, fuel density, tree canopy cover, outage history, ignition history and arc energy calculations. The second step in this pilot was to obtain the locations of all RAWS, NWS, and PacifiCorp weather stations throughout our service territory and bring them together to create a combined risk score dataset from the LRAM. For each ZOP, we identified the nearest weather station and calculated the distance and difference in elevations to obtain a situational awareness score. Finally, PacifiCorp combined the situational awareness score with the combined risk score to create a risk blindness score. Using a map in GREATER to understand the blindness of the risk scores, the company identified locations with both low situational awareness and a high combined risk score; these locations are optimal for future micro weather stations.

Timeline

2019 — Installed micro weather stations as part of standard initiative.

2021 — Installed RAWS.

2022 — Evaluate RAWS for expansion or end of pilot.

Results and discussion

RAWS offer the installation benefit of providing data in locations that are not bucket truck accessible.

RAWS data is only provided once every day, as compared to micro weather stations, which provide data every 10 minutes. The granularity of the micro station data is better.

Follow-up planned

Due to the greater sensor capability, PacifiCorp plans to use MWS primarily and only plans to use RAWS where MWS could not be installed.

4.4.2.6 Fault Detection Line Monitoring Pilot

Purpose of research

This pilot explored the use of continuous monitoring sensors, including both line sensors and station relays, for fault identification and detection. It was determined to be a key element in advanced protection and operations, particularly supporting improved situational awareness.

Relevant terms

LineScope — Three-phase power monitoring system for use on circuits up to 138 kV.

Relay — An electrical device, typically incorporating an electromagnet or within a solid-state device, which is activated by a current or signal in one circuit to open or close another circuit.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
Relay Setting Element	since 2020	as needed	by protective zone	time during which setting was active (HH:MM)
Relay Event Record	since 2020	as needed	by protective zone	quarter cycles
Fault Analysis for Relay Event	TBD	as needed	by protective zone	quarter cycles
Outage Record	2003-present	as occurs	by protective zone	microseconds

Methodology

Lines and stations and their priorities were selected based upon their coincidence to fire risk, length of line (percentage in fire risk tier), consideration of whether distribution facilities were associated with PSPS areas, historic records of fault events with unknown locations and the impact to customer reliability when fault events occur. If communications technologies were not proximate to either line end, a smaller set of technology options exist.

Timeline

2021 — Completed most installations of transmission relays with fault detecting

relays) or line sensor piloting (LineScope).

2022 — Complete installations and evaluate program for expansion or completion.

Results and discussion

The primary benefit with fault detection devices that have been placed, is that they provide directionality when patrols are dispatched to locate faults. However, no widespread metrics have been created yet — due to the recent nature of the installations. When evaluating the use of this technology as a less expensive alternative to upgrading the protection devices on a line, the technology has been determined to not provide as much benefit as upgraded protection devices, which can more quickly address a fault.

Follow-up planned

While PacifiCorp experienced some benefits using this technology (fault directionality), when performing a cost-benefit analysis, the benefits of upgrading protection devices outweighed the benefits of the piloted technology. Therefore, PacifiCorp does not plan to prioritize the installation of future LineScope devices.

4.4.2.7 Vegetation Management Database Pilot

Purpose of research

PacifiCorp's historic vegetation records often lacked spatial granularity and were not centralized. The new vegetation management database allows vegetation management records to be centralized and incorporates GPS locations from field work.

Relevant terms

There are no uncommon, relevant terms for this subsection.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
Vegetation Work Records	2020-Present	Daily	10m	Daily

Methodology

Record templates are created by vegetation management and new work records are entered by contractors and staff foresters in the field on company-provided tablets. The database storing these records is maintained by a vendor with access and download options provided to PacifiCorp personnel.

Timeline

2020 —Initiated record system.

2021— Made additional refinements.

2022 —Evaluate for a standard program.

Results and discussion

Data generated by this system has been used for reporting purposes. Additional incorporation of these records into various vegetation analyses is anticipated as the volume of records increases.

Follow-up planned

This new system has been successfully implemented by field crews and is part of their standard processes.

4.4.2.8 Sophisticated Program Control Settings Pilot

Purpose of research

This pilot evaluates the optimal approaches in using sensitive and sophisticated device settings to reduce wildfire risk (and improve reliability). Devices, including relays, reclosers and fuses, all have methods by which they are programmed to operate in response to a fault condition. If there is limited coordination between devices, it can increase the probability of equipment damage, or delayed device operations which create and extend an ignition risk.

Relevant terms

Elevated Fire Risk (EFR) settings — EFR settings on reclosers can be used by PacifiCorp to address high wildfire risk situations.

Fast trip — An advanced protection capability that can be part of a setting profile, for example, setting profiles can be normal (fast trip followed by reclosing attempts), elevated risk (fast trip followed by single reclose attempt after sufficient time to limit persistence of heat).

Fault — Abnormal electrical current that if not interrupted within a certain time may damage the electrical system which is experiencing the abnormal current.

Protective zone — Part of the electrical system which is protected by a certain protective scheme established by the electrical system equipment (breakers, relays, etc.).

Relay — An electrical device, typically incorporating an electromagnet or within a solid-state device, which is activated by a current or signal in one circuit to open or close another circuit.

Relay event record — An electronic log recording a subset of values such as the date, time, recording interval, and pre-defined categories (voltage, amperage, etc.) when specific thresholds are out of programmed boundaries.

Setting group — A predetermined quantity of independent system protective settings contained within a defined group used by programmable devices such as substation relay or field recloser device.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
Relay Setting Element	since 2020	as needed	by protective zone	time during which setting was active (HH:MM)
Relay Event Record	since 2020	as needed	by protective zone	quarter cycles

Methodology

As new relays and reclosers are set they are evaluated for their coincidence to elevated fire risk areas. In areas where this risk exists, remote (grid operations) device control and communications equipment upgrades to increase communication speeds between coordinating devices are planned for installation. For all installations, independent of fire risk area, the option for advanced settings, including high impedance fault relays will be deployed.

Timeline

2020 — Began to install reclosers and relays.

2021 — Used alternative recloser settings during elevated wildfire risk.

2022 — Evaluate use across the company.

Results and discussion

Based on field reports during the 2021 fire season, PacifiCorp observed benefits in the use of EFR settings on reclosers including a reduction of ignition potential through operation.

Follow-up planned

This program supported a reduction in ignition potential through elevated wildfire events therefore it is in the process of being implemented throughout the company where the potential for elevated fire risk exists.

4.5 MODEL AND METRIC CALCULATION METHODOLOGIES

4.5.1 Additional models for ignition probability, wildfire and PSPS risk

Each utility is required to report details on the models and methodologies used to determine ignition probability, wildfire risk, and PSPS risk. This must include the following for each model – a list of all inputs, details of data elements used in the analysis, modeling assumptions and methodologies, input from Subject Matter Experts (SMEs), model verification and validation (e.g., equation(s), functions, algorithms or other validation studies), model uncertainty and accuracy, output (e.g., windspeed model) and applications of model in WMP (e.g., in selection of mitigations, decision-making).

The narrative for each model must be organized using the headings described below. A concise summary of the model(s) must be provided in the main body of the WMP in this section, with additional detail provided for each model in an appendix.

1. ***Purpose of model*** *– Brief summary of context and goals of model*

2. ***Relevant terms*** *– Definitions of relevant terms (e.g., defining "enhanced vegetation management" for a model on vegetation-related ignitions)*

3. ***Data elements*** *– Details of data elements used for analysis. Including at minimum the following:*

    a. *Scope and granularity (or, resolution) of data in time and location (i.e., date range, spatial granularity for each data element, see example table above).*
    b. *Explain the frequency of data updates.*
    c. *Sources of data. Explain in detail measurement approaches.*
    d. *Explain in detail approaches used to verify data quality.*
    e. *Characteristics of the data (field definitions / schema, uncertainties, acquisition frequency).*
    f. *Describe any processes used to modify the data (such as adjusting vegetative fuel models for wildfire spread based on prior history and vegetation growth).*

4. ***Modeling assumptions and limitations*** *– Details of each modeling assumption, its technical basis, and the resulting limitations of the model.*

5. *Modeling methodology – Details of the modeling methodology. Including at minimum the following:*

    a. *Model equations and functions*
    b. *Any additional input from Subject Matter Experts (SME) input*
    c. *Any statistical analysis or additional algorithms used to obtain output*
    d. *Details on the automation process for automated models.*

6. ***Model uncertainty*** *– Details of the uncertainty associated with the model. This must include uncertainty related to the fundamental formulation of the model as well as due to uncertainty in model input parameters.*

7. ***Model verification and validation*** *– Details of the efforts undertaken to verify and validate the model performance. Including at minimum the following:*
   a. *Documentation describing the verification basis of the model, demonstrating that the software is correctly solving the equations described in the technical approach.*
   b. *Documentation describing the validation basis of the model, demonstrating the extent to which model predictions agree with real-world observations.*

8. ***Modeling frequency*** *– Details on how often the model is run (for example, quarterly to support risk planning versus daily to support on-going risk assessments).*

9. ***Timeline for model development*** *– Model initiation and development progress over time. If updated in last WMP, provide update to changes since prior report.*

10. ***Application and results*** *– Explain where the model has been applied, how it has informed decisions, and any metrics or information on model accuracy and effectiveness collected in the prior year.*

11. ***Key improvements from working group*** *– For each model, describe changes which have been implemented as a result of wildfire risk modeling working group discussions. Provide a high-level summary of recommendations from the wildfire risk modeling working group.*

4.5.1.1 Wildfire Analyst-Enterprise (WFA-E)

1. **Purpose of model – Brief summary of context and goals of model**

PacifiCorp recently began procuring Technosylva's Wildfire Analyst-Enterprise (WFA-E) to take advantage of already established modeling software in use at other utilities and fire agencies to support real-time operations and long-term planning. While still in development for full operational use at PacifiCorp, the WFA-E modeling solution includes a suite of wildfire risk analysis products, including FireCast, FireSim and the Wildfire Risk Reduction Model (WRRM).

FireCast leverages Technosylva's fire spread prediction modeling capabilities through integration with PacifiCorp's Weather Research and Forecast (WRF) model to derive daily territory-wide and utility asset wildfire risk ratings. This information is critical to operations throughout fire season and especially on the days leading up to an extreme fire weather event and potential PSPS. FireSim provides on-demand capability to simulate the potential spread and consequence of a reported fire, which critically supports decision-making for real-time operations and infrastructure protection. FireSim can also simulate the potential consequence of fires that were prevented due to operational actions such as PSPS. WRRM combines millions of fire behavior simulations with proprietary asset data to quantify risk from each asset and calculate potential risk reduction for wildfire hardening projects. PacifiCorp's goal for WFA-E is

to leverage cutting-edge fire science technology to better anticipate, prepare for, respond to, and recover from extreme fire weather events and long-term wildfire risk. This includes PSPS decision-making and the prioritization of fire-hardening projects.

While PacifiCorp has already procured FireCast and FireSim, the WRRM component of Technosylva is planned for procurement in 2022. With this suite of modeling tools, PacifiCorp can begin developing an aggregate index, such as the Fire Potential Index (FPI) used at other utilities, to drive activity changes based on elevated weather conditions and exceeded thresholds. The FPI will mature with time as the models evolve and as additional risk modeling guidelines are created by regulators. PacifiCorp anticipates that the procurement of Technosylva, which aligns with the general risk modeling methodology used by other utilities, will better prepare the company for the 2023 WMP guidelines — where updated risk modeling guidelines are anticipated, based on participation in the OEIS-hosted Wildfire Mitigation Risk Modelling workshop monthly series.

2. Relevant terms

Asset A — Specific feature on the electric utility infrastructure network such as a pole, conductor, capacitor, transformer, or fuse.

Asset class — A grouping of assets based on their characteristics, such as material type, size, orage, that reflects a specific likelihood for equipment failure and wildfire ignition.

Asset Index — A six-digit number used to delineate asset classes.

Burn probability — The probability of a wildfire burning into an area, sometimes referred to as a wildfire threat. Burn probability is the combination of numerous individual fire growth potential simulations to create an overall fire growth potential map using electrical assets as possible ignition sources.

Conditional impacts — The mean wildfire impact given that an equipment-related wildfire occurs at a specific location (also referred to as conditional risk). Conditional impacts are combined with ignition rate and wind factor characteristics to calculate the expected impacts. They are calculated for each asset and can be summed to quantify the conditional impacts for a specific hardening project.

Downfire — The location of a HVRA within the fireplain (fire growth from a specific ignition location)

Expected impacts — The mean annual equipment-related wildfire impact after incorporating the likelihood of equipment failure and subsequent wildfire (also referred to as expected risk). This is a primary output of the WRRM model. It is calculated for each asset and can be summed to quantify the expected impacts for a specific hardening project.

Exposure — The placement of a Highly Valued Resources and Asset (HVRA) in a hazardous environment. For example, building a home within a flammable landscape.

Fireplain —The calculated, estimated area of a fire's spread if it is ignited at a particular location. A fireplain represents the spread area commonly referred to as Time of Arrival, a raster representation of the fire spread, while Fire Perimeters is the vector format representation of the fire spread.

GIS assets — The GIS database of assets used as the source of potential ignitions for the WRRM.

Hardening projects — A series of projects that may occur to change, repair, replace, or affect asset equipment. The intent of these projects is to "harden" the equipment so that it is more durable and less likely to fail. A project is a series of activities that may be combined under a single work order or field visit for planning, budgeting, and/or administrative management.

Highly Valued Resources and Asset (HVRA) — Resources and assets such as structures/homes or environmentally sensitive areas.

Ignition likelihood — The probability of an asset to start a fire ignition based on equipment failure or external weather conditions.

Replacement asset — The new asset class used to replace an existing asset class. Replacement assets have lower equipment failure rates and ignition rates than existing assets.

Risk reduction — The expected risk over a 20-year planning horizon for an asset. This is the primary WRRM model output to quantify risk reduction for an asset replacement. Risk reduction values are summed for assets in specific hardening projects to provide an overall risk reduction for that project.

Susceptibility — A measure of how easily an HVRA is damaged by wildfires of different types and intensities.

Values-at-risk — A general term that is commonly used to describe the HVRA and the risk assigned to them.

Vulnerability — A combination of exposure and susceptibility, Vulnerability is the measure of potential (sometimes called conditional) impacts to HVRA from wildfires of different intensities.

Wildfire hazard — A physical situation with potential for causing damage to resource or assets. Wildfire hazard is measured by two main factors: burn probability and intensity.

Wildfire risk— Overall measure of the possibility for loss or harm caused by wildfire. Wildfire riskis a product of wildfire hazard and vulnerability.

3. **Data elements – Details of data elements used for analysis. Including at minimum the following:**

Data Element	Scope	Spatial Granularity	Temporal Granularity	Collection Period	Collection Frequency	Data Sources
FuelMoisture Data	Vegetation and fuel data cross PacifiCorp territory	2 km	Hourly	Daily	Daily	PacifiCorp WRF and Technosylva
Weather Forecast	Temperature, dewpoint, humidity, windspeed & gust, wind direction, etc. at the surface and aloft	2 km	Hourly	Daily	Daily	PacifiCorp WRF
Real-time Weather Observations	Weather provided from weather stations and other sources across the region which may impact PacifiCorp service territory.	Varies	Ranges from 10 minutes to 1 hour	Daily	Daily	Utility mesonets, ASOS, & RAWS
Historical Fires	Across PacifiCorp territory.	n/a	annual	All recorded	annual	Fire agencies
Fire behavior analysis	n/a	n/a	n/a	n/a	n/a	Provided by vendor
Fire Simulation modeling	n/a	n/a	n/a	n/a	n/a	Provided by vendor
PacifiCorp Distribution/Transmission assets	n/a	n/a	n/a	n/a	n/a	PacifiCorp GIS
Subjective 'values at risk' parameters	n/a	n/a	n/a	n/a	n/a	Provided by vendor

4. **Modeling assumptions and limitations – Details of each modeling assumption, its technical basis, and the resulting limitations of the model.**

- The WRRM model does not include system information such as outages, equipment failures, electric system conditions, or wildfire mitigation initiatives. PacifiCorp plans to incorporate the dynamic outage data as a separate model evolution after the 2023 Risk Modeling Guidelines are updated.

5. **Modeling methodology – Details of the modeling methodology. Including at minimum the following:**

WFA-E consists of three wildfire risk analysis products: FireCast, FireSim and WRRM. WFA-E combines PacifiCorp's daily WRF forecast and 30-year reanalysis data with Technosylva's proprietary wildfire spread model to calculate wildfire behavior, risk and consequence metrics.

Once fully operational, FireCast will ingest PacifiCorp's operational WRF data, then use Technosylva's wildfire spread model to perform millions of wildfire simulations daily across the service territory over a 96-hour forecast horizon. The results of the simulations are used to calculate both territory wide and asset level wildfire risk at three-hour time intervals across the forecast period.

FireSim ingests PacifiCorp's operational WRF data then uses Technosylva's wildfire spread model to perform on-demand wildfire simulations at locations of interest (see Figure 4.7). The user defines the time and length of each simulation.

WRRM was built on the quantitative risk model, developed between San Diego Gas & Electric (SDG&E) and Technosylva, that associates wildfire hazards with the location of electric distribution overhead assets. Development started with fire growth simulations that would identify both fire growth potential and vulnerability of impacted structures at each simulated fire location inside the service territory.

Technosylva will provide key data inputs, such as surface and canopy fuels, topography, and climate data, and perform thousands of simulations for each potential ignition location in a Monte Carlo approach,[9] a random sampling simulation methodology that helps solve deterministic problems, to identify the total fire growth potential for that location (see Figure 4.7).

[9] Monte Carlo is a term for a broad set of computational algorithms that rely on repeated random sampling to obtain numerical results.

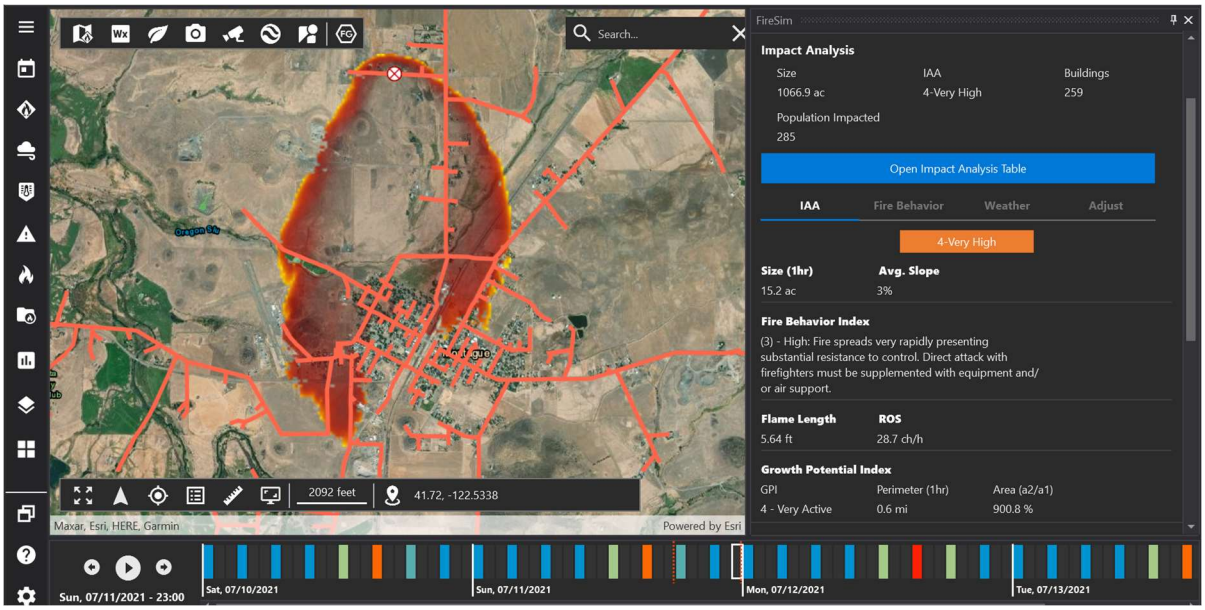

Figure 4.7 Wildfire growth simulation example

Once the fire growth potential for a location is determined, the geospatial simulation is overlaid with property and parcel information relating to the surrounding community to identify potentially impacted structures. Identifying the susceptibility of each structure type to a wildfire (i.e., residences, commercial spaces, parking lots) can be used to estimate a value of impacted square footage or structure damage if an ignition were to occur. This mean value of impacted structure damage generates the conditional impact value for that given location. Figure 4.8 shows wildfire growth simulation and structure values; Figure 4.9 displays the resulting fireplain from a simulation (left diagram). The right diagram shows structure values adjusted by percent loss associated with the fireplain from a wildfire simulation.

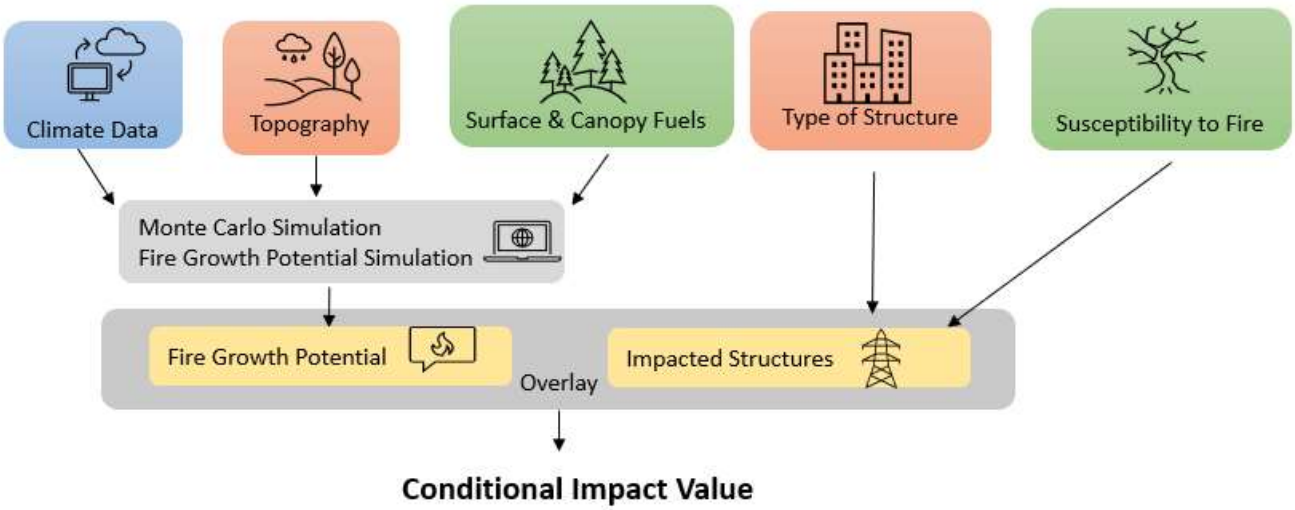

Figure 4.8 Wildfire growth simulation and structure values

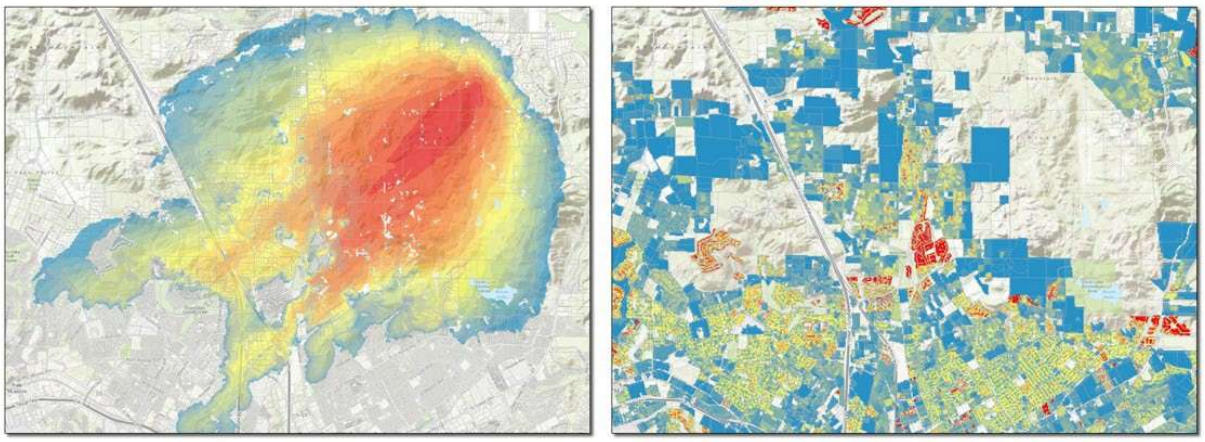

Figure 4.9 Fireplain simulation results

Once the conditional impact is determined, assets associated with the area are assigned an ignition likelihood. This ignition likelihood is the combination of asset failure rate and the ratiofor when those failures might result in an ignition (see Figure 4.10).

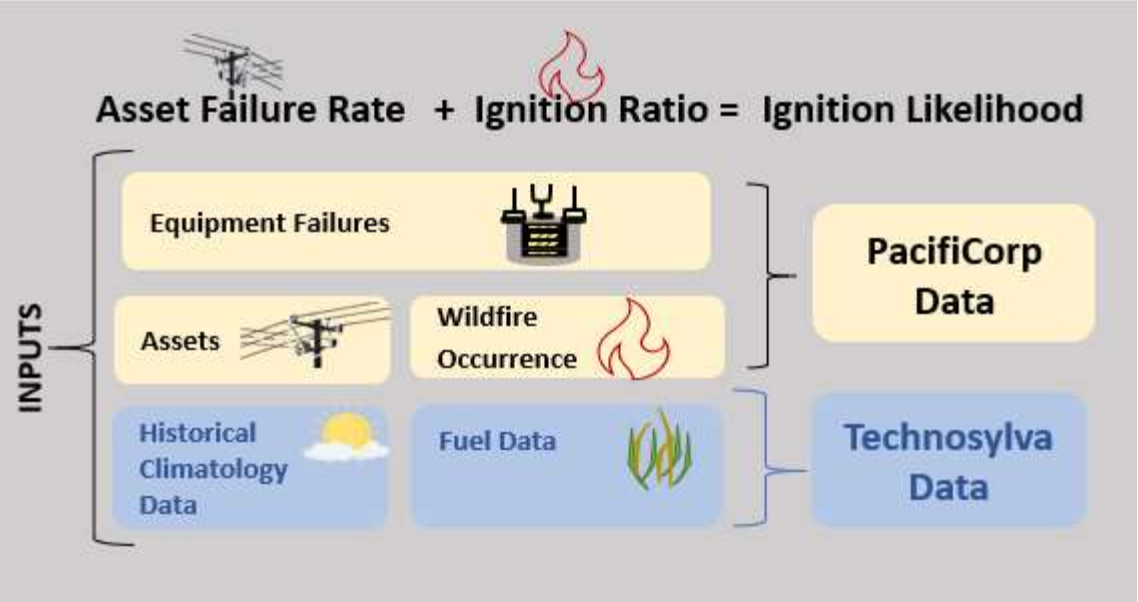

Figure 4.10 Ignition likelihood

As an initial step to demonstrate value, PacifiCorp provided some asset data to Technosylva, who, using a framework similar to that used by other utilities, modeled the number of historic failures and equipment ignitions. Equipment attributes in the GIS asset information were then categorized into the necessary bins to buildthe asset classes with each developed equipment failure rate and ignition ratio. Once an asset was identified as belonging to a specific asset class, the associated equipment failure rate and ignition ratio wasassigned and combined to generate the ignition likelihood.

PacifiCorp plans to invest in the Technosylva model component in 2022, which will assign ignition likelihoods to all assets across the overhead distribution network and provide a combined number of predicted equipment failures and ignitions for comparison with historic records, including the locations of prior fire history. Then this data will be used to calibrate the failure rates and ignitions across the model to achieve a realistic result and relative ranking of where assets ofconcern exist in the electric distribution network.

When conditional impact and ignition likelihood are determined for each asset at each location, it is possible to calculate the overall expected impact of an equipment-related ignition. The expected impact accounts for the mean annual equipment-related wildfire impact after incorporating the data and methods discussed.

6. **Model uncertainty**

   The GIS data used in this model is captured via as-built drawings and reviewed according to set protocols according to the electric GIS production team standards. This data does not reflect ongoing switching or temporary configurations.

7. **Model verification and validation**

   Once implemented, WRRM data delivery will include GIS feature classes, which are visually inspected in a map environment when they are received to ensure the data results coincide with known conditions around the service territory.

8. **Modeling frequency**

   See the Data Elements Table in #3 for model frequency and data refresh rates.

9. **Timeline for model development**

   PacifiCorp did not actively participate in the model development of WFA-E. Instead, PacifiCorp plans to procure version 2.0, which includes updated GIS information, more granular asset data and enhanced GIS asset query functions to assist in project creation.

10. **Application and results**

    The WRRM and subsequent data tables are useful in identifying and prioritizing operational programs such as recloser settings and alternative work protocols.

11. **Key improvements from working group**

    Wildfire Risk Modeling working group discussions are underway. Direct improvements from the discussions have not yet been determined, but PacifiCorp anticipates incorporating recommendations or best practices learned through this collaboration into the evolution of the company's risk modeling suite. Additionally, PacifiCorp is already leveraging the benefits of general industry and industry partner collaboration through the incorporation of Technosylva into the company's risk modeling framework.

4.5.1.2 Contemporary fire weather risk model

1. **Purpose of model**

   The purpose of the fire weather risk model is to create a normalized relative ranking for the fire weather risk at a ZOP level, using recent historical gridded outputs. The main goal is to use the High Resolution Rapid Refresh (HRRR) model (3-km resolution)

to identify zones that have a high frequency of specific weather events such as strong winds and frequent droughts. The company then combines the weather component with the fuel density as quantified by the LANDFIRE 2020 remap to identify locations that have a coincidence of frequent fire weather and abundant fuel to sustain large wildfires.

2. **Relevant terms**

LANDFIRE —The LANDFIRE program provides 20+ national geospatial layers (e.g., vegetation, fuel, disturbance, etc.), databases and ecological models that are available to the public for the United States and insular areas.

Module — Subsection of a circuit.

Zones of Protection — A ZOP is a module, i.e., subsection of a circuit with control, either programmatically, automatically or manually Figure 4.16 shows the ZOPs of a portion of a circuit beginning at the black dot, representing the substation's circuit breaker.

3. **Data elements**

This layer is the combination of HRRR weather data going back to 2016 and the LANDFIRE 2020 Fuel Characteristic Classification System Fuelbeds (FCCS) dataset.

4. **Modeling assumptions and limitations**

Climatology can generally be inferred with limited measured assets, i.e., weather stations; models can be used to gauge local climate patterns.

5. **Modeling methodology**

PacifiCorp uses a combination of weather stations and hourly 3-km data to obtain localized and accurate weather history (see Figure 4.11) at the ZOP level, such as hourly wind speed, wind gusts, precipitation, relative humidity and temperatures going back to 2016. This data is then used in the following methodology to determine

Contemporary Fire Weather Risk (also called Fire Weather Risk).

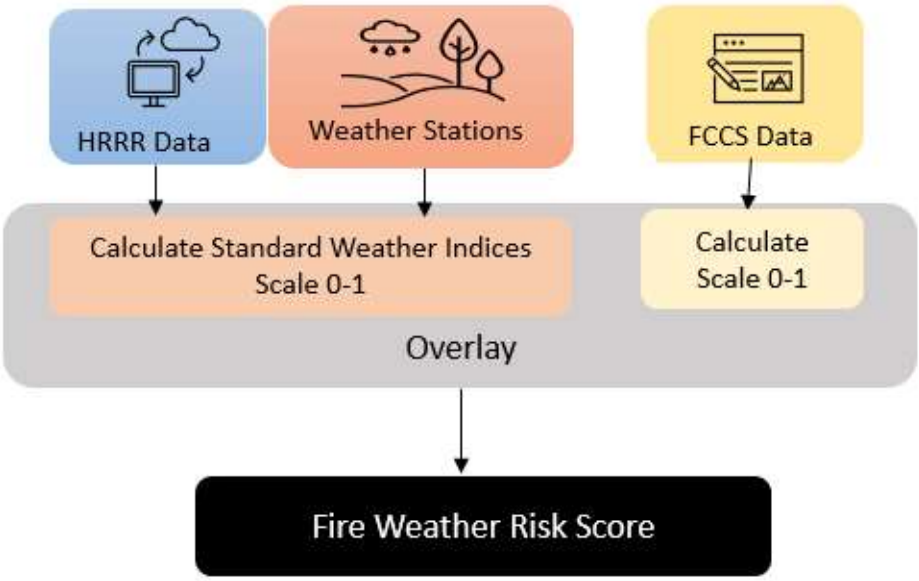

Figure 4.11 Fire weather risk

A step-by-step characterization of our methodology follows:

- Take the sum of the weather indices during the wildfire season at each location normalized by the number of years.
- Apply a min-max scaling to put the exposure measures onto the same 0-1 scale.
- Obtain fuel density measures by overlaying the ZOP shapefile over the Total Available Fuel sublayer from the FCCS and mapping it to a 0-1 scale.
- Combine the weather and fuel scores to get the final Fire Weather Risk Score using a simple linear combination of each subscore multiplied by its own respective coefficient shown as:

$$Fire\ Weather\ Risk\ Score = \sum_{i}^{Layers} x_i c_i$$

Where: x_i is the relative ranking between 0-1 for each sublayer and c_i is the respective chosen coefficient for each variable. After a few iterations we settled on the weather variables having a coefficient of 1 and the fuel component having a coefficient of 2 (weather variables carry 60% of the weight; fuel carries 40%).

6. **Model uncertainty**

   The data inputs to this model come from weather stations, and there can be uncertainty regarding the validity of that data. Therefore, weather station data is monitored by SMEs for anomalies and calibrated annually prior to wildfire season.

7. **Model verification and validation**

   Calibration using company and external weather sources to gauge local terrain impacts.

8. **Modeling frequency**

   The Fire Weather Risk layer is updated after each wildfire season is concluded. The metrics are calculated on a per year basis and used to identify trends across service territory as they emerge.

9. **Timeline for model development**

   This model was created in 2019 and is planned to be updated with 30yr WRF data in 2023.

10. **Application and results**

    The Fire Weather Risk Score can be used independently to identify ZOPs with a high frequency of fire weather coincident with dense fuel. Additionally, this Fire Weather Risk Score is a key element of LRAM (for more on LRAM, see Section 4.5.1.4 on page 81). The weather components of this risk score are a factor that is reviewed to determine the necessity of a PSPS event. Consequently, the Fire Weather Risk score can also be thought of as the relative frequency of weather conditions that necessitate a PSPS event.

11. **Key improvements from working group**

    In 2023, PacifiCorp plans to incorporate the 30-year WRF data described in Section 7.3.2.4 on page 163.

4.5.1.3 Available probabilistic arc energy risk model

1. **Purpose of model**

   The Available Probabilistic Arc Energy Risk model uses distribution system model simulations to arrive at arc energy values for studied locations. Higher arc energy from short-circuit events is associated with an increased risk of ignition. Arc energy is calculated from the available fault current (amps) and the time required for a

protective device to clear the fault event. Available fault current varies across the system due to circuit topology, length, and materials used. Line sections, and ultimately ZOPs and circuits, were scored based on arc energy values and line length (exposure). The score is a gauge of relative ignition risk and can identify locations where system improvements can be proposed to reduce said ignition risk.

2. Relevant terms

Arc flash analysis — Any of several engineering methods (IEEE 1584, NFPA-70E, CSA Z462, Lee Method, Wilkins Method) used to analyze electrical safety in power systems. The methods typically use heat transfer models, heat flux calculations and/or prescribed tables to assess risk level and help determine adequate safety procedures. A variety of parameters, including source impedance, equipment type, equipment location and clearing device are used to calculate total energy from an arc associated with a short circuit event.

CYME model — A software representation of a given power system, where simulations can be run to gain insight on system capability and behavior.

Load current — The current (Amperes) normally flowing through an energized power system to deliver power.

Protective device details — The applicable TCC curves for a protective device, together with logic-based settings.

Short circuit event — An occasion when one or more components of an electrical system contact one or more circuit return paths. Commonly used for arc flash analysis: a phase conductor contacting earth or system neutral. The result is typically a current value higher than load current.

Time current characteristic (TCC) — The specified relationship between applied current and operating time for a protective device such as a fuse, recloser or relay-controlled breaker. TCCs are often represented visually by curves for the purpose of studying device coordination, or for developing new settings. For example, a 100 Amp T-speed fuse will take more time to operate for a given current magnitude than will a 25 Amp T-speed fuse.

3. Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Comments
CYME v9.0 distribution system model	2020	Collected once in 2020, held constant throughout analysis	Lat/lon for each node in the model	Not used	The system model includes source, line and protective device details (type, material, ratings, settings, etc.).

4. **Modeling assumptions and limitations**

   Requires accurate conductor registry in TCC/arc flash models

5. **Modeling methodology**

   A pilot simulation evaluated short-circuit scenarios where 5 Ohms of impedance was assumed for all short-circuit events, and applied voltage at the low end of ANSI A range (95% nominal). These values were chosen to represent an event whose arc energy was reasonably high. Simulating voltage higher than 95% nominal, or with fault impedance lower than 5 Ohms, generally results in faster clearing times and may result in lower total arc energy. A higher impedance value would generally result in slower clearing times and might result in higher total arc energy. The pilot results used relative, not absolute, arc energy value for final scores.

   For each protective device, downstream overhead lines in its ZOP were evaluated for composite scoring by arc flash results and line length (See Figure 4.12 for a schematic of available probabilistic arc energy risk.). That score was also aggregated to the circuit level. The result is a metric that helps the company focus on arc energy high-risk areas for remediation, and that can be used as a component within a more comprehensive score that accounts for risk from other categories.

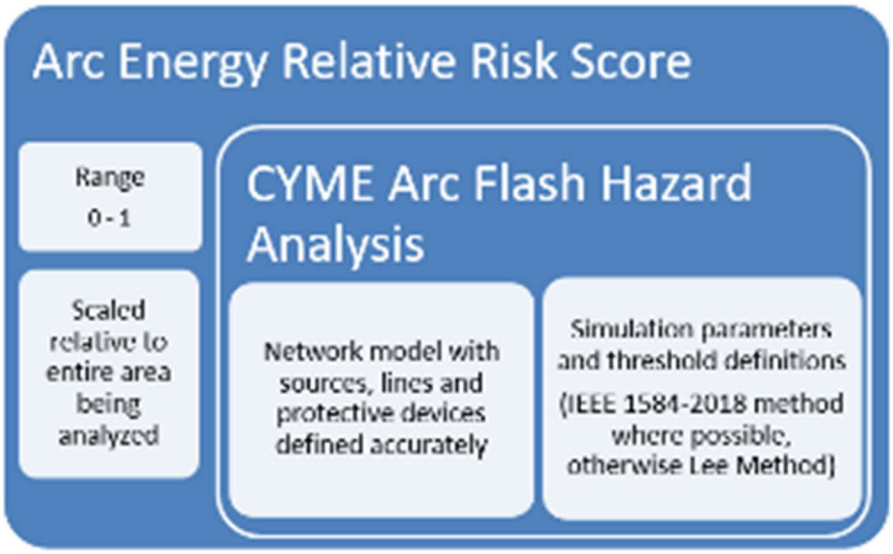

Figure 4.12 Available probabilistic arc energy risk

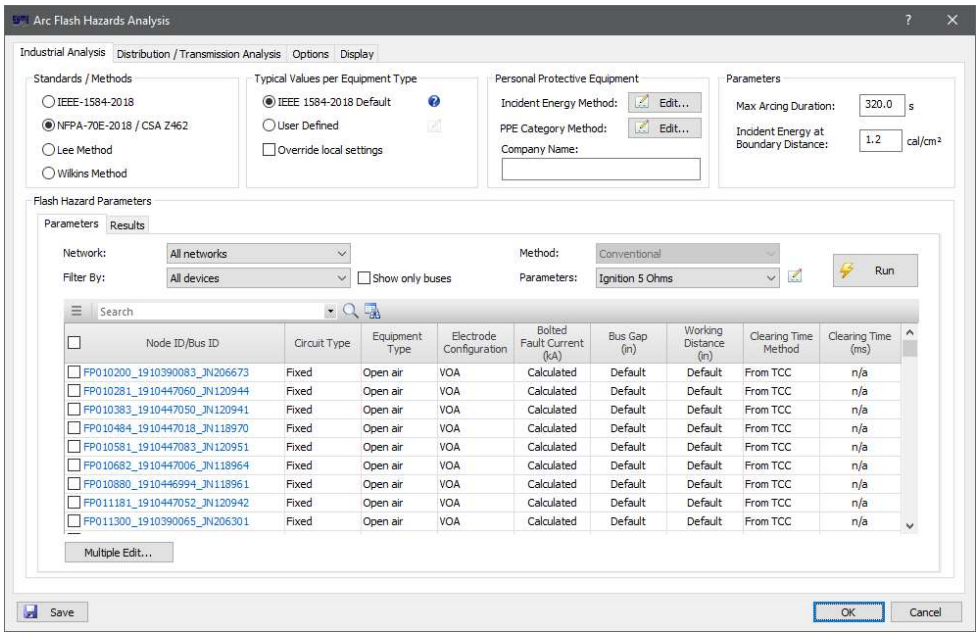

Figure 4.13 Example CYME arc flash analysis input

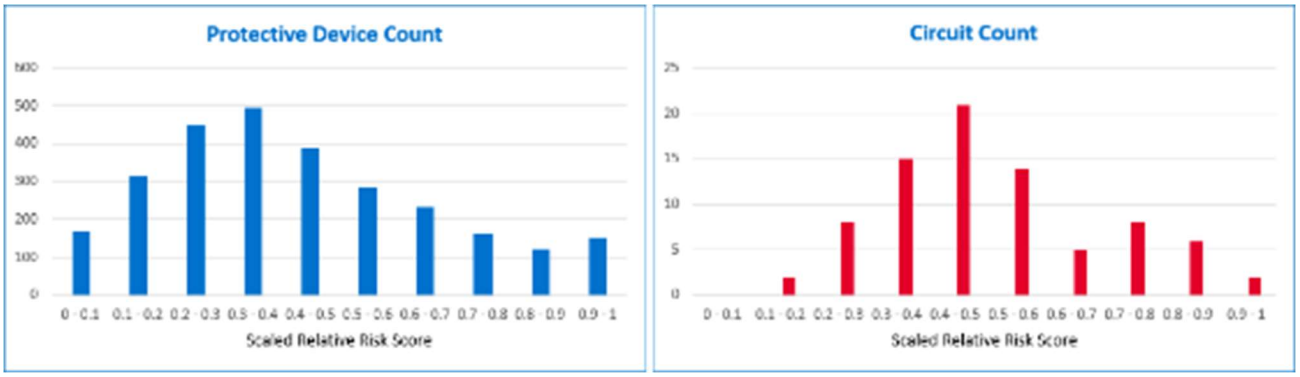

Figure 4.14 Summary of arc energy risk scores (scaled to the range 0-1)

6. Model uncertainty

One of the model's inputs is line equipment. There can be a small time gap after the device is installed and before the model has accounted for it. Hence the model is updated frequently.

7. Model verification and validation

Quality checked by central engineering SMEs.

8. Modeling frequency

Available inputs to the model are updated once per week.

9. **Timeline for model development**

PacifiCorp completed the pilot in PSPS areas described in the WMP. Based on a review of the pilot results and system records, certain equipment has been updated. PacifiCorp expanded the pilot to other HFTD during 2020, with long-term adoption intended over the next five years, including incorporation as a standard aspect of cyclical study processes.

10. **Application and results**

The pilot results identified locations where the potential fault (based on the similarity to modeled configurations) reflected a higher risk of damaged conductors or ignition. PacifiCorp used the modeling results to identify locations where there was a higher risk of ignition from a fault condition to support system network changes to preempt such a risk condition.

11. **Key improvements from working group**

Current improvements to CYME do not include any adjustments to the model framework described in this section. Improvements planned include data import and processing improvements to streamline processes.

4.5.1.4 Localized Risk Assessment Model

The LRAM is an overarching model structure that incorporates other models, as well as a set of inputs and outputs. A simple schematic of LRAM looks like this (Figure 4.15):

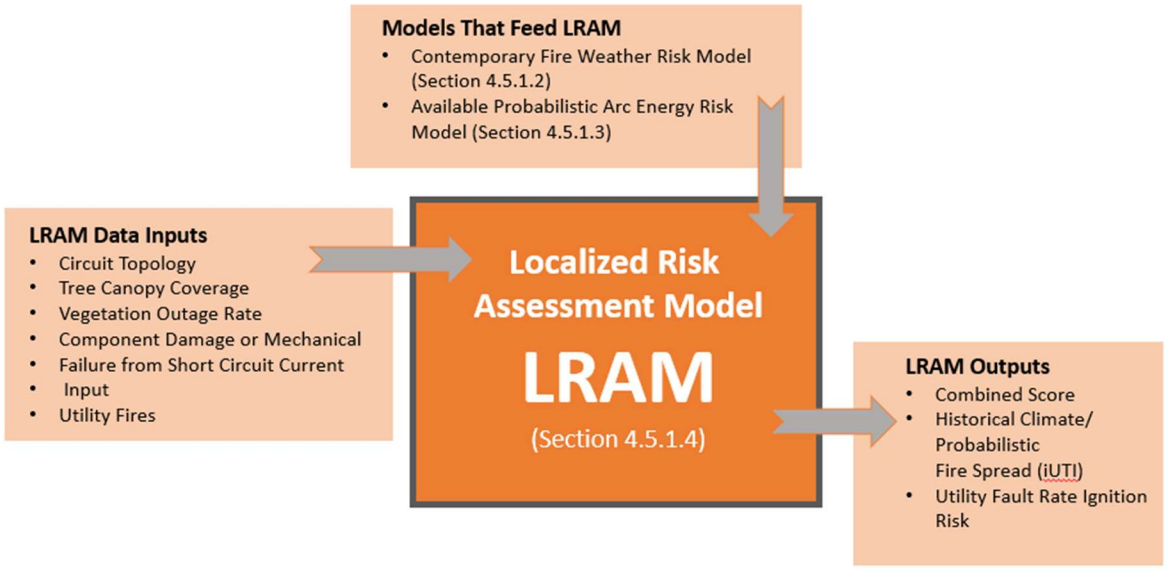

Figure 4.15 LRAM inputs and outputs

1. **Purpose of the model - model and metric calculation**

   From its 2020 Remedial Compliance Program (RCP) filing[10], the company outlined its road map for fire risk modeling, a deterministic method that relied on the HFTD in addition to company-developed climate risk drivers / historic fire risk and outage event analyses. That groundwork set the stage for model goals: establish a risk evaluation that could be utilized to scope Wildfire Mitigation initiatives and prioritize work based on potential for risk reduction.

2. **Relevant terms**

   13 Anderson Fire Behavior Fuel Model — These original 13 standard fire behavior fuel models serve as input to Rothermel's surface fire behavior and spread model. The model represents distinct distributions of fuel loading found among surface fuel components (live and dead), size classes, and fuel types. The fuel models are described by the most common fire-carrying fuel type (grass, brush, timber litter, or slash), loading and surface area-to-volume ratio by size class and component, fuelbed depth, and moisture of extinction.

   Arc flash analysis — Any of several engineering methods (IEEE 1584, NFPA-70E, CSA Z462, Lee Method, Wilkins Method) used to analyze electrical safety in power systems. The methods typically use heat transfer models, heat flux calculations and/or prescribed tables to assess risk level and help determine adequate safety procedures. A variety of parameters, including source impedance, equipment type, equipment location and clearing device are used to calculate total energy from an arc associated with a short-circuit event.

   Conductor damage — The material properties of overhead bare conductors include melting point, temperature coefficient, hardness and tensile strength. When performing engineering analysis on various sizes of copper, aluminum and steel conductors, these properties can be modeled in a 2D damage curve, where the axes are current and time (TCC). This curve can be used to show the duration in time that a conductor can sustain a given current without degradation of its material properties (softening, etc.). Beyond this duration, the conductor is said to have incurred damage.

   CYME model — A software representation of a given power system, where simulations can be run to gain insight on system capability and behavior.

[10] https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/WSD/R.18-10-007%20PacifiCorp%20Remedial%20Compliance%20Plan%20(7-27-20).pdf

Dispatch DoForm/Risk Save — An internal form created at the onset of a fire risk event.

ELMFire — Eulerian Level set Model of Fire spread - is an open-source geospatial model intended for simulating wildland fire.

High resolution rapid refresh (HRRR) — A NOAA, real-time 3-km resolved weather forecasting model updated hourly.

Load current — The current (Amperes) normally flowing through an energized power system to deliver power.

Point layer — GIS layer consisting of individual points with location information and vegetation attributes (point layer: raster data, gridded at 20 meters).

PowerMap — Company mapping system.

PROSPER — Outage record database.

Protective device details — The applicable TCC curves for a protective device, together with logic-based settings.

Short circuit event — An occasion when one or more components of an electrical system contact one or more circuit return paths. Commonly used for arc flash analysis: a phase conductor contacting earth or system neutral. The result is typically a current value higher than load current.

Source details — A numerical representation of impedance, typically at the head of a circuit or substation, of the upstream configuration and equivalent impedance to all connected current contributors (e.g., generation). A low impedance suggests that generation is relatively close and available fault current is relatively high.

Time current characteristic (TCC) — The specified relationship between applied current and operating time for a protective device such as a fuse, recloser or relay-controlled breaker. TCCs are often represented visually by curves for the purpose of studying device coordination, or for developing new settings. For example, a 100 Amp T-speed fuse will take more time to operate for a given current magnitude than will a 25 Amp T-speed fuse.

Zone of Protection (ZOP) — A ZOP is a module, i.e., subsection of a circuit with control, either programmatically, automatically or manually. Figure 4.16 shows the ZOPs of a portion of a circuit beginning at the black dot, representing the substation's circuit breaker. The ZOP is the smaller granule against which any location risk should be considered. Generally speaking, a ZOP goes from a protective device, like a circuit

breaker, to the next protective device(s), such as line recloser or a fuse. Integration of all risks, combined mathematically, using rationalized weighting factors provide rankings for each ZOP that can be used to prioritize efforts for wildfire mitigation actions.

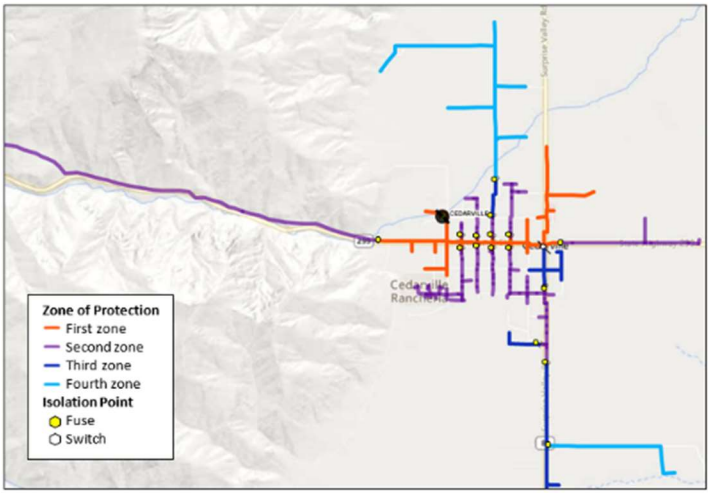

Figure 4.16 Example of a Zone of Protection

3. Data elements

Table 4.3 LRAM data elements

Data Element	Level of Granularity (a)	Frequency (b)	Data sources (c)	Data quality verification (d)	Data characteristics (e)	Data modification and/or future improvements (f)
Circuit Topology	Spatially, approximate 10' accuracy	Data is refreshed and maintained daily.	GIS Point and line features	Review by engineering team.	PacifiCorp base data containing spatial locations, facility and equipment details (e.g., conductor types, spacing, equipment). This data is managed and mapped by the GIS department, which updates records based on field personnel work orders. The data is used to apply model area findings to specific facilities.	Better locational precision; more hardware detail in GIS.
Contemporary Fire Weather Risk	See Section 4.5.1.2 on page 74					
Utility Fires	GPS accuracy from field resource	data records are reviewed monthly. The model initiation and development progress over time.	Dispatch log, PROSPER outage records, risk save event forms, equipment location and asset details, in addition to event response personnel details and environmental drivers at the time of the event.	Quality checked by risk, operations and engineering SMEs.	Data from dispatch logs, PROSPER outage records, risk save event forms, equipment location and asset details, event response personnel details and environmental drivers at the time of the event are combined to create a recorded dataset of utility-caused fires. A detailed data source review consolidates the data into a single source. Data location is based on GIS equipment location at the time of the incident. When reviewed with other fire-risk influencers, this information can help determine potential trends and will help to determine where addition system and equipment risks, which can drive facility locations upgrades and placements for protective equipment See Figure 4.20.	Centralized database with information augmented by risk event investigation team.
Available Arc Energy and Short Circuit Ignition Likelihood	See Section 4.5.1.3 on page 77.					

Data Element	Level of Granularity (a)	Frequency (b)	Data sources (c)	Data quality verification (d)	Data characteristics (e)	Data modification and/or future improvements (f)
Tree Canopy Coverage	30 m granularity	Data analysis will be refreshed based on updates to the NLCD Canopy Cover Layer (anticipated at 3 to 5-year intervals. Major changes to PacifiCorp asset locations would require a refresh in analysis.	NLCD Tree Canopy coverage and internal distribution GIS data. NLCD data has 30m2 resolution and extracted data layers maintain that resolution.	Comparison to historic vegetation outages and historic vegetation maintenance records.	A point layer created from distribution line GIS files with 30m spacing, clustered to avoid oversampling at line intersections. Data is extracted from the NLCD Tree Canopy Cover raster layer at each point, aggregated per circuit or subcircuit segment to provide distribution functions and statistical values for the tree canopy cover along each segment. Limitations from the NLCD data resolution and techniques result in lower accuracies in developed areas.	Augmenting NLCD cover data with higher resolution datasets in developed areas.
Historic Climate/ Probabilistic Fire Spread (iUTI)	30 m pixels rendered on circuit topology	Data analysis will be refreshed based on updates to LANDFIRE dataset. In addition, major changes to PacifiCorp asset locations would require a refresh in analysis.	LANDFIRE fuel data, 13 Anderson fuel models, weather re-analysis data.	Review by stakeholders/fire professionals.	Use of historic fire weather days to simulate current fire spread using random ignitions, modeling probability of spread with current vegetation and existing terrain. Randomly ignited cells model volume of acres burned from modeled ignitions accumulated for each 20 m grid. SMEs draw inferences re elevated areas, upon which iUTI was founded. This gridded raster dataset was overlaid on circuit ZOPs and length-weighted for the ZOP iUTI score.	Better integration of contemporary fuel situation; utility focus on ignitions rather than agnostic to source.

Data Element	Level of Granularity (a)	Frequency (b)	Data sources (c)	Data quality verification (d)	Data characteristics (e)	Data modification and/or future improvements (f)
Vegetation Outage Rate	Reconciles outage events to auto isolation point/ZOP; granularity in certain areas of model may not be particularly precise	Historic vegetation outages have been incorporated into the risk model in late 2020 and will continue to be updated periodically.	Historic outage records and circuit information.	Subject matter expertise.	Determined by counting the outages per ZOP and normalizing by length and time. The general framework is very flexible: an outage rate can be extracted for any outage type (car hit pole, animal contact, etc.) across all ZOPs. Vegetation outage frequencies normalized by line length have been incorporated into the risk model.	Reconciliation of tree canopy/vegetation performance would result in greater accuracy with causal relationship.
Utility Fault Rate Ignition Risk	Reconciles outage events to auto-isolation point/zones of protection; granularity in certain areas of model may not be particularly precise	Annually	The historical outage data is housed in PROSPER and joined with additional facility and asset data.	Quality checked by central engineering SMEs.	Data provides areas of concern and hot spots when historical events occurred as broken down by cause category. This models high risk outage areas and helps with prioritization. All records are reviewed based on the company's process for recording and categorizing outage events. The data for qualifying events is correlated and analyzed consistent with methods developed in response to the CPUC's Wildfire Safety Division's Wildfire Mitigation Plan Template requirements. Outage causes are captured to support segmentation. Certain unrecorded equipment type may be inferred. Changes in circuit topology and environmental impacts can yield substantially different incident rates. Submodule changes can result in substantial variations in ignition risk over time and may not be easily back-cast for comparison purposes, see Figure 4.17.	Finer detail on locations of damaged equipment when risk events occur, i.e., which span was the location at which vegetation contact occurred?
Component Damage or Mechanical Failure from Short Circuit Current	Device clearing time analysis overlaid on circuit topology	PacifiCorp completed the pilot CYME analysis for bare overhead	CYME v9.0 distribution system model, collected in 2020 and held constant throughout	Quality checked by local engineering SMEs.	Identify distribution system components where high current flow and/or heat from a short circuit event is predicted to damage overhead components based on simulation results. The metric will initially be associated with spans of overhead conductor and their protective devices. Simulations will be performed, at least, in CYME.	Cyclic process to validate modeling and performance as part of annual readiness check.

Data Element	Level of Granularity (a)	Frequency (b)	Data sources (c)	Data quality verification (d)	Data characteristics (e)	Data modification and/or future improvements (f)
		conductors in its California service territory in 2021. The yes/no output is not expected to be combined directly with other measures for composite risk scoring but may be used to prioritize improvements related to the composite scores. Over the next five years the conductor analysis is intended to be incorporated as a standard aspect of cyclical study processes in California.	the analysis. With a spatial granularity of Lat/long for each node in the module. This system model includes source, line and protective device details		Available short circuit current magnitude can be estimated by CYME as can time for a device to clear a given fault. The pilot simulation evaluated short circuit scenarios where 10 Ohms of impedance was assumed for all short circuit events, and applied voltage at the high end of ANIS A range (105% nominal). These parameters were found to better represent worst case damage than the 95% nominal voltage scenario. This metric will be measured as a simple yes or no – is the component likely to sustain damage from the fault events studied? Mitigation will be pursued for areas where the result is "yes." See Figure 4.18.	

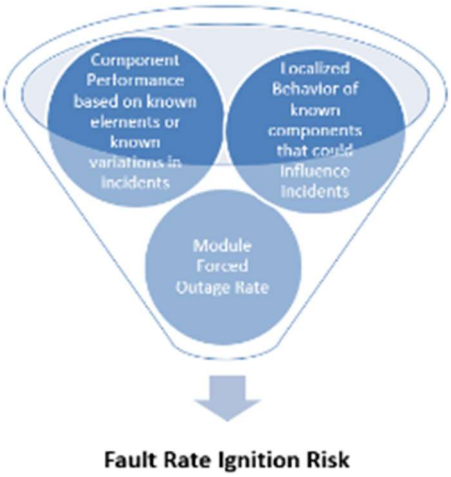

Figure 4.17 Fault rate ignition risk process

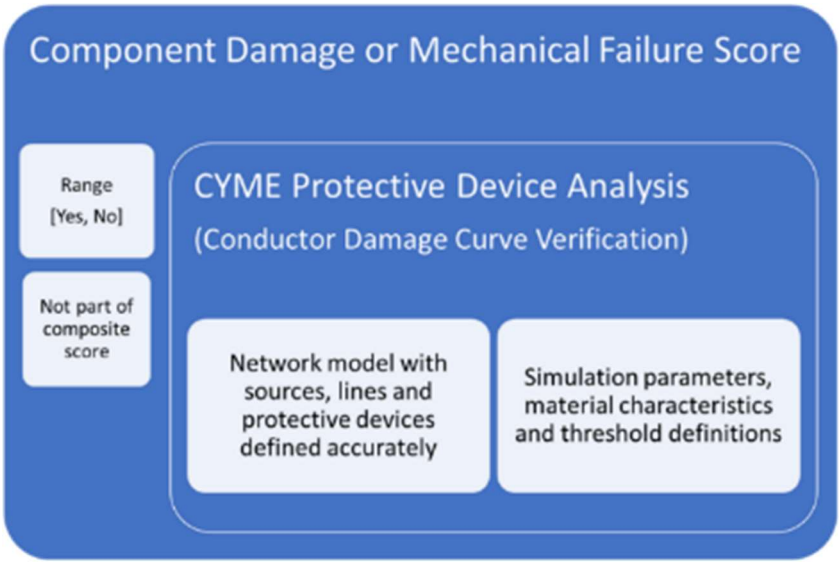

Figure 4.18 Component damage or mechanical failure from short circuit current methodology

4. Modeling assumptions and limitations

General LRAM modeling assumptions and limitations

- The model is not dynamic, it's static and continuously being updated.
- It does not incorporate recent weather, only looks at historical weather trends over time.

- It is based on the number of customers, not on property/property value which better ensures customer equity.

Input/Output element-specific assumptions and limitations

- Circuit topology — Conductor types, spacing, etc. are accurate.
- Historic climate/ probabilistic fire spread (iUTI) — Locations where climate has favored fire spread will continue to favor fire spread.
- Tree canopy coverage — Position errors are random and can be removed through statistical sampling. Techniques used by the NLCD base layer are consistent and accurate. Higher tree canopy density correlates to more trees and more risk.
- Vegetation outage rate — Outages with reference to outages (whether by sustaining or contributory causes) may not be as accurate as ideal; weather-influenced outages may mistake vegetation impactions.
- Utility fault rate ignition risk — Historic fault rates and locations have relationship to future risk events; circuit topology from year to year is relatively stable to enable translating history forward onto zonal expectations.
- Component damage or mechanical failure from short circuit current — Requires accurate source and conductor representation in Protective Device Analysis models.
- Utility fires — Requires manual reporting processes instituted since 2019.

5. Modeling methodology including detailed construct of the model elements

The LRAM modeling uses a combination of input layers, which provide a combined risk score at a ZOP level. The construct of the model and the ancillary data layers are detailed in Figure 4.19, as is the cycle for routine update and reassessment of model elements. Should any model elements fail their quality tests (each of which is separately identified), they would be appraised for alternate methods to incorporate the fundamental attributes they provide to the model output, and any substitution will be reported in future WMPs. Further, should additional data layers be identified and incorporated into wildfire risk assessment, the model elements for that layer will be outlined and model validation methods identified.

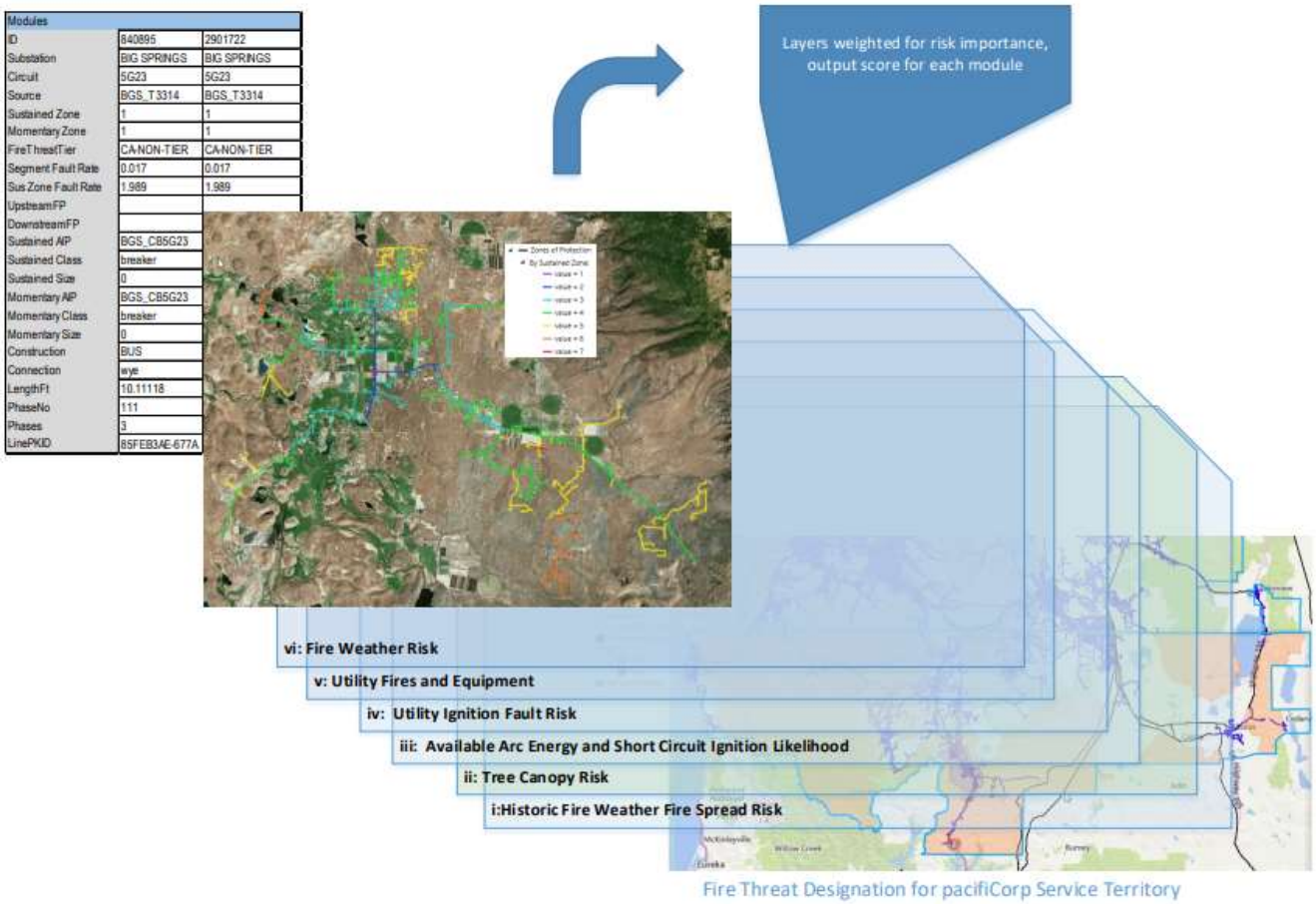

Figure 4.19 LRAM input layers

The combination of all layers if what PacifiCorp refers to as a composite "combined score," to reflect the total risk of a utility-related ignition occurring because of a ZOP fault. The combined score helps PacifiCorp target mitigation programs to the highest risk portions of PacifiCorp's grid. A variety of related factors mean that a higher combined score may not mean that a higher-scoring module will receive priority over a lower-risk-scored module. For example, it might not make sense to prioritize a module for certain types of mitigation in one year if the same module was scheduled for conversion to covered conductor in the following year.

Additionally, the combined score can be combined with a PSPS impact layer. Each module's relative PSPS impact is considered separately in terms of downstream customer counts (DCC). Factors in a DCC risk assessment include impacts of module de-energization on:

- Total number of customers impacted
- The number/type of critical facilities, including an assessment of backup generation capabilities

- The number/type of AFN customers, including an assessment of backup generation capabilities
- The economic impact to commercial customers

In each case, the number of customers is the sum of those customers directly served by the module as well as all downstream customers.

The PSPS impact layer reflects community impacts and helps PacifiCorp prioritize mitigation efforts. Mitigation activities that reduce the wildfire risk associated with a module can justify strategies to minimize the module's PSPS impact by either reducing PSPS likelihood or eliminating the module from PSPS consideration. Consequently, PacifiCorp's fire risk modeling strategy serves as a refreshable, quantifiable foundation for multiple fire-risk influencers within any ZOP.

6. LRAM uncertainty

PacifiCorp does not have the large history data set for outages and ignitions. The history is key to reducing the margin of error in any calculations related to risk reduction evaluations.

As the company can add more projects, time and operating experience it expects to improve these estimates.

7. LRAM verification and validation

Upon completion of the detailed LRAM framework the company conducted stress testing for the weight of each input. It chose "boundary condition" locations, specifically circuits within three areas it served having various fuel, fire weather, equipment characteristics and outage rates and performed comparisons of the model results. The company determined that only the Probabilistic Arc Energy should be weighed at a lower value because utility adjustments to arc energy are responses to relatively low frequency fault events; giving them equal weight with fire weather and fuel improperly tips the scale.

Evolution of the model toward S-MAP and RAMP products such as RSE. PacifiCorp intends to leverage the LRAM to deliver mitigation quantification to produce risk spend efficiencies.

As the company has responded to the deficiencies noted by the OEIS, it outlined the need to demonstrate the application of its LRAM to 1) reconcile its network's fire risk against the currently designated HFTD, 2) to evaluate and amend priorities for mitigation efforts currently on its multi-year plan, 3) to ensure that mitigations were properly aligned for any fire risks the model might detect, 4) to select the logical extent to which mitigation is conducted throughout its network, 5) to quantify the potential

impacts to customers served from portions of the network with elevated fire risk, 6) to evaluate credible impacts from climate change, and 7) to estimate the changes in fire risk as its mitigations are completed. Certain of these areas are still under development (such as future ignition risks as mitigations are completed), however many are now complete and detailed below.

1) Reconciling HFTD Tier with final score

In Figure 4.20 the company displays material applying its LRAM results at the ZOP and aggregated to the circuit served to broadly categorize the ranges of combined scores currently designated as Tier 3, Tier 2 and Non-Tier. This is displayed through a histogram of the final combined risk score for each ZOP and colored by its HFTD tier designation. The distribution of scores contrasted to the tier designation enables identification of locations that should either be moved from Non-tier to Tier 2 or Tier 2 locations to Tier 3. Using the histogram, the company evaluated the combined score threshold and observed that combined scores of below 0.55 separates Non-Tier and above 0.70 separates Tier 3 from Tier 2.

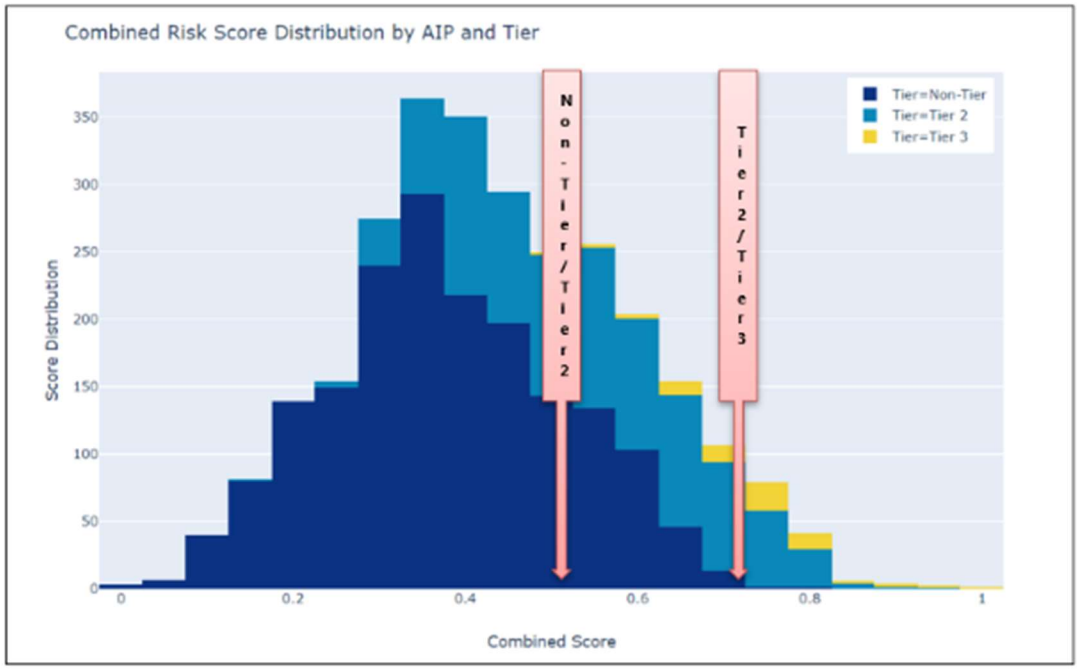

Figure 4.20 Distribution of the Combined Risk Score among the ZOP in California
The two arrows demonstrate where we see choose risk boundaries between Non-Tier/Tier 1 and Tier 1/Tier 2

2) Comparing to prioritization efforts

The next order of model usage focuses on the assessment and modification, where appropriate, of circuit priorities. Originally, the company used the HFTD Tier designation and the customer impacts from PSPS as criteria to establish mitigation

priorities. With LRAM, PacifiCorp can calibrate mitigation priorities at a finer level and with more risk elements consideration. Now each ZOP and circuit has a combined fire risk and PacifiCorp can begin to systematically prioritize future grid upgrades relative to those high-risk areas, particularly with respect to the use of covered conductor.

3) Circuitwide versus targeted efforts

LRAM also allows for evaluating specific ZOPs within circuits, particularly those outside the HFTD, but of substantial combined risk level to warrant targeted mitigation efforts. These specific ZOP, regardless of HFTD classification are shown in Figure 4.21. Each circuit is represented by a data series on the x-axis and the combined score for each ZOP is on the y-axis with every point representing a specific ZOP (colored by tier). While often the combined score may be appraised at the circuit level as a single unit, the graphic below allows for each circuit's ZOPs to be evaluated for their range of combined risk. Circuits with wide variations are candidates for zonal corrections, while those circuits with generally high zones are best addressed as a combined unit for fire risk mitigation.

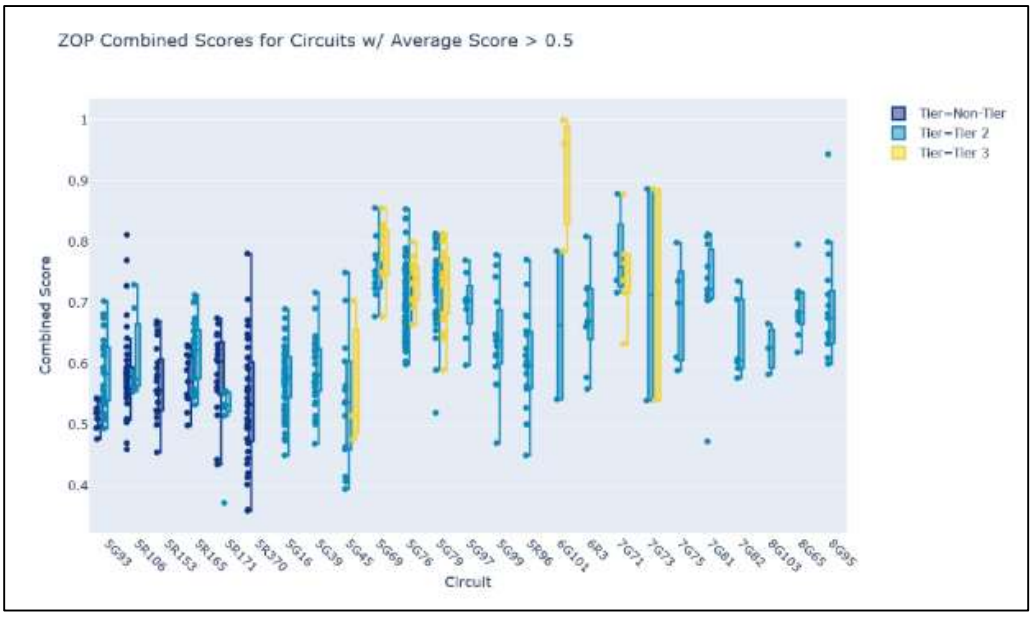

Figure 4.21 Box plot for the combined score of each circuit
colored by HFTD designation
where each point is the score for a specific ZOP

Circuits with a relatively low combined risk score, with outlier ZOP, highlight the necessity for targeted alternative mitigation techniques that are often part of the company's general reliability planning, including protective device coordination, equipment inspection, vegetation inspection, etc.

The tables below identify the extensive methodologies, programs, and techniques PacifiCorp uses to mitigate ignition risks.

Table 4.4 Identified methodologies, programs, and techniques PacifiCorp uses to mitigate ignition risks by fault response

Ignition Risk Driver		Fault Response							
		Coordinate protective equipment	Replace legacy protective equipment	Additional protective equipment	Current Limiting Fusing / Devices	Incipient Fault Detection	Fault Detection Enhancement	Fault Investigation	Proactive or Quickly Reactive Fault Response
Model or Legacy Risk Driver		**Arc Energy/Conductor Damage**							
Contact from object	Animal contact	x		x	x	x		x	
	Balloon contact	x		x	x	x		x	
	Other	x		x	x	x	x	x	
	Unknown	x		x			x		x
	Veg. contact	x	x	x	x	x		x	
	Vehicle contact	x		x			x		
Contamination		x	x		x	x	x	x	x
Equipment / Facility failure	Conductor	x	x		x			x	
	Crossarm					x	x	x	x
	Fuse	x	x		x	x		x	x
	Insulator					x		x	x
	Lightning arrestor					x		x	
	Other					x			
	Pole					x	x	x	x
	Sectionalizer	x	x		x	x		x	x
	Connectors					x		x	x
	Switch					x		x	
	Transformer								
	Voltage regulator					x		x	x
Normal Operation		x	x	x	x	x			
Other		x	x		x	x			
Unknown		x	x		x	x			
Vandalism/Theft									
Wire-to-wire contact		x		x				x	
Contact from 3rd party								x	

Table 4.5 Identified methodologies, programs, and techniques PacifiCorp uses to mitigate ignition risks by inspection maintenance and vegetation management

Ignition Risk Driver		Inspection/Maintenance					Vegetation Management				
		Reliability-Centered Inspection & Correction	Leakage Current Monitoring Pilot	RF/IR/ Resistance Detection of Connectors	Enhanced Inspection	Legacy Equipment Replacement	Vegetation Management	EVM	Radial Pole Clearing	Targeted Tree Removal	Veg Patrols
Model or Legacy Risk Driver		**Equipment Failure**					**Vegetation/Equipment Failure**				
Contact from object	Animal contact								x		
	Balloon contact								x		
	Other								x		
	Unknown	x		x	x	x			x		
	Veg. contact					x	x	x	x	x	x
	Vehicle contact								x		
Contamination		x	x	x	x	x			x		
Equipment / Facility failure	Conductor	x			x	x					
	Crossarm	x		x							
	Fuse	x	x		x	x			x		
	Insulator	x		x		x			x		
	Lightning arrestor		x			x					
	Other										
	Pole	x		x	x						
	Sectionalizer					x					
	Connectors	x			x	x			x		
	Switch	x				x					
	Transformer										
	Voltage regulator										
Normal Operation						x	x	x			
Other						x	x	x			
Unknown						x	x	x	x		
Vandalism/Theft											
Wire-to-wire contact						x					
Contact from 3rd party											

Table 4.6 Identified methodologies, programs, and techniques PacifiCorp uses to mitigate ignition risks by asset hardening

Ignition Risk Driver		Asset Hardening														
		Covered Conductor	Underground Conversion	Enhance theft / vandalism resilience	Neutral Extension / Grounding System	Enhance Insulation (BIL)	Pole relocation	Visibility enhancement	Pole protection	Animal guarding	Spread construction	Create Animal Habitat/Bird Poles	Interset Structures	Midspan spacers	Contractor & Public Education	Damage Prevention Programs
Model or Legacy Risk Driver		**Gust/Fire Weather/General Outage**						**Vehicle Contact**		**Animal Contact**			**Wire to Wire Contact**		**Third Party Interference**	
Contact from **object**	Animal contact	x	x			x				x	x					
	Balloon contact	x	x								x					
	Other	x	x													
	Unknown	x	x			x										
	Veg. contact	x	x									x	x	x		
	Vehicle contact	x	x				x	x	x						x	x
Contamination		x				x					x					x
Equipment / Facility failure	Conductor	x	x									x	x	x		x
	Crossarm	x				x			x						x	x
	Fuse					x										x
	Insulator					x										x
	Lightning arrestor															x
	Other															x
	Pole	x				x			x						x	x
	Sectionalizer															x
	Connectors															x
	Switch															x
	Transformer															x
	Voltage regulator															x
Normal Operation		x	x		x			x								x
Other		x	x		x			x								
Unknown		x	x		x			x								
Vandalism/Theft		x	x	x											x	
Wire-to-wire contact		x	x			x	x				x	x	x	x	x	
Contact from 3rd party		x													x	x

8. LRAM modeling frequency

Each of the data elements that make up LRAM have their own frequencies. These are most simply explained in Table 4.3 but are re-presented here:

Circuit topology — Data is refreshed and maintained daily.

Historic climate/ probabilistic fire spread (iUTI) — Data analysis will be refreshed based on updates to LANDFIRE dataset. In addition, major changes to PacifiCorp asset locations would require a refresh in analysis.

Tree canopy coverage — Data analysis will be refreshed based on updates to the NLCD Canopy Cover Layer, which is anticipated at three to five-year intervals.

Vegetation outage rate — Periodic updates.

Utility fault rate ignition risk — Annually.

Utility fires — Data records are reviewed monthly.

9. LRAM timeline for model development

PacifiCorp expects to continuously improve the LRAM as the individual layers are updated or new layers are added. The company will also archive and evaluate the model annually — updating all the layers at that time. The annual reevaluation also establishes a baseline. The company plans to compare future to archived LRAM scores. This current-versus-future comparison illuminates model and network improvements and enables quantification of grid modernization efforts on utility risks for specific elements such as outage rates (risk events), arc energy calculations, and utility-caused ignitions. The annual baseline will also allow long-term climate monitoring (measured through the weather components of the Fire Weather Risk Layer). The company will then be able to combine these identified climate trends with California's 4th Climate Change Assessment for an informed view of the macro climate trends in PacifiCorp's service territory, which will support effective planning and prioritization.

Risk Modeling Refresh Process	
Annually	Evaluate the risk influencers to be quantified for the upcoming period
Annually	Develop the method for calculating the influencer for each risk influencer
Annually	Establish weighting for each influencer relative to some identified objective
Annually	Calculate module scoring for the combined influencers
Annually	Stress test the results against objective criteria
Annually	Modify calculation or weighting as necessary
Annually	Finalize the rating/ranking for each module
Annually	Compare against prioritization efforts for WMP, including PSPS operations
Annually	Modify prioritization where appropriate
Annually	Communicate the results of the risk scoring method
Annually	Archive results with appropriate version details
Ongoing	Review other risk influencers for inclusion in future assessment periods

Figure 4.22 LRAM annual refresh process summary

10. LRAM application and results

The LRAM application and results are best understood on a data element basis. The application and results for each of the nine data elements are described below:

Circuit topology — The data is used to apply model area findings to specific facilities.

Historic climate/ probabilistic fire spread (iUTI) — Historic fire spread, as a proxy for long-term fire spread risk has been integrated into the model.

Tree canopy coverage — The tree canopy coverage layer has been integrated into the fire risk model. The model results have also been incorporated into vegetation trimming cost forecasts. Layer validation efforts compared coverage to historic vegetation outages and historic vegetation maintenance records. These showed weak, but non-negligible, correlations. Limitations from the NLCD data resolution and techniques result in lower accuracies in developed areas.

Vegetation outage rate — Vegetation outage frequencies normalized by line length have been incorporated into the risk model.

Utility fault rate ignition risk — This dataset forms the basis for module fault rate/outage type/component factors. Implement wildfire mitigation strategy in areas where outage history, causes and equipment result in elevated outage ignition risks and shown in the below graphic.

Component damage or mechanical failure from short circuit current — The results of the pilot were used to identify locations where the potential fault (based on the similarity to modeled configurations) created a risk of damaged bare overhead

conductor. Use of this information allows for system network changes to preempt such a risk condition.

Utility fires — Implement wildfire mitigation strategy in areas where at risk equipment exists. The information can be used to determine any trends which may occur when analyzed with additional fire risk influencers. This data will help to determine where addition system and equipment risk exist to drive facility locations upgrades and placements for protective equipment.

11. LRAM key improvements from the working group

LRAM includes inputs from company utility ignition history. The history is used as a flag for the ZOP. The company is evaluating how to extend this limited dataset. Any new risks, layers, and model modifications will be reported in future WMP updates.

As noted previously, the company intends to extend the LRAM to calculate risk spend efficiencies. Using the methodology for assessment of risk event reduction, noted above, and with developed ignition probabilities, the company will be positioned to calculate the effectiveness of its mitigation measures, while it continues to refine costs of mitigation measures, which serve as a direct input also to the calculations. PacifiCorp will also look to leverage Technosylva's WRRM model to expand upon existing capabilities of LRAM and further evaluate RSE and long-term planning.

Additionally, as the requirements of the SMJUs evolve, the company anticipates integrating categorical risks from assets, as was provided in its 2018 general rate case (GRC) and further described in the 2023 GRC.

Key improvements for LRAM can also be understood on a data element basis. The key improvements for each of the nine data elements are described below:

Circuit topology — Better locational precision; more hardware detail in GIS.

Historic climate/ probabilistic fire spread (iUTI) — Better integration of contemporary fuel situation; utility focus on ignitions rather than agnostic to source.

Tree canopy coverage — Augmenting NLCD cover data with higher resolution datasets in developed areas.

Vegetation outage rate — Reconciliation of tree canopy/vegetation performance would result in greater accuracy with causal relationship.

Utility fault rate ignition risk — Finer detail on locations of damaged equipment when risk events occur, i.e., which span was the location at which vegetation contact occurred?

Component damage or mechanical failure from short circuit current — Cyclic process to validate modeling and performance as part of annual readiness check.

Utility fires — Centralized database with information augmented by risk event investigation team.

4.5.2 Calculation of key metrics

Report details on the calculation of the metrics below. For each metric, a standard definition is provided with statute cited where relevant. The utility must follow the definition provided and detail the procedure they used to calculate the metric values aligned with these definitions. The utility must cite all data sources used in calculating the metrics below. In addition, the utility must include GIS layers showing Red Flag Warning (RFW) frequency and High Wind Warning (HWW) frequency (use data from the previous 5 years, 2016-2021), as well as GIS layers for distribution of Access Functional Need (AFN) customers, and urban/rural/highly rural customers, and disadvantaged communities[11] in its service territory.

1. ***Red Flag Warning overhead circuit mile days*** *– Detail the steps to calculate the annual number of red flag warning (RFW) overhead (OH) circuit mile days. Calculate as the number of circuit miles that are under an RFW multiplied by the number of days those miles are under said RFW. Refer to the NWS Red Flag Warnings. For historical NWS RFW data, refer to the Iowa State University archive of NWS watch / warnings.[12] Detail the steps used to determine if an overhead circuit mile is under an RFW, providing an example of how the RFW OH circuit mile days are calculated for a RFW that occurred within the utility service territory over the last five years.*

2. ***High Wind Warning overhead circuit mile days*** *– Detail the steps used to calculate the annual number of High Wind Warning (HWW) overhead circuit mile days. Calculate as the number of OH circuit miles that are under an HWW multiplied by the number of days those miles are under said HWW. Refer to High Wind Warnings as issued by the NWS. For historical NWS data, refer to the Iowa State University archive of NWS watch / warnings.[13] Detail the steps used to determine if an OH circuit mile is under an HWW, providing an example of how the OH HWW circuit mile days are calculated for a HWW that occurred within the utility service territory over the last five years.*

3. ***Access and Functional Needs population*** *– Detail the steps to calculate the annual number of customers that are considered part of the Access and Functional Needs (AFN) population. Defined in Government Code § 8593.3 and D.19-05-042 as individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking,[14] older adults,*

[11] Energy Safety recommends using CalEnviroScreen and Senate Bill 535 to identify disadvantaged communities.
[12] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml
[13] https://mesonet.agron.iastate.edu/request/gis/watchwarn.
[14] Guidance on calculating number of households with limited or no English proficiency can be found in D.20-04-003

children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant.

4. ***Wildland-Urban Interface*** *– Detail the steps to calculate the annual number of circuit miles and customers in wildland-urban interface (WUI) territory. WUI is defined as the area where houses exist at more than 1 housing unit per 40 acres and (1) wildland vegetation covers more than 50% of the land area (intermix WUI) or (2) wildland vegetation covers less than 50% of the land area, but a large area (over 1,235 acres) covered with more than 75% wildland vegetation is within 1.5 mi (interface WUI) (Radeloff et al, 2005).*[15]

5. ***Urban, rural, and highly rural*** *– Detail the steps for calculating the number of customers and circuit miles in utility territory that are in highly rural, rural, and urban regions for each year. Use the following definitions for classifying an area highly rural/rural/urban (also referenced in glossary):*

   a. *Highly rural – In accordance with 38 CFR 17.701, "highly rural" must be defined as those areas with a population of less than 7 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" must be defined as census tracts.*

   b. *Rural – In accordance with GO 165, "rural" must be defined as those areas with a population of less than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" must be defined as census tracts.*

   c. *Urban – In accordance with GO 165, "urban" must be defined as those areas with a population of more than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" must be defined as census tracts.*

Population density numbers are calculated using the American Community Survey (ACS) 1-year estimates on population density by census tract for each corresponding year (2016 ACS 1-year estimate for 2016 metrics, 2017 ACS 1-year estimate for 2017 metrics, etc.). For years with no ACS 1-year estimate available, use the 1-year estimate immediately before the missing year (e.g., use 2019 estimate if 2020 estimate is not yet published, etc.)

12.Key metric: Red Flag Warnings

First the shapefiles for the Red Flag Warnings (RFW) are obtained from the Iowa State University archive of NWS watches and warnings, see example in Figure 4.23. Next an intersection between the distribution and transmission assets in California and Tier 2, Tier 3, Zone 1 and non-HFTD boundaries. Then, for each RFW and HFTD

[15] Paper can be found here - https://www.fs.fed.us/pnw/pubs/journals/pnw_2005_radeloff001.pdf with the latest WUI map (form 2010) found here - http://silvis.forest.wisc.edu/data/wui-change/

combination and designation the sum of the line lengths within the affected area are calculated for each warning's duration. Finally, the duration and the length of lines within each warning are multiplied to calculate the mile-days metric. These results were summarized in Figure 4.23.

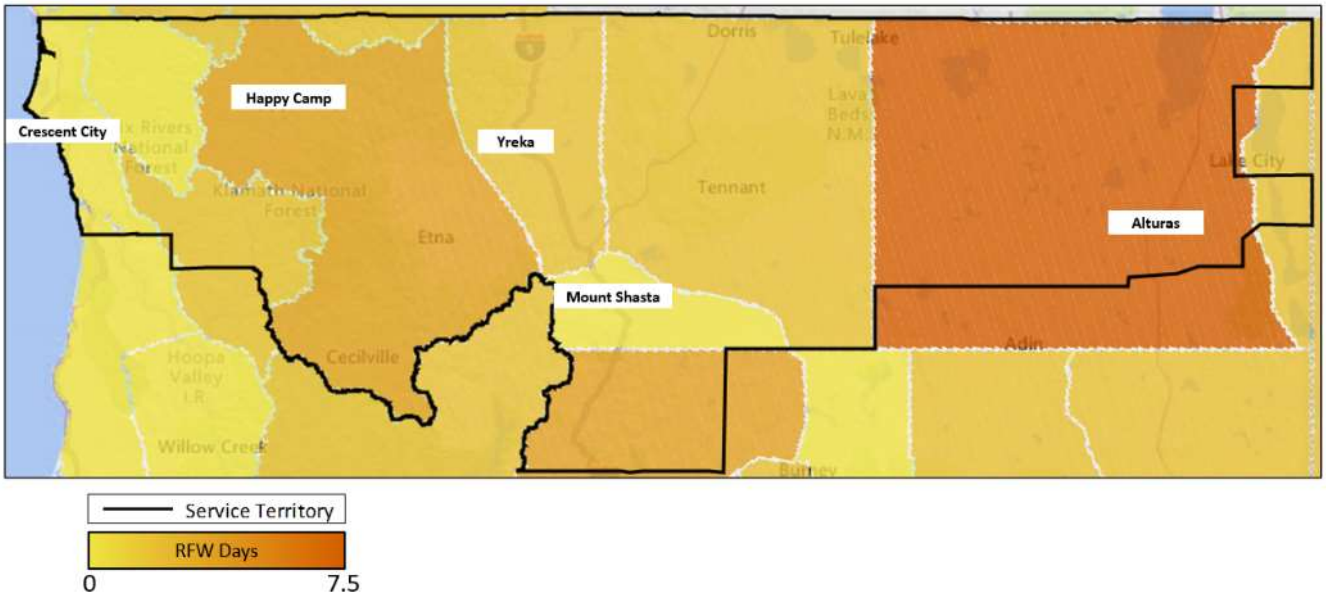

Figure 4.23 Red Flag Warning days, example

1. **Key metric: High Wind Warnings overhead circuit mile days**

First the shapefiles for the High Wind Warnings (HWW) are obtained from the Iowa State University archive of NWS watches and warnings, see example in Figure 4.24. Next an intersection between the distribution and transmission assets in California and Tier 2, Tier 3, Zone 1 and non-HFTD boundaries. Then, for each HWW and HFTD combination and designation the sum of the line lengths within the affected area are calculated for each warning's duration. Finally, the duration and the length of lines within each warning are multiplied to calculate the mile-days metric. These results were summarized. A GIS layer of this metric is attached as GIS Attachment 1 – HWW.

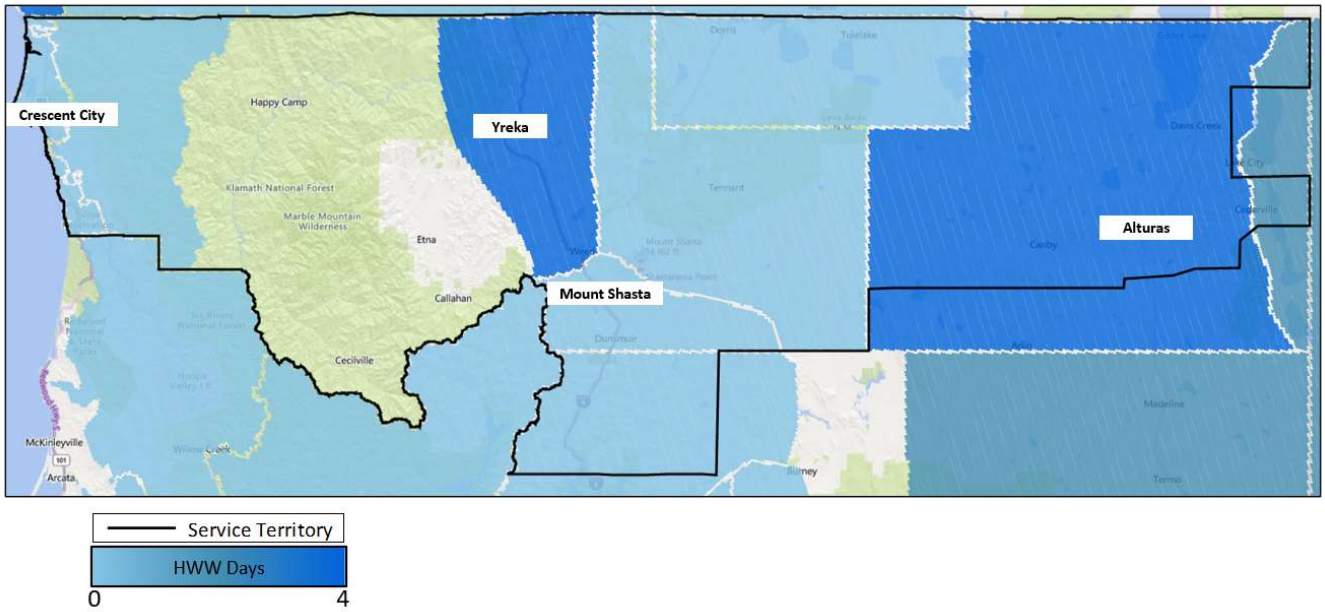

Figure 4.24 High Wind Warning days, example

2. Key metric: Access and Functional Needs population

In the 2022 Annual Access and Functional Needs Plan of PacifiCorp published on February 1, 2021, PacifiCorp fully defines the AFN metric and group:

> Leveraging *the FEMA Comprehensive Preparedness Guide 6 Step Process PacifiCorp along with the IOUs and SMJUs partnered collaboratively with the AFN Core Planning Team and have worked to engage the whole community and develop an overarching Statewide approach that meet the diverse needs of the individuals with AFN. Access and Functional Needs is defined by the California Government Code §8593.3 as: "individuals who have developmental disabilities, physical disabilities, chronic conditions, injuries, limited English proficiencies, who are non-English speakers, older adults, children, people living in institutional settings, or those who are low income, homeless, or transportation disadvantaged, including but not limited to, those who are dependent on public transit and those who are pregnant*.

PacifiCorp has provided the following map, Figure 4.25, of customers who meet the aforementioned criteria and have applied to the program.

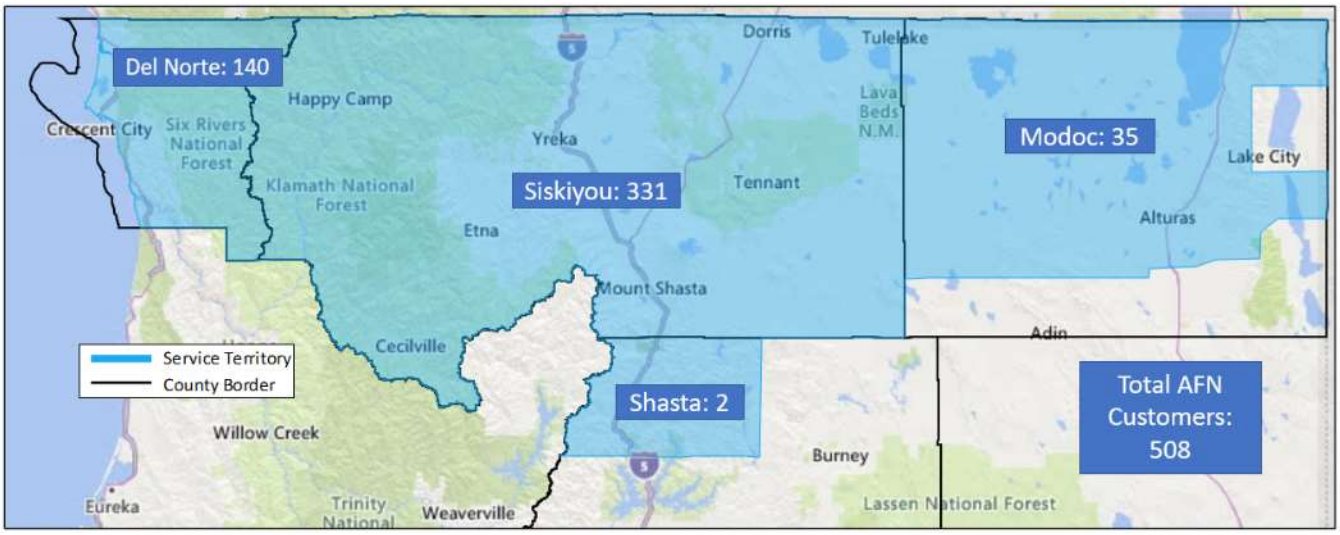

Figure 4.25 Access and Functional Needs population

3. **Key metric: Wildland-Urban Interface**

WUI is defined as the area where houses exist at more than one housing unit per 40 acres and where (1) wildland vegetation covers more than 50% of the land area (intermix WUI), or (2) wildland vegetation covers less than 50% of the land area, but a large area (over 1,235acres) covered with more than 75% wildland vegetation is within 1.5 mi (interface WUI) (Radeloff et al, 2005).[16]

4. **Key metric: Urban, rural, and highly rural**

- Highly rural – In accordance with 38 CFR 17.701, “highly rural” is defined as those areas with a population of less than seven persons per square mile as determined by the U.S. Bureau of the Census. For the purposes of the WMP, “area” must be defined as census tracts.

- Rural – In accordance with GO 165, "rural" must be defined as those areas with a population of less than 1,000 persons per square mile as determined by the U.S. Bureau of the Census. For the purposes of the WMP, “area” must be defined as census tracts.

- Urban – In accordance with GO 165, "urban" must be defined as those areas with a population of more than 1,000 persons per square mile as determined by the U.S. Bureau of the Census. For the purposes of theWMP, “area” must be defined as

[16] Paper can be found here - https://www.fs.fed.us/pnw/pubs/journals/pnw_2005_radeloff001.pdf with the latestWUI map (form 2010) found here - http://silvis.forest.wisc.edu/data/wui-change/

census tracts.

- Population density numbers (see Figure 4.26) are calculated using the ACS one-year estimates on population density by census tract for each corresponding year (2016 ACS one-year estimate for 2016 metrics, 2017 ACS 1-year estimate for 2017 metrics, etc.). For years with no ACS one-year estimate available, use the one-year estimate immediately before the missing year (e.g., use 2019 estimate if 2020 estimate is not yet published, etc.)

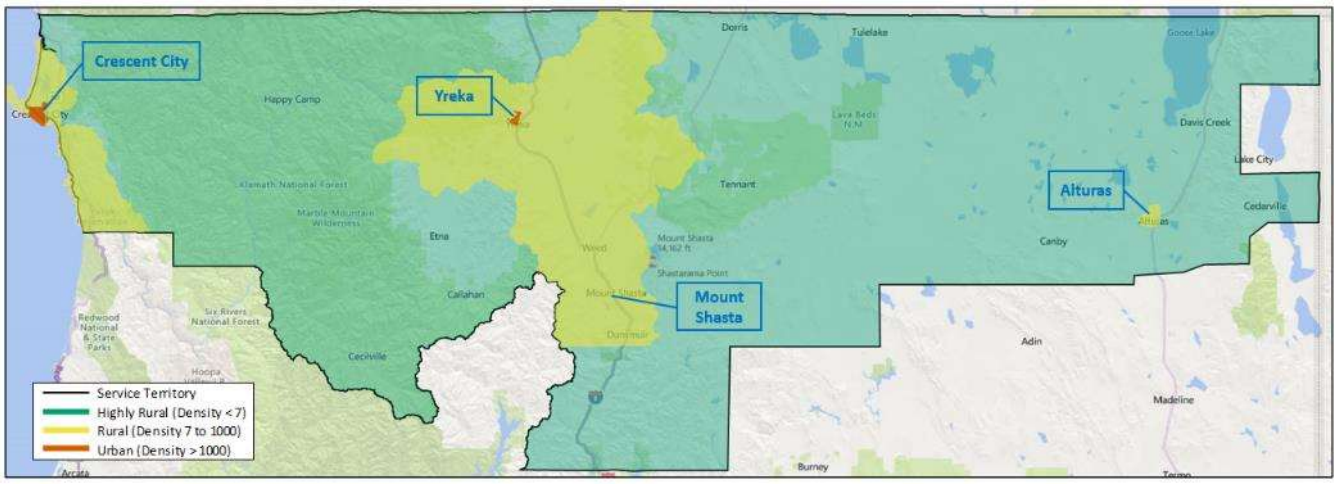

Figure 4.26 Population density[17]

4.6 PROGRESS REPORTING ON KEY AREAS OF IMPROVEMENT

Report progress on all key areas of improvement identified in Section 1.3 of the utility's 2021Action Statement. Provide a summary table of the actions taken to address these key areas and report on progress made over the year. Summarize the progress in a table using a high-level bullet point list of key actions, strategies, schedule, timeline for completion, quantifiable performance-metrics, measurable targets, etc. The table must also include a cross-referenced link to a more detailed narrative and substantiation of progress in an Appendix. The summary table must follow the format illustrated in Table 4.6-1.

Table 4.7 Progress on key areas of improvement and remedies, 2021 (WMP Table 4.6-1)

Utility-#	Issue title	Summary of Progress
PC-1	Failure to follow format for Section 7.3.b, subparts 1-5 of 2021 WMP	PacifiCorp has fully complied with the updated 2022 WMP guidelines; see Section 7.3 on page 149.

[17] Highly rural, Rural and Urban in this document are calculated as per the definition provided in the 2022 WMP Guidelines, and not as per GO 165.

Utility-#	Issue title	Summary of Progress
	Guidelines	
PC-2	Lack of consistency in approach to wildfire risk modeling across utilities	PacifiCorp is currently participating in the monthly Wildfire Risk Modelling Working Group coordinated by OEIS to work towards understanding similarities and differences between the California utility plans. At the conclusion of these workshops in Q3 of 2022, OEIS has planned to provide updated guidelines to support consistency in the approach of wildfire risk modelling across the utilities. In the workplan guidelines provided by OEIS, OEIS acknowledges that the working group may not be able to resolve the approach to wildfire risk modelling prior to the 2022 WMP updates and that the working group will continue after this update. See Section 4.5.1 on page 65, Section 7.3.1 on page 150, and Section 7.3.8.3 on page 234 for more information on PacifiCorp's modeling efforts and evolution.
PC-3	GIS and nonspatial data discrepancy	As reported in the Action Statement Progress Report submitted on November 1, 2021, PacifiCorp has provided clarification on the discrepancy as well as a methodology for the improvement of QA/QC processes in the future. GIS GDB files that are submitted can be difficult to check, since only a few resources in the company can open and navigate GDB files. Therefore, PacifiCorp has initiated a mandatory walk-through review meeting between GIS and key internal stakeholders to check data submitted and connections are correct. Additionally, to continue supporting this effort, PacifiCorp is planning to recruit an additional program manager. This is further described in Section 7.3.7.1 on page 226.
PC-4	Limited evidence to support the effectiveness of covered conductor	PacifiCorp has been participating in Covered Conductor effectiveness workstream where the utilities prepared a joint response to this issue/remedy. Please refer to Attachment 2, Covered Conductor Effectiveness Joint Utility Response
PC-5	Reconductoring projects not prioritized based on wildfire risk	PacifiCorp has provided a response to this in the Action Statement Progress Report submitted on November 1, 2021. See Section 7.3.3.3 on page 169 for additional reconductoring prioritization information.
PC-6	No separate process for replacing expulsion fuses and tracking progress	As a result of this issue, PacifiCorp included in the 2021 Change Order submitted on November 1, 2021, an update which included a separate process for replacing expulsion fuses. Additionally, PacifiCorp has provided a response to this in the Action Statement Progress Report submitted on November 1, 2021. See Section 7.3.3.7 on page 173 for more information on this new program.
PC-7	Limited explanation for how initiatives reduce PSPS impacts	In addition to the response provided in the Action Statement Progress Report submitted on November 1, 2021, PacifiCorp has included two new initiatives in the 2021 Change Order to further reduce the impact of PSPS impacts. The two new initiatives in the change order directly reduce PSPS impacts by providing free portable batteries to Medical Baseline Customers and providing a generator rebate program. See Section 7.3.3.11 on page 176.
PC-8	Lack of details on automatic recloser settings	PacifiCorp has provided a response to this in the Action Statement Progress Report submitted on November 1, 2021. For additional information, see Section 7.3.6.1 on page 218 and Section 7.3.6.2 on page 219.
PC-9	Inadequate justification of initiative-selection process	PacifiCorp has provided a response to this in the Action Statement Progress Report submitted on November 1, 2021. This is also described in Section 7.3.8.1 on page 231.
PC-10	Inadequate approach to PSPS	PacifiCorp has provided a response to this in the Action Statement Progress Report submitted on November 1, 2021. See Section 8.3, page 261 for more information.

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5

INPUTS TO THE PLAN AND DIRECTIONAL VISION FOR WMP

5 INPUTS TO THE PLAN AND DIRECTIONAL VISION FOR WMP

5.1 GOAL OF WILDFIRE MITIGATION PLAN

The goal of the WMPs are shared across Energy Safety and all utilities: Documented reductions in the number of ignitions caused by utility actions or equipment and minimization of the societal consequences (with specific consideration to the impact on AFN populations and marginalized communities) of both wildfires and the mitigations employed to reduce them, including PSPS.

The following subsections report utility-specific objectives and program targets towards the WMP goal. No utility response is required for Section 5.1.

5.2 THE OBJECTIVES OF THE PLAN

Objectives are unique to the utility and reflect the 1, 3, and 10-year projections of progress towards WMP goals. Objectives are determined by the portfolio of mitigation strategies proposed in the WMP. The objectives of the plan must, at a minimum, be consistent with the requirements of California Pub. Util. Code §8386(a) – Each electrical corporation shall construct, maintain, and operate its electrical linesand equipment in a manner that will minimize the risk of catastrophic wildfire posed by those electrical lines and equipment.

Describe utility WMP objectives, categorized by each of the following timeframes, highlighting changes since the prior WMP:

1. *Before the next Annual WMP Update*
2. *Within the next 3 years*
3. *Within the next 10 years – long-term planning beyond the 3-year cycle*

Table 5.1 PacifiCorp's one, three and ten-year objectives

Category	Before the Next Annual WMP Update	Within the next three years	Within the next 10 years
Risk Assessment and Mapping	• Continue implementation of Technosylva's WFA-E Modeling Suite. • Begin implementation of WRRM module for project identification. • Develop all season risk assessment capability. • Identify and develop plan to augment or update tools based on revised OEIS risk modeling guidance.	• PacifiCorp anticipates the updated CA WMP Guidelines, based on collaborative workshops, will provide a guide for adjusted risk-mapping to better align across California utilities. • Based on the workshops, PacifiCorp anticipates a significant shift in risk mapping based on these updated guidelines.	• Risk-map updates occur on an update cycle and occur as routine edits. • New technology is evaluated and potentially incorporated into risk mapping processes.
Situational Awareness and Forecasting	• Complete installations of additional weather stations with 100% correlation for HFTD circuits. • Substantially progress 2023 annual weather station calibration in anticipation of the 2023 fire season. • Begin implementation of wildfire detection pilot project. • Implement semi-automated process to validate weather station data leveraging multiple sources. • Operationalize situational awareness with a visual, configurable map to support decision making.	• Operate a fully established, weather station network. • Weather station correlation for 100% of circuits in CA (inside and outside of HFTD). • Implement a fully automated process to validate weather station data via multiple sources. • Complete wildfire detection pilot and advance technologies based on findings. • Continue improving dynamic situational awareness and risk visualization to support decision-making.	• Work towards using AI and machine learning to create a more automated weather forecasting system. • Have a complete weather station network developed. • As new technology becomes available evaluate and potentially incorporate it into situational awareness processes.
Grid Design and System Hardening	• Continue execution of grid hardening plans. • Reprioritize work as needed based on the evolution of risk modeling. • Evaluate scope beyond PSPS zone mitigation. • Evaluate risk-based, strategic undergrounding and feasibility. • Evaluate expansion of the generator rebate and free portable battery program.	• Complete all grid hardening scope to mitigate existing PSPS zones. • Begin risk-based grid hardening beyond PSPS zones, most likely within Tier 2 locations. • Expand risk-based, strategic undergrounding where feasible and appropriate. • Complete DFA pilot project and inform systemwide potential applications. • Improve remote operability of equipment through substation SCADA and line communication backbone upgrades as a part for the installation of system automation initiative.	• Risk-based deployment of grid hardening complete. • Broader deployment of DFA (pending pilot project results). • Significantly improved remote operability of equipment through substation SCADA and line communications backbone upgrades as a part of the installation of system automation initiative.
Asset Management and	• Complete all CY2022 planned inspections and progress the CY2023 planned asset	• Pending the results of the pilot project, full incorporation of IR technology into distribution detailed inspections.	• Pilot new inspection technology as it becomes available and potentially incorporate this new technology into asset

Category	Before the Next Annual WMP Update	Within the next three years	Within the next 10 years
Inspections	inspections. • Complete the planned IR inspections of transmission lines. • Begin implementation of the distribution IR inspection pilot project.	• Continue planned inspection programs.	management and inspections programs and practices.
Vegetation Management and Inspections	• Continue progressing programs (annual patrols, routine cycle work and annual pole clearing). • Continue to gather an inventory of vegetation work completed based on most recent inspections to inform vegetation management planning. • Incorporate the use of a vegetation density and height "heat map" as a tool (LRAM) to inform prioritization and scheduling of vegetation management activities. • Use a mobile data management software to manage and confirm work completed by subcontractors.	• Continue progressing programs (annual patrols, routine cycle work and annual pole clearing). • Implement Enhanced Overhang Reduction pilot project. • Continue to implement use of and improve mobile data management software capabilities regarding work identification, release, and tracking. • Enhance QA/QC program.	• Continue progressing programs (annual patrols, routine cycle work and annual pole clearing). • Pilot new technology as it becomes available and potentially incorporate this new technology into vegetation management programs and practices or augment current practices.
Grid Operations and Operating Protocols	• Improve processes to better track elevated wildfire risk protocols and activities. • Enhance protocols for post-outage restoration and patrols during time periods of elevated risk. • Continue to use augmented work practices. • Continue use of EFR settings and protocols and incorporate any updates as needed before the 2023 fire season.	• Leverage enhanced remote operability based on grid hardening upgrades to SCADA and communication backbones. • Have a more mature process with few false positive forecast predictions, increased communication completion of PSPS events and quick response to forecasts.	• Continue to leverage enhanced remote operability based on grid hardening upgrades to SCADA and communications backbones.
Data Governance	• Develop additional documentation to support decision making and reporting. • Continue expanding data reporting capabilities. • Continuing quarterly data reporting to meet compliance requirements. • Increase documentation around fire-related data, algorithms, analysis, and data processes.	• Improve thoroughness of documentation, including decision-making, data processing and data analysis. • Continue expanding data reporting capabilities. • Continuing quarterly data reporting to meet compliance requirements.	• Data processes and documentation centrally located. • Data practices consistent across multiple business units. • Full data reporting capabilities. • Continuing quarterly data reporting to meet compliance requirements.

Category	Before the Next Annual WMP Update	Within the next three years	Within the next 10 years
Resource Allocation Methodology	• Develop implementation plan to incorporate new OEIS RSE requirements into modeling and tools by 2024. • Fully implement WRRM model, including RSE calculations. • Update and include RSE calculations in the 2024 WMP Update. • Continue evaluating organizational needs to support WMP implementation.	• Update RSE values to align with the new 2023 OEIS Guidelines. • Improve RSE calculation granularity. • Leverage RSE to evaluate grid hardening scope outside of the PSPS zones. • Evaluate a framework to assess new technologies or pilot projects in terms of RSE.	• Use RSE to evaluate initiatives throughout service territory.
Emergency Planning and Preparedness	• Continued use of tabletop exercises to prepare for emergencies and PSPS events. • Continued evolution and enhancement of the Public Safety Partner Portal. • Incorporate 2022 fire season lessons learned into 2023 protocols. • Continue offering customer support programs during emergencies, such as bill adjustments, extended payment plans, and suspension of disconnection and nonpayment fees.	• Continued use of tabletop exercises to prepare for emergencies and PSPS events. • Incorporate feedback and industry best practices into emergency management practices.	• Continued use of tabletop exercises to prepare for emergencies and PSPS events. • Incorporate feedback and industry best practices into emergency management practices.
Stakeholder Cooperation and Community Engagement	• Continue improvements to internal and external customer and community facing forecast of PSPS status (website). • Continue partnering with public safety partners in communities throughout California regarding wildfire and PSPS preparedness. • Continue collaborating with industry experts and other utilities through working groups and consortiums. • Complete post season wildfire mitigation survey.	• Continue improvements to internal and external customer and community facing forecast of PSPS status (website). • Enhance customer outreach based on survey feedback and industry best practices.	• Continue improvements to internal and external customer and community facing forecast of PSPS status (website). • Enhance customer outreach based on survey feedback and industry best practices.

5.3 PLAN PROGRAM TARGETS

Program targets are quantifiable measurements of activity identified in WMPs and subsequent updates used to show progress towards reaching the objectives.

List and describe all program targets the electrical corporation uses to track utility WMP implementation and utility performance over the last five years. For all program targets, list the 2019 to 2021 performance, a numeric target value that is the projected target for end of year 2022 and 2023, units on the metrics reported, the assumptions that underlie the use of those metrics, update frequency, and how the performance reported could be validated by third parties outside each utility, such as analysts or academic researchers. Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of each targeted preventive strategy and program.

Pub. Util. Code Section 8386.3(c)(5) requires a utility to notify Energy Safety "after it completes a substantial portion of the vegetation management (VM) requirements in its wildfire mitigation plan." To ensure compliance with this statue, the utility is required to populate Table 5.3-1 with VM program targets that the utility can determine when it has completed a "substantial portion"[18] and that Energy Safety can subsequently audit. Energy Safety has provided some required, standardized VM targets below. It is expected that the utilities provide additional VM targets beyond those required. The identification of other VM targets and units for those targets (e.g., for inspections, customer outreach, enhanced vegetation management, etc.) are at the discretion of the utility.

Additionally, in Table 5.3-1, utilities must populate the column "Target%/ Top-Risk%" for each 2022 performance target related to initiatives in the following categories: Grid design and system hardening; Asset management and inspections; and Vegetation management and inspections. This column allows utilities to identify the percentage of the target that will occur in the highest risk areas. For example, if a utility targets conducting 85% of its vegetation management program in the top 20% of its risk-areas, it should input "85/20" in this column. In the "Notes" column, utilities must provide definitions and sources for each of the "Top-Risk%" values provided. In the given example above, an acceptable response would be: "The top 20% of risk areas used for this target relate to the circuit segment risk rankings from [Utility Company's] Wildfire Risk Model outputs, as described in [hyperlink to Section XX] of the 2022 WMP Update."

[18] Energy Safety intends to define "substantial portion" in its forthcoming Compliance guidelines. This definition may be included in the Final version of the 2022 WMP Update Guidelines.

Table 5.2 List and description of program targets, last five years (WMP Table 5.3-1)

Table 5.2 list and description of program targets, last 5 years Program target	2019		2020		2021		2022		Units	Audited by third-party (Y/N)	Notes (Including definitions and sources for Top-Risk%)
	Target	Perf.	Projected	Perf.	Projected	Perf.	Projected	Target % / Top-Risk%			
Advanced weather monitoring and weather stations	N/A	10	10	2	21	21	50	T3: 2%/3% T2: 46%/38% Non HFTD: 52%/59%	# of weather monitors and weather stations		-
Continuous monitoring sensors	N/A	0	4	0	22	2	2	T3: 0%/3% T2: 100%/38% Non HFTD: 0%/59%	# of sensors		-
Fault indicators for detecting faults on electric lines and equipment	N/A	N/A	N/A	0	0	0	500	T3: 11%/3% T2: 51%/38% Non HFTD: 20%/59%	# of fault indicators		The remaining 18% of fault indicators will be decided in the field as they are found and replaced for 2022.
Covered conductor installation	N/A	0	38	1.4	81.22	20	112	T3: 23%/3% T2: 77%/38% Non HFTD: 0%/59%	# of miles		
Distribution pole replacement and reinforcement, including with composite	N/A	0	39	29	128	87	2020	T3: 23%/3% T2: 77%/38% Non HFTD: 0%/59%	# of poles		

Table 5.2 list and description of program targets, last 5 years Program target	2019		2020		2021		2022		Units	Audited by third-party (Y/N)	Notes (Including definitions and sources for Top-Risk%)
	Target	Perf.	Projected	Perf.	Projected	Perf.	Projected	Target % / Top-Risk%			
poles											
Expulsion fuse replacement	N/A	N/A	N/A	0	0	0	2269	T3: TBD/3% T2: TBD/38% Non HFTD: TBD/59%	# of expulsion fuses		Expulsion fuse locations are determined as they are found needing to be replaced as part of a circuit-by-circuit engineering review.
Installation of system automation equipment	N/A	10	31	28	27	31	51	T3: 2%/3% T2: 53%/38% Non HFTD: 45%/59%	# of installations		
Detailed inspections of distribution electric lines and equipment	N/A	473	605	10155	9213	9217	8777	T3: 4%/3% T2: 57%/38% Non HFTD: 39%/59%	# of inspections		
Patrol inspections of distribution electric lines and equipment	2002	2002	1941	46281	50603	50667	46338	T3: 2%/3% T2: 41%/38% Non HFTD: 57%/59%	# of inspections		100% of Tier 3 and Tier 2 distribution facilities are inspected annually as part of this program. The numerator of this calculation accounts for the % of total inspections within each area and not the percentage of that area which is inspected within the year.

Table 5.2 list and description of program targets, last 5 years Program target	2019		2020		2021		2022		Units	Audited by third-party (Y/N)	Notes (Including definitions and sources for Top-Risk%)
	Target	Perf.	Projected	Perf.	Projected	Perf.	Projected	Target % / Top-Risk%			
Patrol inspections of transmission electric lines and equipment	681	681	657	1654	98	12418	12367	T3: 4%/3% T2: 44%/38% Non HFTD: 48%/59%	# of inspections		100% of Tier 3 and Tier 2 distribution facilities are inspected annually as part of this program. The numerator of this calculation accounts for the % of total inspections within each area and not the percentage of that area which is inspected within the year.
Substation inspections	444	439	444	444	444	438	444	T3: 4%/3% T2: 42%/38% Non HFTD: 54%/59%	# of inspections		
Detailed inspections of transmission electric lines and equipment	62	62	122	1188	666	1439	2545	T3: 10%/3% T2: 67%/38% Non HFTD: 23%/59%	# of inspections		
Infrared inspections of transmission electric lines and equipment	784	1246	232	866	700	700	700	T3: 3%/3% T2: 46%/38% Non HFTD: 51%/59%	# of miles		The current IR inspection program is on Transmission lines only.
Intrusive pole inspections	92	92	150	3208	2668	4692	4759	T3: 0%/3% T2: 21%/38% Non HFTD: 76%/59%	# of inspections		Distribution Pole Test and Treat (PTT) is on a 20-year cycle while Transmission PTT is on a 10-year cycle. Due to the cycle timing and the small percentage of PacifiCorp

Table 5.2 list and description of program targets, last 5 years Program target	2019		2020		2021		2022		Units	Audited by third-party (Y/N)	Notes (Including definitions and sources for Top-Risk%)
	Target	Perf.	Projected	Perf.	Projected	Perf.	Projected	Target % / Top-Risk%			
											service territory, there is likely to be some years with no T3 structures are inspected as part of the PTT program.
Patrol inspections of vegetation around distribution electric lines and equipment	N/A	N/A	N/A	784	1369	1167	1007	T3: 1%/3% T2: 59%/38% Non HFTD: 40%/59%	# of miles		100% of Tier 3 and Tier 2 circuits have a vegetation management inspection completed annually. The numerator of this calculation accounts for the % of total patrol inspections within each area however does not account for detail inspections that are scheduled to be completed prior to the height of the fire season as part of routine cycle maintenance.
Patrol inspections of vegetation around transmission electric lines and equipment	N/A	N/A	N/A	323	348	354	163	T3: 0%/3% T2: 42%/38% Non HFTD: 58%/59%	# of miles		Patrol inspections of transmission lines take place in years in which routine maintenance work is not scheduled, generally every other year. Due to timing or routine maintenance and the small percentage of PacifiCorp service territory, there is likely to be some years with no T3 structures are inspected as part of this program.

Table 5.2 list and description of program targets, last 5 years Program target	2019		2020		2021		2022		Units	Audited by third-party (Y/N)	Notes (Including definitions and sources for Top-Risk%)
	Target	Perf.	Projected	Perf.	Projected	Perf.	Projected	Target % / Top-Risk%			
Quality assurance / quality control of vegetation management	N/A	N/A	N/A	1107	1717	1383	1169	T3: 1%/3% T2: 57%/38% Non HFTD: 42%/59%	# of miles		
Detailed inspections and management practices for vegetation clearances around distribution electrical lines and equipment	N/A	825	825	909	1380	1376	1158	T3: 3%/3% T2: 34.3%/38 % Non HFTD: 65.4%/59 %	# of miles		
Vegetation management to achieve clearances around electric lines and equipment	N/A	3195	3195	0	0	1513	1169	T3: 1%/3% T2: 57%/38% Non HFTD: 42%/59%	# of miles		
Detailed inspections and management practices for vegetation clearances around transmission	N/A	345	345	185	181	181	354	T3: 20%/3% T2: 54%/38% Non HFTD: 26%/59%	# of miles		

Table 5.2 list and description of program targets, last 5 years Program target	2019		2020		2021		2022		Units	Audited by third-party (Y/N)	Notes (Including definitions and sources for Top-Risk%)
	Target	Perf.	Projected	Perf.	Projected	Perf.	Projected	Target % / Top-Risk%			
electrical lines and equipment											
Fuel management (including all wood management) and management of “slash” from vegetation management activities	N/A	N/A	N/A	2164	3047	2872	3047	T3: 2%/3% T2: 37%/38% Non HFTD: 61%/59%	# of activities		

5.4 PLANNING FOR WORKFORCE AND OTHER LIMITED RESOURCES

Report on worker qualifications and training practices regarding wildfire and PSPS mitigation for workers in the following target roles:

1. *Vegetation inspections*
2. *Vegetation management projects*
3. *Asset inspections*
4. *Grid hardening*
5. *Risk event inspection*

For each of the target roles listed above:

1. *List all worker titles relevant to target role (target roles listed above)*
2. *For each worker title, list and explain minimum qualifications with an emphasis on qualifications relevant to wildfire and PSPS mitigation. Note if the job requirements include the following:*
   a. *Going beyond a basic knowledge of General Order 95 requirements to performrelevant types of inspections or activities in the target role*
   b. *Being a "Qualified Electrical Worker" (QEW) and define what certifications, qualifications, experience, etc. is required to be a QEW for the target role forthe utility.*
   c. *Include special certification requirements such as being an International Society of Arboriculture (ISA) Certified Arborist with specialty certification as a Utility Specialist*
3. *Report percentage of Full Time Employees (FTEs) in target role with specific job title*
4. *Provide a summarized report detailing the overall percentage of FTEs with qualifications listed in (2) for each of the target roles.*
5. *Report plans to improve qualifications of workers relevant to wildfire and PSPS mitigation. The utility must explain how they are developing more robustoutreach and onboarding training programs for new electric workers to identify hazards that could ignite wildfires.*

5.4.1 Target role: Vegetation inspections

PacifiCorp conducts inspections and/or patrols to identify vegetation maintenance that must be performed to align with the company's Transmission and Distribution Vegetation Management Program Standard Operating Procedures (Vegetation SOP).

Table 5.3 and Table 5.4 present PacifiCorp worker and contractor titles in target roles active in PacifiCorp's California service territory, their minimum qualifications, FTE percentages by title in target roles and percentages by high-interest qualification. PacifiCorp's plans to improve worker qualifications follow these tables.

Table 5.3 PacifiCorp-conducted vegetation inspections – target roles and qualifications

Worker Titles	Minimum Qualifications relevant to wildfire and PSPS mitigation	FTE Percent by Target Role	FTE Percent by High-Interest Qualification
Senior Utility Forester	ISA Arborists; See below	50%	100%
Utility Forester	ISA Arborists; See below	50%	100%

Senior utility foresters and utility foresters must be International Society of Arboriculture (ISA) Certified Arborists with an added Utility Specialist certification. Both senior utility and utility foresters must: perform post-work audits to meet PacifiCorp's program standards (e.g., conductor-to-line clearance specifications) along distribution rights-of-way; investigate vegetation-related outages; identify work required, and review work conducted along transmission rights-of-way.

Table 5.4 Contractor-conducted vegetation inspections – target roles and qualifications

Worker Titles	Minimum Qualifications relevant to wildfire and PSPS mitigation	FTE Percent by Target Role	FTE Percent by High-Interest Qualification
Pre-Listers	See below	44%	25%
General Foreperson	See below	56%	60%

PacifiCorp hires contractors to help implement the vegetation management program, including pre-listers and general forepersons.

Pre-listers conduct patrols and/or inspections to identify vegetation work needed to meet PacifiCorp program standards; they also conduct post-audit inspections. At a minimum, they must have a current ISA Arborist certification or the ability to obtain one within six months of their hire date.

General forepersons serve as front-line managers for PacifiCorp's independent contractors. Like senior utility foresters and utility foresters, they must be ISA Certified Arborists with an added Utility Specialist certification.

Plans to improve qualifications of workers relevant to wildfire and PSPS mitigation

PacifiCorp strives for continuous improvement. Utility and senior utility foresters are encouraged to get ISA Board Certified Master Arborist credentials and tree risk assessment certifications. They are also encouraged to participate in arboriculture-related seminars/conferences and complete other related certifications from accredited institutions. PacifiCorp utility and senior utility foresters provide training, hold regular performance-related discussions with pre-listers and other contractor positions to review expectations and job requirements, identify areas for improvement, ensure work consistency, and review post-audit findings. PacifiCorp helps contractors lacking ISA certifications to obtain them; PacifiCorp will continue to require these certifications.

PacifiCorp also provides environmental awareness training to company employees and contractors. This training minimizes potential harm to sensitive environments and increases general understanding of environmental considerations.

5.4.2 Target role: Vegetation management projects

PacifiCorp seeks to collaborate with communities and agencies in implementing projects with defined scopes that promote wildfire resiliency — for example, projects that reduce fuels or establish fire breaks in and around power line rights-of-way.

The same worker titles, qualifications and additional information provided in Section 5.4.1 on page 121 is applicable.

5.4.3 Target role: Asset inspections

PacifiCorp field inspection specialists and field inspectors conduct asset inspections. Table 5.5 describes their minimum qualifications and their FTE percent by both target role and high-interest qualification. Descriptions of their work follow the table. PacifiCorp plans to improve worker qualifications follow these descriptions.

Table 5.5 Asset inspections – target roles and qualifications

Worker Titles	Minimum Qualifications relevant to wildfire and PSPS mitigation	FTE Percent by TargetRole	FTE Percent by High- Interest Qualification
Field Inspection Specialist	See Below	50%	n/a
Field Inspector	See Below	50%	n/a

Field inspection specialists evaluate and document inspection data on overhead (distribution, transmission, communications, municipality and private ownership) and underground facilities. Inspections include, but are not limited to, pole attachment inspections, bird damage assessments, condition verification, pole plating, pole stub removal assessments, pole attachment transfer requests, ground-line pole testing and visual/safety inspections. These specialists are familiar with the National Electric Safety Code and PacifiCorp construction standards and can apply their knowledge to recommend appropriate corrective actions.

They use measuring sticks and wheels, binoculars and handheld electronic devices to gather data. Field inspection specialists also work with maps, data sheets, work requests and engineered drawings.

In addition to field inspection specialists, PacifiCorp contracts with field inspectors to perform either Visual Assurance or full, Detailed inspections, including cyclical pole testing. These inspectors are trained to identify all code compliance conditions (NESC and GO 95). Their work is comprehensive without regard to the type of risk (public safety, worker safety, reliability, fire threat, etc.).

Plans to improve qualifications of workers relevant to wildfire and PSPS mitigation

Field inspection support annual refresher training incorporates changes or focus areas related to the wildfire mitigation plan efforts. This ensures all inspectors are aware of new equipment and the related construction standards. Additional elements of this annual training, which include a focus on wildfire mitigation and continuous improvement, appear in Section 7.3.4.14 on page 189.

5.4.4 Target role: Grid hardening

PacifiCorp's grid hardening initiatives generally involve retrofitting overhead lines and substation components with more fire-resilient materials, including covered conductor, non-wooden poles, relays/reclosers and advanced communication devices. PacifiCorp employees and contractors work on and around these new devices as either part of planned maintenance and inspections or emergency response efforts. Table 5.6 describes the front-line workers that maintain or repair equipment associated with grid hardening. Brief job descriptions and company plans to improve worker qualifications follow the table.

Table 5.6 Grid hardening – target roles and qualifications

Worker Titles	Minimum Qualifications relevantto wildfire and PSPS Mitigation	FTE Percent by Target Role	FTE Percent by High-Interest Qualification
Journeyman/Lineman	Qualified Electrical Worker (See Below)	88%	100%
Highline Patrolman	Qualified Electrical Worker (See Below)	4%	100%
Technician	Qualified Electrical Worker (See Below)	8%	100%

Journeyman/lineman perform routine maintenance of overhead and underground facilities, poles and wires and respond to emergency outages or PSPS events. PacifiCorp journeyman/linemen are qualified electrical workers. They must have: (1) working experience as a lineman or (2) and graduated from a sanctioned apprenticeship program. They also need to pass a pre-hire physical assessment. Skills and abilities required by this job are normally acquired through job-related high school courses and the lineman apprenticeship program.

Highline transmission patrolmen are journeyman lineman who patrol, inspect and ensure assigned transmission lines are properly maintained. PacifiCorp highline transmission patrolmen understand: (1) equipment, tools, techniques and methods used in the construction, installation, maintenance and repair of overhead line facilities, roads, trails and rights-of-way; (2) stresses, strains and rigging; safety regulations (3) capabilities and limitations of insulator washing equipment; (4) transmission overhead circuitry and switching. The knowledge, skills, and abilities required for this job are comparable with those acquired through a high school education, supplemented by technical study and extensive training and experience as a journeyman, patrolman or lineman. Additionally, highline patrolman have

been trained to use detection equipment that locates static or voltage leakage during visual inspection patrols.

Meter Relay Technicians perform routine maintenance of protection and control devices and advise on emergency response operations. Meter relay techs have a working knowledge of company substation protection and control schemes. They may also install, maintain, adjust, test, troubleshoot and repair substation protection and control equipment, which includes but is not limited to apparatus, meters, relays, controls and remote control equipment.

Plans to improve qualifications of workers relevant to wildfire and PSPS mitigation

Beginning in 2019, PacifiCorp's training program included an annual review of operating practices that reduce wildfire risk during routine work and a review that confirms fire mitigation / suppression tools are available before fire season. This refresher training occurs annually. It has successfully raised awareness of PSPS events, wildfire risk, and how procedures must adapt to that risk.

While effective, this training has been procedural. Full incorporation of grid hardening into PacifiCorp's formal training program is an area of planned improvement. Specifically, this improvement will enhance existing programs, ensuring workers are properly trained to work around materials such as covered conductor, non-wooden poles, and advanced protection and control devices.

5.4.5 Target role: Risk event inspections

At this time PacifiCorp hasn't developed a specific work force dedicated to risk event inspections. Rather, this role has been fulfilled by a combination of field inspectors, field engineers, foresters and journeymen linemen who pass the baton through the risk event inspection process. The minimum qualifications, FTE percentages by title and qualification, and plans to improve qualifications are discussed for each of these titles in sections 5.4.1 through 5.4.3 on pages 121–123.

5.4.5.1 Utility approach

PacifiCorp has developed operational "watchlist" items that notify operational team members that specific follow-up actions are needed. This internal watchlist tool, commonly referred to as the frequent interrupters requiring evaluation tool, notifies employees on the following business day that an investigation needs to be completed. The watchlist triggers can be modified based on a variety of conditions the company can change, for example, vegetation outages are notified to foresters the day after a tree caused outage is completed.

5.4.5.2 Summary of achievements

PacifiCorp has successfully trained and began to use this tool in their field.

5.4.5.3 Challenges

The company is evaluating whether additional steps should be taken to ensure that all relevant investigations are completed.

6

PERFORMANCE METRICS AND UNDERLYING DATA

6 PERFORMANCE METRICS AND UNDERLYING DATA

Instructions: Section to be populated from Quarterly Reports. Tables to be populated are listed below for reference.

NOTE: Report updates to projected metrics that are now actuals (e.g., projected 2021 spend will be replaced with actual unless otherwise noted). If an actual is substantially different from the projected (>10% difference), highlight the corresponding metric in light green.

6.1 RECENT PERFORMANCE ON PROGRESS METRICS, LAST SEVEN YEARS

Instructions for Table 1 of Attachment 3:

In the attached spreadsheet document, report performance on the following metrics within the utility's service territory over the past seven years as needed to correct previously reported data. Where the utility does not collect its own data on a given metric, each utility is required to work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in the "Comments" column.

This table has been provided in Table 1 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.2 RECENT PERFORMANCE ON OUTCOME METRICS, ANNUAL AND NORMALIZED FOR WEATHER, LAST SEVEN YEARS

Instructions for Table 2: of Attachment 3:

In the attached spreadsheet document, report performance on the following metrics within the utility's service territory over the past seven years as needed to correct previously reported data. Risk events and utility-related ignitions are normalized by wind warning status (RFW & HWW). Where the utility does not collect its own data on a given metric, the utility is required to work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in "Comments" column.

Provide a list of all types of findings and number of findings per type, in total and in number of findings per circuit mile.

This table has been provided in Table 2 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.3 DESCRIPTION OF ADDITIONAL METRICS

Instructions for Table 3: of Attachment 3:

In addition to the metrics specified above, list and describe all other metrics the utility uses to evaluate wildfire mitigation performance, the utility's performance on those metrics over the last seven years, the units reported, the assumptions that underlie the use of those metrics, and how the performance reported could be validated by third parties outside the utility, such as analysts or academic researchers. Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of each preventive strategy and program.

This table has been provided in Table 3 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.4 DETAILED INFORMATION SUPPORTING OUTCOME METRICS

Enclose detailed information as requested for the metrics below.

Instructions for Table 4: of Attachment 3:

In the attached spreadsheet document, report numbers of fatalities attributed to any utility wildfire mitigation initiatives, as listed in the utility's previous or current WMP filings or otherwise, according to the type of activity in column one, and by the victim's relationship to the utility (i.e., full-time employee, contractor, of member of the general public), for each of the last seven years as needed to correct previously reported data. For fatalities caused by initiatives beyond these categories, add rows to specify accordingly. The relationship to the utility statuses of full-time employee, contractor, and member of public are mutually exclusive, such that no individual can be counted in more than one category, nor can any individual fatality be attributed to more than one initiative.

This table has been provided in Table 4 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

Instructions for Table 5 of Attachment 3:

In the attached spreadsheet document, report numbers of OSHA-reportable injuries attributed to any utility wildfire mitigation initiatives, as listed in the utility's previous or current WMP filings or otherwise, according to the type of activity in column one, and by the victim's relationship to the utility (i.e., full-time employee, contractor, of member of the general public), for each of the last seven years as needed to correct previously -reported data. For members of the public, all injuries that meet OSHA-reportable standards of severity (i.e., injury or illness resulting in loss of consciousness or requiring medical treatment beyond first aid) must be included, even if those incidents are not reported to OSHA due to the identity of the victims.

For OSHA-reportable injuries caused by initiatives beyond these categories, add rows to specify accordingly. The victim identities listed are mutually exclusive, such that no individual victim can be counted as more than one identity, nor can any individual OSHA-reportable injury be attributed to more than one activity.

This table has been provided in Table 5 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.5 MAPPING RECENT, MODELED, AND BASELINE CONDITIONS

The utility must provide underlying data for recent conditions (over the last five years) of the utility's service territory in a downloadable shapefile GIS format, following the spatial reporting schema attachment[19]. All data is reported quarterly, this is a placeholder for quarterly spatial data.

This spatial data has been provided in the Q1 quarterly filing submitted on May 2, 2022.

6.6 RECENT WEATHER PATTERNS, LAST SEVEN YEARS

Instructions for Table 6 of Attachment 3:

In the attached spreadsheet document, report weather measurements based upon the duration and scope of NWS Red Flag Warnings, High wind warnings and upon proprietary Fire Potential Index (or other similar fire risk potential measure if used) for each year. Calculate and report 5-year historical average as needed to correct previously reported data.

[19] https://energysafety.ca.gov/wp-content/uploads/energy-safety-gis-data-reporting-standard_version2.1_09072021_final.pdf

This table has been provided in Table 6 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.7 RECENT AND PROJECTED DRIVERS OF OUTAGES AND IGNITION PROBABILITY

Instructions for Table 7.1 and Table 7.2 of Attachment 3:

(Table 7.1) In the attached spreadsheet document, report recent drivers of outages according to whether or not risk events of that type are tracked, the number of incidents per year (e.g., all instances of animal contact regardless of whether they caused an outage, an ignition, or neither), the rate at which those incidents (e.g., object contact, equipment failure, etc.) cause an ignition in the column, and the number of ignitions that those incidents caused by category, for each of last seven years as needed to correct previously reported data. Calculate and include 5-year historical averages. This requirement applies to all utilities, not only those required to submit annual ignition data. Any utility that does not have complete 2021 ignition data compiled by the WMP deadline is required to indicate in the 2021 columns that said information is incomplete. (Table 7.2) Similar to Table 7.1, but for ignition probability by line type and HFTD status, according to if ignitions are tracked.

This table has been provided in Table 7.1 and 7.2 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.8 BASELINE STATE OF EQUIPMENT AND WILDFIRE AND PSPS EVENT RISK REDUCTION PLANS

6.8.1 Current baseline state of service territory and utility equipment

Instructions for Table 8: of Attachment 3:

***In** the attached spreadsheet document, provide summary data for the current baseline state of HFTD and non-HFTD service territory in terms of circuit miles; overhead transmission lines, overhead distribution lines, substations, weather stations, and critical facilities located within the territory; and customers by type, located in urban versus rural versus highly rural areas and including the subset within the Wildland-Urban Interface (WUI) as needed to correct previously reported data.*

The totals of the cells for each category of information (e.g., "circuit miles (including WUI and non-WUI)") would be equal to the overall service territory total (e.g., total circuit miles). For example, the total of number of customers in urban, rural, and highly rural areas of HFTD plus those in urban, rural, and highly rural areas of non-HFTD would equal the total number of customers of the entire service territory.

This table has been provided in Table 8 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.8.2 Additions, removal, and upgrade of utility equipment by end of three-year plan term

Instructions for Table 9 of Attachment 3:

In the attached spreadsheet document, input summary information of plans and actuals for additions or removals of utility equipment as needed to correct previously reported data. Report net additions using positive numbers and net removals and undergrounding using negative numbers for circuit miles and numbers of substations. Report changes planned or actualized for that year – for example, if 10 net overhead circuit miles are added in 2020, then report "10" for 2020. If 20 net overhead circuit miles are planned for addition by 2022, with 15 being added by 2021 and 5 more added by 2022, then report "15" for 2022 and "5" for 2021. Do not report cumulative change across years. In this case, do not report "20" for 2022, but instead the number planned to be added for just that year, which is "5".

This table has been provided in Table 9 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

Instructions for Table 10: of Attachment 3:

Referring to the program targets discussed above, report plans and actuals for hardening upgrades in detail in the attached spreadsheet document. Report in terms of number of circuit miles or stations to be upgraded for each year, assuming complete implementation of wildfire mitigation activities, for HFTD and non-HFTD service territory for circuit miles of overhead transmission lines, circuit miles of overhead distribution lines, circuit miles of overhead transmission lines located in Wildland-Urban Interface (WUI), circuit miles of overhead distribution lines in WUI, number of substations, number of substations in WUI, number of weather stations and number of weather stations in WUI as needed to correct previously reported data.

If updating previously reported data, separately include a list of the hardening initiatives included in the calculations for the table.

This table has been provided in Table 10 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

7

MITIGATION INITIATIVES

7 MITIGATION INITIATIVES

7.1 WILDFIRE MITIGATION STRATEGY

Describe organization-wide wildfire mitigation strategy and goals for each of the following time periods, highlighting changes since the prior WMP:

1. *By June 1 of current year*
2. *By September 1 of current year*
3. *Before the next Annual WMP Update*
4. *Within the next 3 years*
5. *Within the next 10 years*

The description of utility wildfire mitigation strategy must:

A. *Discuss the utility's approach to determining how to manage wildfire risk (in terms of ignition probability and estimated wildfire consequence) as distinct from managing risks to safety and/or reliability. Describe how this determination is made both for (1) the types of activities needed and (2) the extent of those activities needed to mitigatethese two different groups of risks. Describe to what degree the activities needed to manage wildfire risk may be incremental to those needed to address safety and/or reliability risks.*

B. *Discuss how risk modeling outcomes are used to inform decision-making processes andused to prioritize mitigation activities. Provide detailed descriptions including clear evaluation criteria[20] and visual aids (such as flow charts or decision trees). Provide an appendix (including use of relevant visual aids) with specific examples demonstrating how risk modeling outcomes are used in prioritizing circuit segments and selecting mitigation measures.*

C. *Include a summary of achievements of major investments and implementation of wildfire mitigation initiatives over the past year, lessons learned, changed circumstances during the 2020-2022 WMP plan cycle, and corresponding adjustment in priorities for the current year. Organize summaries of initiatives by the wildfire mitigation categories listed in Section 7.3.*

D. *List and describe all challenges associated with limited resources and how these challenges are expected to evolve over the next 3 years.*

E. *Outline how the utility expects new technologies and innovations to impact the utility's strategy and implementation approach over the next 3 years, including the utility's program for integrating new technologies into the utility's grid. Include utility research listed above in Section 4.4.*

[20] "Evaluation criteria" should include all points of considerations including any thresholds and weights thatmay affect the outcome of their decision, as well as a descriptor of how it is evaluated (i.e., given a risk score, using SME expertise to determine that score, using a formula).

F. *Provide a GIS layer[21] map showing generalized wildfire risk (e.g., MAVF) data should be as granular as possible.*
G. *Provide GIS[22] layers for the following grid hardening initiatives: covered conductor installation;[23] undergrounding of electrical lines and/or equipment; and removal of electrical lines. Features must have the following attributes: state of hardening, type of hardening where known (i.e., undergrounding, covered conductors, or removal), and expected completion date. Provide as much detail as possible (circuit segment, circuit- level, etc.). The layers must include the following:*
    a. *Hardening planned for 2022*
    b. *Hardening planned for 2023*
    c. *Hardening planned for 2024*
H. *Provide static (either in text or in an appendix), high-level maps of the areas where the utility will be prioritizing Grid Design and System Harding initiatives for 2022, 2023, and by 2032.*
I. *Provide a GIS layer for planned Asset Management and Inspections in 2022. Features must include the following attributes: type, timingand prioritization of asset inspection. Inspection types must follow the same types described in Section 7.3.4, Asset Management and Inspections, and as applicable, should not be limited to patrols and detailed inspections.*
J. *Provide a GIS layer illustrating where enhanced clearances (12 feet or more)were achieved in 2020 and 2021 and where the utility plans to achieve enhanced clearances in 2022. Feature attributes must include clearance distances greater than or equal to 12 feet, if such data is available, either in ranges or as discrete integers (e.g., 12-15 feet, 15-20 feet, etc. OR 12, 13, 14, 15, etc.).*

[21] GIS data that has corresponding feature classes in the most current version of Energy Safety GIS Data Reporting Standard will utilize the format for submission. GIS data that does not have corresponding feature classes shall be submitted in an ESRI compliant GDB and include a data dictionary as part of the metadata.

[22] Energy Safety acknowledges potential security concerns regarding aggregating and presenting critical electrical infrastructure in map form. Utilities may provide maps or GIS layers required by these Guidelines as confidential attachments when necessary.

[23] For a definition of "covered conductor installation" see Section 9 of Attachment 2.

Table 7.1 describes the wildfire mitigation strategy by June 1 of current year and by September 1 of current year. For Annual initiative targets, please see in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

Table 7.1 June 1 and September 1 current year wildfire mitigation strategy

Category	By June 1 of this year	By September 1 of this year
Risk Assessment and Mapping	• Begin implementation of Technosylva's WFA-E tools.	• Continue implementation of Technosylva's WFA-E tools. • Identify potential impacts to tools based on revised OEIS guidance / requirements for risk assessment and modeling.
Situational Awareness	• Integrate newly installed weather stations into the situational awareness model. • Complete annual calibration of existing weather stations to ensure functionality. • Perform verification and validation of forecast vs. actual fire weather data from 2021 to improve forward looking forecast.	• Complete installation of additional weather stations. • Substantially advance the company's risk modeling capabilities and inform prioritization of work in 2022-2023. • Begin plan development for wildfire detection pilot project for execution in 2023.
Grid Hardening	• Reprioritize programs needed before the next fire season and annual update based on the evolution of risk modeling to ensure inclusion in the CY2023-2025 execution plan. • Continue progressing grid hardening construction projects such as installation of covered conductor and system automation equipment for advanced protection and control. • Continue gathering continuous monitoring, DFA data for pilot. • Continue expansion of the free-portable battery program to mitigate the impact of PSPS.	• Review and finalize the 2023-2025 grid hardening scope for inclusion in the 2023 WMP. • Plan corrective work identified through the pole loading infrastructure hardening program. • Construct and commission additional transmission and distribution system automation devices. • Continue construction of covered conductor installation.
Asset Management	• Complete the CY2022 planned inspections within the HFTD. • Complete transmission line IR inspections scheduled in Q2 targeting peak loading or near peak loading conditions.	• Continue asset inspections and corrections in compliance with GO 95 and GO 165. • Prepare to implement distribution IR inspection pilot.
Vegetation Management	• Conduct annual readiness patrols in Tier 3 where cycle work is not planned.	• Conduct annual readiness patrols in the HFTD where cycle work is not planned.

Category	By June 1 of this year	By September 1 of this year
Grid Operations and Protocols	• Review existing operating protocols and ensure preparedness for 2022 fire season. • Continue evolving protocols to better track elevated wildfire risk protocols.	• Review 2022 fire season operating protocols and evaluate areas for improvement in 2023.
Data Governance	• Recruit and hire an additional program manager to manage and delivery complex GIS datasets for reporting. • Complete Q1 Quarterly Reports.	• Complete Q2 Quarterly Reports. • Continue expanding data reporting capability.
Resource Allocation Methodology	• Complete initial RSE evaluation at the initiative level. • Continue participating in OEIS led workshops and utility working groups to evolve RSE calculations.	• Begin implementation of Technosylva's WRRM model to support RSE calculations. • Develop plan to incorporate revised OEIS guidance / requirements for RSE calculations.
Emergency Planning and Preparedness	• Perform tabletop exercises in preparation for the 2022 fire season. • Stand up a Public Safety Partner portal with critical infrastructure information.	• Advance the Public Safety Partner Portal capabilities. • Plan to incorporate 2022 fire season lessons learned.
Stakeholder Cooperation and Community Engagement	• Continue partnering with public safety partners in communities throughout California regarding wildfire and PSPS preparedness. • Update the PSPS website to include the Spanish translation. • Conduct quarterly Wildfire Safety Advisory Board meetings to inform PSPS planning and protocols. • Conduct Wildfire Mitigation and PSPS Planning Webinar.	• Continue improvements to internal and external customer and community facing forecast of PSPS status (website). • Continue partnering with public safety partners in communities throughout California regarding wildfire and PSPS preparedness.

The wildfire mitigation strategy for the end of this year, three years and 10 years can be found in Section 5.2 on page 110.

A. Utility's Approach to Managing Wildfire Risk

PacifiCorp manages wildfire risk through the implementation of its WMP mitigation measures to influence ignition probability as described in Section 4.2 beginning on page 35. This section includes more detailed information regarding these ignition probability drivers as well as what mitigation activities are implemented to mitigate wildfire risk. Further details can be found in

Table 4.4 on page 95, Table 4.5 on page 96, and Table 4.6 on page 97, which include detailed mapping of methodologies, programs, and techniques to mitigate that various ignition risk drivers.

At this time, PacifiCorp does not make a specific distinction between programs that manage safety and reliability risks and those that manage wildfire risk; safety and reliability risks are strongly related to wildfire risk. Many of the risk drivers can be the same, such as faults or outages, and many can be different, such as climbing hazards identified near a pole. All PacifiCorp initiatives mitigate at least one of these types of risks and often more than one. An example of this can be found in any of the asset inspection subsections included in Section 7.3.4 beginning on page 181. These subsections describe how PacifiCorp's traditional inspection and correction programs maintain regulatory compliance and manage routine operational risk; they also mitigate wildfire risk by identifying and correcting conditions which, if uncorrected, could result in an outage or ignite a fire. Therefore, PacifiCorp's inspection programs mitigate all three types or risk: safety, reliability and wildfire.

While all company programs are required to properly mitigate risk, the incremental programs proposed through PacifiCorp's WMP process are specifically designed to mitigate wildfire risk; they incrementally reduce safety and reliability risk differently than traditional programs, which focused more on reliability and safety first, with additional benefits in terms of wildfire risk mitigation. When reviewing the initiatives, programs that were included in the company's 2019 GRC reflect the traditional programs designed to reduce safety and reliability risk with incremental benefits to wildfire risk mitigation, while newly proposed programs in the WMP represent programs specifically designed to reduce wildfire risk.

B. Mitigation Activity Decision-Making Process

Figure 7.1 depicts PacifiCorp's general decision-making processes related to selecting initiatives and prioritizing mitigation activities. This process, which is very high level and generally aligns with processes at other utilities, includes: evaluation, identification, selection, scope development and deployment. While the flowchart doesn't clearly indicate it, any step in the process can "kick back" a mitigation program to previous step. For example, if engineering design discovers unplanned cost or scope creep, the program may be reverted to the *selection phase*.

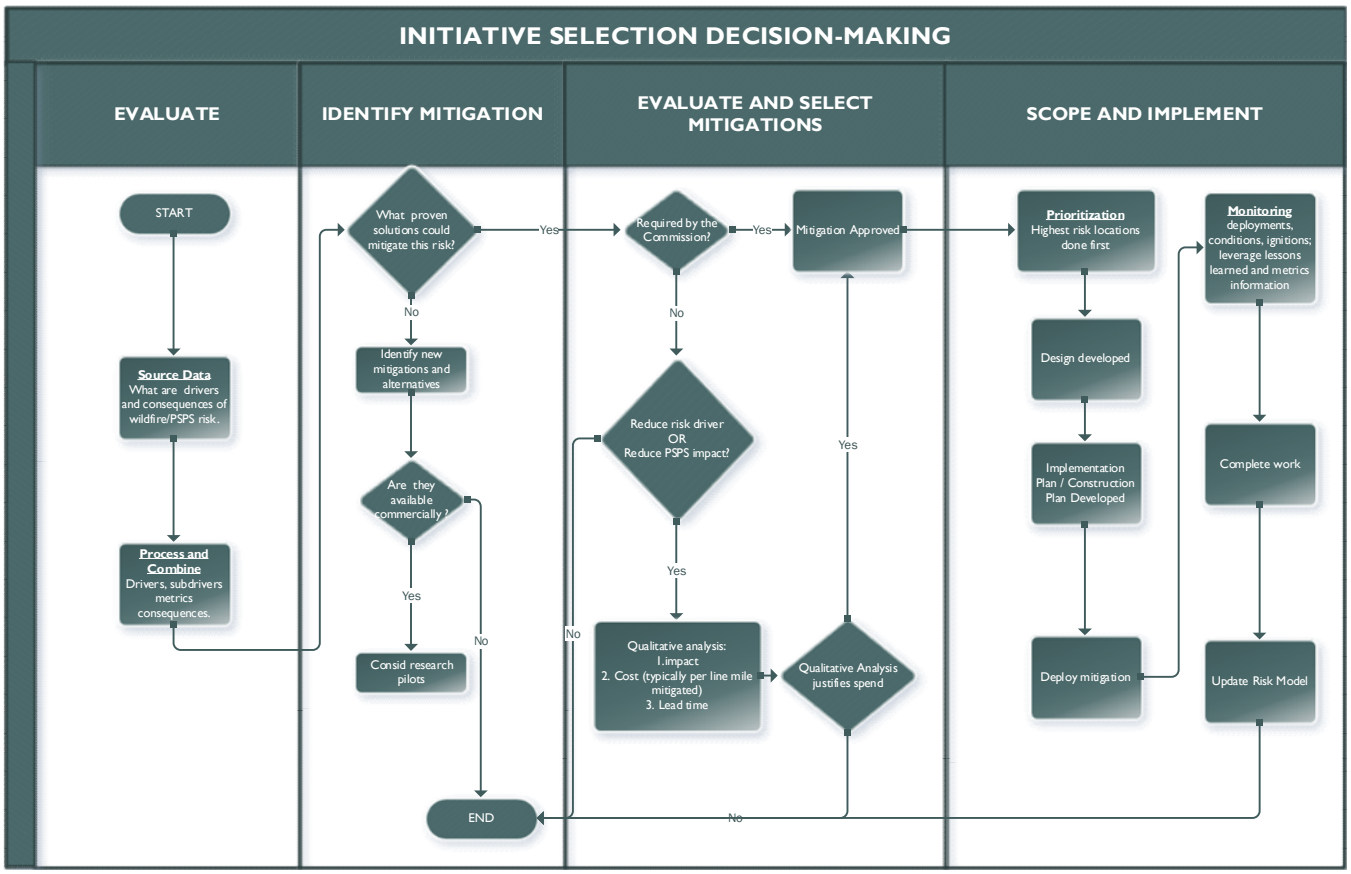

Figure 7.1 Initiative selection decision-making flowchart

Step 1: Evaluation

PacifiCorp begins the initiative decision-making process by identifying trends in risk events. Risk events are identified using the company's outage data, which is aligned with IEEE 1366 and IEEE 1782 and has been mapped to risk drivers based on outage cause categories. After the risk drivers are categorized, PacifiCorp used the outage data to quantify the frequency of each risk driver, as presented in Figure 7.2.

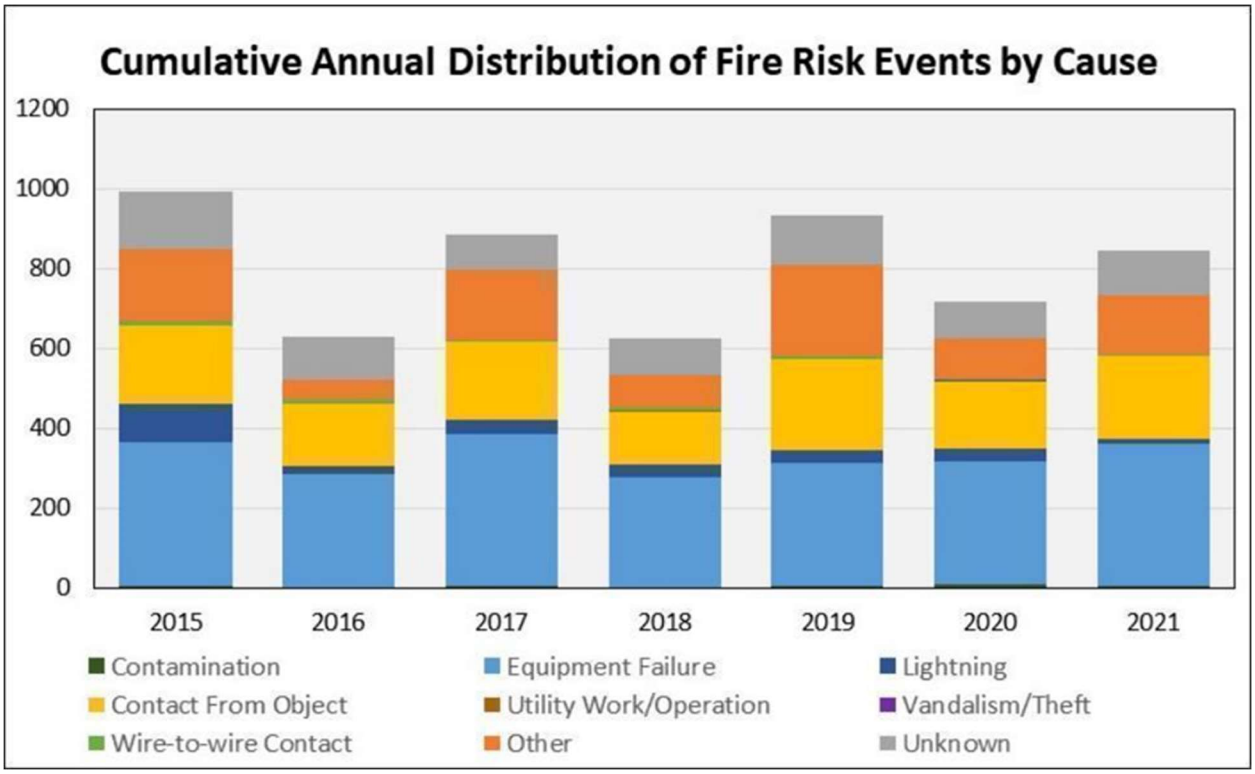

Figure 7.2 Cumulative annual distribution of fire risk events by cause

From this data, it was observed that priority should be placed on initiatives that address the most commonly occurring risk drivers.

Step 2: Identify Mitigations

To identify mitigations, an evaluation of current industry practices and new technology is performed. As other utility wildfire mitigation plans become available, PacifiCorp reviews them for pilot results and initiative progression, which supply valuable information on proven industry solutions. Additionally, PacifiCorp has developed relationships with other utilities across multiple states; these relationships facilitate discussions about industry practices and learning from each other. Proven solutions are then evaluated for selection as a mitigation program.

Step 3: Evaluating and Selecting

Mitigations are evaluated for implementation based on the following criteria:

- Commission or *regulatory requirements*
- Wildfire Risk impact
- Customer impact

- Ease of implementation

Programs approved by upper management then progress to be scoped and deployed.

Step 4: Scoping and Implementation

Program scoping can vary greatly depending on the type of program. Generally, PacifiCorp reviews the type of ignition risk factor the program is planned to address, reviews other simultaneous programs and prioritizes how the work is sequenced to address higher risk locations first. Addressing wildfire risks in PacifiCorp's Tier 3 and Tier 2 areas is a higher priority than addressing the risk in non-HFTD areas. After program prioritization, the program moves to the design stage, which can vary depending on the project. For grid hardening programs, this stage includes developing a formal engineering design (for vegetation management this is the step where the plan is developed). Following the design step, the detailed implementation plan is developed and the mitigation is initiated. Before, throughout the implementation of, and after completion of the program, a variety of metrics are collected and recorded. Metrics vary, depending on the specific program, and can include installation dates, completion dates, conditions, ignitions reported and / or outages reported. This data is all gathered with the plan that it can be incorporated into future revisions of risk modeling.

C. Summary of Changed Circumstances and Adjustment to Priorities

A summary of major investments can be found in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx. Additional information regarding major accomplishments is included in Section 5.3 starting on page 114. Lessons learned associated with the various initiatives has been reported in Section 4.1 on page 31.

Table 7.2 Programs and their modifications based on changing circumstances and priorities

Category	Changed Circumstances (2020-2022)	Adjustment to Priorities
Risk Mapping	Pivoting to Technosylva	Prioritizing RSE
Situational Awareness	• Built and implemented an in-house WRF model; daily WRF output ingested by the company's geospatial analysis application, GREATER. • Created of situational awareness website for internal and external consumption of weather station observations and forecast data. • Completed five years of a 30-year WRF reanalysis of historical weather conditions. • Piloted Technosylva's Wildfire Analyst-Enterprise in 2021. • Created a meteorology program with five full-time staff meteorologists to provide daily weather briefings and decision support.	• Expansion of Situational Awareness initiatives beyond weather stations to include the creation of an impacts-based forecasting system and web-based displays. • Increasing the density and pace of new weather station installations across the HFTD.

Category	Changed Circumstances (2020-2022)	Adjustment to Priorities
Grid Design and System Hardening	Obtained materials, began completing engineering design work and began installing in the field.	Covered conductor prioritization has remained the same.
Asset Management and Inspections	N/A	N/A
Vegetation Management and Inspections	Completed roll out and implementation of mobile data management software and continue to improve data collection process.	The changed circumstance has not resulted in an adjustment to priorities, but rather increased capabilities to track and execute work to accomplish goals.
Grid Operations and protocols	Identified a need for separate tracking of patrols related to elevated risk situations.	N/A
Data Governance	Development of Wildfire Safety team	N/A
Resource Allocation Methodology	N/A	Prioritizing RSE
Emergency Planning and Preparedness	N/A	N/A
Stakeholder Cooperation and Community Engagement	N/A	N/A

D. Resource challenges

PacifiCorp has encountered challenges related to limited field resources, particularly as it related to construction activities. The business plans to address these challenges through the hiring on additional contractors, as described in Section 9.3 starting on page 282.

Additionally, sufficient resources are needed to support plan development, monitoring and control. In 2021, PacifiCorp began planning to meet these unique challenges and established a wildfire safety department as described in Section 7.2 on page 144. An additional FTE is also being added, as reported in the 2021 Change Order submitted on November 1, 2022, to support data management and reporting. Further changes over the next three years are expected as the new 2023 guidelines are evaluated. PacifiCorp plans to further evaluate resources at that time.

E. Technology Evolution and Transformation

The company anticipates that it will continue piloting and researching new technologies with a focus on how these new technologies can transform existing initiatives or inform the need for new initiatives. This is further described in Section 4.4.1 on page 48 and imbedded in the wildfire mitigation strategy goals discussed in this section.

New technologies can provide information that isn't already available with current equipment or methods. For example, enhanced inspections view the equipment through IR allowing for information to be gathered that can't be detected visually. The weather stations that have been installed have allowed for weather modeling within the HFTD and the territory, which

has informed real-time operational decisions. PacifiCorp recognizes that it is vital to continue to learn about and evaluate new technologies and innovations over the next three years.

As new technologies and innovations become available, PacifiCorp plans to evaluate them for piloting or full implementation. It is anticipated that new technologies will add additional insight into the conditions or operational practices for the equipment in the service territory. The data gained will be interpreted in a way that a systematic approach of actions can follow the information gained.

F. GIS layer map showing generalized wildfire risk

A GIS layer map showing generalized wildfire risk, as per LRAM, has been provided in Attachment 1: GIS Wildfire Risk.

G. GIS layer showing grid hardening initiatives

Covered conductor installation undergrounding of electrical lines and/or equipment and removal of electrical lines has been provided in Attachment 2, which includes GIS Layer Covered Conductor, Covered Conductor 2022 and Covered Conductor 2023. These attachments provide grid hardening planned for 2022 and 2023.

Plans for grid hardening beyond 2023 are planned to be scoped in the future based on the 2023 WMP Guidelines and updated risk planning methodologies. Within the GIS layers, all hardening efforts are "in progress" and expected to be completed within the year of the designated file. GIS layers include the circuit ID. All work scoped is for covered conductor except for circuit 5G79, which is planned to be undergrounded.

H. Static high-level maps

Generally, grid hardening initiative work in 2022 and 2023 is prioritized in the HFTD areas (see Figure 4.2 for a map of the HFTD). Upon completion of these areas, PacifiCorp plans to address the next highest risk areas for grid hardening work.

I. GIS layer for planned asset management and inspections, 2022

PacifiCorp has provided, in Attachment 3: GIS Layer Inspections, a GIS layer for planned asset management and inspections in 2022. This layer includes the planned inspection date and inspection type (IR inspections, PTT, detail or visual). Work is prioritized based on the initiative prioritization in Section 7.3.4 starting on page 181, which describes the asset management and inspection program.

J. GIS layer illustrating enhanced clearances

Attachment 5 provides a map of where PacifiCorp plans to perform vegetation management work in 2022. Additionally, Attachment 4 provides a map of where vegetation management work was completed in 2020 and 2021.

7.2 WILDFIRE MITIGATION PLAN IMPLEMENTATION

Describe the processes and procedures the electrical corporation will use to do all the following:

A. *Monitor and audit the implementation of the plan. Include what is being audited, who conducts the audits, what type of data is being collected, and how the data undergoes quality assurance and quality control.*

B. *Identify any deficiencies in the plan or the plan's implementation and correct those deficiencies.*

C. *Monitor and audit the effectiveness of inspections, including inspections performed by contractors, carried out under the plan and other applicable statutes and commission rules.*

D. *Ensure that across audits, initiatives, monitoring, and identifying deficiencies, the utility will report in a format that matches across WMPs, Quarterly Reports, Quarterly Advice Letters,[24] and annual compliance assessment.*

A. Monitoring, auditing, quality assurance, quality control

PacifiCorp's WMP reflects a broad and thorough wildfire mitigation approach to meet the heightened risk and growing impact to communities in the company's California service territory. As a result, the plan contains many elements and touches nearly every department in the company. In recognition of this significant effort, PacifiCorp developed a new department, commonly referred to as Wildfire Safety. This new department consists of thirteen full-time employees, is led by a Managing Director, and includes both a project management office, focused on delivery of line rebuilds and system hardening, and a program delivery team, responsible for overall plan development, monitoring, and implementation. The overall organization is depicted below in Figure 7.3.

[24] General Rule for filing Advice Letters is available in General Order 96-B: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M023/K381/23381302.PDF

Figure 7.3 PacifiCorp's newly formed wildfire safety department

While the broader Wildfire Safety team is tasked with supporting all types of wildfire mitigation initiatives and strategies across the company's entire service territory, a key function of Wildfire Safety Program Delivery team is to develop, implement, monitor, and improve the company's Wildfire Protection Plan in Oregon. It is the responsibility of Wildfire Safety Program Delivery to coordinate with other internal departments such as Asset Management, Vegetation Management, Field Operations, and Emergency Management to ensure all aspects of the plan are delivered. While utilities have always needed to work to prevent wildfire sparked by an electric facility, this extensive approach reflects a new way for PacifiCorp to tackle this elevated risk.

As is true with any plan or program, monitoring plan implementation is just as critical as the plan elements itself. PacifiCorp combines company processes, tools, and site work to monitor program activities; individual departments are responsible for delivering specific portions of the plan. A few key management areas include local operations, emergency management, construction activity, and non-construction programs such as inspections and maintenance.

The emergency management department ensures an annual preparedness review of ongoing tasks and processes such as Wildfire Prevention Practices for operations employees and PSPS processes. Part of this annual review includes desktop exercises and after-event reports for lessons learned that can inform and improve plans. This is further described in Section 7.3.9 starting on page 235.

To facilitate WMP construction projects (generally reflected in the system hardening programs) PacifiCorp established a wildfire mitigation project management office. This office monitors all aspects of construction (engineering, permitting, standards, estimating, materials, and post-audit quality assurance) to ensure the plan deliverables are achieved. PacifiCorp uses company processes, tools, and site work to monitor these activities. For example, weekly coordination meetings are held and costs and progress are tracked and monitored monthly. Additionally, internal engineering audits and verifies all contracted design work to ensure projects meet the necessary scope as well as company and industry standards.

Other aspects of the WMP are overseen by existing program offices such as vegetation management, asset management, and corporate communications. These offices collect all pertinent information (inspection records, etc.) to ensure compliance. All collected data is maintained in the company's corporate enterprise systems. Details regarding program oversight and management are included in the detailed program elements.

While individual departments can monitor individual elements of the company's WMP, PacifiCorp has identified a gap: the WMP lacks a clear plan and process to monitor collective implementation. This gap became more obvious during 2020 plan implementation due to both the increase in reporting requirements and frequency as well a heightened need for coordination between departments to ensure programs reflect the WMP's overall strategy and vision.

PacifiCorp is continually evaluating methods it can employ to ensure greater structure within the PMO to ensure that proper delivery, monitoring and auditing practices are put in place.

B. Deficiencies

Plan deficiencies are generally identified through self-audits, after-action reviews and progress updates. As described above, each department can monitor progress and identify deficiencies. For example, emergency management conducts after-action reviews that include, as a component, action items to close gaps that were found. Audits conducted following asset inspections include detailed reports on findings that are then added to annual inspector training.

One area currently identified for improvement at PacifiCorp and identified by the OEIS is data governance. PacifiCorp has been working diligently to improve data delivery consistent with the GIS Data Schema requirements published by the OEIS. To date, the company has been able to deliver a substantial portion of the asset data, PSPS event data and risk event data in the format requested.

However, improving data governance requires retrieving and translating nonspatial data into GIS format. Like monitoring and auditing the WMP, the evolution of the company's GIS data capability touches many departments and requires an intense amount of input and coordination. While individual departments may have policies, processes and procedures to manage key operations data, PacifiCorp does not have a single, overarching data governance plan. However, the company recognized the need to develop a plan to close this gap, which will continue to be reported in quarterly updates.

Another area identified for improvement, has been the installation of covered conductor in the field, which has been slow to complete on target, and is likely to continue missing targets for the year, despite ample planning and prioritization of current resources. To address this, the business strategy has shifted to fundamentally increase resources using a Construction Management contractor, as described in Section 9.3 on page 282, and PacifiCorp plans to

award the contract at the beginning of 2023.

C. Inspections

The effectiveness of these programs at reducing operating risk — which includes wildfire risk — relies on inspection quality and proper interpretation of findings. PacifiCorp monitors inspections through its quality assurance and quality control (QA/QC) program. This program generally includes desktop and field audits designed to identify gaps in the inspection programs and inspector capabilities. QA/QC also includes corrections that increase inspection accuracy and reliability, which is critical to ensure effectiveness and to support risk reduction.

To perform QA/QC of inspections, PacifiCorp uses a combination of process controls, software tools, company policy and physical record checking to quickly identify inaccuracies for corrections, evaluations, root cause analyses and system improvements. These activities provide a cost-effective way to minimize inaccurate of unreliable inspection results. Inspection results are reviewed continuously to confirm that inspections in the HFTD are meeting acceptable standards of performance.

The main components of this program, including enhancements to mitigate wildfire risk, are:

- Physical audits of at least 5% of planned facility inspections with a focus on fire threats and Tier 2 and Tier 3 prioritization
- Software controls that prohibit freeform Condition assignment, allowing for result controls, minimizing the amount of human error possible
- Quarterly review of already audited results as a secondary check
- Annual inspector training to address audit findings and improve inspection reliability and accuracy

Additional details about these components, program management, cost, evolution and new enhancements to reduce wildfire risk in recognition of PC-4 are included in Section 7.3.4 starting on page 181.

D. Reporting format

PacifiCorp has taken OEIS guidance and begun matching its current programs to older named programs, as requested in earlier updates. Where programs have been realigned, the company has referred to the older program name as well as the current name. This realignment is still evolving. As the company and stakeholders evaluate its plan and become familiar with the programs, how the programs are evolving and aligning with stakeholder directions will become clearer.

7.3 DETAILED WILDFIRE MITIGATION INITIATIVES

In this section, describe how specific wildfire and PSPS mitigation initiatives execute the strategy set out in Section 5. The initiatives are divided into 10 categories, with each providing a space for narrative descriptions of the utility's initiatives. The initiatives are organized by the following categories provided in this section:

1. *Risk assessment and mapping*
2. *Situational awareness and forecasting*
3. *Grid design and system hardening*
4. *Asset management and inspections*
5. *Vegetation management and inspections*
6. *Grid operations and protocols*
7. *Data governance*
8. *Resource allocation methodology*
9. *Emergency planning and preparedness*
10. *Stakeholder cooperation and community engagement*

It is not necessary for a utility to have every initiative listed under each category.

Financial data on mitigation initiatives

Report actual and projected WMP expenditure, as well as the risk-spend-efficiency (RSE), for each initiative by HFTD tier (territory-wide, non-HFTD, HFTD zone 1, HFTD tier 2, HFTD tier 3) in Table 12. of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx. For each item in this category, provide relevant maps within the report or appendices.

Detailed information on mitigation initiatives

Report detailed information for each initiative. For each initiative, organize details under the following headings:

2. ***Risk to be mitigated** / problem to be addressed*
2. ***Initiative selection** ("why" engage in initiative) – include reference to and description of a risk informed analysis and/or risk model on empirical (or projected) impact of initiative in comparison to alternatives and demonstrate that outcomes of risk model are being prioritized*
3. ***Region prioritization** ("where" to engage initiative) – include reference to a risk informed analysis in allocation of initiative (e.g., veg clearance is done for trees tagged as "high-risk") and demonstrate that high-risk areas are being prioritized*
4. ***Progress on initiative** since the last WMP submission and plans, targets, and/or goals for the current year*
5. ***Future improvements to initiative** - include known future plans (beyond the current year) and new/novel strategies the utility may implement in the next 5 years (e.g., references to and strategies from pilot projects and research detailed in Section 4.4).*

7.3.1 Risk assessment and mapping

7.3.1.1 A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment

1. **Risk to be mitigated**

   In Section 4.5, starting on page 65, PacifiCorp explained its evolution toward a comprehensive risk modeling approach that supports evaluating a variety of fire risks in the context of its network overlaid on the appropriate land features. This risk modeling approach also allows for estimating the impacts of various mitigation measures on future fire risks. As it unfolded that approach, it created a single modeling tool through its LRAM that addresses utility ignition, climate risks (historic, current and forecast) and the impacts of fire spread. As result, PacifiCorp consolidated all aspects of the risk assessment mapping (sections 7.3.1.1 and 7.3.1.3, starting on page 150) into this initiative, Section 7.3.1.1, which serves as an enabling technology and foundational element upon which to rationalize the risks, costs and benefits for a variety of mitigation approaches designed to result in improvements in utility fire risk.

2. **Initiative selection**

   In its review of PacifiCorp's application of established HFTD, OEIS and other stakeholders provided feedback on the lack of RSE methods underlying the identification and prioritization of mitigation activities. The company heeded this feedback and took prompt action to begin building out its capability to model a variety of inputs that could inform its risk identification on both a short- and long-term basis. The company has previously reminded OEIS that its obligations through S-MAP and RAMP are still in development in R.18-10-007. To move its WMP forward, the company leapfrogged its risk modeling ahead; it will align LRAM with non-fire elements later, as necessary consistent with rulemaking. For the OEIS definition of this initiative, Risk Mapping and Assessment, see Appendix 9.1 starting on page 271.

3. **Region prioritization**

   PacifiCorp designed the LRAM to be broadly extended throughout its electrical network. It used Tier 3 areas for prioritizing and validating of its model, Tier 2 are subject to PSPS due to local climatology and a Non-Tier area.

4. **Progress on initiative**

   The company has materially delivered Phase 1 of its LRAM.

5. **Future improvements to initiative**

   The company outlined several areas planned for further development, including the incorporation of variable impact of certain equipment or components on localized

wildfire risk.

7.3.1.2 Climate-driven risk map and modeling based on various relevant weather scenarios

1. **Risk to be mitigated**

PacifiCorp recognizes the value in understanding climate driven risks based on relevant weather scenarios. Currently, PacifiCorp's LRAM tool includes a layer designated as "Fire Weather," the climate driven risk element based on various relevant weather scenarios described in Section 4.5.1.2. This layer is relatively static and based on a combination of available datasets such as the HRRR weather data and the LANDFIRE 2020 FCCS datasets. To complement this layer and incorporate a wider array of weather scenarios, PacifiCorp is in the process of procuring a WRF model of the service territory and implementing Technosylva's WFA-E suite discussed in Section 4.5.1.1. Through procurement and implementation of these tools and datasets, this initiative is planned to support a wildfire risk-based resource allocation methodology.

2. **Initiative selection**

Historically, PacifiCorp initiatives were prioritized based on the HFTD map, where areas inside the HFTD are worked first. However, as the wildfire mitigation programs mature, the Company is moving towards a quantitative risk-based methodology to identify and prioritize mitigation activities, such as through RSE, as recommended by OEIS and other stakeholders. To develop an RSE, PacifiCorp first began developing a wildfire risk model, LRAM, consisting of layers of data weighted for risk importance such as:

- Fire Weather Risk, which maps to a climate-driven risk based on various relevance weather scenarios
- Utility Fires and Equipment
- Utility Ignition Fault Risk
- Available Arc Energy and Short Circuit Ignition Likelihood
- Tree Canopy Risk
- Historic Fire Weather Fire Spread Risk

Fire weather risk uses a combination of the High-Resolution Rapid Refresh (HRRR) model tool from NOAA, which is a 3km resolution of weather data which is updated every hour and LANDFIRE 2020 Fuel Characteristic Classification System Fuel beds (FCCS) dataset. This combination allows for the incorporation of wildfire-relevant

impacts such as weather trends and fuel data into LRAM. PacifiCorp has provided a map of the of the LRAM fire weather scores below.

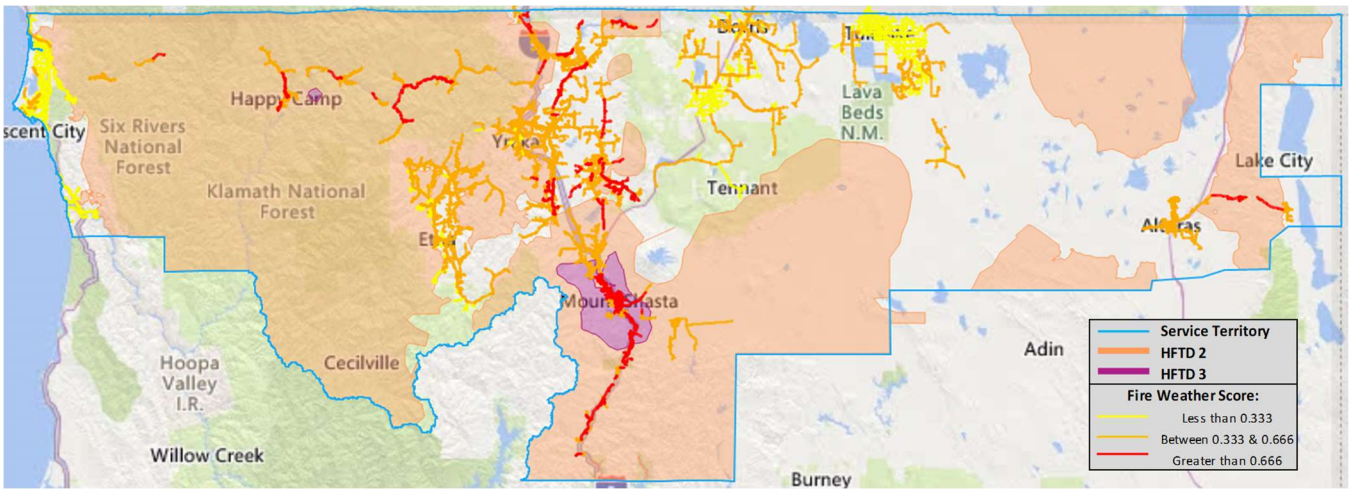

Figure 4 : Map of LRAM Fire Weather Score

This initiative was selected to be developed as a data element of LRAM to support RSE development, therefore the spend associated with this initiative has been accounted for in initiative 7.3.1.1 which supports the overall development of LRAM and related data elements.

3. Region prioritization

Wildfire risk mapping and modelling encompasses the entire PacifiCorp service territory, where tier 3 and tier 2 areas are used to validate that model risks align with the HFTD.

4. Progress on initiative

The company has materially delivered Phase 1 of its LRAM, and has "Combined Scores," at the ZOP level. Climate data and models are rapidly evolving to improve; therefore, LRAM is not seen as a fully operationalized simulation and modeling tool, but rather a tool which can be updated as needed for continuous improvement.

As new and improved data elements are made available, PacifiCorp will evaluate those elements and consider updates to risk models. Specifically related to the climate driven risks and models, PacifiCorp plans to update from the HRRR model to WRF model in 2023, which will provide a 30yr, 2km resolution, hourly, reanalysis of weather variables across PacifiCorp territory. WRF looks at 30yrs of data and provides a more granular resolution of data than the HRRR model.

The WRF data is being procured as a mandatory component of the operational tool being developed for the development of the fire potential index (FPI), described in

initiative 7.3.2.4 Forecast of Fire Risk Index, Fire Potential Index, or similar. Therefore, the progress on this initiative does not have spend associated with it, as the spend is captured under initiative 7.3.2.4.

5. **Future improvements to initiative**
   PacifiCorp anticipates that the update to WRF in 2023 will be a significant improvement to the climate risk elements climate driven risk modelling. While there are no specific climate risk updates planned in the future, PacifiCorp does plan to continuously be learning about improved updates and will incorporate them as the benefit is worth the cost.

7.3.1.3 Ignition probability mapping showing the probability of ignition along the electric lines and equipment

1. **Risk to be mitigated**

   A comprehensive view of Wildfire Risk includes an ignition probability or ignition likelihood factor. Ignition likelihood, as a component of baseline risk, helps to inform long term project selection and prioritization. Additionally, ignition likelihood, as a component of dynamic risk, helps to inform the impacts of fire weather scenarios to inform real time decision making. In both applications, the assessment of ignition probability helps to reduce overall wildfire risk through informed mitigation tactics. PacifiCorp's initial development of ignition probability mapping was included in LRAM as discussed in Section 4.5.1.4.

2. **Initiative selection**

   Historically, PacifiCorp initiatives were prioritized using the HFTD map where work inside the HFTD, and specifically Tier 3, was worked first. As PacifiCorp's risk mapping and resource allocation methodologies evolve, the Company is moving towards a quantitative methodology to prioritize work, more granularly, based on wildfire risk. Additionally, PacifiCorp is seeking to understand the RSE associated with initiatives selected for implementation and understanding the likelihood of ignition, through the selection of this initiative, is a foundational step towards the development of RSE.

   As described in section 4.5.1.4, Localized Risk Assessment Model, LRAM consists of a combination of layers, weighted for risk importance, to produce the output of a "combined score." Contributing layers to Combined Score include both the Utility Risk Layer and Environmental Risk Layer.

   The Utility Risk Layer describes, as a quantitative ranking, the likelihood that utility infrastructure would experience a fault or spark, using the following inputs:

- Outage rates which are derived from historic fault data attributed to causes such as contact with object or equipment failure,
- Tree canopy data from satellite tree canopy data to determine the potential for fall in risks that could result in outage events,
- Ignition history on a circuit and
- Available probabilistic arc energy risk modelled level of potential energy that could be released during a fault event.

The Environmental Risk Layer quantifies, as a relative ranking, the potential for escalation of a spark to an ignition using the following inputs:

- iUTI: Integrated Utility Threat Index that depicts long term, climatological fire weather patterns.
- Contemporary Fire Weather Risk Model (Wildfire Risk Score): Nearer term assessment of frequency and intensity of fire weather events paired with location specific fuel density information.
- Historic Fire Area: Incorporates known wildfire perimeter areas to highlight where large wildfire growth and spread have occurred.

The Combined Score then describes the likelihood, as a quantitative ranking, of a utility spark or fault occurring and escalating into an ignition. This combined score is generally used to understand ignition probability and target long term investment in grid hardening to mitigate the risk of ignition probability.

As development of this initiative supports the overall objectives of LRAM to represent wildfire risk, which can be further developed to support RSE, therefore portions of the spend associated with this initiative has been accounted for in initiative 7.3.1.1 which supports the overall development of LRAM and related layers which constitute LRAM.

While LRAM presents a first step at assessing ignition probability for long term planning and baseline risk, PacifiCorp is also making investments and advancing dynamic risk assessment capabilities through the implementation of Technosylva's WFA-E tools accounted for in initiative 7.3.2.4. These tools, once fully operational, will be providing an ignition likelihood to PacifiCorp within 2022, across the overhead distribution system.

3. **Region prioritization**

Wildfire risk mapping and modelling encompasses the entire PacifiCorp service territory, where tier 3 and tier 2 areas are used to validate that model risks align with

the HFTD.

4. **Progress on initiative**

   The company has materially delivered Phase 1 of its LRAM and has "Combined Scores" at the ZOP level. The next phases of development include using the LRAM foundation alongside Technosylva's WRM module to create a quantifiable resource allocation methodology, risk reduction and RSE.

   At this time, PacifiCorp does not plan to change the methodology or data inputs for ignition probability used within LRAM, but PacifiCorp isstreamlining those processes. For example, in Section 4.5.1.3, PacifiCorp notes that key improvements planned include data import and processing improvements. These improvements to data importing will automate some processes, freeing up valuable resource time for other initiative developments.

   PacifiCorp has begun to develop operational tools through the procurement of Technosylva which includes a model of ignition likelihood, as mapped in Figure 4.10. Moving forward, PacifiCorp plans to validate the ignition likelihood model being provided from Technosylva and incorporate the use of it in the development of RSE, resource allocation methodology and risk reduction. Additionally, ignition likelihood is a component of the operational tool, Technosylva, described in section 7.3.2.4 Forecast of a fire risk index, fire potential index or similar, therefore the spend associated with this Technosylva module has been included in that section.

5. **Future improvements to initiative**
   With the purchase of Technosylva WFA-E, PacifiCorp is further aligning with the methodologies of other utilities in the OEIS Risk Modelling utilities workshops. As PacifiCorp continues to attend these workshops, it is anticipated that further improvements for greater alignment and model improvements may be scoped, planned and implemented, particularly after the release of updated 2023 Risk Modelling guidelines.

7.3.1.4 Initiative mapping and estimation of wildfire and PSPS risk reduction impact

1. **Risk to be mitigated**

   PSPS is a tool used as a measure of last resort to mitigate risk. PacifiCorp recognizes the impact that a PSPS implementation can have, including on irrigation, public transportation and other facilities. This initiative seeks to develop a tool to support wildfire and PSPS risk information which can be used to inform PSPS decision making.

2. **Initiative selection**

   Once fully operation, PacifiCorp plans to use Technosylva's WFA-E tools to estimate risk reduction efficacy described in section 7.3.1.2, 7.3.1.2 and detailed in 7.3.2.4,

where the spend is also captured. This initiative was selected for implementation, based on its capabilities to advance quantitative decision-making and RSE calculations and feedback from OEIS and other stakeholders.

3. **Region prioritization**

   Wildfire risk mapping and modelling encompasses the entire PacifiCorp service territory, where tier 3 and tier 2 areas are used to validate that model risks align with the HFTD.

4. **Progress on initiative**

   Historically, PacifiCorp has taken a qualitative approach to decision making and RSE assessments that incorporates subject matter expertise and input from public safety partners. Through participation in the OEIS hosted Risk Modelling workshops, PacifiCorp learned that several utilities are leveraging Technosylva's expertise to advance methodologies for quantitative assessments. After PacifiCorp procures Technosylva WFA-E, plans for the development of a PSPS risk tool using it can begin.

5. **Future improvements to initiative**
   As PacifiCorp obtains more information from other utilities and more familiarity with the procured Technosylva WFA-E module, it is anticipated that a tool will be developed, aligned with learnings from other utilities, where feasible, and that the tool will be continuously evaluated for improvements.

7.3.1.5 Match drop simulations showing the potential wildfire consequence of ignition that occur along the electric lines and equipment

1. **Risk to be mitigated**

   A component of Wildfire Risk includes the match drop simulations to indicate the potential wildfire consequence of an ignition. These simulations can support both resource allocation methodologies such as RSE calculations and project prioritization or other, more dynamic, decision-making processes. For these reasons, PacifiCorp recognizes the need for a comprehensive view of wildfire risk which includes match drop simulations to gain an understanding of the consequences associated with an ignition.

2. **Initiative selection**

   In the 2020, PacifiCorp engaged Pyregence and participated in a technical advisory committee to support further development of practical tools for utility operations and engineering personnel in the areas of "match drop" simulations along specific corridors.[25] The Pyregence Ignition Modelling research helped inform the

[25] See Section 4.3 of PacifiCorp's 2021 WMP Update at page 52 for more information.

understanding of how fire-affecting climate change may impact PacifiCorp's service territory, specifically in terms of changes to ignition probability and estimated wildfire consequence as discussed in 4.2.1 beginning on page 38. While direct applications of this research were more static and not fully operationalized at PacifiCorp, this research demonstrated the potential value and usefulness of ignition simulation modeling. Therefore, PacifiCorp's first pass at assessing the potential wildfire consequence of ignitions was incorporated into the company's risk model, LRAM, financially accounted for in Section 7.3.1.1. Additionally, as further described below, this initiative has evolved to include more dynamic components of wildfire consequences of ignition through implementation of Technosylva's FireSim product, financially accounted for in Section 7.3.2.4 and technically described in Section 4.5.1.1.

3. **Region prioritization**

Wildfire risk mapping and modelling encompasses the entire PacifiCorp service territory, where tier 3 and tier 2 areas are used to validate that model risks align with the HFTD.

4. **Progress on initiative**

Historically, PacifiCorp initiatives were prioritized based on the HFTD map, where areas inside the HFTD are worked first. However, as the wildfire mitigation programs mature, the Company is moving towards a quantitative risk-based methodology to identify and prioritize mitigation activities, such as through RSE, as recommended by OEIS and other stakeholders. To develop an RSE, PacifiCorp first began developing a wildfire risk model, LRAM.

As described in section 4.5.1.4 Localized Risk Assessment Model, page 91, LRAM consists of a combination of layers, weighted for risk importance, to produce the output of a "Combined Score". Contributing layers to Combined Score include both the Utility Risk Layer and Environmental Risk Layer:

The Utility Risk Layer describes, as a quantitative ranking, the likelihood that utility infrastructure would experience fault or spark using the following inputs:

- Outage Rates: Historic fault data attributed to causes such as contact with object or equipment failure.
- Tree Canopy: Satellite tree canopy data to determine the potential for fall in risks that could result in outage events.
- Ignition History: History of ignitions on a circuit.
- Available Probabilistic Arc Energy Risk Model: Calculated/modeled level of potential energy that could be released during a fault event.

The Environmental Risk Layer quantifies, as a relative ranking, the potential for escalation of a spark to an ignition using the following inputs:

- iUTI: Integrated Utility Threat Index that depicts long term, climatological fire weather patterns.
- Contemporary Fire Weather Risk Model (Wildfire Risk Score): Nearer term assessment of frequency and intensity of fire weather events paired with location specific fuel density information.
- Historic Fire Area: Incorporates known wildfire perimeter areas to highlight where large wildfire growth and spread have occurred.

The Combined Score then describes the likelihood, as a quantitative ranking, of a utility spark or fault occurring and escalating into an ignition. This combined score is generally used to understand ignition probability and target long term investment in grid hardening to mitigate the risk of ignition probability.

While helpful to inform project prioritization and overall risk model development, LRAM does not include full simulation capabilities, such as "match-drop" simulations. Specifically, the Environmental Risk Layer is helpful to understand the relative potential escalation for a spark using key factors and data, but does not allow for multiple, operational simulations using updated, or real time information.

With the procurement of Technosylva, as financially accounted for in Section 7.3.2.4 (Forecast of a fire risk index, fire potential index, or similar) and technically described in Section 4.5.1.1, PacifiCorp will obtain the Technosylva FireSim product and build upon this initial research. The FireSim product will specifically model wildfire spread through the simulation of millions of wildfires across the service territory, similar to "match-drop" simulations. These simulations will then be incorporated into the Wildfire Risk score at three-hour time internals across the forecast period.

5. **Future improvements to initiative**
   With the procurement of Technosylva WFA-E, PacifiCorp will have achieved a significant progression in maturity of this initiative. It is anticipated that the continued maintenance costs of Technosylva will continue to provide the most updated Match Drop simulation in its wildfire risk scores.

7.3.2 Situational awareness and forecasting

7.3.2.1 Advanced weather monitoring and weather stations

1. **Risk to be mitigated / problem to be addressed**

   A key component of wildfire risk mitigation is making informed decisions during

dynamic weather situations that could impact power infrastructure. Dynamic weather situations require quality data, communicated remotely across the service territory. While there is some publicly available weather data, it can have gaps and/or not be recorded with the sensitivity needed to make more accurate forecasts. Therefore, PacifiCorp began to develop its own weather network to address these gaps and to provide reliable, accurate weather data to support better forecasting and more informed decision-making.

2. **Initiative selection**

In its evaluation to establish a cost-benefit analysis to support its weather network expansion, the company found itself unable to find a way to quantifying the proper level of weather station density; however, PacifiCorp plans to keep working to identify weather station circuit density. PacifiCorp's focus has been on establishing a network of weather stations to provide situational awareness for each circuit in the HFTD by the end of 2022.

The alternative to establishing a weather station network, is to use generalized public weather data, which has been available for many years. Additionally, public weather data can be less reliable or less frequently calibrated than company-owned and collected data. Therefore, PacifiCorp began to develop a weather station network.

For the OEIS definition of the advanced weather monitoring initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

PacifiCorp outlined its process to begin building out its weather network in its September 9, 2020, Quarterly Report filing. Because of the importance of localized, real-time weather data to any PSPS program, PacifiCorp's main priority in 2019 was locating weather stations in and around defined proactive de-energization zones. The company engaged REAX to advise on the best placement of stations, considering topography and climate trends. After the target locations were established, PacifiCorp reviewed those locations with the NWS office in Medford, Oregon (which supports Siskiyou County, California for much of its weather forecasting). All data collected by these stations is communicated into MesoWest (operated by the University of Utah), which aggregates all climate data and makes it publicly available, on a 10-minute refresh.

In 2020, PacifiCorp focused on better coverage across its whole service territory and near populated communities bordering Tier 2 areas. PacifiCorp expanded the system to establish a more macro understanding across its service territory, including outside the PSPS areas. Also in 2020, the company used distance and elevation change from a particular circuit ZOP to the closest weather stations in the area to find data gaps that would help determine locations for weather station placement. Thereafter, the

company engaged weather experts, including those at the NWS and Pyregence Project participants, and fire response professionals, including at the BLM and the NIFC, to consider the proposed locations. The company integrated the BLM's RAWS network (by installing RAWS stations throughout California, Oregon and Washington). The weather station network expansion will increase PacifiCorp's general situational awareness, improve risk modeling efforts in those areas, and as suggested by the OEIS, improve understanding of how weather systems move across the entire territory. In 2020, the company used the LRAM to identify areas where climate-driven fire risk and utility equipment risks resulted in elevated combined scores; the company then calculated distances to available weather stations, using elevation and absolute measurements to score those areas with greater risk but limited weather information. Finally, its new meteorologists calibrated those locations to refine target locations.

In 2021 and continuing into 2022, the meteorological team began placing weather stations in locations with forecast gaps. Sometimes an extreme weather pattern will originate outside the high-risk areas; the earlier the forecast is able to capture data related to that event, the better forecast we have. This guiding principle helped the PacifiCorp meteorologists identify best new weather station locations.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp has continued to develop the weather station network based on informed placement recommendations from the meteorology forecasters who develop the situational awareness reports. Additionally, PacifiCorp has initiated the plan to establish the weather station network density and systematic methodology for placement.

   As described in Section 4.4.2.7 on page 61, PacifiCorp piloted the use of different types of weather stations. Due to the greater sensor capability, PacifiCorp plans to use MWS primarily and only plans to use RAWS where MWS could not be installed.

   Additionally, this year PacifiCorp plans to initiate planning for a wildfire detection pilot (see Section 4.4.1.1 on page 48).

5. **Future improvements to initiative**

   While PacifiCorp has piloted multiple weather station types, and implemented weather stations along HFTD circuits, additionally improvements to this initiative include further expansion of weather station placement via the methodology that is planned to be developed in 2022.

7.3.2.2 Continuous monitoring sensors

7.3.2.2.1 Distribution Fault Anticipation

1. **Risk to be mitigated / problem to be addressed**

   As discussed in Section 4.2.1, starting on page 38, utility ignition risks are correlated with fault events. Fault events occur due to some form of contact, equipment failure or damage or other short circuit event occurring on the system. Monitoring of waveforms can identify an incipient condition, allowing pre-emptive action to potentially avoid a fault event.

2. **Initiative selection**

   DFA equipment (see Section 4.4.2.1 on page 51) serves as a continuous monitoring tool that applies machine-learning processes. While the company continues to look for opportunities to improve its inspection process, there are situations that may not be detectable, even using some of the newly adopted tools that are part of the enhanced inspection program. DFA is anticipated to provide a full-time monitoring function to complement routine patrol and equipment inspection.

3. **Region prioritization**

   The company began development of a DFA pilot program in 2019; DFA devices were commissioned on two of the highest priority circuits in 2021. As the opportunity arises to use this technology at locations, particularly those having high combined fire risk scores where the substation equipment lends itself to placement of the DFA devices and where communication networks exist, the company will extend the application of this pilot technology.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp completed the installation of DFA devices on two circuits outside of the Weed substation (5G45 and 5G83). Two additional circuits out of Lassen substation (5G77 and 5G79) had DFA devices installed during 2021 covering PacifiCorp's Weed and Mt. Shasta service areas. The goal is to record data as per the DFA pilot (see Section 4.4.2.1 on page 51).

5. **Future improvements to initiative**

   PacifiCorp plans to evaluate the results of the pilot before making a recommendation on the next steps of the initiative.

7.3.2.2.2 Wildfire Cameras

1. **Risk to be mitigated / problem to be addressed**

   As discussed in Section 7.3.2.1 on page 158, a key component of wildfire risk

mitigation is making informed decisions during dynamic weather situations that could impact power infrastructure. While the more granular weather station information discussed in Section 7.3.2.1 on page 158 is valuable it cannot provide an actual view of the situation on the ground. In the WSD-017 OEIS Action Statement expressed concern that PacifiCorp was not collecting data on active wildfires in the area. PacifiCorp plans to investigate the development of a wildfire detection network to mitigate this data gap through the wildfire detection pilot program (see Section 4.4.1.1 on page 48).

2. **Initiative selection**

   The wildfire detection pilot (Section 4.4.1.1 on page 48) will address the OEIS recommendation to incorporate HD camera deployment and fire detection technology for ignition recognition.

3. **Region prioritization**

   In 2022, PacifiCorp plans to develop a new Wildfire Detection program, consisting of wildfire cameras and smoke detectors, strategically placed in remote locations of the HFTD where there are no other wildfire detection capabilities.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   This year PacifiCorp plans to initiate planning for a wildfire detection pilot (see Section 4.4.1.1 on page 48) that will include the use of HD cameras.

5. **Future improvements to initiative**

   PacifiCorp plans to evaluate the results of the pilot before making a recommendation on the next steps of the initiative.

7.3.2.3 Fault indicators for detecting faults on electric lines and equipment

1. **Risk to be mitigated / problem to be addressed**

   Based on heightened risk during fire season, PacifiCorp may deploy alternate relay settings that incorporate more sensitive fault detection and isolation capabilities. Alternative settings may include the disabling of reclosing. Use of alternate settings, however, can result in more frequent outages on a given circuit. And longer patrols can extend the duration of outages. Consequently, circuits can experience more frequent and longer outages, especially where traditional equipment and technology cannot pinpoint fault locations. Therefore, this initiative was developed to mitigate the potential impact to customers associated with other wildfire mitigation tactics by facilitating faster restoration through the implementation of communicating fault circuit indicators (CFCI) and fault circuit indicators.

2. **Initiative selection**

   While alternate settings can be an effective strategy to reduce the risk of wildfire, PacifiCorp recognizes the disruption of outages on customers and communities. Therefore, PacifiCorp introduced a new initiative to install CFCIs on circuits where more sensitive settings may be deployed during periods of heightened risk in the 2021 Change Order submitted on November 1, 2021, and provided in attachment 8. These CFCI devices sense faults and communicate these results back to PacifiCorp's central grid operations center. When placed strategically along circuits, the results can be used to help pinpoint fault locations and target operations response and patrols, reducing restoration times and mitigating the impact to customers. Because of their impact in reducing the amount of time required to patrol lines when a device with reclosing functionality opens, CFCI devices facilitate the use of more sensitive fire settings. For the OEIS definition of the fault indicators initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   CFCIs are installed in more remote areas, with an installation priority for those fault indicators located in the HFTD.

4. **Progress on initiative since the last WMP submission and plans, targets, and/or goals for the current year**

   PacifiCorp developed this initiative in 2021 and plans to install CFCIs in 2022.

5. **Future improvements to initiative**

   Continued exploration of the use of intelligent electric devices is part of the company's approach to grid design and system hardening (Section 4.1.3 starting on page 32).

7.3.2.4 Forecast of a fire risk index, fire potential index, or similar

1. **Risk to be mitigated / problem to be addressed**

   Generalized public weather data is and has been available for many years and limited company data is also available. However, in particularly dynamic situations that pose an increased wildfire risk, this data is insufficient and not reliable enough to fully understand localized ignition risks, particularly in rural locations. As such, data limitations present challenges for making localized emergency management decisions, like whether to initiate a PSPS. Additionally, data alone is not enough to understand and evaluate risk. Data must be aggregated, evaluated and applied locally to the electrical system and surrounding areas to inform decision-making, which is the objective of this initiative.

2. **Initiative selection**

Implementation of impact-based forecast software solutions will position PacifiCorp to take better informed actions in advance of severe weather. This will help the company to reduce restoration times and increase reliability, while reducing the risk of wildfire. The solutions PacifiCorp chose for implementing this initiative will greatly improve its ability to prepare for and respond to extreme fire weather events. Data from these forecasting systems will also be integrated with existing utility data and advanced wildfire models to manage real-time fire risk, prioritize fire-hardening infrastructure projects, and quantify the risk reduction of PacifiCorp's wildfire mitigation efforts throughout its California service territory. For the OEIS definition of this initiative see Section 9.1 starting on page 271.

3. **Region prioritization**

HFTDs have been prioritized for implementation of the impact-based software solutions described in this section. For example, these areas were prioritized over others for initial implementation of Technosylva's wildfire modeling software solutions (described below).

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

High performance computing clusters (HPCC) — PacifiCorp built and implemented two custom, fully redundant HPCCs that became operational in November 2021. They run an operational weather forecast model and will create a high resolution, 30-year historical record of weather across PacifiCorp's California service territory by 2023. Because the system is fully redundant, it will not go down when it is needed most; namely, in emergency situations.

Operational weather forecast model — PacifiCorp is building a high-resolution WRF model that:

- Provides twice-daily high-resolution forecasts across a 96-hour time horizon and generates greater than one terabyte of weather forecast data daily
- Makes limited data publicly available through PacifiCorp's situational awareness websites
- Began computing a 30-year, high-resolution, hourly reanalysis of weather and fuels across PacifiCorp's California service territory, which is expected to be complete by year-end 2022

Wildfire modeling —PacifiCorp partially implemented Technosylva's WFA-E software package to model daily wildfire consequence in its California service territory HFTD from July 1, 2021, through December 31, 2021. It produced millions of daily wildfire simulations throughout the highest fire risk areas. A post-season analysis is currently

underway to evaluate improvement of operational decisions made during the pilot project.

By year-end 2022, PacifiCorp plans to implement the full suite of Technosylva's WFA-E software throughout its California service territory. (See discussion in Section 4.5.1.1. on page 66) FireCast will provide indicators of risks to all assets based on a thorough assessment of initial attack conditions in fire spread simulations. FireSim will produce fire spread simulations that will give PacifiCorp a more comprehensive ability to identify destructive fires. Technosylva's WRRM software will integrate with PacifiCorp's climatology data to provide a comprehensive analysis of risk to all assets in its service territory. Finally, the WRF model described above will work in tandem with FireCast and FireSim to provide a detailed map of weather and fire information. Taken together, all the information produced by these applications will drive operational decisions, like whether to initiate a PSPS, and prioritization of vegetation management, grid-hardening, and asset management projects/maintenance work.

Situational awareness websites — In 2021, PacifiCorp built situational awareness websites for use by its employees, customers and public safety partners. These websites integrate real-time observations with weather forecast data to monitor real-time trends, highlight when conditions become extreme, and provide an internal PSPS dashboard for real-time decision-making during PSPS events. Ongoing enhancements to these sites are expected to take place through 2022.

5. **Future improvements to initiative**

LRAM — PacifiCorp's LRAM enables more refined understanding of the unique risk profile at each ZOP, which informs long- and short-term wildfire mitigation strategies. This planning model currently uses HRRR data, which is a historical five-year set of data. After the WRF model is completed, LRAM can be updated to include a more encompassing 30-year set of historical weather data.

Operational weather forecast model — Integration of the WRF models into Technosylva is critical to meeting the 48–72-hour CPUC PSPS customer communication requirements.

Results of the 30-year weather data reanalysis will ultimately serve as a foundation for an all-weather outage prediction model that will provide PacifiCorp with the information it needs to forecast the number of outages that may occur in each ZOP. Beginning in 2023, these machine-learning models will support improved PSPS decision-making. Further improvements are anticipated through 2026. In 2024, the operational WRFs will provide probabilistic forecasts that address the inherent uncertainty of single, deterministic forecasts to answer questions like:

Wildfire modeling — Beyond 2022, PacifiCorp expects that Technosylva will continue to provide ongoing ad hoc support, enhancements, and customization to continue to

meet PacifiCorp's needs.

Situational awareness websites — Beyond 2022, PacifiCorp expects to continue its partnership with StormGeo to provide ongoing enhancements to its existing situational awareness websites.

7.3.2.5 Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions

PacifiCorp trains and deploys personnel when there is elevated fire risk, activating "watches" or "activations" depending on how much fire climatology indicates elevated fire risk. These personnel go on readiness patrols and may modify system protection settings and monitor the network during the elevated fire risk period.

1. **Risk to be mitigated**

As discussed in Section 4.2.1 starting on page 38, utility ignition risks are tied to fault events. Fault events are more likely when it is very windy. High winds that occur when it is also dry can lead to ignitions that spread. This initiative focuses on providing a local, real-time risk assessment to inform decision-making and mitigate the potential for a fault event and subsequent ignition.

2. **Initiative selection**

To mitigate the risk associated with the potential increased fault event rate during weather events, personnel are deployed to the field during high-risk situations to participate in 'watches.' For the OEIS definition of this personnel monitoring initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

PacifiCorp personnel are deployed throughout the service territory based on company situational awareness and local operations experience, with a priority for HFTD-designated areas.

4. **Progress on initiative**

Personnel have previously been trained on the process and protocols for monitoring during elevated fire risk conditions, however PacifiCorp has limited experience with this type of patrol compared to other California utilities. In 2021, PacifiCorp observed a need for greater accounting of these activities. In 2022, PacifiCorp plans to initiate a separate tracking mechanism so field personnel can document spend and activities for wildfire mitigation patrols, separate from other activities. This will help PacifiCorp better report on activities and identify future room for improvement.

5. **Future improvements to initiative**

In 2022, PacifiCorp will gather information to drive future improvements to this initiative. The company is considering the use of phone/tablet applications, like other California utilities, to reduce reporting times.

7.3.2.6 Weather forecasting and estimating impacts on electric lines and equipment

The ability to gather, interpret and translate data into an assessment of utility-specific risk and to inform decision-making is key component of PacifiCorp's situational awareness. To support this effort, PacifiCorp has created a meteorology department (Figure 7.5) within the company's broader emergency management department. This new team consists of four experienced professionals and one manager.

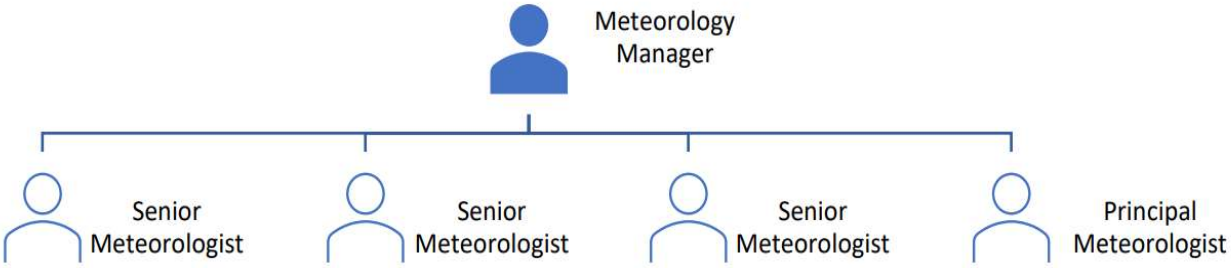

Figure 7.5 Meteorology team

1. **Risk to be mitigated / problem to be addressed**

This initiative is foundational to inform other key initiatives such as Section 7.3.6.2 Protective Equipment and Device Settings on page 219, and Section 7.3.6.4 Personnel Work Procedures and Training on page 221 by providing for a team of personnel to develop tools, manage datasets, and evaluate risk throughout the year. It is represented separately as an initiative here for transparency and tracking purposes but mitigates the same risk as these other, linked initiatives.

2. **Initiative selection**

Current artificial intelligence models cannot accurately predict weather behavior; there is still a need for human review by personnel, such as meteorologists, to review modeling reports models and use their expertise to inform and improve the company's situational awareness. The meteorology team supplements the company's longer-term risk analysis with real-time risk assessment and forecasting, identifies and closes forecasting data gaps, manages day-to-day risks, and recommends changes to operational protocols during periods of elevated risk as depicted in Figure 7.6. For the OEIS definition of the weather forecasting initiative, see Section 9.1 starting on page 271.

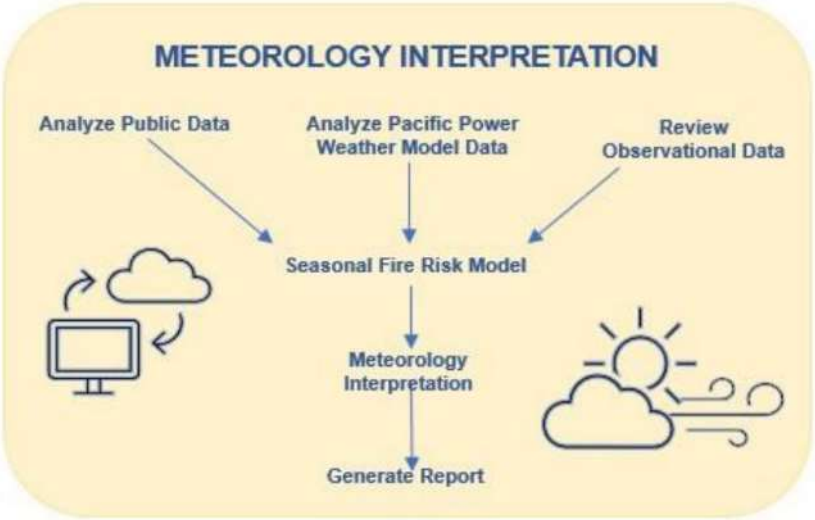

Figure 7.6 Meteorology Interpretation

3. **Region prioritization**

   Meteorologists inform on weather forecasts for PacifiCorp's entire service territory with a focus on HFTD areas.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Since the last submission of the WMP, PacifiCorp has developed a meteorology team that consists of one meteorologist manager and four meteorologists.

5. **Future improvements to initiative**

   PacifiCorp plans to further develop this team and expand it if necessary.

7.3.3 Grid design and system hardening

7.3.3.1 Capacitor maintenance and replacement program

See sections 7.3.4.1 and 7.3.4.2 on pages 181-183, which include maintenance of overhead distribution and transmission lines. Capacitor maintenance and replacement are included as a part of these maintenance programs.

7.3.3.2 Circuit breaker maintenance and installation to de-energize lines upon detecting a fault

See Sections 7.3.4.15 on page 192, which include maintenance of overhead distribution and transmission lines. Circuit breaker maintenance and installation to de-

energize lines upon detecting a fault are included as a part of these maintenance programs.

7.3.3.3 Covered conductor installation

1. **Risk to be mitigated / problem to be addressed**

   PacifiCorp overhead distribution equipment and lines are designed to meet current compliance requirements. However, under certain conditions, such as high wind speeds, these lines can become more vulnerable to the "contact by object" risk drivers. PacifiCorp plans to address this risk through a line rebuild program, more commonly referred to as the installation of covered conductor in the WMP.

2. **Initiative selection**

   PacifiCorp's line rebuild program includes deployment of the following main techniques:

   Reconductor with covered conductor: Specialized overhead covered conductors can be constructed with additional shielding and enhanced insulating properties to aid in wildfire mitigation. Covered conductor is less susceptible to incidental contact with foreign objects, such as branches or Mylar balloons. While covered conductor does not prevent incidental contact from occurring, it reduces the potential that incidental contact will result in a fault event, thereby reducing the wildfire risk. For the OEIS definition of the covered conductor installation initiative, see Section 9.1 starting on page 271.

   Pole replacement: PacifiCorp included pole replacement with the covered conductor projects as an efficient use of resources. In some cases, poles need to be replaced to accommodate the additional weight of covered conductor; replacing wooden poles with stronger nonwooden solutions such as fiberglass or steel also increases grid resiliency and eliminates the need to return later. This approach also ensures that pole replacements are prioritized effectively. This proposed change will provide the additional clarity and transparency sought in the WSD-017 OEIS Action Statement.

   Undergrounding: While an underground design does not eliminate every ignition potential (i.e., because of aboveground junctions), it is the most effective strategy for reducing the risk of any utility-related ignition. Unfortunately, the cost of underground construction often makes it difficult to apply on a widespread basis. Therefore, PacifiCorp evaluates the potential to convert overhead lines to underground lines for rebuild projects on a project-by-project basis. Through the design process, each individual project is assessed to determine whether sections of the rebuild should be completed with underground construction. For example, a more remote, heavily forested location with few customer connections could be an ideal candidate for undergrounding. PacifiCorp will also learn from other utilities that may be using

undergrounding more broadly as a wildfire mitigation tactic. Where implemented, the use of undergrounding will be reported for transparency under Section 7.3.3.16 on page 180.

Small Diameter Copper Replacement: Small diameter copper and iron conductors coordinate with devices and line equipment under normal operating conditions and standard protection and control schemes to identify and isolate faults. However, this small diameter conductor is often not able to be compatible with the upstream fusing and relay settings required for fault detection programs, in particular those contemplated in sections of PacifiCorp's plan, creating an arc energy risk under fault conditions. Specifically, under certain fault conditions, the small diameter conductor with fail before the protection scheme is able to operate. As PacifiCorp's advanced fault detection programs reduce wildfire risk, the company's small diameter copper and iron conductor replacement program is viewed as a necessary element of these programs, thereby reducing wildfire risk. Through the line rebuild design process, small diameter copper shall be replaced.

3. Region prioritization

Covered conductor was prioritized using LRAM, as depicted in Figure 7.7 below

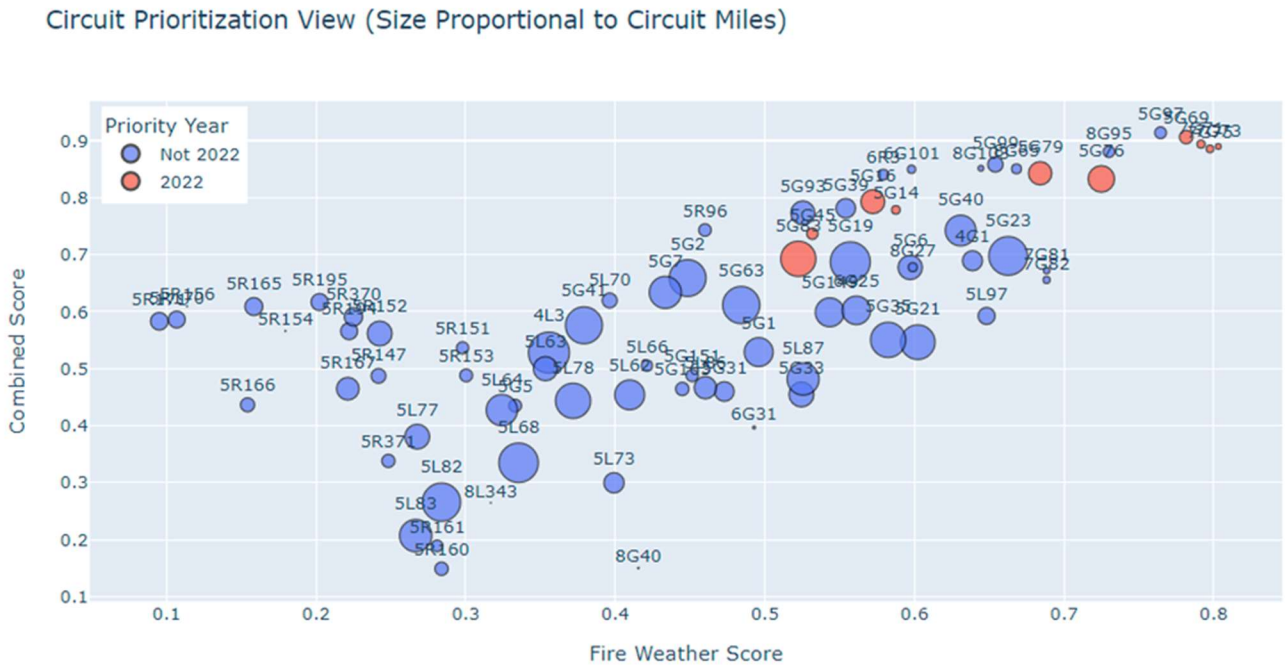

Figure 7.7 Pre-LRAM priority is shown by color using the projected year of construction

The climate risk is shown on the x-axis, the combined score (which integrates utility ignition risk

with fire climate risk) is shown on the y-axis

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp has progressed past the initial plan and development phase; as part of the implementation phase, covered conductor installation has begun. In 2022, PacifiCorp plans to ramp up the installation of covered conductor, based on lessons learned from 2021.

5. **Future improvements to initiative**

   PacifiCorp plans to complete the current covered conductor plan and then explore the expansion of the initiative outside of the highest fire-risk areas. For additional information on covered conductor installation see Section 9.3 on page 282.

7.3.3.4 Covered conductor maintenance

1. **Risk to be mitigated / problem to be addressed**

   This initiative addresses the risk drivers associated with equipment failure or contact by object.

2. **Initiative selection**

   In its WSD-017 OEIS Action Statement, OEIS recommended that PacifiCorp enhance current operations to provide maintenance to covered conductor. For the OEIS definition of the covered conductor maintenance initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   The prioritization of this initiative shall align with the Section 7.3.4.1 on page 181 detailed inspections of distribution electric lines.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp plans to initiate this effort as an element of the detailed inspections of distribution electric lines, Section 7.3.4.1 on page 181. The goal of this is to update the company's inspection methodology and condition assessment criteria to ensure adequate inclusion of covered conductor. PacifiCorp will also update field inspection service training materials to include covered conductor by 2023.

5. **Future improvements to initiative.**

   Covered conductor maintenance will become a standard part of inspections; no

additional future improvements are anticipated at this time.

7.3.3.5 Crossarm maintenance, repair and replacement

See sections 7.3.4.1 and 7.3.4.2 on pages 181-183, which include maintenance of overhead distribution and transmission lines. Crossarm maintenance, repair and replacement are included as a part of these maintenance programs.

7.3.3.6 Distribution pole replacement and reinforcement, including with composite poles

1. **Risk to be mitigated / problem to be addressed**

   Some materials are more susceptible to fire and ignition than others, PacifiCorp can build a more resilient system by utilizing equipment which is more fire resistant by using alternate materials such as fiber glass or steel poles. As PacifiCorp identifies poles for replacement through the Line Rebuild program, described in section 7.3.3.3. PacifiCorp plans to mitigate the risk associated with wood poles by replacing them with more fire resilient materials.

2. **Initiative selection**

   Through the line rebuild program, a significant number of poles in the HFTD are planned for replacement to accommodate the higher loads (or heavier weight) of covered conductor. As poles are replaced through the line rebuild program, they will be replaced with non-wood materials, which are more fire resistant, such as fiber glass or steel.

3. **Region prioritization**

   Region prioritization of pole replacement aligns with the covered conductor program, which aligns with tier 3 and tier 2 circuits being worked first.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   The line rebuild program is a multi-year initiative, including an engineering design phase, procurement phase and installation phase. Since the previous WMP submission, PacifiCorp has completed the engineering design phase on several projects and identified poles for replacement. Additionally, since the last WMP submission, 87 poles have been replaced, as stated in the 2022-05-02_PC_2022_Q1-QDR_R1 submission of Table 12.

5. **Future improvements to initiative**

   PacifiCorp plans to complete the current line rebuild plan, which includes the replacement of poles in the HFTD areas and then explore the expansion of the

initiative outside of the highest fire-risk areas.

7.3.3.7 Expulsion fuse replacement

1. **Risk to be mitigated / problem to be addressed**

   This initiative is to mitigate the equipment facility failure risk driver associated with fuses.

2. **Initiative selection**

   In the 2021 WMP, PacifiCorp planned to replace expulsion with non-expulsion fuses concurrently with other grid hardening programs, namely the covered conductor initiative. In basic terms, this approach was driven by efficiency considerations, to save on labor cost by completing all work at one time. Thus, this approach did not expedite expulsion fuse replacements. As described in the Change Order Report, PacifiCorp is both (a) expediting the replacement of expulsion fuses on lines where covered conductor installation is planned and (b) expanding the expulsion fuse replacement program to circuits in the HFTD where installation of covered conductor is not currently planned. For the OEIS definition of the expulsion fuse initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   PacifiCorp plans to replace all expulsion fuses located in HFTD Tier 3 and Tier 2 as part of a multi-year effort; this is a new program, developed based on feedback received in the WSD-017 OEIS Action Statement. This risk-informed strategy will fully address the risk ignition probability due to expulsion fuses in the HFTDs.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Since the last WMP submission, PacifiCorp implemented a separate expulsion fuse replacement program, as described in the Change Order Report.

5. **Future improvements to initiative**

   When all expulsion fuses in the prioritized areas have been replaced, PacifiCorp plans to evaluate additional replacements, such as those outside of the HFTD, based on risk.

7.3.3.8 Grid topology improvements to mitigate or reduce PSPS events

1. **Risk to be mitigated**

   Generally, this initiative is to mitigate the risk associated with PSPS to reduce the scale and scope of a PSPS using line segmentation such as through the use of microgrids.

2. **Initiative selection**

   As many of the communities that PacifiCorp serves are within the HFTD and PSPS zones, it is challenging to reduce any possibility of PSPS events through grid topology improvements alone. Grid topology improvements to reduce PSPS events focus on evaluating and improving existing circuitry as opposed to complete relocation of assets. Therefore, the existing grid hardening initiatives mitigate or reduce PSPS events as a function or reducing wildfire risk. For the OEIS definition of the grid topology initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   Generally, the existing grid hardening initiatives prioritize the HFTD.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   While PacifiCorp only implemented one PSPS event in the state of California during the 2021 fire season, PacifiCorp monitored elevated risk all year. When risky conditions appeared, the company was vigilant while still maintaining the ability to implement a PSPS event. During these times, PacifiCorp learned that efficiently and effectively implementing a PSPS event in a way that keeps customer and community impacts as low as practical is about being flexible, understanding the system, and making informed decisions based on accurate information to take appropriate action in the moment.

   PacifiCorp anticipates that the planned asset hardening projects provide the system flexibility and that as weather patterns and specific risks change, the company will be able to implement reactive switching or isolation points during an event. Reactive switching and isolation points allow the company to use a switch, for example, to turn power off for only 10 customers rather than 100, minimizing customer impact.

5. **Future improvements to initiative**

   PacifiCorp has completed reactive switching plans for the PDZ and continues to look at other areas for the future development of plans outside the PDZ. At this time, no specific scope or budget has been set aside for this program.

7.3.3.9 Installation of system automation equipment

1. **Risk to be mitigated / problem to be addressed**

   Various risks can be mitigated by shutting off power to segments of the system. System automation equipment allows for this power shut off to happen very quickly, reducing the fire potential and happen for a short period of time, allowing for power to be restored more quickly.

2. **Initiative selection**

   PacifiCorp interprets system automation equipment to mean all equipment, schemes, engineering and processes to facilitate advanced detection and coordination on the company's distribution circuits. For the OEIS definition of the system automation initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   PacifiCorp's installation of system hardening wildfire mitigation program includes the deployment of distribution and transmission protection and control schemes and equipment, such as relays, circuit breakers, reclosers and communications equipment, to enhance fault detection capabilities, reduce fault isolation time, improve fault location and record availability, and speed up restoration efforts. Equipment that is electrically connected to the HFTD has been prioritized.

4. **Progress on initiative**

   PacifiCorp is currently implementing the field installations of this equipment and progress against targets has been reported in quarterly filings as well as the 2022-05-02_PC_2022_Q1-QDR_R1.xlsx of this filing.

5. **Future improvements to initiative**

   PacifiCorp will continue to monitor new technology developments for solutions which may provide a better alternative to the reclosers and relays selected in this program.

7.3.3.10 Maintenance, repair, and replacement of connectors, including hotline clamps

1. **Risk to be mitigated / problem to be addressed**

   This initiative addresses the risk drivers associated with equipment failure or contact by object due to unmaintained equipment.

2. **Initiative selection**

   This initiative describes the repair and replacement of connectors as they are identified during the Line Rebuild program. For the OEIS definition of this maintenance initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   Connector repair is prioritized in conjunction with the company's covered conductor and detailed distribution line inspection programs, see sections 7.3.3.3 on page 169 and 7.3.4.1 on page 181.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Since the last WMP, PacifiCorp updated this narrative to better describe the methodologies that PacifiCorp uses to perform this work and better describe the initiative to address recommendations in the OEIS Evaluation of 2021 Wildfire Mitigation Plan Update for PacifiCorp.

5. **Future improvements to initiative**

   Currently, PacifiCorp is completing the proactive replacement of connectors along the Line Rebuild Program. As PacifiCorp progresses other initiatives, connectors will be evaluated for concurrent work.

7.3.3.11 Mitigation of impact on customers and other residents affected during PSPS event

7.3.3.11.1 Free portable battery program

1. **Risk to be mitigated / problem to be addressed**

   PSPS events are implemented as a last resort during high fire-risk situations; they supplement — not replace — existing wildfire mitigation strategies. To minimize the impact of PSPS events on medical baseline customers, PacifiCorp implemented a program to provide backup batteries at no cost to its customers who depend on medical equipment powered by electricity.

2. **Initiative selection**

   This initiative was prioritized in response to Decision 21-06-034, to "*Provide support for customers that rely on electricity to maintain necessary life functions, including durable medical equipment and assistive technology'*. For the OEIS definition of this mitigation initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   The first phase of the free portable battery program focused delivery of batteries to PacifiCorp's medical baseline customers located in HFTD Tier 2 and Tier 3 areas. In its next phase, PacifiCorp expanded outreach to all medical baseline customers in its California service territory.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp delivered 34 batteries to 28 qualifying registered medical baseline customers within PSPS areas by December 31, 2021. On January 5, 2022, the

program was expanded to include medical baseline customers in remaining areas of PacifiCorp's California service territory; the goal of the program's next phase is to deliver batteries to 50 customers by May 31, 2022.

5. **Future improvements to initiative.**

   PacifiCorp is conducting research into program sustainability; future improvements may include a battery replacement program as portable battery systems age and expire.

7.3.3.11.2 Generator rebate program

1. **Risk to be mitigated / problem to be addressed**

   PSPS events are implemented as a last resort during high fire-risk situations; they supplement — not replace — existing wildfire mitigation strategies. PacifiCorp's generator rebate program sought to mitigate the risk customers face during an outage.

2. **Initiative selection**

   This initiative was prioritized in response to the CPUC's current PSPS guidelines "*to ensure utilities continually improve planning, preparation and access to resources during PSPS events.*"

3. **Region prioritization**

   Under this new program, customers located in HFTD Tier 2 and Tier 3 areas who purchase a qualified generator and/or portable power station will be eligible to receive a rebate of up to $200. Customers registered in either the CARE or Medical Baseline programs run by PacifiCorp and required by the state of California will be eligible for an additional $200 in rebates, or a total of $400; rebates cannot exceed the total purchase price of the qualified product.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp began offering this new rebate in 2021. PacifiCorp is working to increase awareness of the programs in place to lessen the impact of PSPS events.

5. **Future improvements to initiative**

   PacifiCorp is continuously learning from other utilities and plans to explore the costs and benefits of expanded offerings.

7.3.3.12 Other corrective action

See Section 7.3.3.3, page 169, on covered conductor installation for additional

information about other corrective actions such as small diameter copper replacement. Targets and progress on this initiative will be tracked through this initiative, 7.3.3.12, however spend will roll up into the Line Rebuild Program described in Section 7.3.3.3, page 169.

7.3.3.13 Pole loading infrastructure hardening and replacement program based on pole loading assessment program

1. **Risk to be mitigated**

   Older installations may not meet current design and strength standards for new construction. Lower strength margins pose wildfire risk as these lines may become susceptible to extreme weather events. However, modeling and evaluating the strength of older installations can be difficult because relevant information like exact pole height, diameter, lean, and attachment height and characteristics, may not be available.

2. **Initiative selection**

   LiDAR data, which allows for highly accurate 3D depictions of pole assets, can replace existing models and assumptions allowing PacifiCorp to identify real-time loading concerns for poles already in-service. This enhanced analysis can also help recommend and prioritize corrective work such as pole or insulator replacements and pole reinforcement. For the OEIS definition of the pole loading initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   PacifiCorp has piloted the use of LiDAR to create structural models for calculating pole leading capacity four miles of 1978-vintage transmission line and 19 miles of a 1920/1950-vintage transmission line located within the HFTD.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Detailed progress on this program is further described in Section 4.4.2.4 on page 56.

5. **Future improvements to initiative**

   Currently, PacifiCorp does not plan to continue this pilot due to the large cost and minimal benefit to risk reduction. More information can also be found in Section 4.4.2.4 on page 56.

7.3.3.14 Transformer maintenance and replacement

See sections 7.3.4.1 and 7.3.4.2 on pages 181-183, which include maintenance of

overhead distribution and transmission lines. Transformer maintenance and replacement are included as a part of these maintenance programs.

7.3.3.15 Transmission tower maintenance and replacement

See sections 7.3.4.1 and 7.3.4.2 on pages 181-183, which include maintenance of overhead distribution and transmission lines. Transmission tower maintenance and replacement are included as a part of these maintenance programs.

7.3.3.16 Undergrounding of electric lines and/or equipment

1. **Risk to be mitigated / problem to be addressed**

PacifiCorp overhead distribution equipment and lines are designed to meet all industry standards and compliance requirements. Under certain conditions, such as high wind speeds, these lines can become more vulnerable to the "contact by object" risk drivers. On higher risk lines, PacifiCorp plans to address this risk through a line rebuild program, which may include the installation of covered conductor, undergrounding of electric lines, replacement of poles and/or replacement small copper diameter conductor. While undergrounding is the most effective methods for reducing utility related ignition risks and nearly eliminates "contact by object" risks, both undergrounding and covered conductor substantially mitigate the ignition risk associated with "contact by object." Other benefits included improved reliability and PSPS avoidance. Covered conductor is generally a more cost-effective mitigation strategy. In certain scenarios, however, there are specific topological cost drivers which can make undergrounding more cost effective than covered conductor. Undergrounding can be the appropriate solution for many instances, including to improve reliability in remote or rugged terrain locations. In addition, land-owners may bear some of the cost because of land-owner preferences for undergrounding, making an underground strategy more cost effective. In the circumstance that undergrounding lines is more cost effective and/or culturally appropriate, PacifiCorp plans to use an underground design in conjunction with the line rebuild program.

2. **Initiative selection**

While an underground design does not eliminate every ignition potential (i.e., because of aboveground junctions), it is the most effective strategy for reducing the risk of any utility-related ignition. Unfortunately, the cost of underground construction often makes it difficult to apply on a widespread basis. Undergrounding involves increased expenses related to additional equipment needs, procurement of land, and additional labor requirements. In general PacifiCorp estimates that undergrounding costs range between $1 million- $6 million per line mile based on existing potential projects evaluated to date. However, PacifiCorp recognizes that the range could be much bigger depending on each project and the specific location evaluated. Therefore, PacifiCorp evaluates the potential to convert overhead lines to underground lines for rebuild projects on a project-by-project basis. Through the design process, each individual project is assessed to determine whether sections of the rebuild should be completed with underground construction. For example, a more remote, heavily forested location with few customer connections could be an ideal candidate for undergrounding. PacifiCorp will also learn from other utilities that may be using undergrounding more broadly as a wildfire mitigation tactic. In table 12, spend for the line rebuild program is accounted for in initiative 7.3.3.3 however where undergrounding is implemented, the line miles will be reported for under this initiative,

7.3.3.16.

3. **Region prioritization**

   Region prioritization of undergrounding aligns with the covered conductor program, which aligns with tier 3 and tier 2 circuits being worked first, as these circuits represent the greatest ignition risk.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   The line rebuild program is a multi-year initiative, including an engineering design phase, procurement phase and installation phase. In previous WMP submissions, PacifiCorp had not identified any circuits which met the criteria for undergrounding conductor, however since the previous submission of the WMP, PacifiCorp has completed the engineering design phase on several higher priority circuits, which includes the cost evaluation of covered conductor versus undergrounding, and identified two projects where undergrounding provided the following benefits:

   - Reduced maintenance cost and improved access in a heavy tree canopy area with limited access,
   - Avoided cost increase that would be experienced with overhead construction at higher elevations where the additional pole loading requirements result in substantially more pole replacements
   - Avoidance of important cultural areas with permitting and construction constraints.

5. **Future improvements to initiative**

   PacifiCorp plans to complete the current line rebuild plan, which includes the select installation of undergrounded lines, in the HFTD areas and then explore the expansion of the initiative outside of the highest fire-risk areas. For additional information on underground installation see Section 9.4.

7.3.3.17 Updates to grid topology to minimize risk of ignition in HFTDs

At this time, PacifiCorp does not have any specific grid design and system hardening programs focused on updates to grid topology intended to minimize risk of HFTD ignition that are not included in other programs.

7.3.4 Asset management and inspections

7.3.4.1 Detailed inspections of distribution electric lines and equipment

PacifiCorp's detailed inspections of distribution electric lines and equipment is a critical program required to maintain regulatory compliance with California GO 165 and 95. These inspections also mitigate some wildfire risk by identifying and correcting conditions which, if uncorrected could potentially ignite a fire. Table 1 in Attachment 2.3 includes a more extensive breakdown of conditions identified.

1. **Risk to be mitigated / problem to be addressed**

   This initiative addresses the risk drivers associated with equipment failure and addresses the compliance requirements from GO 165.

2. **Initiative selection**

   PacifiCorp's detailed inspection program, which includes a careful visual inspection accomplished by visiting each structure, as well as inspecting spans between structures, is the company's most appropriate initiative related to the inspection of overhead distribution lines. The program identifies potential nonconformance with the NESC or other applicable state requirements such as California general orders, nonconformance with PacifiCorp construction standards, infringement by other utilities or individuals, defects, potential safety hazards, and deterioration of the facilities that need to be corrected to maintain reliable and safe service. For the OEIS definition of this detailed inspection initiative, see Section 9.1 starting on page 271.

   During an evaluation, an inspector documents potential violations and noteworthy observations — including potential fire threats — by assigning a condition code and priority level. The priority levels align with GO 95, Rule 18; the conditions codes are specifically designed to predetermine fire threat as well as other types of conditions. In a typical year, PacifiCorp performs approximately 13,000 detailed inspections of electric distribution facilities and has historically identified approximately 7,000 conditions that require corrective action.

   PacifiCorp defines a fire risk condition as having at least moderate potential impact to safety or reliability. As a result, the company assigns a condition code priority level A or B to these fire risk conditions; priority level A conditions must be addressed within 30 days. Therefore, accelerated correction timeframes for fire risk conditions that include specific rules based on geographic wildfire risk location cannot apply to C conditions.

3. **Region prioritization**

   During a given calendar year, PacifiCorp prioritizes inspections of facilities located within the HFTD to occur earlier in the year, specifically Tier 3 areas. While all required inspections are completed within the prescribed cycle, the intent of this prioritization is to inspect facilities located in the highest fire threat areas prior to fire season where the risk is the greatest.

4. **Progress on initiative**

   PacifiCorp will continue to complete inspections on a cycle and continue to comply with GO 165. Actual performance for 2021 and targets for 2022 for this initiative are provided in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

5. **Future improvements to initiative**

   PacifiCorp plans to continue this effective detailed inspection of lines at the same pace and aligned with current compliance requirements.

7.3.4.2 Detailed inspections of transmission electric lines and equipment

See Section 7.3.4.1, page 181, on Detailed Inspections of Distribution Electric Lines and Equipment for additional information. Targets and progress on this initiative will be tracked through this initiative, 7.3.4.2.

7.3.4.3 Improvement of inspections

At this time, PacifiCorp does not have any additional improvement of inspection programs other than the ones described by other initiatives and pilot programs.

7.3.4.4 Infrared inspections of distribution electric lines and equipment

1. **Risk to be mitigated / problem to be addressed**

   Certain issues with electrical connections and equipment cannot be seen during traditional inspections. Connections are difficult to fully assess from the ground or air as it is not possible to visually see the electrical flow. If connections look secure but are not truly tight, the electrical flow may all follow one path resulting in potential premature failure of a connection. Left undetected, these issues could cause an equipment failure.

2. **Initiative selection**

   This initiative was selected for development in the RF and Handheld IR pilot (see Section 4.4.2.3 on page 55) due to the success of the transmission IR inspection initiate to identify Conditions for correction. For the OEIS definition of this IR inspection initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   The region for the pilot is described in RF and Handheld IR pilot (see Section 4.4.2.3 on page 55) and represents a portion of the HFTD with some ease-of-deployment criteria.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals**

for the current year

In 2021, the handheld IR vendor held a training with PacifiCorp field personnel likely to work with the equipment. The company's 2022 goal will modify this initiative by developing the specific action plan for the field to begin collecting information.

5. **Future improvements to initiative**

PacifiCorp plans to continue the pilot for this program in a small, select area to determine the best methodology for inspecting and collecting the resulting condition information for correction. The results of this pilot will inform the future full distribution IR program.

7.3.4.5 Infrared inspections of transmission electric lines and equipment

1. **Risk to be mitigated / problem to be addressed**

The purpose of PacifiCorp's IR inspection program on overhead transmission lines is to reduce ignition probability associated with equipment failure using enhanced detection tools which can identify hot spots not detectable through visual inspections. Hot spots on power lines and equipment can be indicative of loose connections, deterioration and/or potential future fault locations. Therefore, identification and removal of hot spots on high-risk overhead transmission lines can prevent further deterioration, reduce the potential for equipment failure and faults, and reduce ignition probability related to equipment failure.

2. **Initiative selection**

   PacifiCorp has implemented the enhanced transmission line inspection program with a focus on proactive identification and prevention of equipment failures. The inspections are performed annually using a helicopter on all overhead transmission lines in the state of California. The frequency of the inspections is informed by prudent utility practices using a risk-based approach to identify intervals. The risk-based approach involves flying the lines during peak loading when the equipment is under the highest potential stress increasing the probability of finding issues via an infrared inspection. For the OEIS definition of this transmission IR inspection initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   This program flies all California transmission lines, with prioritization set by the technological need to fly during peak load times.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Enhanced IR inspection has identified 10 issues since the initial pilot was presented in 2019. Those benefits turned the IR inspection into an initiative covering 700 line miles of transmission lines within the state of California including all the lines within the HFTD region. The inspections identified two issues in 2021 with each corrective action reducing the ignition risk probability from equipment failure. Moving forward the lines will be inspected annually during the peak loading intervals with refinements made to the number of intervals determined. Reports found have been implemented into the standard work processes allowing for quick planning and resolution of issues discovered.

5. **Future improvements to initiative**

   Future improvements involve simplifying the peak loading intervals to inspect the lines with the most overlapping peak intervals. Simplifying the number of intervals determined streamlines the inspection process by capturing more of the lines during a single inspection timeframe and reduces the helicopter costs to fly the lines.

7.3.4.6 Intrusive pole inspections

1. **Risk to be mitigated / problem to be addressed**

   PacifiCorp's intrusive pole inspection program, which may include pole-sounding, inspection hole drilling and excavation tests, is designed to identify decay, wear or woodpecker damage, assess the condition of wood poles and identify the need for any treatment, repair or replacement. Like other inspection programs, intrusive

inspections mitigate some wildfire risk by identifying and correcting conditions. In this case, the inspections identify poles for replacement or reinforcement to prevent potential structural failure of a pole that could lead to a potential wire down event and ignition risk.

2. **Initiative selection**

   PacifiCorp's existing intrusive pole inspection program is the initiative most closely aligned with this document subsection. The existing program initiative may include pole-sounding, inspection hole drilling, and excavation tests. It identifies decay, wear or woodpecker damage; assesses wood pole conditions; and identifies the need for any treatment, repair or replacement. While PacifiCorp's intrusive testing can be performed as a standalone inspection, it is most often performed with a detailed inspection described in Sections 7.3.4.1 and 7.3.4.2 on page 181. For the OEIS definition of this intrusive pole inspection initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   PacifiCorp's intrusive poles inspections are performed consistent with the cycle prescribed in California GO 165.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   In 2021, PacifiCorp continued implementing intrusive inspections in California. In a given year, PacifiCorp consistently observes between a 2% and 4% reject rate across its entire service territory through the intrusive pole inspection program. These findings demonstrate the value that the inspection provides through the identification of corrective work. Additionally, when poles are located within a Tier 3 or Tier 2 area, pole replacements and/or reinforcement is performed on an accelerated schedule to reduce wildfire risk.

5. **Future improvements to initiative**

   PacifiCorp plans to continue this effective intrusive pole inspection initiative at the same pace over the next five years.

7.3.4.7 LiDAR inspections of distribution electric lines and equipment

Currently, PacifiCorp does not intend to initiate LiDAR inspections of distribution electric lines and equipment. Generally, LiDAR has proven to be a more expensive method of line inspection. LiDAR inspection work, as noted in Section 7.3.4.8 on page 187 is being done on transmission lines.

7.3.4.8 LiDAR inspections of transmission electric lines and equipment

1. **Risk to be mitigated / problem to be addressed**

   LiDAR inspections provide measurements that can be analyzed to identify safety concerns with equipment when analyzed against current engineering standards. The LiDAR data collection allows for accurate, 3) depictions of assets measured. The results can identify poles with loading concerns allowing for corrective work to be performed.

2. **Initiative selection**

   The lines identified with LiDAR were based upon the fire risk, historic fault rates, and inspection results that might indicate potential for weakened poles. The lines were flown with LiDAR and the data incorporated into PLS-CADD, which is a strength modeling program. For the OEIS definition of this LiDAR inspection initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   LiDAR inspections took place on lines with higher fault rates that had an increased fire risk potential.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year.**

   The program identified multiple poles that would need to be replaced. The poles identified have been scheduled to be replaced as part of the reconductoring initiative or other endeavors. LiDAR inspection is an expensive means compared to the risks that it can mitigate. PacifiCorp has not historically experienced pole failures in its California service territory.

5. **Future improvements to initiative**

   At this time, PacifiCorp does not intend to pursue this initiative further.

7.3.4.9 Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations

At this time, PacifiCorp does not have any specific asset management and inspections wildfire mitigation programs focused on other discretionary inspection of distribution lines not included in other programs.

7.3.4.10 Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations

At this time, PacifiCorp does not have any specific asset management and inspections wildfire mitigation programs focused on other discretionary inspection of distribution lines not included in other programs.

7.3.4.11 Patrol inspections of distribution electric lines and equipment

1. **Risk to be mitigated / problem to be addressed**

Inspections of distribution facilities are designed to reduce wildfire risk by identifying and correcting conditions prior to equipment failure.

2. **Initiative selection**

PacifiCorp's existing patrol inspection program involves viewing each facility from a location with reasonable site lines. The inspection identifies damage or defects to the distribution system, or other potential hazards or right-of-way encroachments that may endanger the public or adversely affect the integrity of the electric system, including items that could potentially cause a spark.

PacifiCorp's patrol inspections of electric lines and equipment is a critical program in maintaining compliance with California GO 165 and 95. PacifiCorp's patrol inspection program is also critical to reducing wildfire risk through the identification of conditions. Additionally, the identification of any conditions during a patrol inspection demonstrates that this program provides broad value. For the OEIS definition of this patrol inspection initiative, see Section 9.1 starting on page 271.

3. **Region prioritized**

During a given calendar year, PacifiCorp prioritizes inspections of facilities located within the HFTD to occur earlier in the year, specifically Tier 3 areas. While all required inspections are completed within the prescribed cycle, the intent of this prioritization is to inspect facilities located in the highest fire threat areas prior to fire season where the risk is the greatest.

4. **Progress on initiative**

PacifiCorp plans to continue this effective distribution patrol inspection initiative as per policy, 2021 actuals and 2022 planned numbers can be found in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

5. **Future improvements to initiative**

PacifiCorp plans to continue this effective patrol inspection initiative at the same pace over the next five years.

7.3.4.12 Patrol inspections of transmission electric lines and equipment

See Section 7.3.4.11, page 188, on Patrol Inspections of Distribution Electric Lines and Equipment for additional information. Targets and progress on this initiative will be tracked through this initiative, 7.3.4.12.

7.3.4.13 Pole loading assessment program to determine safety factor

At this time, PacifiCorp does not have any specific asset management and inspections wildfire mitigation programs focused on pole loading assessment as a way of determining safety factors which is not included in other programs.

7.3.4.14 Quality assurance / quality control of inspections

1. **Risk to be mitigated**

Inspection quality assurance and quality control (QA/QC) at PacifiCorp aims to ensure this effectiveness. PacifiCorp QA/QC generally includes desktop and field audits designed to identify gaps in the inspection programs, inspector capability, and corrective actions, thereby increasing inspection result accuracy and reliability.

2. **Initiative selection**

To perform QA/QC of inspections, PacifiCorp uses a combination of process controls, software tools, company policy, and physical record checking to quickly identify inaccuracies for corrective action, evaluation, root cause analysis and system improvements. Engaging in these initiatives is a cost-effective means to minimize the risk that inspection results are inaccurate or unreliable. For the OEIS definition of this QA/QC initiative, see Section 9.1 starting on page 271.

Inspection results are reviewed continuously to confirm that inspections in the HFTD are meeting acceptable standards of performance.

PacifiCorp's main QA/QC components, including enhancements to mitigate wildfire risk, are:

- Physical audits of at least 5% of planned inspections of facilities with a focus fire threats and Tier 2 and Tier 3 prioritization

- Software controls that prohibit freeform condition assignment, allowing for result controls, minimizing the amount of human error capable

- A quarterly review of already audited results as a secondary check, including desktop audits

- Annual training with inspectors to address audit findings and improve inspection reliability and accuracy

These components are described in more detail below, including any program enhancements, costs, and evolution consistent with feedback from the OEIS and PC-4.

Physical Audits

PacifiCorp's QA/QC physical audits are conducted on a random selection of inspected facilities, where corrections due to inspection results are prioritized by GO 95 priority levels, including expedited correction timelines for conditions classified as a fire risk and in the Tier 2 and Tier 3 districts.

PacifiCorp emphasizes audits in wildfire risk areas by prioritizing Tier 2 and Tier 3 regions for inspection in the first half of the year. This means these regions go through the QA/QC process first. After a physical audit is done, the audit results are compared with the original inspection results to see if they conform to the set condition reporting criteria, data entry, and work performance in accordance with company specifications. Nonconforming results are sent to the inspection contractor for reinspection along with the required reinspection timeline.

Software Controls

In recent years, PacifiCorp began using cellphones and tablets to make inspection records and findings. A renewed focus on inspection QA/QC in 2020 led to the enhancement of the inspection programs and structure along with added software controls to ensure inspections and findings are recorded consistently with internal procedures. Nonconforming results are denied. For example, if the inspection program is designed to only allow either an A or B priority assigned to a certain type of finding, an inspector can't enter a C Priority. This ensures that findings are not accidentally mischaracterized with a lower priority level.

Quarterly Desktop Reviews

Two macro-level desktop audits were conducted quarterly; one desktop audit was conducted by the field inspection support group (standard process as per PacifiCorp internal policy) and another was conducted by a cross-functional team of asset management, work planning and operational performance management. The cross-functional team desktop audit prioritized review of "fire risk" conditions and conditions in Tier 2 and Tier 3 regions for QA/QC and correction.

To support these ongoing reviews, a new internal tool was developed to evaluate inspection results, automatically isolate open fire risk conditions in plots, facilitate quick data export, provide insight about trends, and drive a deeper understanding of the fire risk conditions.

Historically, desktop reviews consisted of all open conditions generally grouped together without specific focus areas. The new tool automatically identifies potential misalignment with internal procedures, including alignment with fire risk priorities and types. Initial rollout of this new tool proved useful and, as part of the 2021 plan, desktop review of inspection results continued to use this tool and grow to review inspection results within 30 days of input. This will ensure that potential mismatches or mischaracterization of conditions and risk can be immediately addressed. This new quick QA/QC response is projected to address issues while they are fresh in the minds of inspectors, drive continuous improvement and learning opportunities, increase record accuracy and inspection result reliability.

PacifiCorp intends to continue quarterly desktop reviews, which typically include a deep dive into trends and risk.

Annual Training

PacifiCorp field inspection support conducts annual field inspector training in January. This training includes technical content such as NESC code or California General Order requirements as well as program content, such as how to record findings, assess priorities, ensure effectiveness of an inspection, and facilitate corrective action. In January 2022, this training included additional content regarding fire risks and broader participation from asset management to ensure alignment in content and priorities. While this training covers PacifiCorp's total service territory, the training did include focused on the specific Tier 2 and Tier 3 planned inspections in California and the potential challenges and risks associated with the HFTD. PacifiCorp intends to continue to grow this training with a focus on wildfire mitigation and incorporate lessons learned through the other QA/QC components to foster continuous improvement.

3. **Region prioritization**

As previously described, PacifiCorp emphasizes audits in wildfire risk areas by prioritizing Tier 2 and Tier 3 regions for inspection in the first half of the year, which also leads to these regions going through the QA/QC process first. Additionally, an increase of audits within Tier 2 and Tier 3 has scaled with the increased volume of inspections within Tier 2 and Tier 3.

4. **Progress on initiative**

For the 2021 inspection cycle, approximately $36k was spent on physical audits, desktop audits and updating inspector training. The entirety of the 2021 fulfilled QA/QC inspection plan included all of California, including the Tier 2 and Tier 3 fire risk areas. PacifiCorp has included initiative specific progress and spending in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

5. **Future improvements to initiative**

In 2022, PacifiCorp plans to incrementally improve the QA/QC of inspection results by evaluating audit results at the end of the year, identifying gaps or misalignments, conducting a root cause analysis of how to best address issues and correcting them (typically through the annual inspector training in January). At the end of 2022, PacifiCorp will evaluate if additional spend is needed or if gaps can be addressed with revised inspector training.

As part of PacifiCorp's dedication to heightened focus on wildfire mitigation, there are plans for the QA/QC of inspection results to include evaluating methodologies that further speed up fire risk region QA/QC through prioritization of field audits in Tier 2 and Tier 3 regions.

7.3.4.15 Substation inspections

1. **Risk to be mitigated**

While differently located than overhead equipment, misoperation of substation equipment has the potential to create an arc. Additionally, substation equipment, such as circuit breakers, are critical components of protection and control schemes and normal system operations. Like other inspection programs, substation inspections, which assess both the substation security and key equipment condition, identify potential correction work or maintenance needed. This corrective work and maintenance prevents equipment misoperation that could negatively impact system operation and protection and control schemes in place or result in an ignition risk.

2. **Initiative selection**

PacifiCorp's standard substation inspection initiative best addresses the subsection of this plan. These inspections are considered standard operations; they provide incremental reduction to wildfire risk. Table 7.3 describes the types and frequency of inspections performed as a part of this program and planned frequency for each. For the OEIS definition of this substation inspection initiative, see Section 9.1 starting on page 271.

Table 7.3 Types of substation inspections performed as a part of this program and planned frequency for each

Type of Inspection	Voltage Class	Frequency
Substation Inspection(including IR)	Bulk Transmission	Annual (12 months)
	Other Transmission	Annual (12 months)
	Distribution	Biennial (24 months)
Substation & SecurityInspection[26]	Bulk Transmission	Monthly
	Other Transmission	At least 8 times per year
	Distribution	At least 8 times per year

3. **Region prioritization**

   PacifiCorp performs substation inspections on a routine basis consistent with California General Order 174 requirements. As a part of this program, qualified personnel inspect PacifiCorp's substations in California monthly. These inspections include the assessment of physical safety, security, and performance of substation components, including fencing, grounding, and major equipment, as well as the performance of minor housekeeping tasks to ensure safe and reliable service.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Substations are inspected eight times per year. Over the course of 2022, the goal is to complete 444 inspections.

5. **Future improvements**

   PacifiCorp plans to continue this substation inspection initiative at the same pace over the next five years.

7.3.5 Vegetation management and inspections

PacifiCorp's vegetation management program is modeled on industry best practices, including systematic maintenance, scientifically based pruning to maintain safe vegetation to conductor clearances, tree removal (both incompatible species and hazard trees), tree replacement, cover-type conversion, herbicide use, tree growth regulator applications, and the use of specialized tools and equipment. PacifiCorp contracts with vegetation management service providers to perform this work.

The program is designed to identify and correct vegetation conditions that are inconsistent with distinct distribution and transmission specifications in the company's Vegetation Management Standard Operating Procedures (SOP). Correcting these

[26] On average, substation and security inspections are typically performed on all substations monthly. However, internal policies require that non bulk transmission substations are to be inspections at least 8 times per year.

conditions minimizes and/or eliminates safety and reliability risks posed by trees and other incompatible vegetation that could encroach upon or grow near power lines. The overall objective of the vegetation management program is to minimize vegetation-related faults, including any faults that could be a source of fire ignition. PacifiCorp's vegetation management program is compliant with GO 95, Rule 35, and is described in detail in the Vegetation SOP.

Vegetation management conducted in or adjacent to distribution circuit corridors is mainly cyclical. In areas located outside of the HFTD, vegetation management work circuit is currently conducted every two years; full clearance work is done on a four-year cycle, with interim work at the two-year mark between each cycle. In the HFTD, certain vegetation management work is conducted annually, including an annual vegetation inspection. Where scheduled program work has not been completed before the fire season, an incremental patrol is conducted to identify and correct potential wildfire ignition risks. See Section 7.3.4.11 on page 188.

Vegetation management conducted on or near transmission line corridors focuses on maintaining extended clearances. Work also attempts to employ industry practices, such as integrated vegetation management (IVM) where practicable, to promote cover-type conversion, thereby preventing any future incompatible vegetation growth disrupting clearances. Transmission lines generally have broader rights-of-way, which allows PacifiCorp to generally maintain clearances well over the Minimum Vegetation Clearance Distance (MVCD) required in Table 2 of FAC-003-04. Vegetation maintenance activities are scheduled on an as-needed basis, dependent on results of regular inspections and specific local conditions.

Integral to vegetation management activities for distribution and transmission is the identification and removal of hazard trees. In addition, consistent with California Public Resource Code (PRC) § 4292, PacifiCorp addresses vegetation adjacent to "subject" poles in state-regulated areas to further reduce wildfire ignition risks and increase wildfire resiliency. When appropriate, bare-ground herbicide treatments are used to keep the 10-foot cylinder clear of vegetation. Vegetation management crews working in fire-prone areas are required to adhere to fire restrictions and to receive training related to fire prevention and suppression.

Through implementing the vegetation management program, wildfire ignition risk of vegetation to energized conductor contact is minimized.

7.3.5.1 Additional efforts to manage community and environmental impacts

As part of PacifiCorp's vegetation management program, PacifiCorp representatives and contractors interact with members of the community daily. PacifiCorp has processes in place to manage, minimize, or avoid community and environmental impacts.

1. **Risk to be mitigated**

   Vegetation management activities may result in impacts on communities and/or the environment where work is conducted. Impacts may be expressed in both the planning and implementation phases of the work. Implementation of vegetation management activities may require obtaining approvals from authorizing agencies at the local, state and federal levels, and stakeholders including concerned customers or communities that may result in inefficiencies or delays.

2. **Initiative selection**

   Coordination with authorizing agencies and customers is a critical component to successfully delivering a compliant vegetation management program. PacifiCorp strives to conduct vegetation management actions while maintaining environmental compliance and customer relations. PacifiCorp wants customers and authorizing agencies to be informed of its vegetation management program. For the OEIS definition of this community and environmental impact initiative, see Section 9.1 starting on page 271.

   Customers are typically notified, as a courtesy, at least five business days in advance of vegetation management work. Notification includes personal notification, door hangers, mail and consent forms. These forms of notification also facilitate customer questions, concerns and requests for further coordination in executing the work. When a tree is identified to be removed or herbicide or growth regulators are to be used, PacifiCorp makes reasonable attempts to obtain customer consent and has a robust escalation process. The goal is to find resolution between the customer and the company. If this coordination is unsuccessful, PacifiCorp will determine course in conducting the required work.

   Through this customer interaction, PacifiCorp takes opportunities to provide or discuss educational materials regarding tree-power line conflicts and planting the right tree in the right place. This coordination minimizes impacts to the community. Where larger-scale projects are planned that will have community impacts, PacifiCorp coordinates with leadership at the state and local levels, including cities, counties and neighborhood associations or groups, such as fire safe councils. Additional forms of notifications may also be used, such as automated callouts to customers, letters, social media, and other news media outlets to inform community member of planned activities. Where work will take place on municipal, county, state or federal properties, the appropriate authorizing officer or agency representative is notified.

   PacifiCorp routinely collaborates with local land managers in obtaining permits, scheduling work, and addressing issues as they arise. PacifiCorp works closely with various local offices of federal agencies to ensure there are approval processes in place for vegetation management work, including hazard tree removals. Annual meetings

are held with agencies where applicable, to enhance communication, discuss scope of work, and identify permit requirements and potential environmental impacts of scheduled vegetation management work.

To minimize environmental impacts and impacts to other sensitive resources, PacifiCorp conducts environmental reviews (biological and cultural) of vegetation management activities where warranted. To facilitate these reviews, minimize the timeframe to acquire agency approvals and ensure consistent implementation of process between PacifiCorp and federal land managing agencies, PacifiCorp continues to develop its Operations and Maintenance Plans (O&M Plan) in accordance with passage of legislation by the United States Congress; Section 211 of the Omnibus Appropriations Act of 2018 amended Title V of the Federal Land Policy and Management Act, which established a formal procedure for submission and approval of vegetation management plans, with an emphasis on standardized, consistent plans and minimizing the need for case-by-case approvals for hazard tree removal, pending implementation procedures to be established by applicable land managing agencies.

O&M Plan(s) establish agreed-upon agency review times of proposed maintenance activities based on activity type and presence or absence of sensitive resources that may be impacted. Even with an established O&M Plan, depending on the scope of the activity and potential for environmental impacts, agency approval timeframes may be prolonged and take several months or longer. The O&M Plan outlines PacifiCorp measures implemented for the protection of sensitive resources based on maintenance activity type, including vegetation management activities. The O&M Plan also includes PacifiCorp and land management agency roles and responsibilities in supporting PacifiCorp's rapid response to correct conditions identified in a timely manner. Development of these plans also supports company outreach to land managing agencies to inform and educate them on utility practices.

3. Region prioritization

Implementation of initiatives described above, including current process to notify communities of vegetation management activities, takes place where work is planned and is focused in areas where significant vegetation management work is needed (e.g., efforts to remove fire-impacted trees/hazard trees). Notification and coordination are also focused with customers and organizations that have previously requested advanced notice and increased coordination.

To manage environmental compliance PacifiCorp prioritizes environmental reviews and agency coordination based on project schedule considering agency review and permitting timelines. Projects are reviewed and packaged together where feasible to streamline review and coordination with authorizing agencies.

4. **Progress on initiative**

PacifiCorp's vegetation management department works closely with PacifiCorp's environmental, right-of-way, and legal departments to minimize and manage community and environmental impacts.

Developing O&M Plans is a multi-year effort. PacifiCorp is currently coordinating with the Klamath National Forest (KNF) to develop an O&M Plan. The O&M Plan with the KNF was targeted for completion in 2021 and is now undergoing final reviews by the KNF and other agency stakeholders; and is planned to be finalized in 2022. PacifiCorp has initiated discussions with the Region 5 of the USFS to develop strategy for developing O&M Plans for the remaining forests within PacifiCorp's California service territory. PacifiCorp continues to implement process improvements (standardized biological and cultural reviews) for environmentally screening and evaluating projects to manage environmental compliance and streamline agency reviews.

5. **Future improvements to initiative**

PacifiCorp will continue to seek opportunities to enhance community relations and manage community expectations. PacifiCorp will continue to engage with other land managing agencies within its service territory in 2022 to initiate O&M Plan development, including process improvements. In 2021, PacifiCorp hired additional staff as part of a non-wildfire mitigation compliance requirement, to oversee development and long-term implementation of O&M Plans and associated environmental screening process. In 2022, PacifiCorp plans to explore other opportunities, such as use of letters, to notify customers along a distribution circuit of upcoming vegetation management work.

7.3.5.2 Detailed inspections and management practices for vegetation clearances around distribution electrical lines and equipment

As part of the vegetation management program, PacifiCorp conducts inspections of all distribution lines that are scheduled as part of routine vegetation management maintenance.

1. **Risk to be mitigated**

Trees and other vegetation growing under or near power lines within striking distance of conductors and electrical equipment, can create safety, service reliability and ignition risks.

2. **Initiative selection**

As part of vegetation program maintenance, PacifiCorp conducts inspections of vegetation around distribution lines and equipment to identify imminent threats or

hazards and vegetation conditions that do not meet PacifiCorp's program standards/specifications. These pre-work inspections are typically conducted within weeks to one to two months by contractors before the scheduled program work. Inspectors/pre-listers use tablets to record vegetation conditions to be corrected. For the OEIS definition of this distribution inspection initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   PacifiCorp's service territory in California is divided into three districts. The distribution lines are inspected and managed at the circuit level. PacifiCorp senior utility foresters prioritize scheduling inspections and subsequent corrective work considering the HFTD, efficient workload distribution, weather conditions and resource availability.

4. **Progress on initiative**

   In 2021, PacifiCorp completed rollout of the electronic planning and tracking system. PacifiCorp conducted inspection and corrective work of 909 miles of distribution line that were scheduled for routine cycle and interim maintenance within our service territory in California, which resulted in pruning over 19,000 trees and removal of over 2,800 trees. PacifiCorp has included initiative specific progress and spending in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

5. **Future improvements to initiative**

   As PacifiCorp continues to implement its multi-year WMP, the company will continue to evaluate how inspections may be improved by either change to scope, tools, frequency or correction timeframes.

   PacifiCorp will continue to use its electronic planning and tracking system by incorporating all vegetation management activities in California and will continue to identify improvements to the system. PacifiCorp will also continue to investigate and evaluate other technologies to improve distribution inspections.

7.3.5.3 Detailed inspections and management practices for vegetation clearances around transmission electrical lines and equipment

See Section 7.3.5.2, page 197, on Detailed Inspections and Management Practices for Vegetation Clearances Around Distribution Electrical Lines and Equipment for additional information. Targets and progress on this initiative will be tracked through this initiative, 7.3.5.3.

7.3.5.4 Emergency response vegetation management due to red flag warning or other urgent weather conditions

1. **Risk to be mitigated**

   Weather conditions, such as heat and/or high winds have the potential to generate and spread wildfire when an ignition occurs.

2. **Initiative selection**

   While PacifiCorp is committed to executing the company's planned vegetation management programs, circumstances may still arise where, due to unexpected conditions such as weather, additional risk can be mitigated through supplemental vegetation inspections and corrective work. PacifiCorp does not have emergency response vegetation management actions specific to RFW, however, does adhere with local requirements and restrictions to mitigate ignition risk. During RFWs, PacifiCorp may move resources to work in other areas that are not impacted by the RFW or are outside of the HFTD, where feasible. Vegetation management personnel also follow local guidance and requirements as they pertain to fire restrictions, such as work hours, using a fire watch following work and using equipment that minimize potential to cause sparks. For the OEIS definition of this emergency response initiative, see Section 9.1 starting on page 271.

   PacifiCorp also has emergency response protocols associated with PSPS events. At times of elevated risk, PacifiCorp vegetation management may perform patrols to identify and address potential ignition risks due to vegetation and inform PSPS decision making. These patrols, typically referred to as PSPS alert patrols, may be performed throughout the weather event and/or PSPS event.

3. **Region prioritization**

   Emergency response vegetation management associated with potential PSPS events, is focused in proactive de-energization zones where the weather event is occurring. Patrols are also initiated and prioritized based on risk and situational awareness.

4. **Progress on initiative**

   In 2021 vegetation management conducted PSPS alert patrols during one weather event. PacifiCorp also improved implementation of PSPS patrols through use of its mobile data management software. When PSPS vegetation management patrols are conducted, a separate project within the mobile data management software is created specific to the potential PSPS or weather event. This allows for patrol findings to be separate from routine maintenance or other wildfire mitigation actions that may be implemented on the circuit(s) being patrolled under a PSPS event.

5. **Future improvements to initiative**

   PacifiCorp will continue performing risk-based PSPS patrols in 2022 and leverage the new data management software process.

7.3.5.5 Fuel management (including all wood management) and management of "slash" from vegetation management activities

PacifiCorp manages slash through a combination of chipping, lop and scatter and hauling off site.

1. **Risk to be mitigated**

   The completion of both planned and emergency vegetation management work can, in some instances, create smaller vegetation materials such as brush, tree limbs or shrubs less than 6 inches in diameter, a byproduct also referred to as "slash." The presence of slash from vegetation management activities can contribute to the overall fuel availability along a utility right-of-way.

   Similarly, vegetation growing at the base of poles can contribute to fuel loading.

2. **Initiative selection**

   PacifiCorp conducts fuel management through removal of slash from the tree canopy, chipping debris where accessible, and removes (recycles where practicable) slash in developed areas unless the property owner indicates otherwise. In rural, off-road areas PacifiCorp uses a lop and scatter and chipping practice to reduce the volume of available fuel within the right-of-way and adheres with land managing agency requirements. For the OEIS definition of this fuel management initiative, see Section 9.1 starting on page 271.

   An integral component of PacifiCorp's vegetation program that influences fuel management and reduction of slash are the appropriate use of herbicide and tree-growth regulators as part of IVM. By preventing and/or inhibiting undesirable vegetation growth, the volume of slash can be further reduced. PacifiCorp uses herbicides and tree-growth regulators, where approved by the property owner or land managing agency in targeted areas.

   PacifiCorp also annually conducts pole clearing, removal of vegetation around subject poles which further reduces fuel volume.

3. **Region prioritization**

   Slash management is conducted throughout PacifiCorp's service territory and Expanded pole clearing activities take place in the LRA.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

In 2021, PacifiCorp implemented slash management in accordance with the company's Vegetation SOP and through expanded pole clearing. PacifiCorp conducted vegetation clearing of 2,164 poles outside of SRA (CAL FIRE state-regulated areas), which is incremental to mandated pole clearing activity. In 2022, PacifiCorp plans to clear vegetation at 3,047 poles under the expanded pole clearing project.

In addition, PacifiCorp partners with communities and/or agencies to implement fuel reduction projects. In 2020, PacifiCorp partnered with the Shasta Trinity National Forest on a fuel reduction and highway safety enhancement project. PacifiCorp contractors removed trees adjacent to a transmission right-of-way, which parallels the highway. PacifiCorp also mowed vegetation within the right-of-way to further reduce fuel loading. This work was in conjunction with the forest service while they removed additional trees near the highway for the goals of fuel reduction and decreasing shade for highway safety. In 2022, PacifiCorp will continue to seek opportunities to partner with communities and/or agencies to support fuel reduction projects. In addition, PacifiCorp continued to implement IVM to promote compatible low-growing vegetation to minimize ignition risks, slash management and expanded pole clearing activities.

PacifiCorp vegetation management has expanded pole clearing to include Local Responsibility Area (LRA) subject equipment poles located in the HFTD in additional to its existing program in compliance with regulations of clearing State Responsibility Area (SRA) subject poles.

Expanded pole clearing involves the removal of all vegetation within a 10-foot radius cylinder of clear space around a subject pole and the application of herbicides to prevent any vegetation regrowth (unless prohibited by law or the property owner), see Figure 7.8 below.[27]

[27] Illustration of pole-clearing requirements (California Department of Forestry & Fire Protection 2008, Figure 3, PRC 4292, 14 CCR 1254, Fire Break Clearance Requirement Around Poles and Towers

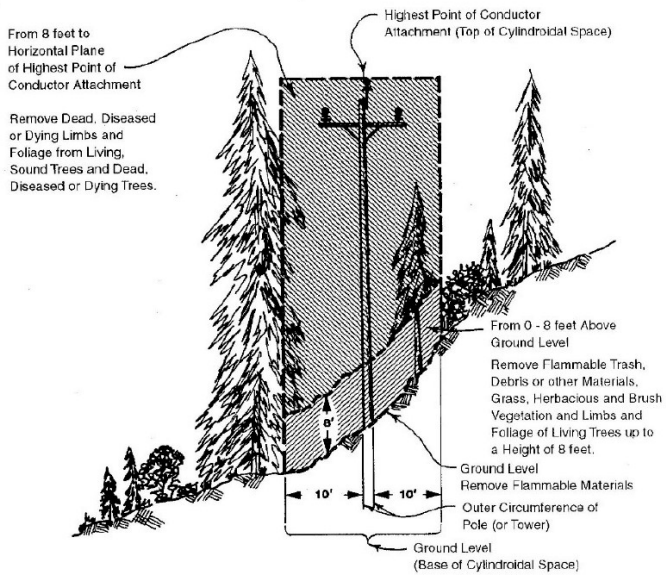

Figure 7.8 Pole clearing

This strategy is distinct from additional clearance and removal activities and requirements because it is not designed to prevent contact between vegetation and a power line. Instead, like "slash management," pole clearing reduces the risk of fire ignition if sparks are emitted from electrical equipment. PacifiCorp intends to implement pole clearing on wildland vegetation in the HFTD around poles that have fuses, air switches, clamps or other devices that could create sparks.

After a pole has been cleared, a spark falling within the 10-foot radius would be much less likely to ignite a fire.

5. Future improvements to initiative

PacifiCorp will continue to seek opportunities to responsibly expand use of herbicide and tree growth regulators as a component to IVM through the development of O&M plans and agreements with land managing agencies to reduce slash and promote low-growing, right-of-way compatible species.

PacifiCorp will track this activity electronically to develop an inventory of poles to be cleared. The inventory will allow the company to efficiently manage an expanded pole clearing project.

7.3.5.6 Improvement of inspections

1. **Risk to be mitigated**

   Vegetation may grow more quickly than expected and may encroach on conductor clearances; vegetation that needs to be pruned per the company Vegetation SOP or addressed on some other way may not be appropriately identified.

2. **Initiative selection**

   PacifiCorp has initiated incremental inspections before the height of the fire season, see Section 7.3.4.11 on page 188. In addition, PacifiCorp conducts post-audit inspections of completed work and addresses any conditions that do not meet the vegetation program standards/specifications; see Section 7.3.4.14 on page 189. For the OEIS definition of this inspection improvement initiative, see Section 9.1 starting on page 271.

   These audits serve as quality control and provide opportunities for PacifiCorp senior utility and utility foresters to engage with the vegetation management contractors — opening discussions about the required specifications and working to improve inspections.

3. **Region prioritization**

   Audits and contractor coordination/reviews are conducted throughout PacifiCorp's service territory.

4. **Progress on initiative**

   In 2021, PacifiCorp foresters increased engagement with vegetation management contractors by establishing recurring meetings to discuss inspection and vegetation management quality and execution. PacifiCorp foresters also provide training to inspectors as discussed in Section 5.4.3 starting on page 123.

   PacifiCorp continues to seek opportunities for improving inspection quality and using technology to improve inspections and identify changes that may be needed. In 2021, inspections improved through an electronic planning and tracking system. See Section 7.3.5.18 on page 214.

   Historically, PacifiCorp tracked vegetation management activities at the local level, generally relying on paper forms, maps, documents and local knowledge. To move toward improved transparency, efficiency and data analytics, PacifiCorp incorporated the use of a work planning and tracking system. Inspectors use tablets to document vegetation maintenance activity requirements by location (for example, parcel or parcels). This information is then available to maintenance contractors, which allows for improved planning and documentation. Once the work is done, it is recorded in

the field via tablets used by tree crews. Post-audits are then conducted, and findings identified. This increased connectivity between inspector/pre-lister, vegetation management crews and post-auditor (PacifiCorp foresters or designated third-party contractor) results in greater communication and ability to identify recurring issues with inspections and the execution of the work. This also allows for additional granularity in reporting, records retention, and contractor performance.

5. **Future improvements to initiative**

In 2020 PacifiCorp completed initial rollout and implementation of the planning and tracking system and will continue to use and improve this system to allow for increased data collection and accuracy, analysis, and efficiencies. PacifiCorp will continue to investigate use of other technologies such as LiDAR to augment inspections.

7.3.5.7 Remote sensing inspections of vegetation around distribution electric lines and equipment

1. **Risk to be mitigated**

Vegetation contact can occur due to tree growth, tree limbs falling or blowing into lines, or uprooted trees falling into lines. Vegetation pruning or removals mitigate these contact risks; remote sensing inspections potentially identify where mitigation should be performed and quantify the relative risk for vegetation issues between areas.

2. **Initiative selection**

PacifiCorp has previously investigated using LiDAR around vegetation and is currently evaluating remote inspection via satellite imagery and AI models. Satellite imagery combined with modeling has the potential to be more cost-effective over larger areas than LiDAR inspections. For the OEIS definition of this remote sensing initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

Regions were selected to provide a mix of vegetation and terrain type for initial assessment, by areas with available comparison data, and further prioritized based on fire risk. At the time of the initiative, the most recent available satellite imagery was from the summer of 2020. Regions with significant burning after that date were, therefore, excluded from the initial phase.

4. **Progress on initiative**

PacifiCorp evaluated several forms of technology pilots to support and streamline vegetation inspection processes. At this time, the technology has not resulted in

reduced visits; it has, however, proven viable for other pilot efforts outlined in the company's WMP, as outlined in Section 4.4.2.2 on page 53. The company recently completed a pilot using satellite imagery trained with LiDAR data to produce vegetation and strike tree maps. Assessment showed high accuracy on strike tree locations, with significant cost savings over LiDAR. Vegetation height and canopy coverage maps have higher resolution and less masking than publicly available data, resulting in more accurate and extensive tree capture.

5. **Future improvements to initiative**

PacifiCorp will have some additional short-term work in 2022, and then will evaluate the expansion of this initiative for 2023 onward. The expanded plans include satellite imagery-derived vegetation maps to cover the remaining HFTD tiers, areas with 2020 burn damage, and locations with large gaps in publicly available data. Future LiDAR initiatives may be conducted if use cases warrant more targeted information than can be generated by satellite imagery and AI models alone, and if they offer business value in terms of risk management, situational awareness or reduced vegetation management or facility inspection costs.

7.3.5.8 Remote sensing inspections of vegetation around transmission electric lines and equipment

See Section 7.3.5.7, page 204, on Remote sensing inspections of vegetation around distribution electric lines and equipment for additional information. Targets and progress on this initiative will be tracked through this initiative, 7.3.5.8.

7.3.5.9 Other discretionary inspections of vegetation around distribution electric lines and equipment beyond inspections mandated by rules and regulations

At this time, PacifiCorp does not have any specific vegetation management and inspection wildfire mitigation programs focused on other discretionary inspections of vegetation that grows around distribution lines.

7.3.5.10 Other discretionary inspections of vegetation around transmission electric lines and equipment beyond inspections mandated by rules and regulations

At this time, PacifiCorp does not have any specific vegetation management and inspection wildfire mitigation programs focused on other discretionary inspection of vegetation that grows around transmission lines.

7.3.5.11 Patrol inspections of vegetation around distribution electric lines and equipment

1. **Risk to be mitigated**

   Risk of wildfire ignition is greater during certain times of the year, such as the height of the fire season, considering weather conditions.

2. **Initiative selection**

   To further reduce wildfire risk in the HFTD, PacifiCorp vegetation management implemented annual vegetation patrols incremental to scheduled program routine maintenance on lines within the HFTD. Correction work is subsequently conducted based on those inspection results. For the OEIS definition of this patrol inspection initiative, see Section 9.1 starting on page 271.

   In 2019, PacifiCorp implemented a "readiness patrol" of overhead distribution lines initiative in the HFTD. This initiative supports removal and or pruning of vegetation that may pose an ignition risk, such as hazard trees. Before the height of the fire season, PacifiCorp conducts readiness patrols located within HFTD on lines not scheduled for regular maintenance work in that year. Consistent with existing procedures, a Level 1 assessment (ANSI A300 Part 9) is conducted to identify any trees that may have become hazard trees over the course of the past year and target these trees for removal. In addition, inspectors identify for pruning or removal fast-growing vegetation that is likely to violate minimum clearance distances before the end of the current growing season.

   In conjunction with such annual patrols, vegetation management annually completes correction work based on the patrol results.

3. **Region prioritization**

   These patrols are conducted in the HFTD where program cycle work has not been completed or is not scheduled before fire season.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   In 2020, PacifiCorp inspected 1,059 miles of distribution line in the HFTD. Specific targets are provided in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

5. **Future improvements to initiative**

   PacifiCorp will continue investigating use of technology to augment these patrols.

7.3.5.12 Patrol inspections of vegetation around transmission electric lines and equipment

1. **Risk to be mitigated**

   Refer to Section 7.3.5.11 on page 206 for additional inspection details related to risks to be mitigated and initiative selection. For the OEIS definition of this transmission patrol inspection initiative, see Section 9.1 starting on page 271.

2. **Initiative selection**

   PacifiCorp conducts an additional vegetation management inspection of overhead lines in the HFTD. For transmission, this inspection is specific to the segments of line that are within the HFTD.

3. **Region prioritization**

   PacifiCorp conducts an additional vegetation management inspection of overhead lines in the HFTD. For transmission, this inspection is specific to the segments of line that are within the HFTD. Refer to Section 7.3.5.11 on page 206 for additional inspection details.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp has included initiative specific progress and spending in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

5. **Future improvements to initiative**

   PacifiCorp will continue investigating use of technology to augment these patrols.

7.3.5.13 Quality assurance / quality control of vegetation management

1. **Risk to be mitigated**

   Vegetation may not be appropriately identified or may not be pruned or removed in accordance with PacifiCorp's Vegetation SOP.

2. **Initiative selection**

   Quality control actions such as audits are critical to ensure vegetation requiring work (pruning and/or removal) is properly identified and the work is subsequently conducted in accordance with vegetation program standards/specifications. An additional definition For the OEIS definition of this QA/QC initiative, see Section 9.1 starting on page 271.

PacifiCorp currently uses internal staff with ISA certifications to conduct post-work audits of routine maintenance, readiness patrol corrective actions, and pole clearing. PacifiCorp also conducts ad hoc tree crew audits or crew visits where a PacifiCorp forester engages with the vegetation management contractor, such as a crew leader, and/or supervisor to review work and/or discuss opportunities for improvement.

PacifiCorp does not formally conduct specific audits of the inspections (vegetation work prescribed by the pre-listers) as an explicit part of the audit program. Instead, audits are conducted after tree work is done. While the audits focus on the execution of the vegetation management actions (e.g., pruning and removals), the post-audits do result in findings that relate to the initial inspection, such as trees needing work that may have been missed by the pre-lister (which ought to also be caught by the work crew). PacifiCorp foresters then address applicable post-audit findings with pre-listers who conducted the inspections.

During post-audits, observations and instruction about corrections are documented in the mobile data management software system, observations are discussed, and feedback is provided to the vegetation management contractor. Like PacifiCorp's other programs, if an exception is identified that poses an imminent safety or reliability risk, the audit will be suspended, the exception addressed through corrective actions, and the crew may be shut down.

3. **Region prioritization**

Post-audits are performed throughout PacifiCorp's service territory on routine maintenance work and incremental work conducted because of readiness patrols, while prioritizing post-audit completion within the HFTD.

4. **Progress on initiative**

In 2019, PacifiCorp hired four utility foresters to conduct post-audits of vegetation management work completed by PacifiCorp's vegetation management contractors. In 2021, PacifiCorp also implemented centralized tracking of post-audit progress.

PacifiCorp has continued to refine its work management process, specifically filing specific, work-related milestone-type documentation including contractor accepted work release, work completed documentation, contractor signed completed work release, post-audit completion and audit findings, or exceptions addressed and corrected. In 2021, PacifiCorp converted a contractor to a full-time employee position to oversee this tracking documentation and to coordinate with vegetation management contractors among other job duties.

Post-audits benefit both PacifiCorp and the vegetation management contractor and are considered a best management practice.

5. **Future improvements to initiative**

   In 2022, PacifiCorp plans to take steps in expanding its QC capabilities by increasing internal staff resources (supervisor and auditors) to conduct post-audits and other QA/QC functions to help improve and achieve desired outcomes of the vegetation management program. PacifiCorp will continue to develop and refine its QA/QC program.

7.3.5.14 Recruiting and training of vegetation management personnel

1. **Risk to be mitigated**

   A fully trained workforce is an important part of any successful wildfire mitigation initiative. Specific to vegetation management, personnel are needed to ensure program work such as inspections or tree trimming is completed properly and on schedule to mitigate the risk of vegetation-related wildfire ignitions and outages.

2. **Initiative selection**

   PacifiCorp continues to work with initiatives related to contractor-based training, internal training, ISA certification and the use of a Vegetation Management Process Checklist. For the OEIS definition of this training and recruitment initiative, see Section 9.1. starting on page 271.

   Vegetation management contractors are responsible for providing a trained and competent workforce to address vegetation along PacifiCorp's transmission and distribution system, in accordance with PacifiCorp's specifications. They also coordinate training with Joint Apprenticeship Training Committees where present. Contractors also provide training on an as-needed basis to their personnel including herbicide use, fire prevention and suppression, general environmental requirements, customer service/communication, safety practices and tree felling procedures. Contractors have fire suppression tools and equipment in place. Contractors also conduct training in a variety of venues including classroom settings, conference calls or during job briefings at the work site. Contractor personnel are required to have ISA certifications and are required to conduct continuing education to maintain such certifications.

   PacifiCorp facilitates annual environmental awareness training of vegetation management contractors focusing on restrictions and requirements related to laws and regulations pertaining to avian species. PacifiCorp provides informal training and discussion on topics including regarding work scope specifications, changes in work scope or PacifiCorp processes, and PacifiCorp's mobile data management system. PacifiCorp also participates in benchmarking discussions with contractors to review expectations, best practices, and opportunities for improvement. Training opportunities also arise during post-work audits conducted by the foresters.

PacifiCorp has developed a Vegetation Management Process Checklist (contained within its SOP) as a guide for both internal and external personnel to serve as a process job-aid.

PacifiCorp's internal vegetation management foresters must maintain arborist and utility specialist ISA certifications, which means foresters receive ongoing training. PacifiCorp also provides annual training to foresters including environmental awareness, wildfire preparedness, prevention and response and safety. PacifiCorp foresters conduct job shadowing or "ride-alongs" to cross-train one another. In addition to this, regularly recurring meetings are held with PacifiCorp foresters to discuss ongoing work, opportunities for improvement, share best practices, etc. PacifiCorp foresters are encouraged through discussions and planning sessions with their supervisor to identify and take vegetation management related courses and certifications such as ISA Tree Risk Assessment Qualification to foster and identify opportunities for professional development.

3. **Region prioritization**

   Training and recruiting practices are implemented and consistent throughout PacifiCorp's California service territory.

4. **Progress on initiative**

   In 2021, PacifiCorp initiated cross-training opportunities for internal vegetation management staff. This includes identifying other internal work groups to discuss or provide training on their work functions as they relate to vegetation management (e.g., training on internal software programs) to increase work process efficiencies and drive continuous improvement.

5. **Future improvements to initiative**

   In 2022, PacifiCorp will provide training and discussion on PacifiCorp's wildfire mitigation plan to both internal and external vegetation management personnel.

7.3.5.15 Identification and remediation of "at-risk species"

1. **Risk to be mitigated**

   Vegetation contact with conductors, whether through grow-in, blow-in, or fall-in creates an ignition and outage risk.

2. **Initiative selection**

   At-risk species, with fast growth rates, can increase the risk of electrical contact. In addition to growth rates, other risk factors — being prone to structural failure (trunk, branch, roots) and environmental factors, such as wind — are considered when

prescribing remedial actions, including discretionary removal. Remediation of at-risk trees is a subset to the company's vegetation management's clearance around electric lines and equipment program. A PacifiCorp vegetation maintenance program objective is to prevent vegetation from growing-into, and contacting, power lines. PacifiCorp has established post-work clearance specifications categorized by tree growth rates (see Section 7.3.5.19) to prevent vegetation-to-conductor contacts. Vegetation inspections categorize growth by species as: slow, moderate, fast (cycle-buster). Within the HFTD, pruning is performed to prevent vegetation from breaching a 4-foot minimum clearance within one year. This may require additional pruning for at-risk species with very fast growth rates. Pre-listers also identify discretionary removals of at-risk species to eliminate ignition risk and need for cyclical pruning. For the OEIS definition of this remediation initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   At-risk species inspection is performed along with other vegetation maintenance inspections. These are performed annually in the HFTD, and in accordance with routine maintenance schedules in other areas.

4. **Progress on initiative and plans for next year**

   PacifiCorp completed vegetation inspection, including at-risk species, of lines within HFTD areas in 2021, and will continue to inspect these areas annually. In late Q4 of 2021, PacifiCorp updated its mobile data management software to collect additional information at the time of inspection, including quantifying the number of "cycle-busters" (trees that may not maintain clearance from conductor for the full cycle).

5. **Future improvements to initiative**

   The company is investigating the use of remote sensing to expand identification of at-risk tree species. PacifiCorp is conducting a pilot study (refer to Section 4.4.2.4 on page 56) using LiDAR, Satellite and publicly available datasets to identify potential clearances encroachments, potential strike trees, and to identify areas with higher risk of vegetation contact and/or greater need for vegetation maintenance work. These pilot studies could be useful in the future in the dentification of high-risk trees, including "cycle-busters" to develop incremental modification to the existing program. Removal and remediation of trees with strike potential to electric lines and equipment

1. **Risk to be mitigated**

   Hazard trees, (dead, dying, diseased, deformed, or unstable) have an increased risk of failure, and therefore a higher strike likelihood. Risks to be mitigated include outages, wildfire ignition, property damage, and safety concerns posed by hazard trees.

2. **Initiative selection**

   PacifiCorp identifies hazard trees based on visual inspection by pre-listers with knowledge of species identification and hazard tree identification/assessment as part of detailed inspections (routine maintenance) and readiness patrols. Identified trees are removed, topped, or pruned to eliminate risk of contact with conductors. For the OEIS definition of this strike tree removal and remediation initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   All areas within PacifiCorp's California service territory are inspected for hazard trees and mitigated during detailed inspections (routine maintenance). In addition, areas within the HFTD are inspected for hazard trees annually as a part of the annual patrols described in sections 7.3.5.11 and 7.3.5.12 on pages 206-207.

4. **Progress on initiative and plans for next year**

   PacifiCorp completed hazard tree inspections in the HFTD in 2021 and will continue to inspect annually, targeting inspections to be completed by the end of August. In late Q4 2021, PacifiCorp updated is mobile data management software to collect additional information during inspections regarding hazard trees. Species and quantity information is now collected; this will better inform tree crews and allow PacifiCorp to better track hazard tree removals versus inventory reduction removals and trends through time.

5. **Future improvements to initiative**

   The company is collecting data on potential strike trees as part of the LiDAR and remote sensing pilots (Section 4.4.2.4 on page 56 and PacifiCorp's 2021 Pilot 3: LiDAR Vegetation Inspection Pilot program). The company is also investigating the use of remote sensing techniques to augment the traditional identification of hazard trees. Additionally, as presented in Section 7.3.5.15 on page 210, PacifiCorp is conducting pilot studies (refer to Section 4.4.2.4 on page 56) using LiDAR and publicly available datasets to identify potential clearances encroachments, potential strike trees, and identify areas with higher risk of vegetation contact and/or greater need for vegetation maintenance work. These pilot studies could include identification of high-risk trees, including tree species, within strike distance to develop a future program incremental to the existing program to address fall-in risk. PacifiCorp is continuing to pursue this tactic through implementation of these pilot studies to support strategic efforts.

   Section 4.4.2.4 on page 56 and PacifiCorp's 2021 Pilot 3: LiDAR Vegetation Inspection Pilot program have shown that both LiDAR and satellite vegetation models can identify trees with strike capability, though not trees with various 'hazard' traits. The

use of remote sensing technologies to identify tree mortality is not yet a mature technology but is under development and may be available in the future.

7.3.5.16 Substation inspections

1. **Risk to be mitigated**

   Vegetation contact with conductors creates an ignition risk, and a risk of fire damage to substation equipment. Substation inspections determine where vegetation may pose a current or future risk to substation equipment.

2. **Initiative selection**

   PacifiCorp performs substation inspections for vegetation along with regular cycle and interim vegetation maintenance. For the OEIS definition of this substation inspection initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   Substation vegetation inspections are performed throughout our service territory as part of regular cycle or interim maintenance.

4. **Progress on initiative**

   PacifiCorp performs regular inspections on all substations. Substations within the HFTD are inspected for vegetation annually and other substations are inspected bi-annually.

5. **Future improvements to initiative**

   PacifiCorp plans to continue implementation of substation vegetation inspections as a part of regular cycle work.

7.3.5.17 Substation vegetation management

1. **Risk to be mitigated**

   Vegetation contact with conductors poses a risk of arcing and of damage to substation equipment. Removal of vegetation encroachments mitigates this risk.

2. **Initiative selection**

   PacifiCorp removes or prunes any vegetation identified in the substation inspection consistent with cycle work. For the OEIS definition of this substation vegetation management initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

Substation vegetation management is performed throughout our service territory.

4. **Progress on initiative**

   PacifiCorp completed substation vegetation removals and overhang trimming for all fire areas in 2021 and will continued to perform annual mitigation.

5. **Future improvements to initiative**

   PacifiCorp plans to continue performing substation vegetation management activities as a part of routine cycle work.

7.3.5.18 Vegetation management system

1. **Risk to be mitigated**

   Vegetation contact risks are primarily mitigated through trimming or removals. Maintaining clear and complete records of vegetation work needed and performed helps ensure thorough and accurate mitigation of vegetation risks throughout the company's service territory. Refer to Section 4.4.2.7 on page 61.

2. **Initiative selection**

   In 2021, PacifiCorp continued its work with a records system introduced in 2020. The system includes GIS data and more detailed records for vegetation work. The same records system was successfully implemented in other states. These records will provide the backbone for the vegetation inventory. For the OEIS definition of this vegetation management system initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   PacifiCorp is using one, service territory-wide system of vegetation records management. GIS records will begin accumulating in the new system in specific locations as those areas are due for previously determined vegetation maintenance work, including regular mitigation in the HFTD.

4. **Progress on initiative**

   PacifiCorp began implementing more detailed records system in 2020 and have implemented updates to the forms and information collected for 2022. This record system now includes GIS data and is in use by both PacifiCorp staff and contract workers. The company also began characterizing general vegetation location and volume near assets using publicly available data on tree canopy and more specific information from remote sensing pilot programs. This information provides knowledge of vegetation risks at a system level while more specific data accumulates through ongoing vegetation management field records.

5. **Future improvements to initiative**

PacifiCorp is investigating options to improve vegetation data using remote sensing technologies, particularly as a means for growth forecasting. For example, the pilot project in Section 4.4.2.7 on page 61 was recently completed using Salo Sciences data to detect general growth. However, several years-worth of data for each location must be gathered before growth estimates can be calculated.

7.3.5.19 Vegetation management to achieve clearances around electric lines and equipment

1. **Risk to be mitigated**

Risk of ignition due to contact (grow-in, blow-in and fall-in) of vegetation with energized conductors and equipment.

2. **Initiative selection**

To minimize wildfire risk, PacifiCorp's vegetation management program uses multiple methods to maintain vegetation clearances including identification and removal of hazard trees, line patrols, expanded clearance distances, spatial pruning distinctions, and natural target pruning. For the OEIS definition of this vegetation management clearance initiative, see Section 9.1 starting on page 271.

The company conducts cycle-based maintenance to achieve clearances around electric lines and equipment consistent with Appendix E Guidelines of GO 95, Rule 35. The company identifies and removes hazard trees and conducts patrols of lines in the HFTD where cycle maintenance has not been completed.

PacifiCorp has adopted expanded post-work minimum clearance distances, of at least 12 feet for all distribution lines and at least 20 feet for transmission lines under 115 kV and 30 feet for any transmission lines of 115 – 230 kV.

PacifiCorp also prunes vegetation beyond minimum required clearances in multiple ways. First, PacifiCorp uses increased clearance distances on distribution lines for certain species of trees, depending on tree growth rate. PacifiCorp separates vegetation into three categories: (a) slow-growing; (b) moderate growing; and (c) fast growing. In all cases, PacifiCorp applies the 12-foot minimum clearance for slow-growing species. In certain cases, PacifiCorp applies an increased clearance for moderate growing and fast-growing species.

Second, PacifiCorp integrates spatial concepts to distinguish between (i) side clearances, (ii) under clearances, and (iii) overhang clearances. Recognizing that certain trees grow faster vertically than other trees, it is appropriate to use an increased clearance when moderate- or fast-growing trees are under a conductor. Increasing overhang clearances also reduces the potential for faults due to overhang.

Third, as a practical matter, PacifiCorp will often prune beyond the minimum required distances because of the physical structure of the tree. PacifiCorp uses natural target pruning. Natural targets are the final pruning cut location at a strong point in a tree's disease defense system, which are branch collars and proper laterals. Pruning at natural targets protects the joining trunk or limb. This technique is drawn from ISA Best Management Practices: Tree Pruning.[28]

Through conducting patrols of lines in the HFTD, see Section 7.3.5.11 on page 206, PacifiCorp maintains minimum clearance distances and increases frequency of hazard tree identification and removal. Hazard trees identified during annual inspections are removed or pruned sufficiently to eliminate the hazard. As a result, some hazard trees will be identified and removed earlier than under the regular program (i.e., which would have then occurred during the next regular cycle).

PacifiCorp's existing SOPs require the removal of hazard trees. Consistent with California law, removal is required when "dead, rotten or diseased trees or dead, rotten or diseased portions of otherwise healthy trees overhang or lean toward and may fall into a span of supply or communication lines."[29] Furthermore, the SOP encourages removal, when allowed, even when removal is not required under GO 95, Rule 35 or PRC § 4293.

Hazard trees are identified through detailed inspections and patrols by field crews performing work. PacifiCorp uses an initial Level 1 assessment, as defined in ANSI A300 (Part 9). Suspect trees are targeted for removal. In many circumstances, obtaining property owner consent to removal is often part of the process. PacifiCorp goes to great lengths to obtain property owner permission, making repeated and reasoned requests by different representatives of the company.

3. **Region prioritization**

Vegetation management actions are conducted throughout PacifiCorp's service territory.

4. **Progress on initiative**

PacifiCorp conducted vegetation management activities consistent with its Vegetation SOP and this WMP in 2021 and will continue implementing this initiative in 2022.

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[28] (Gilman and Lilly 2002) and A300 (ANSI 2008). (See also Miller, Randall H., 1998. Why Utilities "V-Out" Trees. Arborist News. 7(2):9-16.)

[29] GO 95, Rule 35; see also Public Resources Code § 4293 "Dead trees, old decadent or rotten trees, trees weakened by decay or disease and trees or portions thereof that are leaning toward the line which may contact the line from the side or may fall on the line shall be felled, cut, or pruned so as to remove such hazard."

5. **Future improvements to initiative**

PacifiCorp will continue to review opportunities to use technology that augments the vegetation management program (such as LiDAR and satellite imagery). In 2022, PacifiCorp will identify a distribution circuit or portion of a distribution circuit to implement enhanced overhang clearances, as indicated in Section 4.4.1 starting on page 48 with the intent to identify resources needed to execute this enhanced practice including equipment, vegetation management crews, increased customer coordination, work management and tracking. Species prone to limb failure would be targeted for enhanced overhang clearances.

7.3.5.20 Vegetation management activities post-fire

1. **Risk to be mitigated**

Trees with sufficient height to strike distribution and transmission electric infrastructure that are impacted by wildfire create an ignition, outage, and safety risk.

2. **Initiative selection**

PacifiCorp foresters and/or vegetation management contractors patrol wildfire-impacted areas adjacent to electrical infrastructure to identify trees impacted by fire within strike distance of electrical infrastructure, determine risk, and determine strategy for mitigating the identified risk. Trees that pose an imminent risk are topped or felled to eliminate the risk as soon as practicable. Depending on the risk identified and considering other factors such as land ownership and environmental concerns, other mitigation efforts to address remaining fire-impacted trees may occur. In all cases, safety is paramount; vegetation post-fire work is done to reduce safety risks to the public and PacifiCorp crews or contractors that may be responding to repair infrastructure damaged or destroyed by fire. For the OEIS definition of this post-fire vegetation management initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

Post-fire vegetation management, including inspection and risk mitigation (topping or felling or fire-impacted trees within strike distance of infrastructure), is conducted throughout PacifiCorp's service territory.

4. **Progress on initiative**

No changes to post-fire inspection and mitigation activities occurred in 2021.

5. **Future improvements to initiative**

Through responding to the catastrophic wildfires of 2020, PacifiCorp identified opportunities for improvement regarding coordination and mitigation strategies. The QA/QC supervisor identified in Section 7.3.5.13 on page 207and planned to be hired

in 2022, will oversee vegetation management response to wildfires in the field and will further develop and refine post-fire response strategies.

7.3.6 Grid operations and protocols

7.3.6.1 Automatic recloser operations

1. **Risk to be mitigated**

   Line protective devices, such as line reclosers, are currently deployed on various transmission and distribution lines throughout PacifiCorp's service territory. When a line trips open due to fault activity, reclosers can be programmed to momentarily open, allow the fault to dissipate, and then reclose to test if the fault is temporary. The reclosing function gives the ability to restore service on a line that has tripped while maintaining the option to open again if the fault persists. In general, recloser operation is beneficial because it reduces the number of sustained outages and improves customer reliability. The reclosing function, however, implicates some degree of ignition risk because additional energy can be released if a fault persists. When a fault is detected on the line, a recloser will trip and reclose based on predetermined settings to re-energize the line. If the fault is temporary in nature and is no longer present upon the reclose operation, the line will re-energize resulting in limited impact to customers. If the fault persists, however, reclosing can, depending on the circumstances, potentially cause arcing or an emission of sparks. Accordingly, a strategic balance between customer reliability and wildfire mitigation is required.

2. **Initiative selection**

   PacifiCorp's reclosing protocols generally apply a "fast trip setting" protocol as per Section 4.4.2.8 on page 62, where multiple reclose attempts are made. The protocols where reclosing is disabled are reserved for only extreme weather events, transmission lines, or certain distribution configurations where EFR settings discussed in Section 7.3.6.2 on page 219 are not compatible with the hardware installed. For the OEIS definition of this automatic recloser initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   Generally PacifiCorp does not disable reclosing seasonally. Instead, reclosing may be disabled based on situational awareness reports during periods of extreme risk, which can happen throughout the company's California service territory. Additionally, PacifiCorp prioritizes other mitigation tactics, such as grid hardening or increased patrols, over recloser disabling where possible, to not overuse the tool and cause unintended impacts to customers.

4. **Progress on initiative since the last WMP submission and plans, targets, and/or goals**

for the current year

In the 2022 updates to the WMP guidelines, OEIS has added a new section, 7.3.6.2 on page 219, which aligns with the protocols.

5. **Future improvements to initiative**

Implementing and continuously improving this program requires advanced investigation of fault events to understand the nature and type of faults and whether this program is properly mitigating these events.

7.3.6.2 Protective equipment and device settings

1. **Risk to be mitigated / problem to be addressed**

In general, a more sensitive setting can reduce the energy released as a result of a fault. At the same time, less sensitive settings, in conjunction with recloser operations, reduce the number of sustained outages and improve service reliability.

2. **Initiative selection**

With protective device settings that result in reduced potential for arcing or emission of sparks, there are likely to be more outages. Again, a strategic balance between customer reliability and wildfire mitigation is required. For the OEIS definition of this protective equipment initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

Operating protocols designate that identified areas with a high risk in the situational awareness forecast may have alternative settings applied to protective device settings.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

This is a relatively new initiative. PacifiCorp plans to continue using EFR settings in situations of high wildfire risk using a more standardized application informed by advancements in situational awareness.

5. **Future improvements to initiative**

PacifiCorp is taking steps to increase situational awareness efforts, such as the installation of CFCIs described in Section 7.3.2.3 on page 162, to support quicker locating of faults and restoration of power. PacifiCorp communications, describing how these settings reduce wildfire risk and impact, are provided to communities such that they are informed. Similar to the implementation of PSPS, PacifiCorp plans for the implementation of EFR aim to find the appropriate balance between mitigating

wildfire risk and providing reliable power to communities and will be applied where appropriate and feasible.

7.3.6.3 Crew-accompanying ignition prevention and suppression resources and services

1. **Risk to be mitigated**

   Utility support of ignition prevention and suppression resources can reduce the potential for wildfires and provide electrical safety support during wildfire.

2. **Initiative selection**

   This initiative includes PacifiCorp personnel accompanying suppression resources in the event of a wildfire as well as personnel carrying fire extinguishers. In the extremely unlikely event that a fire ignition occurs while field crews or other PacifiCorp personnel (collectively "field personnel") are working in the field, such field personnel are equipped with basic tools to extinguish small fires. For the OEIS definition of this ignition prevention and suppression initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   Firefighting equipment resources may be moved into affected areas as needed to support other districts. For example, Medford, Oregon resources are available for use in Yreka, California.

   Table 7.4 lists of resources and their location:

Table 7.4 List of firefighting equipment and locations

Equipment Description	Location
500 gallon water tanker and pump with ¾ inch high pressure hose	Bend
250 gallon water skid-tank on trailer	Grants Pass
500 gallon water trailer, 2 inch hose	Klamath Falls
250 gallon water skid-tank (requires trailer for movement)	Klamath Falls
500 gallon water trailer, 2 inch hose	Medford
250 gallon fire tank and pump (trailer or pickup loaded)	Pendleton
500 gallon water tanker, 3 inch hose, firefighting equipment	Roseburg
250 gallon fire tank and pump *(trailer or pickup loaded)*	Walla Walla
250 gallon fire tank and pump *(trailer or pickup loaded)*	Yakima

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   During the 2021 year, PacifiCorp found the existing level of resources to be adequate therefore, there are no changes to this initiative in 2021 and none are expected to be needed in 2022.

5. **Future improvements to initiative**

   PacifiCorp plans to continue maintaining its own firefighting equipment, listed above, over the next five years.

7.3.6.4 Personnel work procedures and training in conditions of elevated fire risk

1. **Risk to be mitigated / problem to be addressed**

   During fire season, PacifiCorp modifies field operations to further mitigate wildfire risk to reduce the risks associated with ignitions.

2. **Initiative selection**

   During fire season, PacifiCorp field personnel mitigate wildfire risk by using a variety of tactics. Routine work, such as condition correction and outage response, poses some degree of ignition risk, and, in certain circumstances, crews modify their work practices and equipment to decrease this risk. Additionally, field personnel may mitigate wildfire risk through increased patrols, or adjusting reclosers to EFR settings. For the OEIS definition of this personnel work procedure and training initiative, see Section 9.1 starting on page 271.

   Operating Conditions include:

   • Normal Condition: Standard operating protocols

   • Elevated Condition: Specific work activities may require additional mitigation measures to proceed with work, such as operating machinery at low-risk times of day, watering areas prior to work, keeping water tanks on site, etc.

   • Extreme or RFW Condition: Most overhead work is stopped, except where not performing the work would create a greater risk

3. **Region prioritization**

   As a part of the forecast effort and daily meteorology briefings, field operations considers the local weather and geographic conditions that may create an elevated risk of wildfire. These practices reduce the potential of direct or indirect causes of ignition during planned work activities, fault response and outage restoration and can be applied across any portion of the service territory.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   During the 2021 year, PacifiCorp found the existing level of resources to be adequate therefore, there are no changes to this initiative in 2021 and none are expected to be needed in 2022.

5. **Future improvements to initiative**

   PacifiCorp will continue the successful practices established in this initiative.

7.3.6.5 Protocols for PSPS re-energization

PacifiCorp describes its PSPS process, including "all clear" designation to facilitate re-energization in Chapter 8, starting on page 251. It further describes its emergency plans including restoration actions in Section 7.3.9.5 on page 242.

1. **Risk to be mitigated / problem to be addressed**

   PacifiCorp will execute a PSPS as a last resort mitigation during extreme fire weather conditions where the probability of weather-related system impacts is much higher than normal and the consequences of ignitions due to high winds and dry conditions can lead to a catastrophic wildfire. While power lines are de-energized, they are still exposed to strong winds and the potential for damage. Even after the wind has dropped below levels associated with system impacts, fire weather conditions are typically still extreme, therefore before re-energizing a line, post-event patrols are completed to determine whether any damage has occurred to the line which needs to be corrected prior to re-energization.

2. **Initiative selection**

   Post-event patrols and restoration of a de-energized circuit will not begin until the risk reduces, generally indicated by the reduction in wind speed below impactful levels as measured by local weather stations paired with continued reduction of forecasted wind speeds as determined by the meteorology department.

   After a potential PSPS event has been identified, advanced restoration planning activities begin on circuits or portions of circuits identified by meteorology that may be part of the PSPS event, before the event even occurs. Proactive patrols of the identified circuits or portions of circuits are initiated pre-event to gather additional information about the circuits that may be included in PSPS event. Depending on the needs, both local and regional resources may be leverages. Additionally contracted resources may also be used depending on the volume of work required. Increased resource levels used to perform pre-event inspections will be maintained to support re-energization activities for circuits or portions of circuits that experienced a PSPS.

During the restoration planning activities, the Emergency Coordination Center (ECC) will work with other departments to prioritize restoration activities. While there will be restoration focus on critical infrastructure and services, the ECC will also be evaluating weather, system impacts, and outage duration. During the PSPS event, field personnel may be actively patrolling the de-energized circuits for damage (i.e. line down, broken crossarms, tree through line, etc.) and debris (i.e. tree branches and other items blown into the line). Repairs will be made if issues are discovered. While the de-energized circuit will still have to be patrolled prior to re-energization, these activities will reduce the time necessary to restore service.

3. Post-event patrols and restoration of a de-energized circuit will not begin until weather stations in the area indicate that winds have fallen below impactful levels and are forecasted to remain below impactful levels. Once the meteorology department has indicated the conditions are favorable to re-energize and no other risk has been identified, field personnel will begin ground patrols of the de-energized circuits. As they patrol, the circuit will be restored in a stepped process so customers can be re-energized as the patrol progresses. Patrols will not occur during nighttime hours given the difficulty of seeing damage or items in the line that could cause an ignition. Patrol personnel will rest during this time and be prepared to re-start re-energization activities once there is adequate daylight. It should be noted that the quantity and/or severity of the damage found on a circuit during final patrol can delay re-energization.

4. **Region Prioritization**

   All lines de-energized as part of a PSPS event will be patrolled in their entirety, using a step restoration process. The step restoration process allows certain customers, usually closer to the substation, to be restored as the patrol progresses and not have to wait for the entire circuit to be patrolled. PacifiCorp works with emergency and public safety partners to identify critical customers for prioritization, when possible.

5. **Progress on initiative since the last WMP submission and plans, targets, and/or goals for the current year**

   PacifiCorp is continuously looking for opportunities to reduce event restoration time to balance potential impacts to customers with wildfire risk. In 2021, reduce patrols times and aerial patrols were utilized during the 2021 PSPS event in Dunsmuir, California and were found to expedite the re-energization process. While aerial patrols were possible during the 2021 PSPS event in Dunsmuir, there are times where it is not safe to utilize aerial patrols. However, this event highlighted that, when feasible and available, aerial patrols can be utilized to minimize de-energization duration. For 2022, PacifiCorp will continue to explore the use of aerial patrols, when safe to do so, as a means to expedite patrols prior to re-energization.

5. **Future improvements to initiative**

   PacifiCorp is continuously evaluating opportunities to minimize restoration timeframes. Circuit hardening, more granular de-energization capability, and the introduction of other patrol methods are planned to support timely re-energization.

7.3.6.6 PSPS events and mitigation of PSPS impacts

1. **Risk to be mitigated / problem to be addressed**

   PSPS reduces the risk of powerline-caused wildfires but also introduces the potential for economic and societal impacts in the affected communities. PacifiCorp recognizes the need to reduce these impacts as much as is reasonable and feasible. As described in Section 8.3, reducing the impact of PSPS is a significant goal of PacifiCorp's WMP and PacifiCorp perceives the best way to reduce PSPS impacts is to reduce the number, geographic scope, and duration of PSPS events. While recognizing the general application of all mitigation initiatives to help reduce the impact of PSPS, PacifiCorp also acknowledges that certain initiatives are more directly tied to the PSPS Program.

2. **Initiative selection**

   PacifiCorp's mitigation of PSPS impacts is included in the grid design and system hardening wildfire mitigation program focused on mitigation of impact on customers and other residents affected during PSPS event outside of the initiatives described in Section 7.3.3 on page 168. PacifiCorp's additional programs or efforts to mitigate the impact on customers and other residents affected during a PSPS event are described in Section 7.3.3.11. These programs include the free portable battery to promote alternative power sources to mitigate the impacts of a PSPS on customers who rely on electric power for medical equipment. For the free portable battery program, outreach is performed to offer medical baseline customers free portable batteries, custom sized for their medical equipment, and training on the equipment. Should this customer experience a PSPS, they have a backup battery to mitigate the impact of the PSPS.

   In addition to the free portable battery, PacifiCorp is increasing the density of its weather station network to provide more granular observations along its distribution circuits and transmission lines in areas of wildfire risk. This, in combination with existing sectionalizing devices, should allow for more targeted PSPS, reducing the number of customers impacted by a PSPS. Further, PacifiCorp will be able to use the results of its 30-year WRF reanalysis and Wildfire Risk Reduction Model (WRRM) outputs to inform the installation of new sectionalizing devices to isolate the highest risk portions of a circuit, further reducing the PSPS impacts to the affected communities.

3. **Region prioritization**

   PacifiCorp grid design and system hardening programs are focused on prioritizing the HFTD areas, these programs include the targeted installation of reclosers and relays to support more targeted PSPS events, instead of a broad full circuit approach, further reducing the impact of PSPS.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Since the 2021 WMP, PacifiCorp has initiated the free portable battery program, as further described in Section 7.3.3.11. To minimize the impact on PSPS events on medical baseline customers, PacifiCorp has implemented a program to provide backup batteries at no cost. Customers who depend on medical equipment powered by electricity can receive the backup battery through this program. This is PacifiCorp's initiative and response to the Decision 21-06-034, to "*Provide support for customers that rely on electricity to maintain necessary life functions, including durable medical equipment and assistive technology'*. Phase 1 of the free portable battery program began delivery to the medical baseline customers who met the criteria that were located in the HFTD Tier 2 and 3 areas. Next phases of the battery program will expand outreach to all medical baseline customers in the California service territory.

   For 2022, PacifiCorp plans to expand the program based on learnings from other utilities.

5. **Future improvements to initiative**

   PacifiCorp plans to be continually improving PSPS events and will continue to reduce the impact of PSPS, primarily through grid hardening efforts but also through more granularity in situational awareness initiatives.

7.3.6.7 Stationed and on-call ignition prevention and suppression resources and services

1. **Risk to be mitigated**

   Ignitions, under specific conditions can spread quickly and uncontrollably, therefore there is a benefit to having suppression resources available.

2. **Initiative selection**

   PacifiCorp equips field personnel with fire extinguishers such that should an ignition

occur, that can safely be suppressed with the extinguisher they have, they will do so. For the OEIS definition of this ignition and suppression resource initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   There is no region prioritization for this initiative.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   During the 2021 year, PacifiCorp found the existing level of resources to be adequate therefore, there are no changes to this initiative in 2021 and none are expected to be needed in 2022.

5. **Future improvements to initiative**

   PacifiCorp does not have any planned future improvements for this initiative.

7.3.7 Data governance

7.3.7.1 Centralized repository for data

1. **Risk to be mitigated / problem to be addressed**

   The utility operates with a wide range of both new and legacy database systems that pertain to wildfire mitigation efforts and reporting. For example, risk event data is captured through the company's outage reporting system while asset inspection data is captured and stored in a mainframe type, asset management system. Furthermore, sensitive customer information is stored in an alternate, secure, and restricted database used by customer service and other customer facing organizations such as billing. While the company is not planning to move to a centralized database for all potential data used by the company day-to-day, PacifiCorp does recognize the value in consistent reporting and aggregation of critical datasets pertaining to wildfire mitigation. Due to the large volume of data related to wildfire mitigation initiatives and the complexity associated with processing and validating this data, a well-designed platform to visualize and systematically extract key data can improve access and retrieval of data, enhance reporting capabilities and accuracy, supplement compliance, and tracking of programs.

2. **Initiative selection**

   As of now, utility data related to wildfire mitigation initiatives is collected through a variety of applications, often which are custom made for the contractor, resource group, and/or task as described above. And while it may not make sense to combine databases from an operations management, information security, and customer data

protections perspective, PacifiCorp developed an-in house tool that provides visualization of data that is stored in many databases or repositories through the use of layers. Examples of such data include multi-layered access to PacifiCorp's line maps, risk maps, location of weather stations, location of completed grid hardening projects, outage data and risk scores through the LRAM data layer. This tool is a helpful planning tool for integrated visualization of multiple layers of static data, including risk layers. This enhanced capability to have a map view of circuits, risk and equipment locations also includes the ability to retrieve the data in excel format for reporting, compliance checks and program tracking.

Additionally, compliance checks and program tracking can better be managed with a central repository of wildfire mitigation initiative targets previously reported. This initiative also includes developing and maintaining a central repository of initiative data, such as targets, filings, and data request responses which is managed by the new, Wildfire Program Delivery Team accounted for in Section 7.2.

3. **Region prioritization**

This initiative has no region prioritization, the same process is used across all data. However, more data pertaining to the HFTD is generally used in evaluating and reporting, therefore this data can be reviewed more than non HFTD data.

4. **Progress on initiative since the last WMP submission and plans, targets, and/or goals for the current year**

When the last WMP was submitted, in 2021, PacifiCorp had not established a specific central repository for all WMP related filings and data requests. Data collected for WMP filings were stored in multiple locations and data collected for data requests were stored by a different group, instead of centrally located. At the beginning of 2022, with the establishment of a Wildfire Mitigation Program Delivery group, PacifiCorp was able to allocate resources to start the development of a centralized Sharepoint site where all the information that is used to support fillings and data requests is currently stored, which is already showing positive results in terms of consistency and clarity of the data provided for field audits and desktop verifications.

2021 progress is described in the 2021 Change Order filed on November 1, 2021:

Through experience gained in 2021, PacifiCorp learned that this effort requires the extraction and translation of nonspatial data into GIS format. Like monitoring and auditing the WMP, the evolution of the company's GIS data capabilities touches many departments throughout the company and requires an intense amount of input and coordination for all WMP initiatives. For example, data governance touches of initiatives include risk assessment and mapping initiatives in Section 7.3.1 on page 150 (to ensure data is consistent across the various platforms), grid hardening initiatives in Section 7.3.3 on page 168 (to ensure that projects are properly

categorized and represented spatially), and vegetation management initiatives in Section 7.3.5 on page 193 (to demonstrate completion of key vegetation management initiatives and monitor compliance).

PacifiCorp had underestimated the resources needed to meet the compliance reporting requirements, which are continuously evolving to meet the needs or regulators and stakeholders.

For 2022, PacifiCorp plans to add resources specifically to manage and deliver complex GIS datasets on a quarterly basis.

5. **Future improvements to initiative**

PacifiCorp anticipates that this new central repository of filings and data requests will further progress the company's ability to make quantitative based updates to initiatives and is the first step towards consistent reporting and efficient data sharing. Incremental improvements to data management are expected to occur over the next five years to further progress towards a more streamlined process.

Additionally, PacifiCorp plans to expand this repository of data for all collected wildfire mitigation data which can be accessed and utilized by engineering, project management, and management. Some applications of this data could include:

- Data informed updates to system operation procedures;
- Outage informed project prioritization and risk reduction evaluation; and
- Development of dashboards and reports to support wildfire mitigation initiatives and alignment with recent discussions with other IOUs in the joint workstreams.

7.3.7.2 Collaborative research on utility ignition and/or wildfire

PacifiCorp has provided details regarding its collaboration on research projects in Section 4.4.1 starting on page 48. During these activities the company has extracted data appropriate to the organization's needs and made it available in the method best serving their analysis.

7.3.7.3 Documentation and disclosure of wildfire-related data and algorithms

1. **Risk to be mitigated / problem to be addressed**

Situational awareness tools utilize wildfire related data through the Technosylva models described in Section 4.5.1.1 Wildfire related data should be accurate and

promptly integrated into modelling to best inform tools and decisions.

2. **Initiative selection**

   Utility fire data utilized in LRAM comes from a centralized data base of field records, augmented by the risk event investigation team, as described in Table 4.3. Additional wildfire related data, such as historical fires across PacifiCorp territory are provided directly to Technosylva by various fire agencies, as described in the table found in Section 4.5.1.1.

   PacifiCorp utilizes commonly available algorithms to model wildfire spread and does not have custom algorithms related to wildfire. LRAM, described in 4.5.1.4 utilizes ELM Fire, an open-source geospatial model intended for simulating wildland fire; and Technosylva utilizes their FireSim model algorithms, which is also utilized by other utilities in California.

3. **Region prioritization**

   This initiative has no region prioritization, the same process is used across all data.

4. **Progress on initiative since the last WMP submission and plans, targets, and/or goals for the current year**

   Since last year's WMP update, PacifiCorp plans have pivoted to incorporate the use of Technosylva modelling in plans to develop new tools, as described throughout this 2022 WMP update. The procurement of Technosylva WFA-E supports a common algorithm to that used by other California utilities.

5. **Future improvements to initiative**

   With the procurement of Technosylva WFA-E, PacifiCorp will have obtained a significant advancement in wildfire algorithms and plans to continue attending the OEIS hosted Risk Modelling workshops to learn of future improvements and recommendations from other utilities.

7.3.7.4 Tracking and analysis of near-miss data

1. **Risk to be mitigated / problem to be addressed**

   Problems and issues that manifest fully are typically easier to track. It is hard to prove a negative. However, near-miss data, which is much easier to overlook, represents valuable, critical experience necessary for fully managing risk.

2. **Initiative selection**

PacifiCorp has used existing resources to produce data that supports its WMPs. Some of these resources are company-owned, some others are external. For the OEIS definition of this near-miss data initiative, see Section 9.1 starting on page 271.

When circumstances have required the development of new databases (such as in the 2019 Decision approving the SMJU WMPs relating to Fire Incident Data Collection Reporting) the company has structured new applications that can be fed as much as possible by existing resources.

3. **Region prioritization**

   This protocol has no region prioritization, the same process is used across all data.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp continues to leverage existing data sources to produce metrics supporting its WMPs, some of which are its data sources while others may be external data sources. The core data relates to outage data, which is collected and categorized consistent with IEEE 1366 & IEEE 1782 as well as Commission Decisions D.96-09-045 and D.16-01-008. Additionally, PacifiCorp performs data reviews to identify opportunities for further data quality improvements when outage data is refreshed, which occurs on an annual basis.

5. **Future improvements to initiative**

   Incremental improvements to data management are expected to occur over the next five years to further progress towards a more streamlined process to improve efficiency. PacifiCorp's long-term plan also includes the evaluation of existing tracking databases and capability to identify any additional information that should be captured and analyzed. Additionally, PacifiCorp intends to review existing classifications of ignition risk drivers, which is generally a function of outage cause codes and categorization, and assess whether additional environmental or operational risk information can be ascertained by analyzing non-ignition risk driver data. While not directly tied to ignition risk, this data may offer insight into other types of utility risks.

7.3.8 Resource allocation methodology

PacifiCorp's resource allocation methodology relies on the general approach for informed decision-making, described in Section 7.1.B in which the available resources, date-specific deliveries and estimated labor (or material) requirements are outlined. To the extent these volumes exceed available capacity (internally and using standard external resources), the company identifies the need for 1) greater prioritization efforts, 2) establishment of nontraditional resource pools, and 3) reassessment of

scheduled work. Compliance-based activities are prioritized first, other activities are prioritized based on geographic wildfire Tier (Tier 2 versus Tier 3) and overall availability of materials. Instead of prioritizing a certain type of program, PacifiCorp prioritizes the location of work and groups all potential program aspects applicable at that location into projects. This ensures that all programs on an applicable circuit, line, or combination of circuits and lines are completed at the same time to make efficient use of resources. Where a wildfire mitigation program requires capital funding and construction, PacifiCorp established a Wildfire Project Management Office in 2020 with a dedicated Wildfire Mitigation Delivery Director responsible for managing resources and execution of programs.

7.3.8.1 Allocation methodology development and application

1. **Risk to be mitigated / problem to be addressed**

   This initiative addresses the need for a consistent methodology for prioritization of wildfire mitigation resources and applying this information to initiative decision-making. PacifiCorp also recognizes the incremental value a resources allocation strategy can have as deployment of multiple wildfire mitigation initiatives are ramping up. As PacifiCorp is continuing to tackle new initiatives and ramp up existing initiatives, further development of a resource allocation strategy will be important.

2. **Initiative selection**

   By engaging in this initiative, PacifiCorp's main goal is to develop and apply a methodology to monitor, prioritize, direct, and optimize the use of resources in order to successfully deliver its wildfire mitigation plan. For the OEIS definition of this allocation initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   This methodology is applied across all wildfire mitigation initiatives across all PacifiCorp territories. Generally, for initiative investment, the methodology prioritizes compliance requirements, then work with the greatest risk reduction potential. In California, work with the greatest risk reduction potential is then prioritized to complete in Tier 3 and Tier 2 HFTD areas first, with consideration for project management to prevent re-do of work and re-visiting of sites. For human resources allocation, PacifiCorp focuses on the identification, acquisition, and adequate allocation of expertise that aligns with the needs for managing wildfire mitigation work. Additionally, PacifiCorp promotes awareness of its wildfire mitigation plans and compliance requirements throughout the company's organization to ensure resources

are prioritized and assigned to wildfire mitigation activities as expected.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Throughout 2021, PacifiCorp has continued to use the general methodology described in Section 7.1.B to prioritize investment and address wildfire risk in PacifiCorp's Tier 3 and Tier 2 areas and will continue to do so during the current year. In line with the human resources allocation methodology, in 2021 PacifiCorp created a new Wildfire Mitigation Program Delivery group and opened new positions with its PMO group to ensure adequate resources are hired and assigned to manage wildfire mitigation initiatives. These resources play a key role in developing plans and assigning and managing resources to execute those plans. Additionally, PacifiCorp has attended the related OEIS and IOU workshops to learn from other utilities, shared best practices and lessons learned as initiative implementation progresses

5. **Future improvements to initiative**

   PacifiCorp will assess the results of its most recent investment in additional human resources and adjust allocation as needed according to demands posed by individual initiatives. In addition to that, starting in 2022 PacifiCorp is performing a series of presentations and meetings as part of its Internal Stakeholder Engagement plan to ensure prioritization of wildfire mitigation activities throughout the organization. For initiative investment, as PacifiCorp matures risk modeling elements, and learns more from other utility practices, changes to the existing methodology will be evaluated and implemented. .

7.3.8.2 Risk reduction scenario development and analysis

1. **Risk to be mitigated / problem to be addressed**

   Risk reduction scenario development and analysis can help inform decision making, particularly when selecting initiatives or prioritizing projects. While not a complete replacement to subject matter expertise, the ability to model various scenarios and understand impacts on risk, particularly risk reduction, can also bring additional transparency to the decision-making process. This initiative includes PacifiCorp's efforts to develop such modeling capabilities for application to different risk reduction scenarios based on implementing wildfire mitigation initiatives implementation and informing utility decision-making.

2. **Initiative selection**

   PacifiCorp understands the need to evaluate different risk reduction scenarios. To date, this initiative has been directly tied to the development and use of LRAM, which is discussed in Section 4.5.1.4 starting on page 81. The Combined Score for each zone of protection, calculated by LRAM, helps to select assets, evaluate projects, and

prioritize implementation of projects based on risk. While helpful to inform project prioritization and overall risk model development, LRAM does not include full simulation or modeling capabilities. As PacifiCorp ramps up the implementation of Grid Hardening initiatives, assessment of different risk reduction scenarios becomes essential to understand the efficiency of mitigation strategies. Therefore, PacifiCorp is investing in additional tools, data, and modeling capabilities through procurement of the Technosylva WFA-E suite of tools discussed in Section 4.5.1.1 and accounted for in initiative 7.3.2.4.

For the OEIS definition of this risk reduction scenario development initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

This methodology is applied across all wildfire mitigation initiatives across PacifiCorp territories. Generally, the methodology prioritizes compliance requirements, then work with the greatest risk reduction. Work with the greatest risk reduction is then prioritized to complete in Tier 3 and Tier 2 HFTD areas first, with consideration for project management to prevent redo of work and revisiting of sites.

4. **Progress on initiative since the last WMP submission and plans, targets, and/or goals for the current year**

PacifiCorp continued using LRAM to assess risk reduction and prioritize work within the HFTD. Updates to LRAM layers were performed as required to keep the data current. Certain initiatives under development such as Expulsion Fuse Replacements can benefit from the use of updated LRAM combined risk scores. While LRAM presents a first step toward assessing risk reduction scenarios to inform project prioritization, PacifiCorp is also making investments and advancing modeling capabilities through the implementation of Technosylva's WFA-E tools discussed in Section 4.5.1.1 and accounted for in initiative 7.3.2.4. These tools, once fully operational, will include a project selection tool called WRRM. Additionally development of WRRM will also be critical to inform risk spend efficiency calculations discussed in Section 7.3.8.3.

5. **Future improvements to initiative**

PacifiCorp is continuously improving risk modeling to better evaluate risk reduction. As mentioned in section 4.5.1.4, PacifiCorp plans to evolve the LRAM model toward S-MAP and RAMP products which will align with other utilities practices and improve assessment of risk reduction scenarios. Additionally, PacifiCorp intends to implement Technosylva's WFA-E modelling in 2022, with continues, expanded use in 2023.

7.3.8.3 Risk-spend efficiency analysis – not to include PSPS

1. **Risk to be mitigated / problem to be addressed**

   PacifiCorp recognizes it is important to develop a methodology to estimate the cost-effectiveness of an initiative. An RSE score is calculated by dividing the mitigation risk reduction of an initiative by the mitigation cost, which is a useful tool for continuously evaluating mitigation options, selecting and planning scope of work, and can be applied to compare various initiatives.

2. **Initiative selection**

   PacifiCorp is developing RSE calculations to assess performance of individual initiatives and compare multiple initiatives based on cost-effectiveness. For the OEIS definition of this RSE initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   PacifiCorp will prioritize grid hardening activities for RSE calculations since it is important that they are evaluated and performed in a way that reduces risk efficiently in consideration of the capital invested.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp has developed the methodology described in Figure 35 to calculate RSE using outage data and LRAM's environmental risk score as inputs. Upon completion of a verification process, PacifiCorp plans to report objective RSE values for line rebuilds (covered conductors), and possibly other Grid Hardening initiatives in 2023.

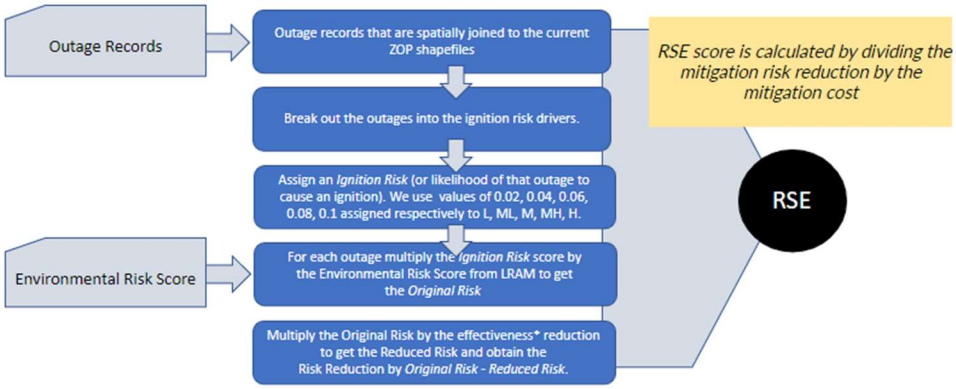


Figure 9 : RSE Flowchart

5. **Future improvements to initiative**

   The methodology for RSE and calculation parameters will be refined throughout 2022, PacifiCorp understands there is inherent uncertainty in the RSE calculations and plans

to develop a verification process that will enable the assessment of factors that influence the estimated RSE values. PacifiCorp also aims to leverage Technosylva's WRRM model to expand upon existing capabilities of RSE. Once these improvements are implemented, PacifiCorp will calculate RSE for initiatives in other categories. Additionally, PacifiCorp plans to continue learning from other utilities through working groups and workshops to refine RSE over time.

7.3.9 Emergency planning and preparedness

7.3.9.1 Adequate and trained workforce for service restoration

Wildfire mitigation refresher training is prioritized for, and provided annually to, applicable field employees within the HFTD. The refresher training includes operating practices that reduce wildfire risk while performing routine work and confirming the availability of fire mitigation/suppression tools before fire season. To ensure enough people are available to work when required, PacifiCorp may draw workers from other parts of its service territory as needed (sometimes crews needed to respond during or restore service after an event can exceed standard local district crew sizes). If an event exceeds the local district's capability to respond, PacifiCorp must have access to additional resources to mitigate or respond to the wildfire event. This potential need for additional resources during an emergency means that PacifiCorp provides the training to all applicable employees that might respond to a wildfire event.

Responding to an emergency involving a wildfire can pose specific challenges. System operators or local emergency response crews may need field operations personnel to gather more extensive information and assess local conditions differently than with other type emergencies or normal operating conditions. Field personnel may also need specialized tools or the ability to monitor and react to changing weather patterns.

PacifiCorp is also a member of mutual assistance agreements with partnering utilities that provide more resources when responding to an event. When an emergency or major event occurs, it is critical that there are enough workers available to rebuild infrastructure and restore service, so the service restoration does not escalate risk. As with performing planned or routine work, PacifiCorp field operations mitigates some wildfire risk by following specific procedures during fire season in heightened fire risk areas.

1. **Risk to be mitigated / problem to be addressed**

   Effective training programs can reduce the wildfire risk by preparing the workforce to perform and fulfill wildfire mitigation initiatives.

2. **Initiative selection**

   Engaging in this initiative sets the groundwork for other initiatives, to ensure that they

are fulfilled according to standards and in such a way that reduces wildfire risk. For the OEIS definition of this service restoration training initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   There is no region prioritization for this initiative, it occurs across California.

4. **Progress on initiative since the last WMP submission and plans, targets, and/or goals for the current year**

   This successful initiative will be maintained, and potentially updated/expanded on based on joint utility collaborative efforts.

5. **Future improvements to initiative**

   As part of its emergency management program, PacifiCorp evaluates exercises and actual response events, by identifying issues raised during the event and documenting lessons learned and corrective action plans. The company uses multiple methods to gather exercise and post-action reviews, including participant and observer evaluation forms, remedial action tracking, and incident reviews. PacifiCorp may implement lessons learned in its response and restoration procedures and incorporate them into emergency response documentation. Future initiative improvements hinge on this specific situational feedback and lessons learned.

7.3.9.2 Community outreach, public awareness, and communications efforts

As part of its PSPS program, PacifiCorp has its Plan to Support Populations with Access and Functional Needs During Public Safety Power Shutoffs, which fully describes community outreach and communication efforts taken to identify and contact key community stakeholders. Overall, PacifiCorp's plan includes information that can be heard, watched and read in a variety of ways with the goal of accessibility and understandability.

1. **Risk to be mitigated / problem to be addressed**

   This initiative seeks to reduce the impact to the customer who may experience a de-energization through preparation and awareness.

2. **Initiative selection**

   As a component and last resort of wildfire mitigation, PacifiCorp may de-energize lines, which will always impact customers. PacifiCorp seeks to reduce the impact due to this loss of power by providing wildfire preparedness education to its customer. For the OEIS definition of this community outreach initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   Advertisements related to PSPS preparedness are run in the HFTD. However, additional community outreach programs, which include a webinar and various other videos, are available across the company's service territory.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp continues to refine and enhance both identification of AFN customers and ongoing communication targeted to reach more AFN customers. While all medical baseline customers are identified as AFN customers, in 2022, PacifiCorp intends to increase outreach to all customers to identify more customers relying on medical equipment and to broaden the scope of customers who self-identify as AFN. Customers will receive communications about the medical baseline rate and a Spanish version of the medical baseline application will be available on the website this year. California Alternate Rates for Energy (CARE) applications are sent to all residential customers. In 2021, PacifiCorp added a check box on the CARE application asking customers to identify as AFN. The check box added an additional 193 AFN customers throughout the service territory and 43 AFN customers in the Power De-Energization Zones (PDZ).

5. **Future improvements to initiative**

   PacifiCorp plans to continually evaluate the community outreach plans and improve it based on feedback from customers, public safety partners, and to align with regulatory requirements.

7.3.9.3 Customer support in emergencies

In reporting outages, PacifiCorp will continue its customer outage management protocols and real-time outage maps to inform customers about the presence and location of outages as well as the estimated restoration plans. While the specifics of the frequency, content, and use of the messaging may change, the overall tools and processes will be the same. Details regarding PacifiCorp's PSPS-specific notifications, tools, messaging, and notifications have been included in Section 8. Additionally, PacifiCorp has the following wildfire emergency-related customer support programs.

Outage reporting — PacifiCorp intends to enhance wildfire mitigation-specific outreach through its customer contact center to provide impacted customers with information regarding service interruptions, restoration efforts, along with relief support by adding to the telephone scripts a high-level overview of customer protections, including directing the caller to the company webpage(s).

Support for low-income customers — PacifiCorp's support for low-income customers

program includes the ability to:

- Freeze all standard and high-usage reviews for the CARE program eligibility until the 12-month period has lapsed, or potentially longer.
- Contact all community outreach contractors and community-based organizations who assist in enrolling hard-to-reach low-income customers, to better inform customers of these eligibility changes.
- Partner with program administrators of the customer-funded emergency assistance program for low-income customers and increase the assistance limit amount for affected customers during the following 12-month period.

Billing adjustments — PacifiCorp can adjust billing, including prorating monthly bill to the date of the emergency or subsequent damage to customer premises and recalibrating energy usage estimates when premises are unoccupied because of a disaster.

Deposit waivers — PacifiCorp can waive deposit and late fee requirements for one year from the declared emergency.

Extended payment plans — Affected customers with existing service or those seeking to establish service at a new residence, who have an old bill, are offered a payment plan with 20% due, with equal installments for the remainder for at least 12 billing cycles with no interest.

Suspension of disconnection and nonpayment fees — PacifiCorp may suspend disconnection for nonpayment and associated fees and eliminate reporting to credit reporting agencies or any collection services for unpaid bills.

Repair processing and timing — Immediately after the emergency, the company assesses the premises of affected customers whose utility service had been disrupted or degraded and, if applicable, the meter is removed.

Access to utility representatives — PacifiCorp will directly contact customers with damaged facilities after the meter is removed from the damaged property and will expedite any work required to reinstate electrical service. Additionally, PacifiCorp will closely coordinate with local agencies to facilitate any permitting requirements and ensure work is completed as quickly as practical.

Community support centers — PacifiCorp has logistical support for deployment of community support centers, if necessary, during a PSPS event. Community support centers will be established upon recommendation of the Unified Command. The center(s) will be open from 8 a.m. to 8 p.m. with the potential to stay open longer based on community needs. The community support center tent (if needed) is

approximately 33 feet × 18 feet and can sustain winds of 55 mph gusting to 65 mph. PacifiCorp personnel will staff the center(s) to assist and provide information to community members of Siskiyou County. A community support center location is established within each PDZ and will provide the ability for the community to have specific needs met.

Services provided include:

- Shelter from environment
- Air conditioning
- Potable water
- Seating and tables
- Restroom facilities
- Refrigeration for medicine and/or baby needs
- Interior and area lighting
- On-site security
- Communications capability such as Wi-fi access, SatPhone, radio, cellular phone etc.
- Televisions
- On-site medical support (EMT-A at a minimum, Paramedic preferred)
- Charging stations for Cell Phones, AM/FM/Weather radios, computers, etc.
- Ice

Locations of CRCs include:

- Happy Camp PDZ – Happy Camp Community Center
- Shasta PDZ - Mt Shasta Community Center
- Weed and Snowbrush PDZ- Weed Community Center
- Dunsmir PDZ - Dunsmuir Community Center

1. **Risk to be mitigated / problem to be addressed**

   During emergencies, such as wildfires, customers could need additional support.

2. **Initiative selection**

   It is a PacifiCorp priority to provide reliable, safe power to its customers, and customer satisfaction is important to maintaining the business. Therefore, PacifiCorp sees the importance of an initiative, such as this one, where the company provides support to customers. For the OEIS definition of this customer support initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   PacifiCorp emergency planning programs cover all California service territory except

for the community support centers, which are centrally located in the HFTD.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp has also implemented a variety of consumer protections and procedures to assist customers when a disaster impacts their communities, consistent with CPUC Rule D.18-03-011. These protections are in addition to routine customer service protections as provided in communicating outages and restoration time estimates as are supported through the company's web portal and customer service organization. Program and protection responses and their duration are determined based on the type, scale, and size of the event of the disaster. Some disasters will warrant greater relief than others. In the case of a larger, vast and far-reaching disaster, it may be reasonable to provide greater relief for a longer duration.

5. **Future improvements to initiative**

   At this time, PacifiCorp does not have plans to improve this initiative, however the company is constantly gathering customer feedback and will take lessons learned from experiences and integrate them into future programs and plans.

7.3.9.4 Disaster and emergency preparedness plan

Pacific Power actively monitors real-time weather conditions and tries to provide customers with additional notifications if de-energization is likely. When real-time observations and weather forecasts indicate that the three triggers for "de-energization watch" have been evaluated, and the Wildfire Risk Index is elevated, a de-energization watch protocol is initiated. The protocol includes activation of an Emergency Coordination Center (ECC), communication with local public safety partners, and implementation of additional monitoring activities.

The ECC is staffed by specialized staff who assemble during de-energization warning and implementation to provide critical operations support through the collection and analysis of data. The ECC makes decisions to maintain the safety and reliability of the transmission and distribution system and helps facilitate cross-organization incident coordination. The ECC is led by an ECC Director and has the support of a safety officer, a joint information team, emergency management, meteorology and operational stakeholders representing field operations, system operations, vegetation management, engineering, and other specialties.

When the ECC is activated, PacifiCorp emergency management gathers input from public safety partners to properly characterize and consider impacts to local communities and send notifications to the operators of pre-identified critical facilities, partner utilities, and adjacent local public safety partners. The PacifiCorp customer service team then coordinates through the ECC to confirm customer lists for the area

to develop a communication plan for those customers potentially impacted.

Local patrol and inspection of lines during a PSPS watch can include a variety of methods depending on the accessibility of locations, the reliability of the line, area conditions and other factors. The ECC reviews these factors to determine necessary tasks such as the deployment of crews or remote monitoring by system operations.

Because of the public desire for reliable electric service, together with public safety concerns associated with de-energization, a PSPS is a measure of last resort. Nonetheless, consistent with existing regulations and the general mandate to operate the electrical system safely, the ECC has discretion to determine when a PSPS is appropriate.

The ECC Director considers all available information, including real-time feedback and input from other ECC participants and field operations to determine whether PSPS should be executed. Additionally, the ECC Director may decide to further refine the PSPS areas described above. As a matter of practical reality, the ECC Director cannot know whether a PSPS will prevent a utility-related ignition. If a PSPS is not implemented and an ignition occurs, the ignition itself is not proof that a PSPS should have been implemented. Likewise, if a PSPS is implemented, the event itself does not prove that an ignition that would have otherwise occurred was prevented.

1. **Risk to be mitigated / problem to be addressed**

   When there's a potential for wildfire, it is important to be prepared to respond in an organized and quick manner.

2. **Initiative selection**

   This initiative describes how PacifiCorp prepares for a wildfire emergency. For the OEIS definition of this disaster preparedness initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   PacifiCorp has de-energization plans prepared for the areas of the highest risk, designated as the PDZ, however an ECC can be activated in any part of the service territory.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   In 2021, PacifiCorp began to host Practice ECC rounds to improve response times. This year, PacifiCorp plans to continue the Practice ECC, as well as include some important lessons learned from 2021 related to tracking and reporting.

5. **Future improvements to initiative**

   As PacifiCorp gains more experience with the ECC protocols, the program will evolve.

7.3.9.5 Preparedness and planning for service restoration

1. **Risk to be mitigated / problem to be addressed**

   Service restoration after a PSPS poses additional risk as compared to standard service restoration. Extreme fire weather can cause damage to infrastructure during the PSPS event itself while lines are de-energized. Therefore, additional patrols may be required during restoration to mitigate incremental ignition risk that this potential damage can have during re-energization.

2. **Initiative selection**

   This initiative is foundational to PSPS efforts and is not directly connected to risk drivers or other metrics. For the OEIS definition of this service restoration preparedness initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   PacifiCorp has prepared plans for service restoration in the PSPS zones, to expedite the steps for service restoration.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp does not have targets related to the initiative other than to implement the PSPS plans which have already been developed.

5. **Future improvements to initiative**

   PacifiCorp plans to continue to review other utilities plans with more de-energization experience for improvements.

7.3.9.6 Protocols in place to learn from wildfire events

Effective response to any event is determined by the ability to implement a controlled incident command structure and to take responsibility for restoration and recovery activities. It is critical that responsible individuals within the incident command system are familiar with their responsibilities and have practice performing those responsibilities. Individuals identified with primary or secondary responsibility within the command center structure complete an annual review of the overall disaster response and recovery plan. These individuals are required to contribute to post-crisis and emergency reporting, outlining any issues or concerns regarding their role and responsibilities.

1. **Risk to be mitigated / problem to be addressed**

   Wildfire events are fast-moving, high-stakes emergency circumstances that PacifiCorp and its personnel are not called upon to manage on a day-to-day basis. Without established methods to learn from wildfire events, the company and its staff are at a greater risk of missteps based on the need to make quick decisions without routine experience. For the OEIS definition of this wildfire event learning protocol initiative, see Section 9.1 starting on page 271.

2. **Initiative selection**

   PacifiCorp leverages existing systems and processes included in the company's Emergency Response Plan to learn from wildfire events in the same way it learns from any emergency event. Therefore, PacifiCorp does not have a specific program for incorporation of lessons learned that is not already covered in an existing program or through ongoing process improvement.

   That said, PacifiCorp evaluates exercises and actual response incidents by identifying issues raised during the exercise or incident and documenting lessons learned and corrective action plans. Multiple methods are used to gather exercise and post-action reviews, including participant and observer evaluation forms, remedial action tracking, and post-exercise or after-incident reviews. Lessons learned may be implemented for inclusion in PacifiCorp's response and restoration procedures and incorporated in the emergency response plans.

3. **Region prioritization**

   There is no region prioritization for this initiative. Incorporation of lessons learned may be prioritized in high-risk areas, such as PSPS zones where appropriate.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   The incident command system is activated periodically throughout the year in the normal course of operations. Additionally, an annual exercise is conducted to ensure that individuals otherwise not involved in incident management on a regular basis are practiced in responding.

5. **Future improvements to initiative**

   PacifiCorp has a goal of continuous incident management improvement.

7.3.10 Stakeholder cooperation and community engagement

7.3.10.1 Community engagement

PacifiCorp provides wildfire safety and preparedness and PSPS public outreach and education through a variety of channels. Some communication efforts target the company's entire customer base, while other communications target communities in the HFTD with some overlap into non-HFTD locations depending on media market and distribution channel. PacifiCorp maintains a flexible, dynamic education and awareness strategy that is informed by customer survey data, community stakeholder input, and community needs. Overall, PacifiCorp's outreach includes information that can be heard, watched, and read in a variety of ways with the goal of accessibility and understandability.

1. **Risk to be mitigated / problem to be addressed**

   This initiative seeks to reduce the impact to the customer who may experience a de-energization.

2. **Initiative selection**

   As a component and last resort of wildfire mitigation, PacifiCorp may de-energize lines, which will always impact customers. PacifiCorp seeks to reduce the impact due to this loss of power by providing wildfire preparedness education to its customer. For the OEIS definition of this community engagement initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   Advertisements related to PSPS preparedness are run in the HFTD. However, additional community outreach programs, which include a webinar and various other videos, are available across the company's service territory.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   For 2022, PacifiCorp plans to update its survey to include an evaluation of PSPS impact reduction programs. For the past several years, the company has deployed some form of paid media campaign to raise awareness and action on wildfire safety. The company plans to expand this effort in 2022 as part of the broader community engagement strategy. The company will deploy radio, newspaper, digital, and social media ads, as a minimum, to promote wildfire safety and preparedness.

5. **Future improvements to initiative**

PacifiCorp plans to continually evaluate the communication plan and improve it based on feedback from customers and public safety partners as pictured in Figure 7.10.

Figure 7.10 Communications feedback loop

7.3.10.2 Cooperation and best practice sharing with agencies outside California

1. **Risk to be mitigated**

   Industry collaboration is another component of PacifiCorp's Wildfire Protection Plan. Through active participation in workshops, international and national forums, consortiums, and advisory boards, PacifiCorp maintains an understanding of existing best practices and collaborates with industry experts regarding new technologies and research.

2. **Initiative selection**

   Through our lessons learned we have been able to develop processes and procedures that are being adopted in other states and countries in coordination with other agencies and jurisdictions. Some key industry collaboration channels are shown in Figure 7.11. For the OEIS definition of this cooperation-related initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   PacifiCorp has used lessons learned and best practices to expand the PSPS process into other parts of our service territory such as areas deemed a high fire threat in Oregon, Washington and Utah.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Pacific Power is an active member of the International Wildfire Risk Mitigation Consortium, an industry-sponsored collaborative that shares wildfire risk mitigation

insights and discoveries of innovative, unique utility wildfire practices from across the globe. This consortium, with working groups focused in the areas of asset management, operations and protocols, risk management, and vegetation management, supports working and networking channels between members of the global utility community to support the ongoing sharing of data, information, technology, and practices.

Additionally, PacifiCorp plays leadership and support roles through other organizations such as the Edison Electric Institute, the Electric Sector Coordinating Council, and the Institute of Electrical and Electronics Engineers (IEEE). Within the western United States, PacifiCorp also engages with the Western Energy Institute and the Rocky Mountain Electric League as well as the Western Protective Relaying Conference.

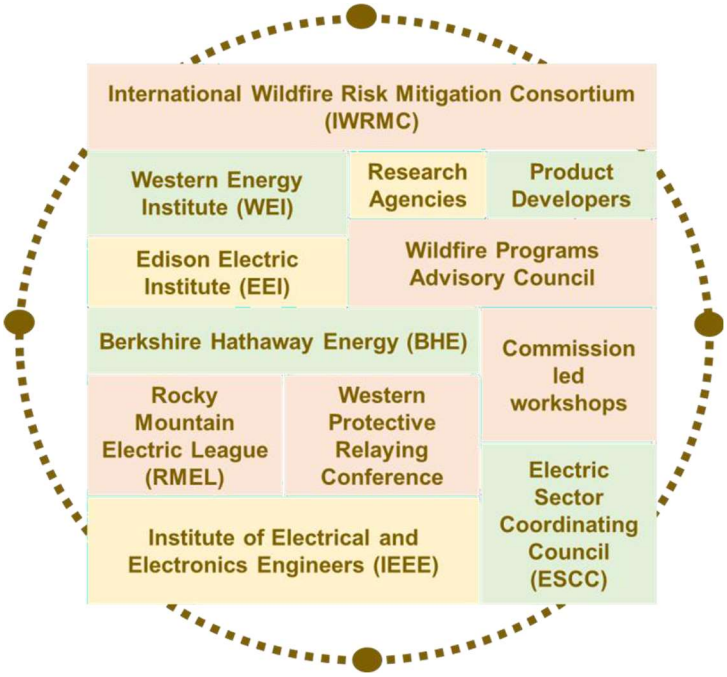


Figure 7.11 Key industry collaboration channels

Furthermore, PacifiCorp partners with certain research and response agencies to develop and test new technologies, such as existing efforts with the with the Oregon Department of Forestry to install wildfire cameras on utility infrastructure in key, high-risk locations. Additionally, PacifiCorp is working with Texas A&M University on a DFA pilot (see Section 4.4.1.1 on page 48).

Through these various engagement channels, PacifiCorp maintains industry networks, understands the evolution of technologies, discovers broader applications for such advancements, freely shares data to enable scientists and academics, collaborates with developers to push the boundaries of existing capabilities, and expands its research

network through support of advisory boards or grant funding.

5. **Future improvements to initiative**

   PacifiCorp's ethos of continuous improvement guides the company to always seek and incorporate lessons learned, and as new opportunities arise, PacifiCorp will evaluate them for incorporation into this initiative.

7.3.10.3 Cooperation with suppression agencies

PacifiCorp's emergency management team maintains relationships with federal and state emergency responders and mutual assistance groups. The company's emergency manager has contact information for state, county and tribal emergency managers, the state's Emergency Operations Center Emergency Support Functions (ESF) personnel, and the Geographic Area Coordination Centers for fire-related emergency response. District operations managers also maintain relationships with local first responders. If an incident like a wildland fire occurs and emergency operations are established, a district manager or an identified company representative will deploy when needed or requested to the jurisdictional agency's Incident Command Post (ICP) to provide necessary electric utility support and coordination.

Throughout the year, PacifiCorp also participates in regulatory proceedings, town hall meetings, and open-house events to engage other industry leaders, community leaders and members, and local emergency response management organizations. These events focus on a range of aspects of PacifiCorp's wildfire emergency planning and preparedness programs, including communication protocols, notification protocols, and resource coordination efforts.

1. **Risk to be mitigated / problem to be addressed**

   Suppression agencies may require the support of electric utility personnel to support wildfire suppression efforts.

2. **Initiative selection**

   This initiative has the potential to reduce the spread of wildfire. For the OEIS definition of this patrol inspection initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

   There is no region prioritization for this initiative.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp plans to maintain the relationship with suppression agencies in 2022.

5. **Future improvements to initiative**

The company will continue to maintain the current initiative and update plans based on lessons learned, learnings from other utility plans and regulation changes.

7.3.10.4 Forest service and fuel reduction cooperation and joint road map

1. **Risk to be mitigated**

Vegetation management activities may result in impacts on communities or the environment where work is conducted. Impacts may be expressed in both the planning and implementation phases of the work. Implementation of vegetation management activities may require obtaining approvals from authorizing agencies at the local, state and federal levels, and from stakeholders including concerned customers or the communities affected that may result in inefficiencies or delays.

2. **Initiative selection**

Coordination with authorizing agencies and customers is a critical component to successful delivery of a compliant vegetation management program. PacifiCorp strives to conduct vegetation management actions while maintaining environmental compliance and customer relations. PacifiCorp wants customers and authorizing agencies to be informed of its vegetation management program. For the OEIS definition of this community and environmental impact initiative, see Section 9.1 starting on page 271.

3. **Region prioritization**

Implementation of initiatives described above, including the process to notify communities of vegetation management activity, takes place where work is planned and is focused in areas where significant vegetation management work is needed (e.g., efforts to remove fire-impacted trees/hazard trees). Notification and coordination are focused with customers and organizations that have previously requested advanced notice and increased coordination.

To manage environmental compliance PacifiCorp prioritizes environmental reviews and agency coordination based on project schedule considering time required for agency review and permitting. Projects are reviewed and packaged where feasible to streamline review and coordination with authorizing agencies.

4. **Progress on initiative**

PacifiCorp collaborates with CalFire, local logging companies and forest service agencies on fire breaks/fuels reduction and safety projects as opportunities arise. In

the past, this collaboration included:

- Cal Fire – In the Lake Shastina community, PacifiCorp participated in a joint fuel reduction project with Cal Fire. While CalFire was clearing 100' from roads to allow for emergency vehicle access, PacifiCorp collaborated to concurrently clear vegetation along transmission lines.

- Shasta Trinity USFS – In 2021 while the US Forest Service was completing a large scale fuel reduction project along Hwy 89, PacifiCorp joined the efforts and removed many large trees along Line 2. Additionally, this project also involved Cal Trans; who provided the flagging for the operations.

- Dunsmuir Fire Safe Council – During a city of Dunsmuir fuel reduction project along the I-5 corridor, PacifiCorp had facilities in the area and provided crew support to remove vegetation within the project area.

- Logging Companies – As logging companies work near PacifiCorp facilities, the Company provides fuel reduction support. For example, for a logging project adjacent to line 2 and line 14, PacifiCorp provided mowing services along the right of way to connect their project on either side of the transmission lines.

These types of collaborative efforts are often at the request of community groups or as concurrent work is identified within the year. PacifiCorp does not have a specific plan or overarching joint roadmap to drive cooperative work with other groups but, instead relies on existing partnerships and working relations to identify opportunities as they arise through coordinating with these groups while implementing the vegetation management program.

5. Future improvements to initiative

Cooperation with agencies for fuel reduction projects has been successful and PacifiCorp will continue to engage with other land managing agencies within its service territory in the future.

In 2022, PacifiCorp plans to continue cooperation with the aforementioned organizations and any other organizations that may have aligned objectives.

8

PUBLIC SAFETY POWER SHUTOFFS (PSPS)

8 PUBLIC SAFETY POWER SHUTOFFS (PSPS)

8.1 DIRECTIONAL VISION FOR NECESSITY OF PSPS

Describe any lessons learned from PSPS since the last WMP submission and describe expectations for how the utility's PSPS program will evolve over the coming 1, 3, and 10 years. Be specific by including a description of the utility's protocols and thresholds for PSPS implementation. Include a quantitative description of the projected evolution over time of the circuits and numbers of customers that the utility expects will be impacted by any necessary PSPS events. The description of protocols must be sufficiently detailed and clear to enable a skilled operator to follow the same protocols.

When calculating anticipated PSPS, consider recent weather extremes, including peak weather conditions over the past 10 years as well as recent weather years, and how the utility's current PSPS protocols would have been applied to those years.

Instructions for Table 8-.1-1:

Rank order, from highest (1 – greatest anticipated change in reliability or impact on ignition probability or estimated wildfire consequence. over the next 10 years) to lowest (9 - minimal change or impact, next 10 years), the characteristics of PSPS events (e.g., numbers of customers affected, frequency, scope, and duration), regardless of if the change is an increase or a decrease. To the right of the ranked magnitude of impact, indicate whether the impact would be a significant increase in reliability, a moderate increase in reliability, limited or no impact, a moderate decrease in reliability, or a significant decrease in reliability. For each characteristic, include comments describing the expected change and expected impact, using quantitative estimates wherever possible.

Lessons Learned

PacifiCorp's experience with implementing PSPS remains relatively low, with two PSPS events and one PSPS Watch implemented since 2019. Despite limited experience, PacifiCorp is committed to learning from these events and incorporating any changes or improvements needed. Lessons learned from the 2021 PSPS experience, which can be found in PacifiCorp's PSPS Post Event Report[30] filed on March 1, 2022 included three lessons learned.

The first lesson focused on a more streamlined process to produce GIS mapping data. Real time production of GIS mapping data was more challenging to produce and distribute than anticipated. The Public Safety Partner Portal is the identified resolution to address GIS mapping data streamlining. The second lesson learned focused on the need for better CRC

[30] PacifiCorp's 2021 Post-Season Public Safety Power Shut-Off Report was submitted consistent with Decisions (D.) 21-06-034 and 20-03-004. Decision Adopting Phase 3 Updated and Additional guidelines and Rules for Public Safety Power Shutoffs (Proactive De-energizations) of Electric Facilities to mitigation Wildfire Risk Caused by Utility Infrastructure.

communication to customers. CRC information is being included in messaging to customers and external media sources. The third lesson learned was the need for better notification records. Confirmation of notifications was delayed and inconsistent. There are three actions related to this lesson, including standing up external notification system technical support, increased education for call center personnel and quicker verification of notifications.

From these lessons learned, PacifiCorp has developed next steps and plans to implement a Public Safety Partner portal, have additional messaging to customers during events about CRCs and implement several new notification improvement steps in 2022.

Evolution over 1, 3, and 10 years

It is the intention of the WMP initiatives to reduce the probability of using a PSPS over the coming years.

The culmination of initiatives should result in more granular situational awareness within a hardened system, which would provide better insights as to when (if at all) a PSPS might be used and how to minimize customer impacts. PacifiCorp continues to believe that the implementation of grid hardening initiatives such as the Line Rebuild program (covered conductor) should reduce the ignition risk associated with risk drivers, such as contact by object, and thus raise the thresholds for initiating a PSPS event. The exact impact to preliminary thresholds for a PSPS watch is still being evaluated; PacifiCorp has not adjusted thresholds at this time. Improvements to weather forecasting, in conjunction with implemented initiatives, such as increased asset inspections, more timely corrections and increased vegetation management, may also make the system more resilient against extreme weather events, such as those associated with climate change.

The PacifiCorp meteorology department generates situational awareness reports on a daily basis, to aid in decision-making during periods of elevated risk, including in support of PSPS assessment and activation. These reports identify where fuels (dead and live vegetation) are critically dry, where and when critical fire weather conditions are expected (gusty winds and low humidity), and where and when the weather is forecast to negatively impact system performance and reliability. It is the intersection of these three triggers that result in the potential for a PSPS event.

PacifiCorp continues to develop a fully mature aggregate index to assess risk, similar to the FPI used by other utilities. It is PacifiCorp's intent to procure modeling tools and begin using an index by 2023, through the Situational Awareness initiative described in Section 7.3.2.4 on page 163 to assess risk and PSPS decision-making. PacifiCorp expects that this will be an iterative process as new information, methods and industry best practices are incorporated. Additionally, Pacific Power expects to potentially refine this methodology as the company finds a balance between adequately warning the public of a potential PSPS event versus raising a false alarm too frequently or over-use of PSPS as a tool.

Over the next three to 10 years, PacifiCorp will evolve its index, in collaboration with other utilities to reduce the scale, scope and impact of PSPS events.

Table 8.1 Anticipated characteristics of PSPS use over next 10 years (WMP Table 8.1-1)

Rank order 1-9	PSPS characteristic	Significantly increase; increase;no change; decrease. significantly decrease	Comments
5	Number of customers affected by PSPS events (total)	Decrease	Completing mitigation efforts removes exposed segments of circuits and helps protect customers served by those segments from PSPS risk.
6	Number of customers affected by PSPS events (normalized by fire weather, e.g., RFW line mile days)	Decrease	Completing efforts removes exposed circuit segments and helps protect customers served by those segments from PSPS risk.
3	Frequency of PSPS events in number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability (total)	Decrease	Grid configurations and communication technologies are being introduced, which give the company more ability to remotely reconfigure the network's system protection; this removes risk and reduces the need for PSPS operations.
4	Frequency of PSPS events in number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability (normalized by fire weather,e.g., Red Flag Warning line mile days)	Decrease	Grid configurations and communication technologies are being introduced, which give the company more ability to remotely reconfigure the network's system protection; this removes risk and reduces the need for PSPS operations.
1	Scope of PSPS events in circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization (total)	Significantly decrease	As the company builds out its weather network, enhances its LRAM modeling and completes asset hardening projects the scope of events will reduce.
2	Scope of PSPS events in circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization (normalized by fire weather, e.g., Red Flag Warning line mile days)	Significantly decrease	As the company builds out its weather network, enhances its LRAM modeling and completes asset hardening projects the scope of events will reduce.
7	Duration of PSPS events in customer hours (total)	Decrease	The addition of more network modularization, including advancement of grid technologies, will reduce the duration of PSPS events.
8	Duration of PSPS events in customer hours (normalized by fire weather, e.g., Red Flag Warning line mile days)	Decrease	The addition of more network modularization, including advancement of grid technologies, will reduce the duration of PSPS events.
	Other (Describe) – Rank as 9 and leave other columns blank if no other characteristics associated with PSPS		

8.2 PROTOCOLS ON PUBLIC SAFETY POWER SHUTOFF

Describe protocols on Public Safety Power Shutoff (PSPS or de-energization), highlighting changes since the previous WMP submission:

1. *Method used to evaluate the potential consequences of PSPS and wildfires. Specifically, the utility is required to discuss how the relative consequences of PSPS and wildfires are compared and evaluated. Inaddition, the utility must report the wildfire risk thresholds and decision-making process that determine the need for a PSPS.*
2. *Strategy to minimize public safety risk during high wildfire risk conditions and details ofthe considerations, including but not limited to a list and description of community assistance locations and services provided during a de-energization event.*
3. *Outline of tactical and strategic decision-making protocol for initiating a PSPS/de-energization (e.g., decision tree).*
4. *Strategy to provide for safe and effective re-energization of any area that is de-energized due to PSPS protocol.*
5. *Company standards relative to customer communications, including consideration for the need to notify priority essential services – critical first responders, public safety partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water utilities/agencies. This section, or an appendix to this section, must include a complete listing of which entities the electrical corporation considers to be priority essential services. This section must also include a description of strategy and protocols to ensure timely notifications to customers, including access and functional needs populations, in the languages prevalent within the utility's service territory.*
6. *Protocols for mitigating the public safety impacts of these protocols, including impactson first responders, health care facilities, operators of telecommunications infrastructure, and water utilities/agencies.*

1. Method Used to Evaluate PSPS Consequences

PacifiCorp evaluates the weather-related outage risk and wildfire risk across its service territory every day using a combination of recently deployed weather and wildfire models, LRAM/HRRR, publicly available information from the National Weather Service and Geographic Area Coordination Center, and in-house subject matter experts. It is the intersection of these two risks that can result in a PSPS.

To assess the risk for wind-related outages, PacifiCorp correlated five years of historical High Resolution Rapid Refresh (HRRR) model forecasts to outage occurrence over that same period to generate circuit-level fragility curves. These results are used by PacifiCorp to convert the daily wind forecasts from NOAA's HRRR model to wind gust percentiles and expected outage rates. This allows PacifiCorp to

identify circuits at higher risk of wind-related outages up to 48 hours in advance. PacifiCorp is currently working to implement a more robust version of this tool using its 96-hour WRF model (operational) and the 30-year WRF reanalysis (in progress).

PacifiCorp currently relies on its internal meteorologists as well as publicly available observations and forecasts from the GACC to assess local and regional wildfire risk. This assessment considers fire weather conditions, National Fire Danger Rating System (NFDRS) outputs, and fire weather indices such as the Hot-Dry-Windy Index as forecast by PacifiCorp's WRF. PacifiCorp also considers fire weather and fire potential forecasts from the GACC and NWS. Going forward, PacifiCorp is on track to deploy Technosylva's Wildfire Analyst Enterprise by August of 2022. This tool will become an important component of the company's wildfire risk assessment by providing detailed circuit level ignition and wildfire consequence forecasts.

2. Strategy to Minimize Public Safety Risk

PacifiCorp has a working relationship with state, county and local agencies which are available to support any response. Through these well-established partnerships, accurate situational awareness, and response capabilities, PacifiCorp is able to safely execute PSPS actions. Using an approach which provides regular and ongoing updates while maintaining a common operating picture across all response agencies.

PacifiCorp works with local emergency managers, public safety partners, and tribal leadership to identify appropriate deployment locations for Community Resource Centers (CRCs). In general, PacifiCorp has identified at least 3 CRC locations per county and at least one CRC per PSPS zone, where most CRC locations are within 10-20 miles of PSPS zones. Additionally, PacifiCorp contracts with private vendors to support the deployment of temporary CRCs in the event that fixed facilities are not a feasible option. The current list of identified CRC locations is below.

General Area	PSPS Zone Name	CRC Identified
Siskiyou County	Mt Shasta PSPS Zone	Mt Shasta Community Center
	Weed / Snowbrush PSPS Zone	Weed Community Center
	Dunsmuir PSPS Zone	Dunsmuir Community Center
Del Norte County	Happy Camp PSPS Zone	Karuk Senior Nutrition Program Happy Camp Wellness Center Kahtishraam Wellness Center
	Cave Junction PSPS Zone	Selma Community Center Cave Junction Senior Center Cave Junction High School

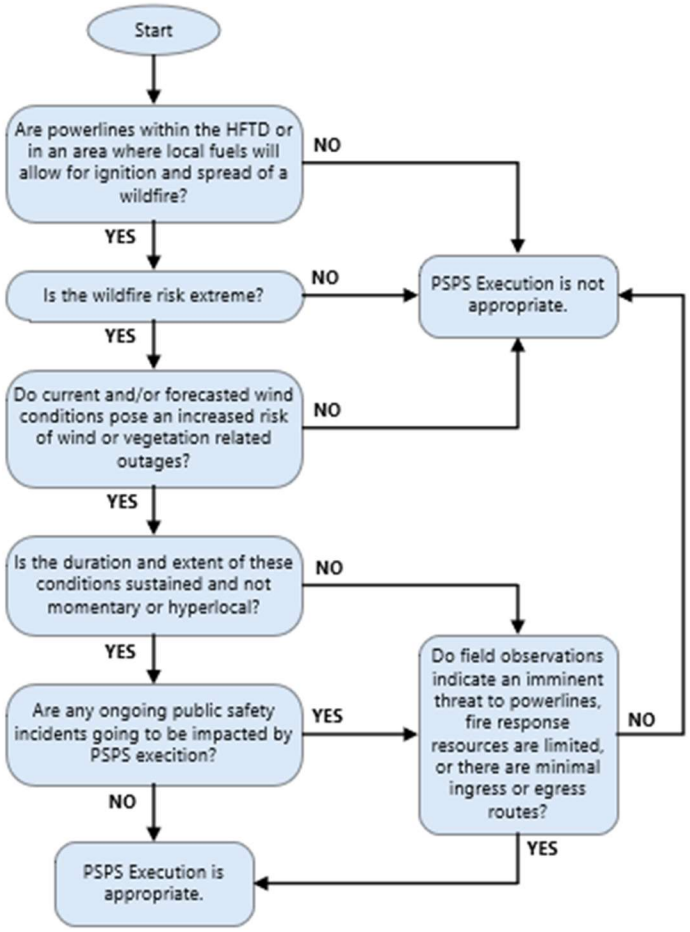
Additionally, PacifiCorp provides (CRCs) to affected areas as needed to support

community needs. CRC capabilities typically include:

- Shelter from environment
- Air conditioning
- Air Purifiers & Air Quality Monitors
- Potable water & Non-perishable snacks
- Seating and tables
- Restroom facilities
- Refrigeration & Heating for medicine and/or baby needs
- Interior and area lighting
- On-site security
- Televisions
- Ice
- Communications capability such as Wi-fi access, SatPhone, Radio, Cellular phone etc.
- On-site medical support
- Charging stations for Cell Phones, AM/FM/Weather radios, computers, etc.
- Small Crates for Pets
- AFN/LEP Population support
- Portable ADA Ramp
- Personal Protective Equipment

3. Outline of Tactical and Strategic Decision-Making Protocols for Initiating PSPS

The decision tree below outlines the tactical and strategic decision-making protocols for initiating PSPS. PacifiCorp considers multiple factors when assessing the conditions that influence the PSPS decision making such as fuels, forecast wind conditions, field observations, and ingress or egress routes. The duration and extension of forecasted weather conditions is also evaluated in this protocol.



4. Strategy to Provide Safe and Effective Re-Energization

PacifiCorp has a working relationship with state, county and local agencies which are available to support any response. Through these well-established partnerships, accurate situational awareness and response capabilities, the Company is able to safely restore power within areas affected by PSPS actions. PacifiCorp uses a liaison officer approach which provides regular and ongoing updates to emergency management agency partners. This approach maintains a common operating picture across all response agencies and provides the greatest opportunity for safe power restoration while also considering any variables to be mitigated or just in time adjustments to plans to be completed directly from the Emergency Coordination Center. PacifiCorp maintains the ability to deploy emergency management staff to local Emergency Operation Centers at the request of the local or state entity.

5. Company Communication Standards

PacifiCorp uses a common language that integrates the notification and communication protocols developed for California Statewide Alert and Warning

Guidelines.

To meet this requirement, the messages address: (1) Who is the source of the warning? (2) What is the threat? (3) Does this affect my location? (4) What should I do? and (5) How long is this event expected to last?

Communications direct customers to education and outreach materials shared by the company before each wildfire season.

PacifiCorp notifies customers and delivers clear and understandable information; communications are available in different languages (English, Spanish, Chinese traditional, Chinese simplified, German, Hmong, Mixteco, Vietnamese and Tagalog) and use multiple modes/channels to reach different AFN populations.

PacifiCorp communicates the possibility of a de-energization event, the estimated start date and time, the estimated duration of the event, and the estimated time to restore power in warning notifications. These notifications coincide with the timelines outlined in **Error! Reference source not found.** and identify when customers can expect additional information as the event progresses..

Keeping in mind that weather related events are extremely dynamic and weather forecasting can be challenging, the timelines in **Error! Reference source not found.** may be reduced if changing conditions do not allow for such advance notification. This dynamic nature and potential deviation from the timeline is recognized in D.19-05-042. In these instances, the company will promptly notify customers and will include a summary of the circumstances warranting deviation from these timelines in the final report.

Throughout the notification process, PacifiCorp performs positive or affirmative communication with Medical Baseline Customers through special procedures and methods, such as personal phone notification instead of automatic calls, in-person notification at the service location in the event contact cannot be confirmed and tracked verification of contact with these customers.

Table 8.2 Notification timeline

72 Hours	De-Energization Watch with Initial Public Safety Partner Notification
48 Hours	De-energization Watch or Warning with Initial Public Notification
24 Hours	De-energization Warning
2 Hours	De-energization Imminent
1 Hour	De-energization Imminent
Event Begins	De-energization Begins
Re-energization Begins	Re-energization Begins
Re-energization Completed	Re-energization Completed

Cancellation of Event	De-energization Event Canceled

5. Protocols for Mitigating Public Safety Impacts of these Protocols

PacifiCorp's general process for a PSPS is described in Figure 8.1:

PacifiCorp PSPS protocols

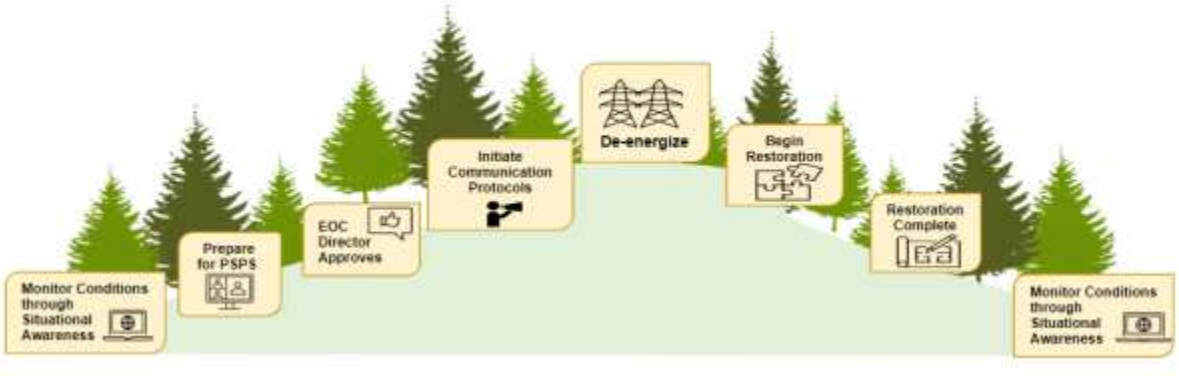


Figure 8.1 PSPS process

PacifiCorp uses an internal escalation process to ensure that it addresses fire risk mitigation at the same time it works to limit community impacts from potential de-energization. To ensure the best possible service for customers, PacifiCorp is establishing "internal watches" during which the company performs the following tasks:

- Activates the Emergency Coordination Center (ECC)
- Conducts pre-event patrols
- Alters system protection settings, if applicable
- Develops granular forecasts for periods of concurrent elevated risk
- Prepositions line and vegetation personnel to monitor key locations
- Notifies public safety partners of elevated concern and the company's mitigation efforts
- Actively monitors the network during the watch period
- Notify and coordinate with all appropriate critical infrastructure and public safety partners for plan development, response actions and mitigation strategies.
- Upon an all-clear notice, the ECC shuts down.

Currently, situational awareness reports are used throughout the elevated risk process to inform decision making. Reports include fuel information and where weather conditions have the potential of ignition. When PacifiCorp completes procurement and implementation of the Technosylva suite of tools described in section 7.3.2.4, these tools will be used to support the evaluation of potential consequences of PSPS and wildfires. It is anticipated that this will be an iterative process, where PacifiCorp seeks to balance wildfire safety and customer reliability.

When a PSPS is imminent, PacifiCorp utilizes a contracted vendor to support the rapid deployment of Community Resource Centers in the community. PacifiCorp is prepared to set up CRCs as per section 7.3.9.3 page 237, where the CRC locations and services are provided.

In Section 7.3.9.4 page 240, PacifiCorp has described the PSPS/de-energization protocols.

In Section 7.3.9.5 page 242, PacifiCorp has described the re-energization protocols.

8.3 PROJECTED CHANGES TO PSPS IMPACT

Describe utility-wide plan to reduce scale, scope and frequency of PSPS for each of the following time periods, highlighting changes since the prior WMP report and including key program targets used to track progress over time,

1. *By June 1 of current year*
2. *By September 1 of current year*
3. *By next WMP submission*

Reducing the impact of PSPS is a significant goal of PacifiCorp's WMP and PacifiCorp perceives the best way to reduce PSPS impacts is to reduce the number, geographic scope, and duration of PSPS events. While recognizing the general application of all mitigation initiatives to help reduce the impact of PSPS, PacifiCorp also acknowledges that certain initiatives are more directly tied to the PSPS Program.

Above all, improved situational awareness reflects a category of initiatives closely related to the PSPS decision-making process. Like other utilities, PacifiCorp's situational awareness plans include the installation of additional weather stations to access localized weather risk data and inform decision making. Additionally, to better leverage this weather data and other key information, PacifiCorp is investing in range of new data processing and modeling capabilities.

This includes key investment and the development of an operational weather forecast model that leverages fully redundant HPCC capabilities to process and deliver a twice daily 96-hour forecast

as described in Section 7.3.2.4 on page 163. Furthermore, PacifiCorp is procuring Technosylva's WFE-A modeling suite as described in Section 4.5.1.1 on page 66, including FireCast, to model fire spread risk daily across PacifiCorp's service territory, FireSim to model on demand fires spread potential, and WRRM to quantify asset risk and inform planning.

This additional data and more sophisticated situational awareness model will continue to better inform decision making, which reduces PSPS impacts by (i) reducing the likelihood that a PSPS will be implemented unnecessarily and (ii) facilitating a more surgical application of PSPS, thereby reducing its scope. This effort is further described in Section 7.3.2.4 on page 163.

Other initiatives have less direct involvement in the PSPS decision-making process. But those initiatives can still have a dramatic influence on reducing PSPS impacts by reducing the likelihood of PSPS. Many of PacifiCorp's initiatives are specifically geared to reduce wildfire ignition risk with the most notable being covered conductor. PacifiCorp's covered conductor will materially reduce PSPS impacts by (a) making PSPS substantially less likely and (b) helping PacifiCorp surgically reduce the size and areas of impact. Above all, the mechanical properties of a covered conductor design physically prevent the initiation of a flash-over due to vegetation on the line. Notably, while data continues to be gathered to better understand specific relationships, the general correlation between wind, vegetation contacts, and wildfire spread is well-understood. Installing covered conductor will increase the grid's resiliency against wind-driven vegetation contacts, which can lead to devasting wildfire ignitions. High winds are, of course, a critical factor in the assessment of risk and considered in any PSPS decision-making process. The mitigation benefits of covered conductor, especially when combined with other grid hardening efforts implemented as part of a rebuild effort, will significantly decrease PSPS impacts by significantly decreasing the likelihood of a PSPS. If the powerlines can withstand higher wind speeds, it will decrease the occurrence of PSPS events. Covered conductor projects also give PacifiCorp flexibility to take a more surgical approach to PSPS.

As a specific example, PacifiCorp recently completed approximately 3 miles of covered conductor in Mt Shasta as depicted in Figure 8.2.

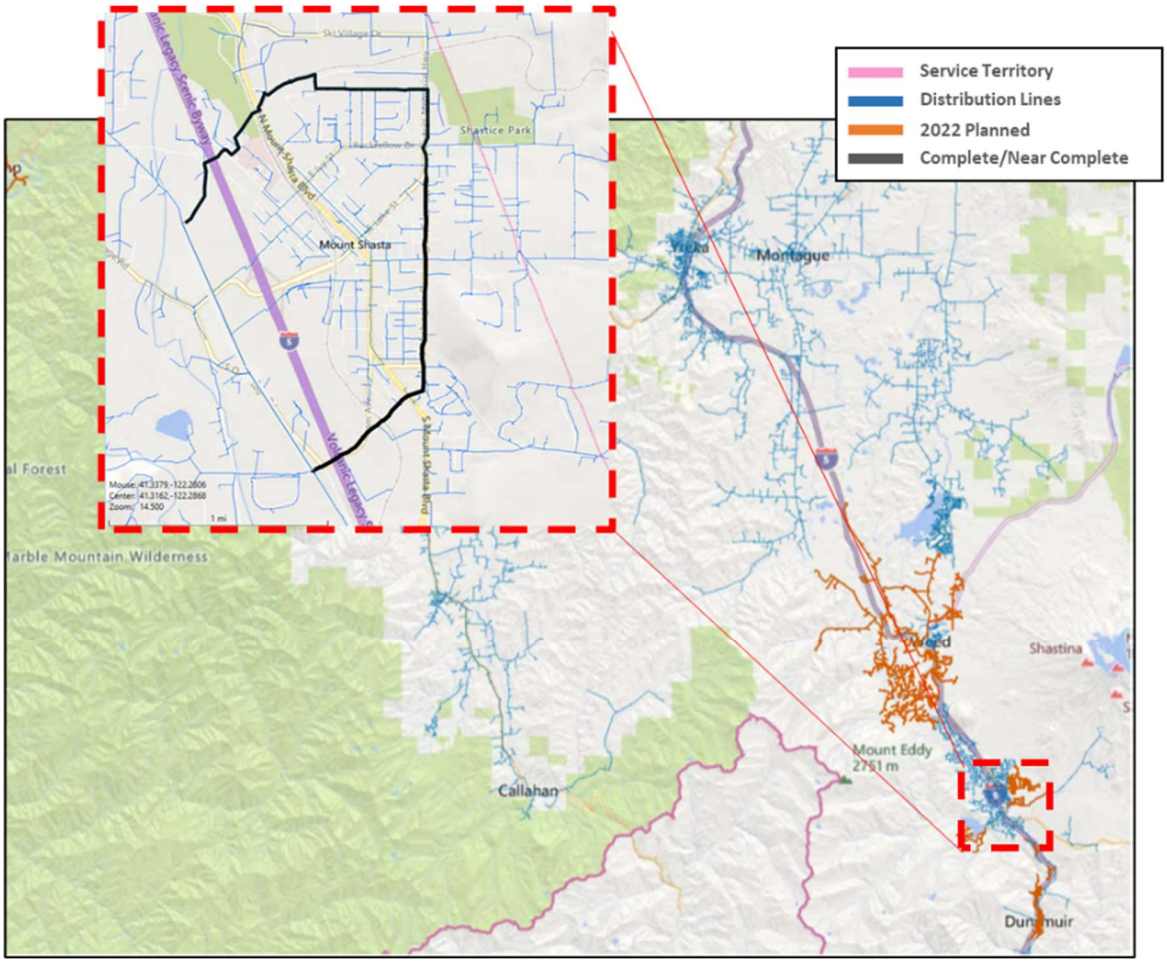


Figure 8.2 Example Grid Hardening Project in Mt Shasta

While the entire Mt Shasta grid hardening plan includes the implementation of approximately 82 miles of covered conductor over three years, this initial step will begin to provide flexibility and resilience. Prior to the completion of this project, any extreme or localized risk experienced by the inner 3 miles that may have required implementation of a PSPS event, would have directly impacted any taps or other circuits or circuit segments fed from this loop. Prior to grid hardening, PacifiCorp was not able to isolate the risk posed to the main loop from the taps or distant portions of the circuit. The covered conductor removes that direct linkage and provides flexibility in decision making. Conditions experienced by the main loop will no longer necessitate a PSPS event on the entire circuit. While this example is small in scope and not likely to have immediate material impacts on decision making, it demonstrates the general concept of mitigating PSPS impacts through implementation of covered conductor. As more and more miles are hardened, more and more direct linkages will be broken, further mitigating the impact of PSPS.

Other initiatives specifically address reducing the impact of a PSPS that has actually been implemented. Examples include the new portable battery program and generator rebate program

discussed in Section 7.3.3.11 on page 176. Additionally, PacifiCorp continues improving its readiness to open Community Resource Centers in any community impacted by a PSPS as described in Section 7.3.9.3 on page 237.

Specific program targets associated with these initiatives can be found in Section 5.3 on page 114 and Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx. The following describes planned program deliverables with direct linkages to PSPS impacts by June of the current year, September 1 of the current year, and before the next WMP Update.

By June 1 of the current year

Installed weather stations will have their annual calibration completed and be prepared to provide accurate weather data to situational awareness forecast processes which can potentially reduce the scope and scale of a PSPS.

By September 1 of the current year

Several initiatives will be significantly progressed, as per 2022-05-02_PC_2022_Q1-QDR_R1.xlsx quarterly targets. Much of these initiatives, such as those related to the grid hardening category, are projected to impact the scale, scope and frequency of PSPS over time.

By next Annual WMP Update

PacifiCorp will have met the goals described in Table 5.1, which directly impact the scale, scope, frequency or impact of PSPS over time. As an example, PacifiCorp initiated the installation of covered conductor in 2021. Based on targets in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx for covered conductor, PacifiCorp anticipates that a significant portion of covered conductor will be completed, providing significant ignition risk reduction, thus potentially reducing the frequency of PSPS.

A key change since the 2021 WMP Update is that PacifiCorp plans to implement Technosylva modelling tools to enhance situational awareness. As described above, this addition to PacifiCorp initiatives is projected to provide more granular data, with increased accuracy such that PacifiCorp can potentially reduce the scope of a PSPS by the next annual update.

8.4 ENGAGING VULNERABLE COMMUNITIES

Report on the following:

1. *Describe protocols for PSPS that are intended to mitigate the public safety impacts of PSPS on vulnerable, marginalized and/or at-risk communities. Describe how the utility is identifying these communities.*
2. *List all languages which are "prevalent" in utility's territory. A language is prevalent if it is spoken by 1,000 or more persons in the utility's territory or if it is spoken by 5% or more of the population within a "public safety answering point" in the utility territory[31] (D.20-03-004).*
3. *List all languages for which public outreach material is available, in written or oral form.*
4. *Detail the community outreach efforts for PSPS and wildfire-related outreach. Include efforts to reach all languages prevalent in utility territory.*

PacifiCorp describes its outreach plan in greater detail, responsive to each of these points outlined in its PSPS Phase 2 Progress Report and in sections 7.3.9 and 7.3.10 starting on pages 235 and 243 respectively.

Information regarding PacifiCorp's engagement with vulnerable communities information has been provided in the 2022 Annual Access and Functional Needs Plan of PacifiCorp filed on January 31, 2022 and is summarized below:

1. **PSPS Protocols Intended to Mitigate the Public Safety Impacts of PSPS on Vulnerable, Marginalized, and/or At-Risk Communities**

   Vulnerable customers, such as those customers identified to need electricity for medical equipment or AFN customers, receive additional outreach prior to a PSPS, which is intended to mitigate the impact of a PSPS for these customers. Prior to a PSPS, PacifiCorp endeavors to accomplish "confirmed communication" with these customers, either through a phone conversation (not voicemail) or, in some circumstances, through a personal visit from a PacifiCorp employee. Medical baseline customers who could not be reached through these means are then forwarded to emergency services for follow-up.
   PacifiCorp currently identifies AFN customers through collaboration with state and Community Based Organizations (CBOs). Additionally, PacifiCorp includes on its PSPS website FAQs information on how customers can sign up for the medical baseline program.

[31] See Cal. Government Code § 53112

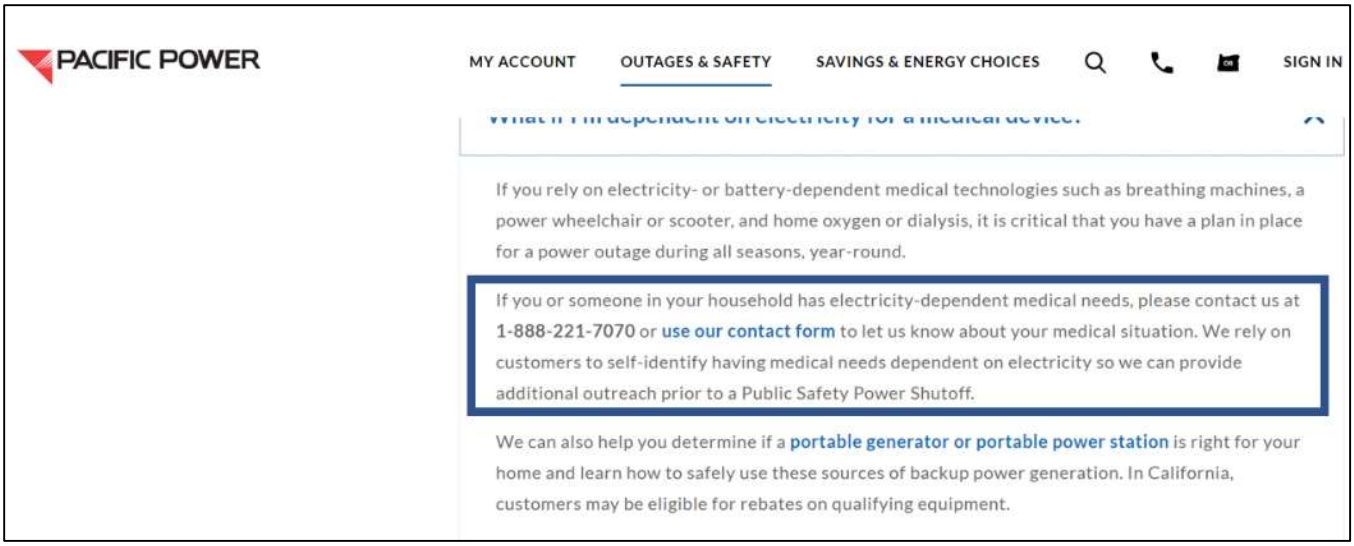


Figure 3 : Medical Baseline Signup Online

2. **Prevalent Languages**

   English is the prevalent language in the PacifiCorp California service territory.

3. **Public Outreach Material Languages**

   To ensure that outreach is provided in identified languages, Pacific Power delivers wildfire safety-specific communications including brochures, handouts, and bill messages translated into Spanish; a message in nine languages – which includes Chinese traditional, Chinese simplified, Tagalog, Vietnamese, Mixteco, Zapoteco, Hmong, German and Spanish – is included in PSPS event communications including press releases, social media posts and website updates. The company is working to expand those messages onto other, non-event PSPS and wildfire safety collateral.

4. **Community Outreach Efforts of PSSP and Wildfire-Related Outreach**

   The Pacific Power PSPS webpage provides timely and detailed information for potential and actual PSPS events relevant to a specific location. Pacific Power's website has the bandwidth to manage site traffic under extreme demand; and has implemented bandwidth capacity to a level that will allow for increased customer access while maintaining site integrity. The webpage (available at www.pacificpower.net/psps) allows customers to determine the likelihood of a PSPS event based on address information. An additional online tool allows the customer to see the "Public safety power shutoff forecasting" for that area over the following seven days. The status indicates whether the area is operating as "Normal," whether there is a PSPS "Watch," or whether there is an actual PSPS "Event." The website is easily accessible by mobile device - additionally - the Pacific Power 'app' is available

for mobile devices which allows customer access to real-time outage updates and information. Material languages are described in Section 3 above.

8.5 PSPS-SPECIFIC METRICS

PSPS data is reported quarterly. Placeholder tables below to be filled in based on quarterly data

Instructions for PSPS table: of Attachment 3:

In the attached spreadsheet document, report performance on the following PSPS metrics within the utility's service territory over the past seven years as needed to correct previously reported data. Where the utility does not collect its own data on a given metric, the utility is required to work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in the "Comments" column.

Please see WMP Table 11 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx submitted on May 2, 2022.

8.6 IDENTIFICATION OF FREQUENTLY DE-ENERGIZED CIRCUITS

Senate Bill 533 (2021) added an additional requirement to the WMPs. Pub. Util. Code Section 8386(c)(8) requires the "Identification of circuits that have frequently been de-energized pursuant[32] to a de-energization event to mitigate the risk of wildfire and the measures taken, orplanned to be taken, by the electrical corporation to reduce the need for, and impact of, future de-energization of those circuits, including, but not limited to, the estimated annual decline in circuit de-energization and de-energization impact on customers, and replacing, hardening, or undergrounding any portion of the circuit or of upstream transmission or distribution lines." To comply with this statutory addition, utilities are required to populate Table 8.3 and provide a map showing the listed frequently de-energized circuits.

Table 8.3 Frequently de-energized circuits

ID of Circuit	County	Dates of Outages	# of Customers Affected	Measures taken, or plannedto be taken, to reduce the need for, and impact of, future PSPS of circuit
N/A	N/A	N/A	N/A	N/A

[32] "Frequently de-energized circuit" has been defined in the glossary as "A circuit which has been de-energized pursuant to a de-energization event to mitigate the risk of wildfire three or more times in a calendar year."

9

APPENDIX

9 APPENDIX

9.1 DEFINITIONS OF INITIATIVE ACTIVITIES BY CATEGORY

Table 9.1 Definitions of initiative activities by category

Category	Initiative activity	Definition
A. Risk mapping and simulation	A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment	Development and use of tools and processes to develop and update risk map and simulations and to estimate risk reduction potential of initiatives for a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.
	Climate-driven risk map and modeling based on various relevant weather scenarios	Development and use of tools and processes demonstrating medium and long-term climate trends based on the best available climate models demonstrating the most wildfire-relevant impacts (e.g., warming trends, fuel moisture trends, soil moisture trends, vegetation distribution trends). Describe how these trends are being incorporated into risk modeling or other risk-informed analyses.
	Ignition probability mapping showing the probability of ignition along the electric lines and equipment	Development and use of tools and processes to assess the risk of ignition across regions of the grid (or more granularly, e.g., circuits, spans, or assets).
	Initiative mapping and estimation of wildfire and PSPS risk-reduction impact	Development of a tool to estimate the risk reduction efficacy (for both wildfire and PSPS risk) and RSE of various initiatives.
	Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment	Development and use of tools and processes to assess the impact of potential ignition and risk to communities (e.g., in terms of potential fatalities, structures burned, monetary damages, area burned, impact on air quality and greenhouse gas, or GHG, reduction goals, etc.).
B. Situational awareness and forecasting	Advanced weather monitoring and weather stations	Purchase, installation, maintenance, and operation of weather stations. Collection, recording, and analysis of weather data from weather stations and from external sources.
	Continuous monitoring sensors	Installation, maintenance, and monitoring of sensors and sensorized equipment used to monitor the condition of electric lines and equipment.
	Fault indicators for detecting faults on electric lines and equipment	Installation and maintenance of fault indicators.
	Forecast of a fire risk index, fire potential index, or similar	Index that uses a combination of weather parameters (such as wind speed, humidity, and temperature), vegetation and/or fuel conditions, and other factors to judge current fire risk and to create a forecast indicative of fire risk. A sufficiently granular index is required to inform operational decision-making.

Category	Initiative activity	Definition
	Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	Personnel position within utility service territory to monitor system conditions and weather on site. Field observations is required to inform operational decisions.
	Weather forecasting and estimating impacts on electric lines and equipment	Development methodology for forecast of weather conditions relevant to utility operations, forecasting weather conditions and conducting analysis to incorporate into utility decision-making, learning and updates to reduce false positives and false negatives of forecast PSPS conditions.
C. Grid design and system hardening	Capacitor maintenance and replacement program	Remediation, adjustments, or installations of new equipment to improve or replace existing capacitor equipment.
	Circuit breaker maintenance and installation to de-energize lines upon detecting a fault	Remediation, adjustments, or installations of new equipment to improve or replace existing fast switching circuit breaker equipment to improve the ability to protect electrical circuits from damage caused by overload of electricity or short circuit.
	Covered conductor installation	Installation of covered or insulated conductors to replace standard bare or unprotected conductors (defined in accordance with GO 95 as supply conductors, including but not limited to lead wires, not enclosed in a grounded metal pole or not covered by: a "suitable protective covering" (in accordance with Rule 22.8), grounded metal conduit, or grounded metal sheath or shield). In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D
	Covered conductor maintenance	Remediation and adjustments to installed covered or insulated conductors. In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non- conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.

Category	Initiative activity	Definition
	Crossarm maintenance, repair, and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing crossarms, defined as horizontal support attached to poles or structures generally at right angles to the conductor supported in accordance with GO 95.
	Distribution pole replacement and reinforcement, including with composite poles	Remediation, adjustments, or installations of new equipment to improve or replace existing distribution poles (i.e., those supporting lines under 65kV), including with equipment such as composite poles manufactured with materials reduce ignition probability by increasing pole lifespan and resilience against failure from object contact and other events.
	Expulsion fuse replacement	Installations of new and CAL FIRE-approved power fuses to replace existing expulsion fuse equipment.
	Grid topology improvements to mitigate or reduce PSPS events	Plan to support and actions taken to mitigate or reduce PSPS events in terms of geographic scope and number of customers affected, such as installation and operation of electrical equipment to sectionalize or island portions of the grid, microgrids, or local generation.
	Installation of system automation equipment	Installation of electric equipment that increases the ability of the utility to automate system operation and monitoring, including equipment that can be adjusted remotely such as automatic reclosers (switching devices designed to detect and interrupt momentary faults that can reclose automatically and detect if a fault remains, remaining open if so).
	Maintenance, repair, and replacement of connectors, including hotline clamps	Remediation, adjustments, or installations of new equipment to improve or replace existing connector equipment, such as hotline clamps.
	Mitigation of impact on customers and other residents affected during PSPS event	Actions taken to improve access to electricity for customers and other residents during PSPS events, such as installation and operation of local generation equipment (at the community, household, or other level).
	Other corrective action	Other maintenance, repair, or replacement of utility equipment and structures so that they function properly and safely, including remediation activities (such as insulator washing) of other electric equipment deficiencies that may increase ignition probability due to potential equipment failure or other drivers.
	Pole loading infrastructure hardening and replacement program based on pole loading assessment program	Actions taken to remediate, adjust, or install replacement equipment for poles that the utility has identified as failing to meet safety factor requirements in accordance with GO 95 or additional utility standards in the utility's pole loading assessment program.
	Transformers maintenance and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing transformer equipment.
	Transmission tower maintenance and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing transmission towers (e.g., structures such as lattice steel towers or tubular steel poles that support lines at or above 65kV).

Category	Initiative activity	Definition
	Undergrounding of electric lines and/or equipment	Actions taken to convert overhead electric lines and/or equipment to underground electric lines and/or equipment (i.e., located underground and in accordance with GO 128).
	Updates to grid topology to minimize risk of ignition in the HFTDs	Changes in the plan, installation, construction, removal, and/or undergrounding to minimize the risk of ignition due to the design, location, or configuration of utility electric equipment in the HFTDs.
D. Asset management and inspections	Detailed inspections of distribution electric lines and equipment	In accordance with GO 165, careful visual inspections of overhead electric distribution lines and equipment where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.
	Detailed inspections of transmission electric lines and equipment	Careful visual inspections of overhead electric transmission lines and equipment where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.
	Improvement of inspections	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
	IR inspections of distribution electric lines and equipment	Inspections of overhead electric distribution lines, equipment, and right-of-way using IR (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.
	IR inspections of transmission electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using IR (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.
	Intrusive pole inspections	In accordance with GO 165, intrusive inspections involve movement of soil, taking samples for analysis, and/or using more sophisticated diagnostic tools beyond visual inspections or instrument reading.
	LiDAR inspections of distribution electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	LiDAR inspections of transmission electric lines and equipment	Inspections of overhead electric distribution lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).

Category	Initiative activity	Definition
	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric transmission lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric distribution lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Patrol inspections of distribution electric lines and equipment	In accordance with GO 165, simple visual inspections of overhead electric distribution lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out during other company business.
	Patrol inspections of transmission electric lines and equipment	Simple visual inspections of overhead electric transmission lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out during other company business.
	Pole loading assessment program to determine safety factor	Calculations to determine whether a pole meets pole loading safety factor requirements of GO 95, including planning and information collection needed to support said calculations. Calculations must consider many factors including the size, location, and type of pole; types of attachments; length of conductors attached; and number and design of supporting guys, per D.15-11-021.
	Quality assurance / quality control of inspections	Establishment and function of audit process to manage and confirm work completed by employees or contractors, including packaging QA/QC information for input to decision-making and related integrated workforce management processes.
	Substation inspections	In accordance with GO 175, inspection of substations performed by qualified persons and according to the frequency established by the utility, including record-keeping.
E. Vegetation management and inspection	Additional efforts to manage community and environmental impacts	Plan and execution of strategy to mitigate negative impacts from utility vegetation management to local communities and the environment, such as coordination with communities, local governments, and agencies to plan and execute vegetation management work.
	Detailed inspections and management practices for vegetation clearances around distribution electrical lines and equipment	Careful visual inspections and maintenance of vegetation around the distribution right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded. Describe the frequency of inspection and maintenance programs.

Category	Initiative activity	Definition
	Detailed inspections and management practices for vegetation clearances around transmission electrical lines and equipment	Careful visual inspections and maintenance of vegetation around the transmission right-of- way, where individual trees are carefully examined, visually, and the condition of each rated and recorded. Describe the frequency of inspection and maintenance programs.
	Emergency response vegetation management due to red flag warning or other urgent weather conditions	Plan and execution of vegetation management activities, such as trimming or removal, executed based upon and in advance of forecast weather conditions that indicate high fire threat in terms of ignition probability and wildfire consequence.
	Fuel management and, management of all wood and “slash” from vegetation management activities	Plan and execution of fuel management activities in proximity to potential sources of ignition. This includes pole clearing per PRC 4292 and reduction or adjustment of live fuel (based on species or otherwise)
	Improvement of inspections	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
	Remote sensing inspections of vegetation around distribution electric lines and equipment	Inspections of right-of-way using remote sensing methods such as LiDAR, satellite imagery, and UAV.
	Remote sensing inspections of vegetation around transmission electric lines and equipment	Inspections of right-of-way using remote sensing methods such as LiDAR, satellite imagery, and UAV.
	Other discretionary inspections of vegetation around distribution electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Other discretionary inspections of vegetation around transmission electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Patrol inspections of vegetation around distribution electric lines and equipment	Visual inspections of vegetation along rights-of- way that is designed to identify obvious hazards. Patrol inspections may be carried out during other company business.
	Patrol inspections of vegetation around transmission electric lines and equipment	Visual inspections of vegetation along rights-of- way that is designed to identify obvious hazards. Patrol inspections may be carried out during other company business.
	Quality assurance / quality control of vegetation management	Establishment and function of audit process to manage and oversee the work completed by employees or contractors, including packaging QA/QC information for input to decision-making and workforce management processes. This includes identification of the percentage of vegetation inspections that are audited annually, as a program target in Table 5.3-1.

Category	Initiative activity	Definition
	Recruiting and training of vegetation management personnel	Programs to ensure that the utility can identify and hire qualified vegetation management personnel and to ensure that both employees and contractors tasked with vegetation management responsibilities are adequately trained to perform vegetation management work, according to the utility's wildfire mitigation plan, in addition to rules and regulations for safety. Include discussion of continuous improvement of training programs and personnel qualifications.
	Identification and remediation of "at-risk species"	Specific actions, not otherwise described in other WMP initiatives, taken to reduce the ignition probability and wildfire consequence attributable to "at-risk species,", such as trimming, removal, and replacement.
	Removal and remediation of trees with strike potential to electric lines and equipment	Actions taken to identify, remove, or otherwise remediate trees that pose a high risk of failure or fracture that could potentially strike electrical equipment.
	Substation inspection	Inspection of vegetation surrounding substations, performed by qualified persons and according to the frequency established by the utility, including record-keeping.
	Substation vegetation management	Based on location and risk to substation equipment only, actions taken to reduce the ignition probability and wildfire consequence attributable to contact from vegetation to substation equipment.
	Vegetation management enterprise system	Inputs, operation, and support for a centralized vegetation management enterprise system updated based upon inspection results including (1) inventory of and management activities such as trimming and removal of vegetation.
	Vegetation management to achieve clearances around electric lines and equipment Additional vegetation management practices beyond regulatory requirements and recommendations	Actions taken to ensure that vegetation does not encroach upon the minimum clearances set forth in Table 1 of GO 95, measured between line conductors and vegetation, such as trimming adjacent or overhanging tree limbs. Identifying and discussing additional vegetation management actions (e.g., trimming and removal of vegetation) taken beyond the minimum regulatory requirements and recommendations, for example, enhanced vegetation management.
	Vegetation management activities post-fire	Vegetation management (VM) activities during post-fire service restoration including, but not limited to activities or protocols that differentiate post-fire VM from programs described in other WMP initiatives; supporting documentation for the tool and/or standard the utility uses to assesses the risk presented by vegetation post-fire; and how the utility includes fire-specific damage attributes into its assessment tool/standard.
F. Grid operations and protocols	Automatic recloser operations	Designing and executing protocols to deactivate automatic reclosers based on local conditions for ignition probability and wildfire consequence.

Category	Initiative activity	Definition
	Protective equipment and device settings	The utility's procedures for adjusting the sensitivity of grid elements to reduce wildfire risk, other than automatic reclosers (such as circuit breakers, switches, etc.). For example, PG&E's Fast Trip Settings.
	Crew-accompanying ignition prevention and suppression resources and services	Those firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, and water) that are deployed with construction crews and other electric workers to provide site-specific fire prevention and ignition mitigation during on-site work
	Personnel work procedures and training in conditions of elevated fire risk	Work activity guidelines that designate what type of work can be performed during operating conditions of different levels of wildfire risk. Training for personnel on these guidelines and the procedures they prescribe, from normal operating procedures to increased mitigation measures to constraints on work performed.
	Protocols for PSPS re- energization	Designing and executing procedures that accelerate the restoration of electric service in areas that are de-energized, while maintaining safety and reliability standards.
	PSPS events and mitigation of PSPS impacts	Designing, executing, and improving upon protocols to conduct PSPS events, including development of advanced methodologies to determine when to use PSPS, and to mitigate the impact of PSPS events on affected customers and residents.
	Stationed and on-call ignition prevention and suppression resources and services	Firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, firefighting foam, chemical extinguishing agent, and water) stationed at utility facilities and/or standing by to respond to calls for fire suppression assistance.
G. Data governance	Centralized repository for data	Designing, maintaining, hosting, and upgrading a platform that supports storage, processing, and utilization of all utility proprietary data and data compiled by the utility from other sources.
	Collaborative research on utility ignition and/or wildfire	Developing and executing research work on utility ignition and/or wildfire topics in collaboration with other non-utility partners, such as academic institutions and research groups, to include data-sharing and funding as applicable.
	Documentation and disclosure of wildfire-related data and algorithms	Design and execution of processes to document and disclose wildfire-related data and algorithms to accord with rules and regulations, including use of scenarios for forecasting and stress testing.
	Tracking and analysis of near-miss data	Tools and procedures to monitor, record, and conduct analysis of data on near miss events.
H. Resource allocation methodology	Allocation methodology development and application	Development of prioritization methodology for human and financial resources, including application of said methodology to utility decision-making.
	Risk reduction scenario development and analysis	Development of modeling capabilities for different risk reduction scenarios based on wildfire mitigation initiative implementation; analysis and application to utility decision- making.

Category	Initiative activity	Definition
	RSE analysis	Tools, procedures, and expertise to support analysis of wildfire mitigation initiative risk- spend efficiency, in terms of MAVF and/ or MARS methodologies.
I. Emergency planning and preparedness	Adequate and trained workforce for service restoration	Actions taken to identify, hire, retain, and train qualified workforce to conduct service restoration in response to emergencies, including short-term contracting strategy and implementation.
	Community outreach, public awareness, and communications efforts	Actions to identify and contact key community stakeholders; increase public awareness of emergency planning and preparedness information; and design, translate, distribute, and evaluate effectiveness of communications taken before, during, and after a wildfire, including AFN populations and Limited English Proficiency populations in particular.
	Customer support in emergencies	Resources dedicated to customer support during emergencies, such as website pages and other digital resources, dedicated phone lines, etc.
	Disaster and emergency preparedness plan	Development of plan to deploy resources according to prioritization methodology for disaster and emergency preparedness of utility and within utility service territory (such as considerations for critical facilities and infrastructure), including strategy for collaboration with Public Safety Partners and communities
	Preparedness and planning for service restoration	Development of plans to prepare the utility to restore service after emergencies, such as developing employee and staff trainings, and to conduct inspections and remediation necessary to re-energize lines and restore service to customers.
	Protocols in place to learn from wildfire events	Tools and procedures to monitor effectiveness of strategy and actions taken to prepare for emergencies and of strategy and actions taken during and after emergencies, including based on an accounting of the outcomes of wildfire events.
J. Stakeholder cooperation and community engagement	Community engagement	Strategy and actions taken to identify and contact key community stakeholders; increase public awareness and support of utility wildfire mitigation activity; and design, translate, distribute, and evaluate effectiveness of related communications. Includes specific strategies and actions taken to address concerns and serve needs of AFN populations and Limited English Proficiency populations in particular.
	Cooperation and best practice sharing with agencies outside CA	Strategy and actions taken to engage with agencies outside of California to exchange best practices both for utility wildfire mitigation and for stakeholder cooperation to mitigate and respond to wildfires.
	Cooperation with suppression agencies	Coordination with CAL FIRE, federal fire authorities, county fire authorities, and local fire authorities to support planning and operations, including support of aerial and ground firefighting in real-time, including information-sharing, dispatch of resources, and dedicated staff.

Category	Initiative activity	Definition
	Forest service and fuel reduction cooperation and joint roadmap	Strategy and actions taken to engage with local, state, and federal entities responsible for or participating in forest management and fuel reduction activities; and design utility cooperation strategy and joint stakeholder roadmap (plan for coordinating stakeholder efforts for forest management and fuel reduction activities).

9.2 CITATIONS FOR RELEVANT STATUTES, COMMISSION DIRECTIVES, PROCEEDINGS, AND ORDERS

Throughout the WMP, cite relevant state and federal statutes, Commission directives, orders, and proceedings. Place the title or tracking number of the statute in parentheses next to comment, or in the appropriate column if noted in a table. Provide in this section a brief description or summary of the relevant portion of the statute. Track citations as end-notes and order (1, 2, 3…) across sections (e.g., if section 1 has 4 citations, section 2 begins numbering at 5).

Citation	Description/Summary	WMP Sections
Public Utilities Code § 8386	Law that, among other things, requires electric corporations to submit wildfire mitigation plans	Executive Summary, pg. viii
Public Resources Code § 4292	Minimum clearance around the base of the pole cleared of all flammable vegetation down to bare soil and the removal of all dead tree branches within this cylinder up to the cross-arm .	Section 7.3.5. pg. 193; Section 7.3.5.5.1 pg. 200
Public Resources Code § 4293	CAL FIRE requires 10 feet of minimum clearance around the base of the pole cleared of all flammable vegetation down to bare soil and the removal of all dead tree branches within this cylinder up to the cross-arm (within the State Responsibility Area)	Section 7.3.5.19, pg. 215
Resolution WSD-002	Guidance Resolution on 2020 Wildfire Mitigation Plans Pursuant to Public Utilities Code Section 8386.	Executive Summary, pg. viii
Resolution WSD-005	Resolution Ratifying Action of the Wildfire Safety Division on San Diego Gas & Electric Company's 2020 Wildfire Mitigation Plan Pursuant to Public Utilities Code Section 8386.	Executive Summary, pg. viii
Resolution WSD-011	Resolution implementing the requirements of Public Utilities Code Sections 8389(d)(1), (2) and (4), related to catastrophic wildfire caused by electrical corporations subject to the Commission's regulatory authority	Executive Summary, pg. viii
R.18-10-007	Order Instituting Rulemaking to Implement Electric Utility Wildfire Mitigation Plans Pursuant to Senate Bill 901 (2018)	Section 7.3.1.1, pg. 150; Section 4.5.1.4, pg. 81
R.20-07-013	Order Instituting Rulemaking to Further Develop a Risk-based Decision-making Framework for Electric and Gas Utilities	Executive Summary, pg. viii; Section 4.2, pg. 35

Citation	Description/Summary	WMP Sections
D.18-03-011	CPUC Phase 2 Decision Adopting Safety Model Assessment Proceeding Settlement Agreement with Modifications	Section 7.3.9.3, pg. 237
D.20-03-004	CPUC Decision on Community Awareness and Public Outreach Before, During, and After a Wildfire, and Explaining Next Steps for Other Phase 2 Issues	Section 8.1, pg. 251
D.21-06-034	Decision Adopting Phase 3 Updated	Section 8.1, pg. 251
General Order 95	Overhead electric line design, construction, and maintenance requirements in order to ensure adequacy of service and safety; covers topics such as proper grounding, clearances, strength requirements, and tree trimming	Executive Summary, pg. viii; Section 4.4.1.2, pg. 49; Section 5.4.3, pg. 123; Section 7.1, pg. 134; Section 7.3.4.1, pg. 181; Section 7.3.4.11, pg. 188; Section 7.3.4.14, pg. 189; Section 7.3.5.19, pg. 215; Section 9.3, pg. 282
General Order 96.b	[Provisions adopted by Decision (D.) 01-07-026 (July 12, 2001), D.02-01-038 (January 9, 2002), D.05-01-032 (January 13, 2005), D.07-01-024 (January 25, 2007), D.07-09-019 (September 6, 2007), D.08-05-019 (May 15, 2008), Resolution ALJ-221 (August 21, 2008), Resolution W-4749 (March 26, 2009), and D.09-04-005 (April 16, 2009) Resolution T-17327 (January 12, 2012) Resolution ALJ-346 (May 10, 2018)	Section 7.2, pg. 144
General Order 165	Inspection requirements for transmission and distribution facilities in order to ensure safety and high-quality electrical service; sets maximum allowable inspection cycle lengths, scheduling and performance of corrective action, record-keeping, and reporting	Executive Summary, pg. viii Section 4.5.2, pg. 101; Section 7.3.4.1, pg. 181; Section 7.3.4.6, pg. 185; Section 7.3.4.11, pg. 188;
General Order 166	Standards for Operation, Reliability, and Safety During Emergencies and Disasters	Executive Summary, pg. viii
General Order 174	Inspection requirements for substations to promote the safety of workers, the public, and enable adequacy of service	Section 7.3.5.15, pg. 210
SB 901	Wildfire Preparedness and Response	Executive Summary, pg. viii
WSD GIS Data Standards	Wildfire Safety Division Draft Geographic Information System Data Reporting Requirements and Schema for California Electrical Corporations (August 21, 2020); Sets forth requirements for WMP spatial data submissions	Section 6.5, pg. 130
WSD-017 OEIS Action Statement	Office of Energy Infrastructure Safety Final Revised Action Statement issued June 2021.	Section 7.3.2.2.2, pg. 161; Section 7.3.3.3, pg. 169; Section 7.3.3.4, pg. 171; Section 7.3.3.7, pg. 173

9.3 COVERED CONDUCTOR INSTALLATION REPORTING

In Section 7.3.3.3, page 169 covered conductor installation, report on the following key information for covered conductor installation:

- Methodology for installation and implementation

Covered conductor is installed as a component of the PacifiCorp Line Rebuild Program. The line rebuild program includes installing covered conductor, replacing poles with more fire resistant materials, and replacing small diameter copper conductor. When a circuit is identified for the Line Rebuild Program based on risk, engineering looks at the full system along that line for upgrades to align with Wildfire Mitigation objectives. Lines identified during the Line Rebuild evaluation for covered conductor installation are installed per internal standards and policies.[33] These policies and standards align with the manufacturer recommendations and provide the overall instruction for field installations.

- Design and design considerations (such as selection of type of covered conductor, additional hardware needed for installation, pole strengthening or replacements, etc.)

Once the line is identified for rebuild, generally as a result of risk analysis intended to reduce the potential for PSPS events, area engineering evaluates the scoped line for additional hardware needed for installations, similar to how other distribution projects are defined such as new connections or load growth accommodations. Additional hardware can include items such as cross arm replacement, pole replacement and small copper diameter conductor replacement. After the general scope is finalized, a detailed engineering analysis for each pole and segment is performed by a licensed engineering contractor. This pole loading calculations to determine whether pole replacements are needed to accommodate the additional weight of covered conductor. As a final step prior to construction, this detailed analysis is quality checked internally by engineering to ensure the final design meet internal standards.

- Implementation (including timeframes, prioritization, contractor and labor needs, etc.)

General implementation progress and timelines for covered conductor are included in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx. Since initiation in 2019, the company has delivered fewer miles of covered conductor in California than planned and is currently faced with the continued challenge of ramping up to achieve 2022 targets. Line rebuild projects using covered conductor were initially viewed similar to other distribution projects with short lead times and moderate construction needs. However, these projects generally require a 12-24 project pipeline, depending on permitting and right of way requirements. Additionally, construction resources within the region tend to compete, resulting in construction bottle necks. PacifiCorp acknowledges that these challenges are likely to continue and impact the delivery of covered conductor. To address these challenges, PacifiCorp is planning to engage

[33] Example internal standards include Policy ED 061 and ED-061 supplied via data request to OEIS on March 8, 2022.

a construction management partner through a competitive bidding process in 2022. This new contracted partner is expected to facilitate delivery of the various aspects of covered conductor projects, such as project management, project controls, project reporting, engineering, estimating, permitting, surveying, material procurement, material management, construction, and post construction inspections. PacifiCorp anticipates that the new contracted partner will begin supporting the delivery of covered conductor in late 2022 or early 2023.

- Long-term operations and considerations (including maintenance, long-term effectiveness and feasibility, effectiveness monitoring, etc.)

Maintenance for covered conductor as per GO 95 and 165 will be integrated into the 2023 visual inspection processes for damage. PacifiCorp plans to monitor and measure effectiveness as per the initiative evaluation processes described in Attachment 6.

- Key assumptions

Key assumptions in the cost effectiveness of covered conductor have been explained in Attachment 6.

- Cost-effectiveness evaluations (including cost breakdown per circuit mile, comparison with alternatives, etc.)

PacifiCorp cost effectiveness evaluation of covered conductor has been provided in the Attachment 6: Joint Utility Response to Covered Conductor, provided to OEIS.

- Any other activities relevant to the covered conductor installation

PacifiCorp installs covered conductor and undergrounds conductor as part of the Line Rebuild Program described in Section 7.3.3.3 starting on page 169.

9.4 UNDERGROUNDING IMPLEMENTATION REPORTING

In Section 7.3.3.16, on page 180, undergrounding of electric lines and/or equipment, report on thefollowing key information for undergrounding implementation:

- Methodology for installation and implementation

As described in Section 7.3.3.3 starting on page 169, PacifiCorp evaluates the potential to convert overhead lines to underground lines for rebuild projects on a project-by-project basis. Through the design process, each individual project is assessed to determine whether sections of the rebuild should be completed with underground construction. Once selected, PacifiCorp installs underground lines consistent with engineering standards, local permitting requirements, and general construction practices.

- Design and design considerations (such as permitting requirements, additional hardware needed for installation, etc.)

When compared to overhead installations, undergrounding requires different conductor, vaults, and pad mounted equipment. Additionally, when converting to underground, customer equipment, such as meter bases, generally need to be changed or reconfigured. Generally, PacifiCorp does not have easements larger than what is needed for overhead lines and, therefore, conversion to underground often requires additional easements as the effective footprint of underground can be larger than overhead.

Despite these challenges undergrounding can be an appropriate solution in many instances. For example, the preferences of certain land-owners may favor undergrounding, and/or codes and zoning restrictions may dictate the use of underground. Furthermore, in highly remote or rugged terrain locations with few customer connections, underground may be the preferred alternative to improve reliability and reduce wildfire risk. Most customer overhead meter bases cannot accept underground conductor or are located in an area that may not support underground installation, therefore there can be a significant cost associated with converting an overhead line to underground where there are a lot of customers on the line.

- Implementation (including timeframes, prioritization, contractor and labor needs, etc.)

A typical timeline for undergrounding conductor can be two to five years, depending on land use permitting, easement requirements, number of customer connections, road or railroad crossings, and general topography. Underground projects also generally take longer to construct and can require additional contractors for civil construction work, and equipment operators.

Undergrounding conductor, when used, is a component of the line rebuild program, thus it is prioritized the same way as covered conductor. The general implementation process for underground is described below.

- Long-term operations and considerations (including maintenance, long-term effectiveness and feasibility, effectiveness monitoring, etc.)

As described in Section 7.3.3.3 starting on page 169, underground if generally the most effective at reducing the risk of any utility-related ignition. Other benefits include aesthetics, reliability, and PSPS avoidance. Additionally, underground installations do not require the

same vegetation management or asset inspection activities as overhead installations. This can be a long term operational and cost consideration. However, operations and maintenance of underground is not without challenges. Routine assessment of asset condition, typical accomplished through visual inspections for overhead equipment, can require the use of very expensive, highly specialized equipment. Additionally, should a fault occur on underground equipment resulting in an outage, fault location and restoration can be more challenging and more costly as compared to overhead installations. Additionally, the general cost of underground construction often makes it difficult to apply on a widespread basis. As described in Section 7.3.3.3 starting on page 169, PacifiCorp, at this time, is considering limited and strategic use of undergrounding on a project-by-project basis and plans to continue learning from other utilities that may be using underground more broadly as a wildfire mitigation tactic.

- Key assumptions

PacifiCorp generally assumes that underground is the most effective tactic to reduce ignition risk by eliminating or nearly eliminating the potential for contact with object, vegetation management, or other weather-related impact such as wind, which are get ignition risk drivers. Additionally, based on experience, PacifiCorp assumes that underground is more costly to construct that overhead.

- Cost-effectiveness evaluations (including cost breakdown per circuit mile, comparison with alternatives, etc.)

Generally, undergrounding conductor is more expensive than covered conductor due to the increase in equipment needed, additional procurement of land and additional labor. PacifiCorp estimates, based on experience and general observation of the California Service Territory that undergrounding could cost between $1 million - $6 million per line mile. The large range of costs reflects variation in permitting, construction, and number of meters on the line.

- Any other activities relevant to the undergrounding implementation

PacifiCorp installs covered conductor and undergrounds conductor as part of the Line Rebuild Program described in Section 7.3.3.3 starting on page 169.

~~2022~~ ~~Wildfire Mitigation Plan~~

~~May 6, 2022~~

2022 Wildfire Mitigation Plan

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ACRONYMS

ACS	American Community Survey
AFN	Access and functional needs
ANSI	American National Standards Institute
CPUC	California Public Utilities Commission
DFA	Distribution fault anticipation
ECC	Emergency Coordination Center
EFR	Elevated fire risk
ERC	Energy release component
FPI	Fire potential index
GACC	Geographic Area Coordination Center
GHG	Greenhouse gas
GO 95	California General Order 95
GRC	General rate case
HWW	High Wind Warning
HFTD	High fire threat district
IOU	Investor-owned utility
IR	Infrared
iUTI	Integrated utility threat index
LRAM	Localized Risk Assessment Model
MARS	Multi-attribute risk score
MAVF	Multi-attribute value function
NLCD	National Land Cover Database
NWS	National Weather Service
PDZ	Power de-energization zone
PSPS	Public Safety Power Shutoff
QA/QC	Quality assurance/quality control
RAMP	Risk assessment mitigation phase
RF	Radio frequency
RSE	Risk-spend efficiency
S-MAP	Safety model and assessment proceeding
SCADA	Supervisory control and data acquisition
SME	Subject matter expert
TCC	Time current characteristic
WFA-E	Wildfire Analyst-Enterprise
WMP	Wildfire mitigation plan
WRF	Weather research and forecast
WRRM	Wildfire Risk Reduction Model
WSAB	Wildfire Safety Advisory Board
WUI	Wildland-urban interface
ZOP	Zone of protection

EXECUTIVE SUMMARY

Despite years of focus on wildfire prevention, particularly in California, wildfires continue to impact communities at a more substantial rate than previously recorded. This has exacerbated the costs of wildfire in terms of both loss of human life and property damage. While electric utilities have always needed to mitigate against the potential of wildfire, the continuing growth of the wildland-urban interface (WUI), climate change and a host of other variables require even greater focus to prevent wildfires.

For decades the California Public Utility Commission (CPUC or Commission) has worked to address the specific risks created by the operation of an electric grid through regulations and programs, with even more substantial and targeted efforts over the past several years. PacifiCorp, which does business as Pacific Power in California, has been an active participant as these efforts have evolved. The CPUC first initiated a decade-long fire safety rulemaking in 2008. The first phase of this rulemaking focused on immediate measures in the highest fire risk area, in the seven counties of southern California. Thereafter, rules (codified in General Orders [GO] 95, 165 and 166) having a longer timeline for implementation were developed to reduce the risk of fire ignition caused by overhead utility systems. These rules culminated at approximately the same time the state was experiencing widespread drought, and the company was directed to identify and implement actions, including these new rules, to address wildfire risk on its system. As a result, a Fire Prevention Plan and a Drought Mitigation Plan were prepared and implemented starting in 2014.

In early 2018, as the multi-phase rulemaking concluded, the state of California experienced catastrophic wildfires in both northern and southern California, spurring greater efforts to augment the Drought Mitigation and Fire Prevention plans. In response to Senate Bill (SB) 901, California took a comprehensive approach to mitigating wildfires while also working to create a more resilient electric grid. A key element of SB 901, Public Utilities Code § 8386 and resolutions WSD-002, WSD-005 and WSD-011, is the requirement for all electric utilities to develop and implement Wildfire Mitigation Plans (WMP or Plan). These WMPs were first filed and approved in 2019, while in 2020 the plans were bolstered with process changes developed by the nascent Wildfire Safety Division (WSD).

Starting in 2020, WMPs are to be filed in a three-year cycle, with annual updates until the planning period terminates. The Plan builds on the company's previous filings, in addition to incorporating substantial changes based on stakeholder feedback and input gained through the WSD review process. The 2021 Update seeks to fill gaps identified in the 2020 WMP and address feedback on the company's Remedial Compliance Plan (RCP) filing and Quarterly Updates. Each of the improvements in this Update represents another incremental step towards identification of wildfire risk, strategic identification of options available to mitigate the risk and prioritization and rationalization for each of these mitigation measures.

The first WMPs were developed and filed pursuant to SB 901 in the Commission's

Rulemaking (R.) 18-10-007. Following approval of the 2019 WMPs and the filing and conditional approval of the 2020 WMP, RCP and Quarterly Report, the company has continued to engage with stakeholders, regulators including the Commission, WSD, public safety partners, fire science experts and other utilities and utility experts, to improve and refine its mitigation and planning process. The end goal of these efforts is to improve wildfire resilience and safety for our customers and the broader public using the most appropriate, timely and cost-effective mitigation measures.

Where possible, this update outlines successes and areas where improvements have been made, as well as areas still ripe for improvement. PacifiCorp has continued to improve upon current and legacy datasets to bolster the accessibility of the data provided and, as analytical methods and discoveries emerge, has rapidly incorporated them into the plan to yield better outcomes. PacifiCorp remains fully committed to the continued development and improvement of the company's risk-based decision-making framework; it should be noted, however, that PacifiCorp does not have the risk assessment mitigation phase (RAMP)/Safety model and assessment proceeding (S-MAP) requirements from proceeding R.20-07-013, as the three larger IOUs have. The company has leveraged lessons learned from its experience and the experience of other utilities, guidance from the Commission's initiatives, and engineering and operational best practices to evolve its approach to managing wildfire risk. This experience includes years of experience implementing safety and reliability risk mitigation programs. As a result, many of the initiatives and programs identified in this plan are an extension or augmentation of scope for already existing programs (e.g., the company's vegetation maintenance inspection and correction programs). This experience was also leveraged with historical data when new programs or activities were necessary (e.g., installation of covered conductor).

To date, PacifiCorp has been able to achieve substantial success through implementation of its plans. Key objectives for 2022 include continued implementation of baseline programs, initiation of new programs such as expulsion fuse replacements and installation of fault indicators, development of new technology pilots in the areas of distribution inspections and wildfire detection, and significant investment and advancement of situational awareness through procurement and implementation of several Technosylva modules. These key investments will advance the maturity of multiple initiatives, including risk mapping, the development of a quantitative risk-spend efficiency (RSE), resource allocation, and operational decision-making. Obtaining Technosylva tools will also allow for more precision in the application of mitigation efforts, such as Public Safety Power Shutoff (PSPS). PacifiCorp also plans to implement two pilot programs, a wildfire detection pilot for enhanced situational awareness and an enhanced overhang reduction pilot.

INTRODUCTION

The California Public Utilities Commission (CPUC) guidance in Decision (D.)19-05-036 included substantive and procedural requirements for future Wildfire Mitigation Plans (WMP) based on lessons learned during the first WMP (2019) evaluation and established an expectation for improvement in the WMPs each year. As such, the Office of Energy Infrastructure Safety (Energy Safety), formerly the CPUC's Wildfire Safety Division, has matured the guidelines and reporting requirements for each WMP and WMP Update.

Overview of WMP Guideline Improvements During the 3-year Plan Cycle (2020 – 2022)

- ***2020 WMP Guideline Improvements*** *– The 2020 WMP submission and review process included substantial changes from earlier guidance, which streamlined the structure and consistency in data submissions, requested additional supporting data earlier in the WMP process, and utilized a more structured and consistent approach to evaluating the WMPs. The 2020 WMPs were the base year in a three-year cycle from 2020-2022.*

- ***2021 WMP Guideline Improvements*** *– The 2021 Guidelines were updated based on several guiding principles from lessons learned, comments from stakeholders, and input from the Wildfire Safety Advisory Board (WSAB) during the 2020 WMP evaluation period. This feedback informed the development of four key elements for the 2021 WMP submission and review process:*

  1. *Frontloaded data collection. Process revisions for this element extended the timeframe for Energy Safety and stakeholder review of relevant utility[1] data in advance of the WMP submission and review period, while also reducing the need for follow-up data requests. In addition, with these revisions, utilities submit some data through Quarterly Reports prior to the development of the annual WMP.*
  2. *Standardized templates for utility WMP submission. The 2021 Guidelines included additional templates to facilitate WMP evaluations and comparisons across utility WMPs and identify relevant supporting information. The guidelines also introduced standardization for narrative sections and additional sub-headings. A specific data schema and automated calculation checklist also now standardize Quarterly Reports.*

[1] The term "utility" is used interchangeably with "electrical corporation."

3. *Systematized qualitative evaluation. The guidelines established an assessment framework to increase objectivity, consistency and efficiency of WMP evaluations.*

4. *Tracked utility progress towards wildfire and Public Safety Power Shutoff (PSPS) risk reduction. The 2021 Guidelines provided instructions and guidance for the first annual WMP Updates to the initial three-year plans submitted by the Utilities in 2020. The 2021 WMP Updates highlighted the progress each utility made since 2020.*

- ***2022 WMP Guideline Improvements** – In a similar spirit of continuous improvement, the 2022 WMP Update Guidelines (2022 Guidelines) include new requirements and updates based on lessons learned and comments received from various stakeholder groups (e.g., the public, utilities, WSAB, and Energy Safety staff) during the 2021 WMP evaluation period. As 2022 is the final year of the 3-year plan cycle (2020 – 2022), the 2022 Guidelines primarily correct errors, address omissions, and inconsistencies, and incorporate minor improvements to structure, process, and data reporting elements. Changes are minimal to enable comparison across 2020-2022 WMPs and are as set forth below.*

Naming Convention

To improve the administrative management of WMP submissions, the electronic file names for the WMPs and associated document/data submissions must follow the standardized electronic naming convention illustrated in Table 1 below. The electronic file name(s) must include, in order, the naming convention identified in each column (without quotation marks), with an underscore between the character string of each column. See examples below.

Table 1: Electronic file naming convention with examples

Date Submitted (Year- Month-Day)	*Utility Abbreviated Name*	*Document Year*	*Document Type*	*Revision Number*
"2022-02-05"	• *"PGE" (Pacific Gas & Electric Company)* • *"SDGE" (San Diego Gas & Electric)* • *"SCE" (Southern California Edison)* • *"BVES" (Bear Valley Electrical Services)* • *"LU" (Liberty Utility)* • *"PC" (PacifiCorp)* • *"HWT" (Horizon West)* • *"TBC" (Trans Bay Cable)*	*"2022"*	• *"WMP" (Wildfire Mitigation Plan)* • *"WMP-Update" (Wildfire Mitigation Plan Update)* • *"Survey" (Maturity Model Survey)* • *"Metrics" (Performance Metrics Data)* • *"RNR" (Revision Notice Response)* • *"DSSR" (Data Schema Status Report)* • *"COR" (Change Order Report)* • *"PR" (Progress Report)* • *"QDR" (Quarterly Data Report)* • *"QIU" (Quarter Initiative Update)*	• *R0 (First Version)* • *R1 (Revision 1)* • *R2 (Revision 2)*

Examples:

- ***First Version of a WMP Submission:*** *"2022-02-05_PGE_2022_WMP-Update_R0", which refers to the PG&E 2022 WMP Update submitted on Feb 05, 2022, first version*
- ***Updated submission in response to Energy Safety Revision Notices:*** *"2022-06-05_HW_22_RNR_R1", which refers to the Horizon West Revision Notice Response submitted on June 5, 2022, revision 1*
- ***Maturity Model submission:*** *"2022-04-05_TBC_2022_Survey_R0", which refers to the Trans Bay Cable 2022 Maturity Model Survey submitted on April 5, 2022, first version*
- ***Quarter 2 Report data submission:*** *"2022-05-05_LU_2022_Q2-data_R0", which refers to the Liberty Utility 2022 Quarter 2 Report data submitted on May 5, 2022, first version*

***WMP** Structure*

The structure and organization of the 2022 WMP Updates must follow the eight sections and appendix indicated in Table 2 below.

Table 2: Structure of2022 WMP update

Section # and Title	***General Content***
***Section 1** – Persons responsible forexecuting the plan*	*Contact information for responsible executives, program owners, and experts*
***Section 2** – Adherence to statutoryrequirements*	*Checklist for each requirement with associated section and page number for where a requirement is addressed in the WMP*
***Section 3** – Actuals and planned spending*	*Cost summary tables and impacts toratepayers*
***Section 4** – Lessons learned and risk trends*	*1, 3, and 10-year investor-owned utility (IOU) outlook, projected trends in wildfire risk, research reports and proposals, and model and metric calculation methodologies*
***Section 5** – Inputs to the plan and directional vision*	*Goals, objectives, program targets, and worker qualifications*
***Section 6** – Metrics and underlying data*	*Placeholder for quarterly submissions of WMP metrics. To be filled in by data from prior submissions and Quarterly Data Reports (QDR)*
***Section 7** – Mitigation initiatives*	*Reporting of initiative progress, expenditures,and Risk-Spend Efficiency (RSE)*
***Section 8** – Public Safety Power Shutoff*	*PSPS narrative and data, including customer impact and cost*
***Section 9** – Appendix*	*Citations to relevant statutes, Commission directives, proceedings and orders, and detailed discovery log.*

General Instructions

The following subsection provides detailed instructions for preparing the 2022 WMP Update.

Narratives

Each section of the WMP is required to include narrative responses. The narrative responses must provide qualitative descriptions and explanations of the requested information, supported with a variety of visual aids (e.g., maps, summary tables, informatics, diagrams, flow charts, photographs, sample calculations/equations) and other supporting documentation to facilitate communication and substantiation of concepts and strategies. Each narrative must be clear, concise, and include a high-level bulleted summary of key takeaways for the respective section (where appropriate). WMP Updates must be limited in duplication of narratives across different sections.

Cross-Referencing

The WMP Update must include cross-referencing and hyperlinks to minimize duplication of narratives and provide quick referencing to other relevant sections. All figures and tables must incorporate the use of captions with associated references in the main body of the WMP using hyperlinks. PDFs must incorporate the use of electronic bookmarks for all sections, main headings, and sub-headings.

Quantitative Responses

Use the template tables for reporting quantitative data according to the instructions provided in the respective sections. If a table includes comment boxes, the comment boxes may be extended as needed. Some tables, such as those in Section 3, require reporting directly in the WMP alongside the narrative content. Quarterly Data Reports (QDR) must include the required data in a separate spreadsheet document following the standard format in Attachment 3. Completely fill out the data tables including both existing and updated data. Each section must include a narrative identifying updated tables.

Protocols for Inaccessible Data/Information

If any portion of the WMP requires information that the utility cannot collect and/or is not obtainable from peer utilities, the utility is required to work with federal-, state-, and local- agencies, stakeholders, or partners to obtain the necessary information. When requested information is not collected by any stakeholder, then the utility must identify these circumstances and provide a description of an alternative source of information or proxy that most closely fits the original requirement. The WMP shall clearly cite the source(s) of the data used in lieu of the required data.

For example, by the WMP submission deadline, a utility may not have a full accounting of the value of property destroyed by utility-related ignitions each year due to ongoing investigation into the cause of one or more wildfires within its service territory. In this example, the utility is required to indicate: 1) the known sum of the value of property determined by the relevant fire Authorities Having Jurisdiction (AHJs) to have been destroyed by utility-related ignitions in that year, even if this summation is incomplete, and 2) a list of the wildfires in that year, and an estimation of the value of property destroyed by each wildfire, for which utility facilities are being investigated as potential sources of ignition but for which the cause is still undetermined. The utility is required to cite all data sources used in the calculations.

Finally, the utility is required to provide a plan for improving its data collection and/or cooperation with partners for collecting the required information, including a timeline for implementation. If any of the requested information is confidential, the utility is required to submit two versions to Energy Safety – one that includes all the requested information and a second that redacts the confidential information.

GENERAL GLOSSARY OF DEFINED TERMS

Term	*Definition*
10-hour dead fuel moisture content	*Moisture content of small dead vegetation (e.g.., grass, leaves, which burn quickly but not intensely), which can respond to changes in atmospheric moisture content within 10 hours.*
Access and functional needs (AFN) populations	*Per Public Utilities Code (Pub. Util. Code) § 8593.3 and D.19-05-042, individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking, older adults, children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant.*
Authority Having Jurisdiction	*AHJ, party with assigned responsibility, depending on location and circumstance.*
Asset (utility)	*Electric lines, equipment, or supporting hardware.*
At-risk species	*Species of vegetation that have an elevated risk of (1) coming into contact with powerlines, (2) causing an outage or ignition, and/or (3) easily ignitable and within close enough proximity to potential arcing, sparks and/or other utility equipment thermal failures. "At-risk species" must be a function of species-specific characteristics including growth rate, failure rate of limbs, trunk, and/or roots (as compared to other species), height at maturity, flammability, vulnerability to disease or insects, etc.*
Baseline (ignition probability, maturity)	*A measure, typically of the current state, which establishes a starting point for comparison with measures from other states.*
Carbon dioxide equivalent	*Tons of greenhouse gases (GHG) emitted, multiplied by the global warming potential relative to carbon dioxide.*
Circuit mile	*The total length in miles of separate circuits regardless of the number of conductors used per circuit*
Contractor	*Any individual in the temporary and/or indirect employ of the utility whose limited hours and/or time-bound term of employment are not considered as "full-time" for tax and/or any other purposes.*

Critical facilities and infrastructure	*For brevity in the WMP, "critical facilitates and infrastructure" may be shortened to "critical infrastructure" and/or "critical facilities" throughout the WMP. Critical facilities and infrastructure are defined in accordance with the definition adopted in D.19-05-042 and modified in D.20-05- 051: those facilities and infrastructure that are essential to the public safety and that require additional assistance and advance planning to ensure resiliency during de-energization events. Namely:*
	• *Emergency Services Sector*
	  ○ *Police Stations*
	  ○ *Fire Station*
	  ○ *Emergency Operations Centers*
	  ○ *Public safety answering points*
	• *Government Facilities Sector*
	  ○ *Schools*
	  ○ *Jails and prisons*
	• *Healthcare and Public Health Sector*
	  ○ *Public Health Departments*
	  ○ *Medical facilities, including hospitals, skilled nursing facilities, nursing homes, blood banks, health care facilities, dialysis centers and hospice facilities (excluding doctor offices and other non- essential medical facilities)*

Term	*Definition*

	• *Energy Sector*
	  ○ *Public and private utility facilities vital to maintaining or restoring normal service, including, but not limited to, interconnected publicly owned utilities and electric cooperatives*
	• *Water and Wastewater Systems Sector*
	  ○ *Facilities associated with the provision of drinking water or processing of wastewater including facilities used to pump, divert, transport, store, treat and deliver water or wastewater*
	• *Communications Sector*
	  ○ *Communication carrier infrastructure including selective routers, central offices, head ends,*
	  ○ *cellular switches, remote terminals and cellular sites*
	• *Chemical Sector*
	  ○ *Facilities associated with the provision of manufacturing, maintaining, or distributing hazardous materials and chemicals (including Category N-Customers as defined in D.01-06-085)*
	• *Transportation Sector*
	  ○ *Facilities associated with automobile, rail, aviation, major public transportation, and maritime transportation for civilian and military purposes*

Customer hours	*Total number of customers, multiplied by the average number of hours (e.g.., of power outage).*
Data cleaning	*Calibrating raw data to remove errors (including typographical and numerical mistakes).*
Dead fuel moisture content	*Moisture content of dead vegetation, which responds solely to current environmental conditions and is critical in determining fire potential.*
Detailed inspection	*In accordance with GO 165, an inspection where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.*
Enhanced inspection	*Inspection whose frequency and thoroughness exceeds the requirements of the detailed inspection, particularly if driven by risk calculations.*
Enterprise system	*A centralized information system that ensures data may be shared throughout all functional levels and management hierarchies of an organization, as needed.*
Evacuation impact	*Number of people evacuated, with the duration for which they are evacuated, from homes and businesses, due to wildfires.*
Evacuation zone	*Areas designated by CAL FIRE and local fire agency evacuation orders, to include both "voluntary" and "mandatory" in addition to other orders such as "precautionary" and "immediate threat".*
Fire Season	*The time of year that wildfires are most likely to take place for a given geographic region due to historical weather conditions, vegetative characteristics and impacts of climate change. Goals and targets which have milestones related to the onset, duration, or end of "fire season" or "height of fire season" must be accompanied with calendar dates.*
Frequently de-energized circuit	*A circuit which has been de-energized pursuant to a de- energization event to mitigate the risk of wildfire three or more times in a calendar year.*
Fuel density	*Mass of fuel (vegetation) per area which could combust in a wildfire.*

Term	Definition
Fuel management	*Removing thinning, or otherwise altering vegetation to reduce the potential rate of propagation or intensity of wildfires.*
Fuel moisture content	*Amount of moisture in each mass of fuel (vegetation), measured as a percentage of its dry weight.*
Full-time employee	*Any individual in the ongoing and/or direct employ of the utility whose hours and/or term of employment are considered as "full-time" for tax and/or any other purposes.*
GO 95 nonconformance	*Condition of a utility asset that does not meet standards established by General Order 95.*
Greenhouse gas (GHG) emissions	*Health and Safety Code 38505 identifies seven greenhouse gases that ARB is responsible to monitor and regulate to reduce emissions: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF3).*
Grid hardening	*Actions (such as equipment upgrades, maintenance, and planning for more resilient infrastructure) taken in response to the risk of undesirable events (such as outages) or undesirable conditions of the electrical system to reduce or mitigate those events and conditions, informed by an assessment of the relevant risk drivers or factors.*
Grid topology	*General design of an electric grid, whether looped or radial, with consequences for reliability and ability to support de- energization (e.g., being able to deliver electricity from an additional source).*
Hazard tree	*A tree that has a structural defect that makes it likely to fail in whole or in part.*
High Fire Threat District (HFTD)	*Per D.17-01-009, areas of the State designated by the Office of Energy Infrastructure Safety and CAL FIRE to have elevated wildfire risk, indicating where each utility must take additional action (per GO 95, GO 165, and GO 166) to mitigate wildfire risk.*
Highly rural region	*In accordance with 38 CFR 17.701, "highly rural" must be defined as those areas with a population of less than 7 persons per square mile. For the purposes of the WMP, "area" must be defined as census tracts.*
High Wind Warning (HWW)	*Level of wind risk from weather conditions, as declared by the National Weather Service (NWS). For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings.2*
HWW overhead (OH) Circuit Mile Day	*Sum of overhead circuit miles of utility grid subject to High Wind Warnings (HWW, as defined by the NWS) each day within a given time, calculated as the number of overhead circuit miles that are under an HWW multiplied by the number of days those miles are under said HWW. For example, if 100 overhead circuit miles are under an HWW for 1 day, and 10 of those miles are under HWW for an additional day, then the total HWW OH circuit mile days would be 110.*
Ignition probability	*The relative possibility that an ignition will occur, probability is quantified as a number between 0% and 100% (where 0% indicates impossibility and 100% indicates certainty). The higher the probability of an event, the more certainty there is that the event will occur. (Often informally referred to as likelihood or chance).*

[2] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml

Term	Definition
Ignition-related deficiency	Any condition which may result in ignition or has previously resulted in ignition, even if not during the past five years.
Impact/consequence of ignitions	The effect or outcome of a wildfire ignition upon objectives, which may be expressed by terms including, although not limited to, maintaining health, and safety, ensuring reliability, and minimizing economic and/or environmental damage.
Initiative	Measure or activity proposed or in process designed to reduce the consequences and/or probability of wildfire or PSPS.
Inspection protocol	Documented procedures to be followed to validate that a piece of equipment is in good condition and expected to operate safely and effectively.
Invasive species	A species that is: 1) non-native (or alien) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health.
Level 1 finding	In accordance with GO 95, an immediate safety and/or reliability risk with high probability for significant impact.
Level 2 finding	In accordance with GO 95, a variable (non-immediate high to low) safety and/or reliability risk.
Level 3 finding	In accordance with GO 95, an acceptable safety and/or reliability risk.
Life expectancy	Anticipated years that a piece of equipment can be expected to meet safety and performance requirements.
Limited English proficiency (LEP)	Populations with limited English working proficiency based on the International Language Roundtable scale.
Line miles	The number of miles of transmission and/or distribution line. Differs from circuit miles because individual circuits, such as the two circuits of a double-circuit line, are not counted separately in circuit miles but are counted as separate total miles of line.
Live fuel moisture content	Moisture content within living vegetation, which can retain water longer than dead fuel.
Lost energy	Energy that would have been delivered if not for an outage.
Major roads	Interstate highways, U.S. highways, state and county routes.
Match drop simulation	Wildfire simulation method that takes an arbitrary ignition and forecasts propagation and consequence/impact.
Medical baseline customers	Residential customers with qualifying medical conditions and/or depend on power for qualifying medical devices for certain medical needs. For example, customers that have specific heating and cooling or mobility needs.
Member of the public	Any individual not employed by the utility.
Multi-attribute value function	Risk calculation methodology introduced during CPUC's S- MAP and RAMP proceedings.
Near miss	Previously used to define an event with probability of ignition. Redefined under "Risk event."
Need for PSPS	When the utility's criteria for utilizing PSPS are met.

Term	Definition
Noncompliant clearance	*Rights-of-way whose vegetation is not trimmed in accordance with the requirements of GO 95.*
Outages of the type that could ignite a wildfire	*Outages that, in the judgement of the utility, could have ignited a wildfire.*
Outcome metrics	*Measurements of the performance of the utility and its service territory in terms of both leading and lagging indicators of wildfire, PSPS, and other consequences of wildfire risk, including the potential unintended consequences of wildfire mitigation work, such as acreage burned by utility-related ignitions.*
Overcapacity	*When the energy transmitted by utility equipment exceeds that of its nameplate capacity.*
Patrol inspection	*In accordance with GO 165, a simple visual inspection of applicable utility equipment and structures that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out during other company business.*
Percentile conditions	*Top X% of a particular set (e.g.., wind speed), based on a historical data set with sufficient detail. For example, "Top 95 percentile wind speeds in the last 5 years" would refer to the 5% of avg daily wind speeds recorded by each weather station. If 1,000 weather stations recorded average daily wind speeds over 10 days, then the 95th percentile wind speed would be the top 5% of weather station-days. In this example, there will be 10 days each with 1,000 weather station reports and a total of 10,000 weather station-days, so 50 observations will be in the top 5%. The lowest wind speed in this top 5% would be the "95th percentile wind speed".*
Planned outage	*Electric outage announced ahead of time by the utility.*
Preventive maintenance (PM)	*The practice of maintaining equipment on a regular schedule, based on risk, elapsed time, run-time meter readings, or number of operations. The intent of PM is to "prevent" maintenance problems or failures before they take place by following routine and comprehensive maintenance procedures. The goal is to achieve fewer, shorter, and more predictable outages.*
Priority essential services	*Critical first responders, public safety partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water utilities/agencies.*
Program targets	*Quantifiable measurements of activity identified in WMPs and subsequent updates used to show progress towards reaching the objectives.*
Progress metrics	*Measurements that track how much utility wildfire mitigation activity has changed the conditions of utility wildfire risk exposure or utility ability to manage wildfire risk exposure, in terms of leading indicators of ignition probability and wildfire consequences.*
Property	*Private and public property, buildings and structures, infrastructure, and other items of value that are destroyed by wildfire, including both third-party property and utility assets.*
PSPS event	*Defined as the time from the first public safety partner notified of a planned public safety de-energization to the final customer re-energized.*
PSPS risk	*The potential for the occurrence of a PSPS event expressed in terms of a combination of various outcomes of the event and their associated probabilities.*

Term	Definition
PSPS weather	*Weather that exceeds a utility's risk threshold for initiating a PSPS.*
Red Flag Warning (RFW)	*Level of wildfire risk from weather conditions, as declared by the NWS. For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings.3*
RFW OH Circuit Mile Day	*Sum of overhead circuit miles of utility grid subject to Red Flag Warning each day within a given time, calculated as the number of overhead circuit miles that are under an RFW multiplied by the number of days those miles are under said RFW. For example, if 100 overhead circuit miles are under an RFW for 1 day, and 10 of those miles are under RFW for an additional day, then the total RFW OH circuit mile days would be 110.*
Risk event	*An event with probability of ignition, including wires down, contacts with objects, line slap, events with evidence of heat generation, and other events that cause sparking or have the potential to cause ignition. The following risk events all qualify as risk events:* *Ignitions* *Outages not caused by vegetation* *Vegetation-caused outages* *Wire-down events* *Faults* *Other risk events with potential to cause ignitions*
Risk event simulation	*Simulation of what the consequence would have been of an ignition had it occurred.*
Risk-spend efficiency (RSE)	*An estimate of the cost-effectiveness of initiatives, calculated by dividing the mitigation risk reduction benefit by the mitigation cost estimate based on the full set of risk reduction benefits estimated from the incurred costs. For ongoing initiatives, the RSE can be calculated by determining the "marginal benefit" of additional spending in the ongoing initiative. For example, the RSE of an ongoing initiative could be calculated by dividing the mitigation risk reduction benefit from a 5% increase in spend by the cost associated with a 5% increase in spend*
Rule	*Section of public utility code requiring a particular activity or establishing a particular threshold.*
Run-to-failure	*A maintenance approach that replaces equipment only when it fails.*
Rural region	*In accordance with GO 165, "rural" must be defined as those areas with a population of less than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" must be defined as census tracts.*
Safety hazard	*A condition that poses a significant threat to human life or property.*
Simulated wildfire	*Propagation and impact/consequence of a wildfire ignited at a particular point ('match drop'), as simulated by fire spread software.*
Slash	*Branches or limbs less than four inches in diameter, and bark and split products debris left on the ground because of utility vegetation management. This definition is consistent with Public Resources Code Section 4525.7.*

[3] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml

Term	Definition
Span	*The space between adjacent supporting poles or structures on a circuit consisting of electric lines and equipment. "Span level" refers to asset-scale granularity.*
System Average Interruption Duration Index (SAIDI)	*System-wide total number of minutes per year of sustained outage per customer served.*
Third-party contact	*Contact between a piece of electrical equipment and another object, whether natural (tree branch) or human (vehicle).*
Time to expected failure	*Time remaining on the life expectancy of a piece of equipment.*
Top 30% of proprietary fire potential index (FPI)	*Top 30% of FPI or equivalent scale (e.g., "Extreme" on SCE's FPI; "extreme", 15 or greater, on SDG&E's FPI; and 4 or above on PG&E's FPI).*
Tree with strike potential / danger tree	*A tree within or adjacent to the utility right- of-way that has a structural defect or lean that makes it likely to fail in whole or in part and contact electrical equipment or facilities.*[4]
Unplanned outage	*Electric outage that occurs with no advance notice from the utility (e.g.., blackout).*
Urban region	*In accordance with GO 165, "urban" must be defined as those areas with a population of more than 1,000 persons per square mile as determined by the United States Bureau of the Census.*
Utility-related ignition	*Ignitions involving utility infrastructure or employees, including all ignitions determined by AHJ investigation to originate from utility infrastructure.*
Vegetation management	*Trimming, removal, and other remediations of vegetation used to maintain utility ROW and reduce the risk of outages, ignitions, and other disruption and danger.*
Vegetation risk index	*Risk index indicating the probability of vegetation- caused outages and/or ignitions along a particular circuit, based on the vegetation species, density, height, growth rate, etc.*
Weather normalization	*Adjusting metrics based on relative weather risk factors or indices*
Wildfire impact/ consequence	*The effect or outcome of a wildfire affecting objectives, which may be expressed, by terms including, although not limited to health, safety, reliability, economic and/or environmental damage.*
Wildfire risk	*The potential for the occurrence of a wildfire event expressed in terms of ignition probability, wildfire impact/consequence.*
Wildfire-only WMP programs	*Activities, practices, and strategies that are only necessitated by wildfire risk, unrelated to or beyond that required by minimum reliability and/or safety requirements. Such programs are not indicated or in common use in areas where wildfire risk is minimal (e.g., territory with no vegetation or fuel) or under conditions where wildfires are unlikely to ignite or spread (e.g., when rain is falling).*

[4] "Danger tree" is more specifically defined in California Code of Regulation Title 14 § 895.1.

Term	Definition
Wildland-urban interface (WUI)	*A geographical area identified by the state as a "Fire Hazard Severity Zone", or other areas designated by the enforcing agency to be a significant risk from wildfires, established pursuant to Title 24, Part 2, Chapter 7A.*
Wire down	*Instance where an electric transmission or distribution conductor is broken and falls from its intended position to rest on the ground or a foreign object.*

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1

PERSONS RESPONSIBLE FOR EXECUTING THE WMP

1 PERSONS RESPONSIBLE FOR EXECUTING THE WMP

Provide an accounting of the responsibilities of the responsible person(s) executing the plan, including:

1. *Executive level with overall responsibility*
2. *Program owners specific to each component of the plan*

Title, credentials, and components of responsible person(s) must be released publicly, but other contact information may be provided in a redacted file attached to the WMP submission.

Executive-level owner with overall responsibility

- *Name and title:*
- *Email:*
- *Phone number:*

Program owners specific to each section of the plan

Note: A program owner may own multiple sections, and multiple components across sections, but each section must have a program owner accountable.

Executive-level owner with overall responsibility

- Name and title: Allen Berreth, Vice President of Transmission and Distribution Operations
- Email: Allen.Berreth@Pacificorp.com
- Phone number: 503-813-6205

Program owners specific to each section of the plan

Section 1: Persons responsible for executing the plan

Program owner

- Name and title: Megan Buckner, Director of Wildfire Program Delivery
- Email: Megan.Buckner@PacifiCorp.com
- Phone number: 503-813-5209
- Component: entire section

Section 2: Adherence to statutory requirements

Program owner

- Name and title: Megan Buckner, Director of Wildfire Program Delivery
- Email: Megan.Buckner@PacifiCorp.com
- Phone number: 503-813-5209
- Component: entire section

Section 3: Actuals and planned spending

Program owner

- Name and title: Scott Liedtke, Director of Operational Performance Management
- Email: Scott.Liedtke@PacifiCorp.com
- Phone number: 503-813-6220
- Component: entire section

Program owner

- Name and title: Jeff Keyser, Director of Investment Delivery
- Email: Jeff.Keyser@PacifiCorp.com
- Phone number: 541-776-5494
- Component: entire section

Section 4: Lessons learned and risk trends

Program owner

- Name and title: Amy McCluskey, Managing Director of Asset Management and Wildfire Safety
- Email: Amy.McCluskey@PacifiCorp.com
- Phone number: 503-813-5493
- Component: entire section

Section 5: Inputs to the plan and directional vision

Program owner

- Name and title: Amy McCluskey, Managing Director of Asset Management and Wildfire Safety
- Email: Amy.McCluskey@PacifiCorp.com
- Phone number: 503-813-5493
- Component: entire section

Section 6: Metrics and underlying data

Program owner

- Name and title: Megan Buckner, Director of Wildfire Program Delivery

- Email: Megan.Buckner@PacifiCorp.com
- Phone number: 503-813-5209
- Component: entire section

Section 7: Mitigation initiatives

Program owner

- Name and title: Amy McCluskey, Managing Director of Asset Management and Wildfire Safety
- Email: Amy.McCluskey@PacifiCorp.com
- Phone number: 503-813-5493
- Component: entire section

- Name and title: Steve Vanderburg, Manager of Meteorology and Emergency Management
- Email: Steven.Vanderburg@PacifiCorp.com
- Phone number: 503-251-5180
- Component: Situational Awareness and Forecasting

- Name and title: Kevin Schiedler, Wildfire Mitigation Delivery Director
- Email: Kevin.Schiedler@PacifiCorp.com
- Phone number: 503-813-5595
- Component: Grid Hardening and System Hardening

- Name and title: Jon Connelly, Director of Asset Management
- Email: Jonathan.Connelly@PacifiCorp.com
- Phone number: 503-813-6152
- Component: Asset Management and Inspection

Section 8: Public Safety Power Shutoff

Program owner

- Name and title: Erik Brookhouse, Vice President of System Operations
- Email: Erik.Brookhouse@PacifiCorp.com
- Phone number: 503-251-5153
- Component: entire section

Section 9: Appendix

Program owner

- Name and title: Megan Buckner, Director of Wildfire Program Delivery
- Email: Megan.Buckner@PacifiCorp.com
- Phone number: 503-813-5209
- Component: entire section

1.1 VERIFICATION

Complete the following verification for the WMP submission:

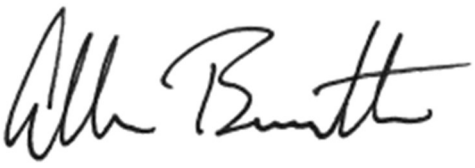
(See Rule 1.11)

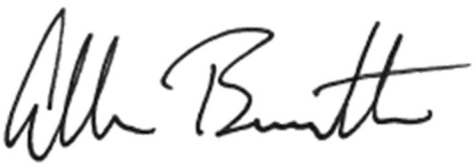
(Where Applicant is a Corporation)

I am an officer of the applicant corporation herein and am authorized to make this verification on its behalf. The statements in the foregoing document are true of my own knowledge, except as to matters which are therein stated on information or belief, and as to those matters, I believe them to be true.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 6th at Portland, Oregon





Allen Berreth, Vice President of Transmission & Distribution Operations

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2

ADHERENCE TO STATUTORY REQUIREMENTS

2 ADHERENCE TO STATUTORY REQUIREMENTS

Section 2 comprises a "checklist" of the Pub. Util. Code § 8386 © requirements and subparts. The utility is required to both affirm that the WMP addresses each requirement AND cite the section and page number where statutory compliance is demonstrated fully. Citations are required to use cross-referencing with hyperlinks. ***Note: Energy Safety reserves the right to automatically reject a WMP that does not provide substantiation for statutory compliance or does not provide citations to appropriate sections of the WMP.***

Table 2.1: Illustrative checklist~~Table 2.1: Illustrative checklist~~ provides an exemplar for the minimum acceptable level of information and citation for the statutory check list.

Table 2.1: Illustrative checklist

Requirement	Description	WMP Section & Page Number
2	The objectives of the plan	Section 4.1, pg. 13
11	Protocols for the de-energization of the electrical corporation's transmission infrastructure, etc.	Section 5 overview, pg. 30-31

Table 2.2: Statutory compliance matrix~~Table 2.2: Statutory compliance matrix~~ provides the full list of statutory requirements. A table like Table 2-2 is required with the appropriate citation for each requirement. If multiple WMP sections address a specific requirement, then references to all relevant sections with a brief indication of information provided in each section must be provided. The table must include each section reference separated by semi-colon (e.g., Section 5, pg. 30-32; (workforce); Section 7, pg. 43 (mutual assistance)) where appropriate, and associated hyperlinks to the referenced section.

Table 2.2: Statutory compliance matrix

Requirement	Description	WMP Section &Page Number
1	An accounting of the responsibilities of person(s) responsible for executing the plan	Section 1, pg. 17-20
2	The objectives of the plan	Section 5, pg. 112~~110~~-127

Requirement	Description	WMP Section &Page Number
3	A description of the preventive strategies and programs to be adopted by the electrical corporation to minimize the risk of itselectrical lines and equipment causing catastrophic wildfires, including consideration of dynamic climate change risks	Section 7.3 pg.152~~149~~-230
4	A description of the metrics the electrical corporation plans to use to evaluate the plan's performance and the assumptions that underlie the use of those metrics	Section 6, pg. 130~~128~~-132
5	A discussion of how the application of previously identified metrics to previous plan performances has informed the plan	Section 4.1, pg. 31-34
6	Protocols for disabling reclosers and de-energizing portions of the electrical distribution system that consider the associated impacts on public safety. As part of these protocols, each electrical corporation shall include protocols related to mitigating the public safety impacts of disabling reclosers and de-energizing portions of the electrical distribution system that consider the impacts on all the aspects listed in PU Code 8386c	Section 7.3.6.1, pg. 221~~207~~ Section 7.3.6.2, pg. 222~~208~~-223~~209~~ Section 8.2, pg. 260~~235~~-267~~237~~
7	Appropriate and feasible procedures for notifying a customer who may be impacted by the de-energizing of electrical lines, including procedures for those customers receiving a medical baseline allowance as described in paragraph (6). The procedures shall direct notification to all public safety offices, critical first responders, health care facilities, and operators of telecommunications infrastructure with premises within the footprint of potential de-energization for a given event	Sections 7.3.10.1, pg.248~~225~~; 7.3.9; pg. 239~~217~~; 8.2; pg. 260~~235~~
8	Identification of circuits that have frequently been de-energized pursuant to a de-energization event to mitigate the risk of wildfire and the measures taken, or planned to be taken, by the electrical corporation to reduce the need for, and impact of, future de-energization of those circuits, including, but not limited to, the estimated annual decline in circuit de- energization and de-energization impact on customers, and replacing, hardening, or undergrounding any portion of the circuit or of upstream transmission or distribution lines	Section 8.6 pg. 276~~242~~
9	Plans for vegetation management	Section 7.3.5, pg.196~~182~~
10	Plans for inspections of the electrical corporation's electrical infrastructure	Section 7.3.4 pg. 185~~171~~
11	Protocols for the de-energization of the electrical corporation's transmission infrastructure, for instances when the de-energization may impact customers who, or entities that, are dependent upon the infrastructure	Section 8.2, pg. 260~~235~~-237
12	A list that identifies, describes, and prioritizes all wildfire risks, and drivers for those risks, throughout the electrical corporation's service territory, including all relevant wildfire risk and risk mitigation information that is part of the Safety Model Assessment Proceeding and the Risk Assessment Mitigation Phase filings	Section 4.3 pg. 45-46
13	A description of how the plan accounts for the wildfire risk identified in the electrical corporation's Risk Assessment Mitigation Phase filing	N/A – As an SMJU, PacifiCorp did not file a RAMP. General risk assessment models used are described in Section 4.5.1, pg. 31

Requirement	Description	WMP Section &Page Number
14	A description of the actions the electrical corporation will take to ensure its system will achieve the highest level of safety, reliability, and resiliency, and to ensure that its system is prepared for a major event, including hardening and modernizing its infrastructure with improved engineering, system design, standards, equipment, and facilities, such as undergrounding, insulation of distribution wires, and pole replacement	Section 7.3.3, pg. 171~~161~~
15	A description of where and how the electrical corporation considered undergrounding electrical distribution lines within those areas of its service territory identified to have the highest wildfire risk in a commission fire threat map	Section 9.4. pg. 291~~256~~ Section 7.3.3.3, pg. 171~~161~~
16	A showing that the electrical corporation has an adequately sized and trained workforce to promptly restore service after a major event, considering employees of other utilities pursuant to mutual aid agreements and employees of entities that have entered contracts with the electrical corporation	Section 5.4.4, pg. 126~~124~~
17	Identification of any geographic area in the electrical corporation's service territory that is a higher wildfire threat than is currently identified in a commission fire threat map, and where the commission must consider expanding the HFTD based on new information or changes in the environment	Section 4.2.1, pg. 38-45
18	A methodology for identifying and presenting enterprise-wide safety risk and wildfire-related risk that is consistent with the methodology used by other electrical corporations unless the commission determines otherwise	Section 7.3.1, pg. 153~~150~~
19	A description of how the plan is consistent with the electrical corporation's disaster and emergency preparedness plan prepared pursuant to Section 768.6, including plans to restore service and community outreach	Section 7.3.9.4, pg. 244~~222~~
20	A statement of how the electrical corporation will restore service after a wildfire	Section 7.3.9, pg. 239~~217~~
21	Protocols for compliance with requirements adopted by the commission regarding activities to support customers during and after a wildfire, outage reporting, support for low-income customers, billing adjustments, deposit waivers, extended payment plans, suspension of disconnection and nonpayment fees, repair processing and timing, access to electrical corporation representatives, and emergency communications	Section 7.3.9.3, pg. 242~~219~~
22	A description of the processes and procedures the electrical corporation will use to do the following: Monitor and audit the implementation of the plan. Identify any deficiencies in the plan or the plan's implementation and correct those deficiencies. Monitor and audit the effectiveness of electrical line and equipment inspections, including inspections performed by contractors, carried out under the plan and other applicable statutes and commission rules.	Section 7.2, pg. 146~~144~~-148

3

ACTUALS AND PLANNED SPENDING FOR MITIGATION PLAN

3 ACTUALS AND PLANNED SPENDING FOR MITIGATION PLAN

3.1 SUMMARY OF WMP INITIATIVE EXPENDITURES

Table 3.1 Summary of WMP expenditures – Total~~Table 3.1 Summary of WMP expenditures – Total~~ summarizes the projected costs (in thousands of US $) per year over the three-year WMP cycle, including actual expenditures for past years. In Table 3.1-2, break out projected costs per category of mitigations, over the three-year WMP plan cycle. In reporting "planned" expenditure, use data from the corresponding year's WMP or WMP Update (i.e., 2020 planned expenditure must use 2020 WMP data). The financials represented in the summary tables below equal the aggregate spending listed in the mitigations financial tables reported quarterly. Nothing in this document is required to be construed as a statement that costs listed are approved or deemed reasonable if the WMP is approved, denied, or otherwise acted upon.

Table 3.1 Summary of WMP expenditures – Total (WMP Table 3.1-1)

Year	Spend in thousands of $USD
2020 Planned	$25,011
2020 Actual	$~~19,416~~18,520
2020 Difference	$~~5,595~~6,491
2021 Planned	$33,375
2021 Actual	$~~33,098~~42,149
2021 Difference	~~$277~~($8,774)
2022 Planned	$~~96,819~~91,900
2020-22 Planned (with 2020 and 2021 Actual)	$~~149,333~~152,570

Table 3.2. Summary of WMP expenditures by category (WMP Table 3.1-2)

WMP Category	2020			2021			2022	2020-2022 Planned (w/ 2020 and 2021 Actuals)
	Planned	Actual	Change	Planned	Actual	Change	Planned	
Risk and Mapping	$25	$186	($161)	$186	$188	($2)	$186	$~~1,348~~560
Situational Awareness	$278	$1,~~209~~178	($~~931~~900)	$462	$1,~~197~~473	($~~735~~1011)	$3,~~313~~054	$5,~~719~~705
Grid Design and System Hardening	$15,403	$8,~~788~~937	$6,~~615~~466	$25,035	$23,~~882~~092	$1,~~153~~936	$~~79,263~~74,603	$~~32,670~~106,639
Asset Management and Inspections	$1,219	$~~803~~1004	$~~416~~215	$848	$919	($71)	$974	$~~80,985~~2,897
Vegetation Management	$5,783	$6,999	($1,~~216~~215)	$6,561	$~~6,639~~16,199	($~~789~~,638)	$12,413	$~~26,051~~35,610
Grid Operations	$2,000	$0	$2,000	$0	$0	$0	$0	$0
Data Governance	$25	$~~186~~181	($~~161~~156)	$210	$215	($5)	$400	$~~801~~796
Resource Allocation	$278	$~~1,209~~0	($~~931~~278)	$0	$0	$0	$0	$~~1,209~~0
Emergency Planning	$0	$0	$0	$0	$0	$0	$210	$210
Stakeholder Cooperation and Community Engagement	$0	$36	($36)	$73	$58	$15	$60	$154
Total	$25,011	$~~19,416~~18,520	$~~5,595~~6,491	$33,375	$~~33,098~~42,149	$~~277~~($8,774)	$~~96,819~~91,900	$~~149,333~~152,570

3.2 SUMMARY OF RATEPAYER IMPACT

For each of the years in Table 3.3 WMP electricity cost increase to ratepayers~~Table 3.3 WMP electricity cost increase to ratepayers~~, report the actual and projected cost increases to ratepayers due to utility-related ignitions and wildfire mitigation activities engaged. For past years, account for all expenditures incurred in that year due to utility-related ignitions and wildfire mitigation activities. Below the table, describe the methodology behind the calculations.

Table 3.3 WMP electricity cost increase to ratepayers (WMP Table 3.2-1)

Outcome Metric Name	Annual Performance						Unit(s)
	Actual					Projected	
	2017	2018	2019	2020	2021	2022	
Increase in electric costs to ratepayer due to utility-related ignitions. (Total)	0	0	0	0	0	0	Dollar value of average monthly rate increase attributable to utility-related ignitions per year.
Increase in electric costs to ratepayer due to wildfire mitigation activities (total)	0	0	0	0	0	0	Dollar value of average monthly rate increase attributable to WMPs per year.

As the period of Table 3.3 ends in 2022, PacifiCorp does not have any cost increases to customers to report. In the company's 2023 General Rate Case, PacifiCorp is proposing an increase due to incremental wildfire mitigation spending. Pending this proceeding, PacifiCorp anticipates the effective date of this proposed increase will be January 1, 2023, thus the impact to customers will not begin until 2023. As such projected costs and impacts become available, PacifiCorp will provide this information, presumably in the company's 2023 WMP.

4

LESSONS LEARNED AND RISK TRENDS

4 LESSONS LEARNED AND RISK TRENDS

4.1 LESSONS LEARNED: HOW TRACKING METRICS ON THE 2020 AND 2021 PLANS INFORMED THE 2022 PLAN UPDATE

Describe how the utility's plan has evolved since the 2020 WMP and 2021 WMP Update submissions. Outline any major themes and lessons learned from the 2020 and 2021 plans, and subsequent implementation of the initiatives. Focus on how utility performance against the metrics used has informed the 2022 WMP Update. Include an overview map of the utility's service territory. If any of the lessons learned are derived from data, include visual/graphical representations of this/these lesson(s) learned.

PacifiCorp's wildfire mitigation efforts have continued to develop and evolve across all categories since the submission of the 2020 WMP and 2021 WMP Update. Program modifications are made based on customer feedback acquired through surveys, internal analysis and subject matter expertise, external industry collaboration and benchmarking, and feedback from stakeholders and regulators such as the Office of Energy Infrastructure Safety (OEIS). The subsections that follow address these modifications by category. The company's particular areas of focus in 2022 include enhancing data analytics and modeling capabilities, evaluating technologies and efficacy studies to assess wildfire mitigation strategies and PSPS risk, and enhancing PSPS preparedness.

4.1.1 Risk assessment and mapping

PacifiCorp continues to develop and mature models to better understand ignition probability, wildfire risk, and estimations of wildfire consequences along electric lines and equipment. The enhanced understanding and more predictive modeling methods better inform operational decision-making at PacifiCorp.

As an example, during 2021, PacifiCorp learned:

- Developing the Localized Risk Assessment Model (LRAM) with increasing granularity and accuracy advances risk-modeling capabilities. Improvements have been centered around weather granularity, automation of the tool refresh for current forecasts and improvement in specific (pilot) locations with vegetation satellite imagery of canopy density.

4.1.2 Situational awareness

Informed situational awareness is the cornerstone of any operational response to wildfire risk.

For example, during 2021, PacifiCorp learned:

- To have additional time to prepare, plan and execute a PSPS event is important to PSPS success. With the 48-hour forecast available in 2021, there was only a short time to plan and send notifications as per CPUC Resolution ESRB-8.[5]
  - To have data infrastructure and processing redundancy is relevant for added risk modeling tool reliability.
  - To explore the use of Technosylva modeling capabilities, with meteorology team help, and inform future decision-making processes during PSPS events after the full rollout of the software has been completed.
  - Risk-modeling automation can enable more real-time updates and facilitates what-if scenario planning.
  - Portable weather stations, which can be quickly installed at the first sign of concerning weather trends, provide detailed insight into remote areas without the delay required for permanent installations.

4.1.3 Grid design and system hardening

PacifiCorp continues to analyze its electric system to develop longer-term strategies that consider the changing climate and increasing wildfire risk, with a continued focus on mitigating PSPS impacts to customers.

During 2021, PacifiCorp learned:

- Hardening measures reduce system faults over time; this recognition was guided by Grid Design and System Hardening research studies (see Section 4.4.2 Research Findings on page 51).
- Accelerated remedies for expulsion fuse replacement are a relevant factor in system hardening; these remedies were implemented in the HFTD.
- The ability to underground certain areas can rely heavily on effective alignment with landowners.

4.1.4 Asset management inspections

PacifiCorp will continue to enhance its distribution and transmission inspection programs to identify potential issues not visible by traditional ground inspections where terrain or other constraints may limit the ability to perform a detailed ground inspection or where infrared (IR) inspections identify issues not seen during standard inspections.

[5] Updates to S-MAP are currently in deliberation under proceeding R. 20-07-013 – Order Instituting Rulemaking to Further Develop a Risk-based Decision-making Framework for Electric and Gas Utilities.

In 2021, PacifiCorp learned:

- Continued identification of conditions through IR inspections year over year highlights the effectiveness and supports continued implementation on an annual basis.
- Clear identification of fire risk conditions can facilitate prioritization and accelerated correction, consistent with or ahead of General Order timeline requirements.

4.1.5 Vegetation management and inspections

PacifiCorp will continue to enhance vegetation management programs.

In 2021, PacifiCorp learned:

- Identification of separate vegetation-related conditions expedites work completion.
- Performing environmental desktop prescreening expedites approval of vegetation management programs on federally managed land.

4.1.6 Grid operations and protocols

PacifiCorp continued to use alternative work practices in the HFTD during elevated fire risk weather conditions.

In 2021, PacifiCorp learned:

- Separate wildfire mitigation spend tracking enhances work tracking and reporting capabilities.

4.1.7 Data governance

PacifiCorp continued to build out and integrate various systems and data sources to support the WMP metrics tables and the GIS schema with the source systems of record.

In 2021, PacifiCorp learned:

- Internal stakeholder collaboration improves enterprise data governance awareness, policies, processes, and training.
- Development of documentation standards for metric and GIS schema logic promotes auditability of the data.
- A Central Repository reporting strategy that leverages common data sources to meet WMP nonspatial and GIS spatial reporting requirements can improve data reporting quality.

4.1.8 Resource allocation methodology

PacifiCorp has developed programs and tools to help with resource allocation across business units and asset classes for various risks.

In 2021, PacifiCorp learned:

- To collaborate with other utilities through workshops regarding the development and implementation of PacifiCorp's initial risk-spend-efficiency (RSE) framework.

4.1.9 Emergency planning and preparedness

In 2021, PacifiCorp enhanced its emergency preparedness plan in collaboration with key internal business units and external public safety partners. PacifiCorp meets at least annually with state, county and local emergency management agencies such as CalFire, California Office of Emergency Services, county offices of emergency services, community and other organizations, public health authorities, local law enforcement and fire jurisdictions and other interested parties. Through these meeting, PacifiCorp gathers inputs from the community and adjusts plans as needed.

In 2021, PacifiCorp learned:

- Using workflow process tools improves the efficiency of notifications with public safety and other state partners.

4.1.10 Stakeholder cooperation and community engagement

PacifiCorp understands the important role all stakeholders play in achieving wildfire prevention and mitigation.

In 2021, PacifiCorp increased its lines of communication and learned:

- Direct engagement with tribal leaders helps the company target generators to tribal members with the most need. Refer to Section 7.3.10 Stakeholder Cooperation on page 248~~225~~ and Section 7.3.10.1 Community Engagement on page 248~~225~~ for additional details on stakeholder cooperation and community engagement initiatives.

- Providing ice at community resource centers supports residents who can pick up ice to keep the food in their fridges cold during an outage.

4.2 UNDERSTANDING MAJOR TRENDS IMPACTING IGNITION PROBABILITYAND WILDFIRE CONSEQUENCE

Describe how the utility assesses wildfire risk in terms of ignition probability and estimated wildfire consequence, including use of Multi-Attribute Risk Score (MARS) and Multi-Attribute Value Function (MAVF) as in the Safety Model and Assessment Proceeding (S-MAP)[6] and Risk Assessment Mitigation Phase (RAMP), highlighting changes since the 2020 WMP and 2021 Update. Include description of how the utility distinguishes between these risks and the risks to safety and reliability. List and describe each "known local condition" that the utility monitors per GO 95, Rule 31.1, including how the condition is monitored and evaluated.

In addition:

A. *Describe how the utility monitors and accounts for the contribution of weather to ignition probability and estimated wildfire consequence in its decision-making, including describing any utility-generated Fire Potential Index or other measure (including input variables, equations, the scale or rating system, an explanation of how uncertainties are accounted for, an explanation of how this index is used to inform operational decisions, and an explanation of how trends in index ratings impact medium-term decisions such as maintenance and longer-term decisions such as capital investments, etc.).*
B. *Describe how the utility monitors and accounts for the contribution of fuel conditions to ignition probability and estimated wildfire consequence in its decision-making, including describing any proprietary fuel condition index (or other measures tracked), the outputs of said index or other measures, and the methodology used for projecting future fuel conditions. Include discussion of measurements and units for live fuel moisture content, dead fuel moisture content, density of each fuel type, and any othervariables tracked. Describe the measures and thresholds the utility uses to determine extreme fuel conditions, including what fuel moisture measurements and threshold values the utility considers "extreme" and its strategy for how fuel conditions inform operational decision-making.*

PacifiCorp leverages information developed by the large investor-owned utilities (IOU) and uses principles of the International Standardization Organization's "Risk Management – Principles and Guidelines" (ISO 31000:2019) to develop the company's risk-based decision-making framework outlined in Figure 4.1~~Figure 4.1~~.

[6] Updates to S-MAP are currently in deliberation under proceeding R. 20-07-013 – Order Instituting Rulemaking to Further Develop a Risk-based Decision-making Framework for Electric and Gas Utilities.

Figure 4.1 Risk-based decision-making framework

This methodology included an assessment of the company's top categorical equipment risks including, substation transformer failure, substation circuit breaker failure, overhead distribution conductor failure and relay misoperation. In a parallel activity, risks were evaluated against various maintenance and investment programs, including risks related to wildfire within its service territory, and benefits of these programs estimated. Nonetheless, due to the similar but differently constructed process, including RSE, as portrayed within this report may not be appropriately compared to other utility plans and results. Where possible, the intended approach and underlying rationale for the incorporation into future decision-making will be outlined, furthering the company's development toward the longer-term RAMP/S-MAP structure which is anticipated to be addressed in the future proceeding R.20-07-013.

PacifiCorp does not yet have a quantitative risk methodology adopted in the S-MAP and is continuing to review the IOU risk-modeling progress for the future development of RAMP and S-MAP.

A. PacifiCorp monitors and accounts for the contribution of weather and ignition probability an estimated wildfire consequence and its decision-making using situational awareness modeling tools such as WFA-E and WRF, combined with the subject matter expert (SME) meteorologist on staff. At this time PacifiCorp does not currently have a formal combined index, such as the Fire Potential Index (FPI) used by other companies, however development is in progress that aligns with the information learned through workshops. To better understand the weather's contribution to wildfire risk and consequence, PacifiCorp is taking a two-pronged approach that leverages big data analytics as well as existing wildfire modeling technologies.

   Big Data Analytics — PacifiCorp is actively creating a 30-year, 2 km-resolution, hourly

WRF reanalysis of weather variables and fire weather indices across much of the western United States. Once complete, this data will be correlated with historical fire occurrence and consequence to improve the company's weather-related thresholds with respect to wildfire risk. Further, the data will be correlated with historical power outages to build and train machine-learning models to better predict weather-related system impacts. Output from PacifiCorp's operational WRF model will be ingested daily by the company's machine-learning models and GIS tools to forecast and map the intersection of fire weather and outage related risks across its service territory.

Wildfire Modeling — PacifiCorp is investing in Technosylva's WFA-E suite of products to enhance its ability to identify distribution circuits and transmission lines that pose a risk of catastrophic wildfire due to current and forecast conditions. In many ways, WFA-E negates the need for a separate FPI as it directly models wildfire potential and consequence across the landscape daily. That said, PacifiCorp will be using Technosylva's products and SMEs to help create an FPI to complement the WFA-E suite of products. This work will leverage the results of the historical reanalysis and associated data analysis mentioned previously.

B. As was the case with assessing weather-related wildfire risks, PacifiCorp is leveraging big data analytics as well as existing wildfire modeling technologies to understand the fuel's contribution to wildfire risk and consequence.

PacifiCorp relies on a combination of sources including observations and forecasts from the local Geographic Area Coordination Center (GACC), PacifiCorp's in-house WRF model, and Technosylva's WFA-E. This includes one-hour dead fuel moisture, 10-hour dead fuel moisture, 100-hour dead fuel moisture, 1000-hour dead fuel moisture and Energy Release Component (ERC). Dead fuel moisture is expressed as a percent of oven dry weight. Raw ERC values are reported in BTUs per square foot; however, ERC is typically expressed as a percentile relative to the known local climatology. Other fuels considerations include herbaceous and woody live fuel moisture, regional vegetation mortality events and greenness of the seasonal grasses.

Big Data Analytics — In addition to weather variables and fire weather indices, the 30-year reanalysis mentioned previously will also include one-hour dead fuel moisture, 10-hour dead fuel moisture, 100-hour dead fuel moisture, 1000-hour dead fuel moisture and ERC. This data will be correlated with historical fire occurrence to improve the company's fuels-related thresholds with respect to wildfire risk. This data will also be integrated with Technosylva's WFA-E.

Wildfire Modeling — As was stated earlier, PacifiCorp is investing in Technosylva's WFA-E suite of products to enhance its ability to identify distribution circuits and transmission lines that pose a risk of catastrophic wildfire due to current and forecast conditions. This includes all relevant fuels information needed to accurately assess wildfire potential and consequence for both short-term forecasts and long-term planning.

Lastly, PacifiCorp owns and operates a network of weather stations that provide 10-minute observations of temperature, humidity, wind speed, wind direction and wind gusts. Some weather stations also have sensors that report 10-hour dead fuel moisture and fuel temperature. Weather stations are calibrated annually before wildfire season to ensure accuracy of the data throughout fire season.

4.2.1 Service territory fire threat evaluation and ignition risk trends

Present a map of the highest risk areas identified within the current High Fire Threat District (HFTD) tiers of the utility's service territory as a figure in the WMP. Discuss fire threat evaluation of the service territory to determine whether a modification to the HFTD is warranted (i.e., expansion beyond existing Tier 2 and Tier 3 areas). If the utility believes there are areas in its service territory that are not currently included in the HFTD but require prioritization for mitigation efforts, then the utility is required to provide a process outlining the formal steps necessary to have those areas considered for recognition in the CPUC-defined HFTD.[7] *Include a discussion of any fire threat assessment of its service territory performed by the electrical corporation, highlighting any changes since prior WMP submissions. In the event that the utility's assessment determines the fire threat rating for any part of its service territory is insufficient (i.e., the actual fire threat is greater than what is indicated by the CPUC's Fire Threat Map and High Fire Threat District designations), the utility is required to identify those areas for potential HFTD modification, based on the new information or environmental changes, showing the differences on a map in the WMP. To the extent this identification relies upon a meteorological or climatological study, a thorough explanation and copy of the study must be included as an Appendix to the WMP.*

List, describe, and map geospatially (where geospatial mapping is applicable) any macro trends impacting ignition probability and estimated wildfire consequence within utility service territory, highlighting any changes since the 2021 WMP Update:

1. *Change in ignition probability and estimated wildfire consequence due to climate change*
2. *Change in ignition probability and estimated wildfire consequence due to relevant invasive species, such as bark beetles*
3. *Change in ignition probability and estimated wildfire consequence due to other drivers of change in fuel density and moisture*
4. *Population changes (including Access and Functional Needs population) that could be impacted by utility ignition*
5. *Population changes in HFTD that could be impacted by utility ignition*
6. *Population changes in WUI that could be impacted by utility ignition*
7. *Utility infrastructure location in HFTD vs non-HFTD*
8. *Utility infrastructure location in urban vs rural vs highly rural areas*

[7] As there is no formal or standard process for modifying the HFTD maps defined by the CPUC, Utilities may utilize a similar approach adopted by SCE during the 2019 WMP review process described in D.19-05-038, p. 53. For this process, in August 2019 SCE submitted a petition to modify D.17-12-024 to recognize SCE-identified HFRA as HFTD Tier 2 areas.

PacifiCorp is constantly monitoring areas for significant change in ignition risk drivers that may result in a change to fire threat for a specified area. At this time, PacifiCorp has not identified any areas where an HFTD expansion is warranted and maintains the previously established HFTD map (see Figure 4.2 through Figure 4.5~~Figure 4.5~~).

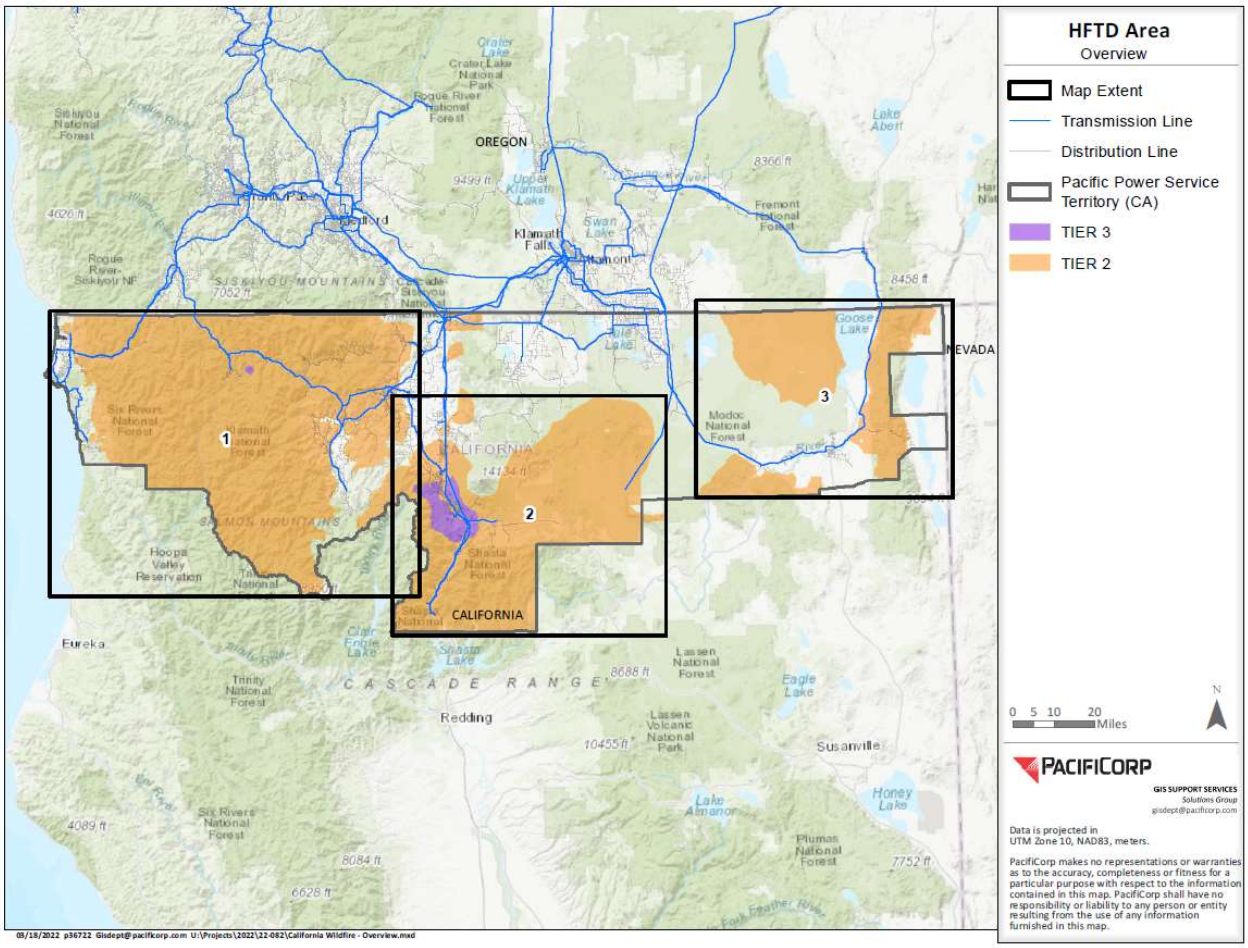


Figure 4.2 HFTD area

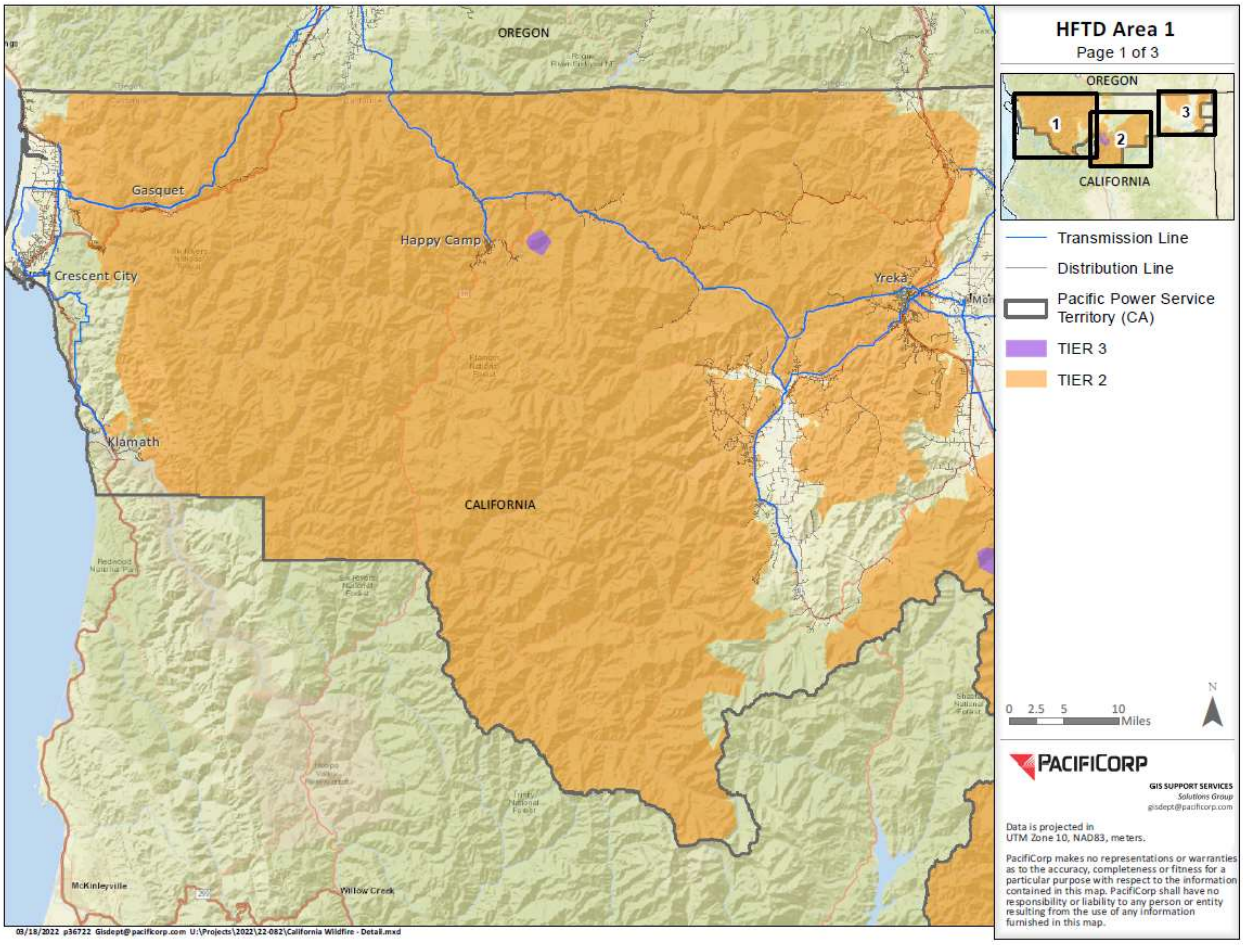


Figure 4.3 HFTD area 1

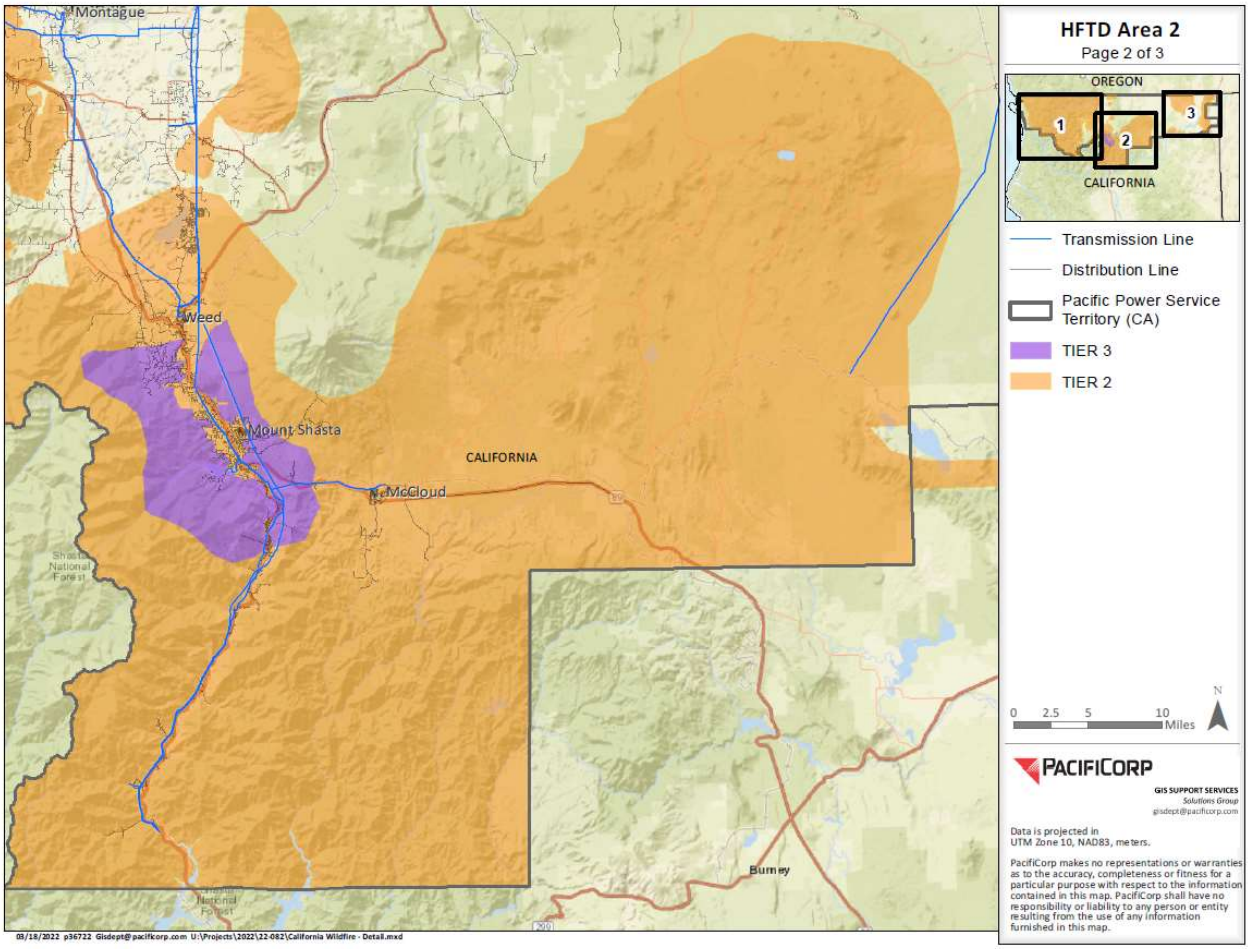


Figure 4.4 HFTD area 2

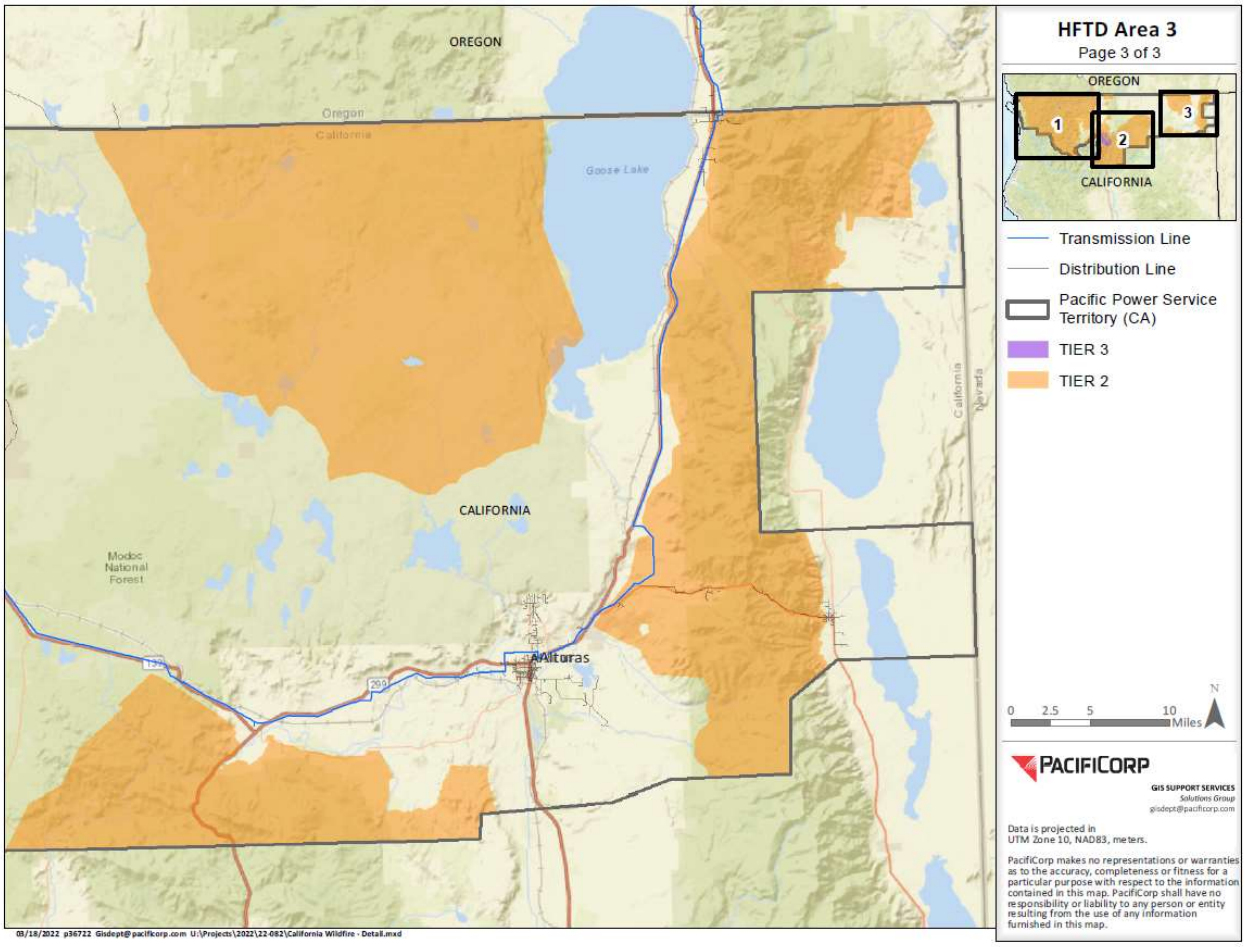


Figure 4.5 HFTD area 3

1. **Change in ignition probability and estimated wildfire consequence due to climate change**

   In 2021, PacifiCorp focused on developing a quantifiable consideration of climate change to address short-term planning gaps. Through this effort, the company engaged climate change experts through the California Energy Commission's Pyregence Project and used materials prepared by the Fourth Climate Change Assessment[8] through CalAdapt to assess climate change. Through this research, PacifiCorp found that fire-affecting climate change — particularly the effect of drying — impacts the company's service territory evenly. Therefore, areas that are higher risk today, such as the HFTD, would continue to be higher risk. Climate models also suggest there may be some decreases in fire weather (e.g., wind gusts). The company will continue analyzing this information and incorporating it into company models.

[8] Pierce, David W., et al. *Climate, Drought, and Sea Level Rise Scenarios for California's Fourth Climate Change Assessment: A Report for California's Fourth Climate Change Assessment*. California Energy Commission, 2018.

This research addresses short-term planning gaps, including a lack climate change-related measurements as they relate to wildfire risk in the company's service territory.

2. **Change in ignition probability and estimated wildfire consequence due to relevant invasive species, such as bark beetles**

   During the period of extreme drought in the company's northern California service territory, from 2014-2017, the company was experiencing substantial impacts from bark beetle invasion, damaging vegetation, for which it conducted hazard tree removal. At this time such invasive species do not appear to be on the rise, however, as noted above, to the extent that extreme drying becomes more normal, the tendency for invasive species such as bark beetle to damage vegetation increases. The company will be watchful of any erosion in tree health due to such impacts and may consider inclusion of these patterns into its risk assessment model.

3. **Change in ignition probability and estimated wildfire consequence due to other drivers of change in fuel density and moisture**

   Since the 2021 WMP update, there have been no significant changes in macrotrends of drivers such as fuel density and moisture. However, PacifiCorp is investing significantly in data and modeling tools to enhance situational awareness capabilities and assess ignition probability and estimated wildfire consequence at a more granular level.

4. **Population changes (including Access and Functional Needs population) that could beimpacted by utility ignition**

   The region the company serves is not a high growth area and no patterns suggesting greater AFN population percentages are anticipated by the company, which could impact areas needing additional support during periods of elevated fire risk.

5. **Population changes in HFTD that could be impacted by utility ignition**

   The company serves a sparse area, much of which is federal, state or tribal lands, which were deemed part of the elevated fire threat areas. While these areas generally are not developed, any changes to their usage could result in expansion of the company's network into areas that are designated HFTD and potentially impact the ratio of elevated fire risk areas the company serves. At this time 41% of its California assets are designated in the HFTD. Additional buildout in those areas would change the ratio and potentially require realignment of mitigation measures and resources. Shown in Table 4.1 is quantitative analysis supporting these conclusions.

- Tract level American Community Survey (ACS) five-year population estimates show a general decline in population within PacifiCorp's California service territory between the 2010 census and 2017. Population began increasing again in 2018 and

2019, but ACS estimates for 2019 are still 3.5% below 2010 population levels for the northernmost areas of California.

- Population changes in the HFTD follow the overall trends of the area. Population estimates for 2019 are roughly 3% below the 2010 population for the HFTD as a whole and roughly 2% below 2010 for the Tier 3 areas.

- Based on these trends, it is unlikely that major population increases will occur inside the HFTD regions of PacifiCorp's service territory.

Table 4.1 Population changes in the high fire threat districts

Data Source	Area	2010	2015	2017	2019
Census and ACS 5-year Tract Est.	Tracts Overlapping PC Territory	89,868	87,455	86,336	86,663
Census and FCC Block Est.	All HFTD	46,247	44,548	44,931	44,745
	Tier 3	4,735	4,499	4,685	4,631

6. Population changes in WUI that could be impacted by utility ignition

The company's service area generally has limited growth and much of it is infill. Limited growth of projects that increase the WUI are expected, based on information the company has from local stakeholders.

ACS estimates are not available at the block level used to determine WUI classifications, but FCC population estimates at the block level also show population decreases in PacifiCorp territory's wildland intermix and interface areas. Population levels estimates from 2019 are roughly 7% below 2010 levels in wildland intermix areas, and roughly 3% below 2010 levels in WUI areas. Populations in WUI areas also decreased between 2017 and 2019, despite modest gains in Northern California more generally. Further, there are zero interface blocks with a population increase of more than 10. Only one intermix block, located in Del Norte County, had a population increase of more than 10 between 2010 and 2019.

Based on these trends, it is unlikely that major population increases will occur inside the WUI regions of PacifiCorp's service territory. See Table 4.2.

Table 4.2 Population changes in WUI that could be impacted by utility ignition

Data Source	Area	2010	2015	2017	2019
Census and ACS 5-year Tract Est.	Tracts Overlapping PC Territory	89,868	87,455	86,336	86,663
Census and FCC Block Est.	Wildland Urban Intermix	22,548	20,918	20,958	20,910
	Wildland Urban Interface	42,115	41,054	41,025	40,942

7. Utility infrastructure location in HFTD versus non-HFTD

When analyzing utility infrastructure location macrotrends, PacifiCorp evaluated if there were any programs to relocate, add or remove a significant amount of utility infrastructure. During this review it was determined that there were no significant updates to the utility infrastructure located inside the HFTD or outside the HFTD.

8. Utility infrastructure location in urban versus rural versus highly rural areas

PacifiCorp does not have any significant infrastructure location changes.

4.3 CHANGE IN IGNITION PROBABILITY DRIVERS

Based on the implementation of the above wildfire mitigation initiatives, explain how the utility sees its ignition probability drivers evolving over the three-year term of the WMP, highlighting any changes since the 2021 WMP Update. Focus on ignition probability and estimated wildfire consequence reduction by ignition probability driver, detailed risk driver, and include a description of how the utility expects to see incidents evolve over the same period, both in total number (of occurrence of a given incident type,whether resulting in an ignition or not) and in likelihood of causing an ignition by type.

Outline methodology for determining ignition probability from events, including data used to determine likelihood of ignition probability, such as past ignition events, number of risk events, and description of events (including vegetation and equipment condition).

Substantial efforts in inspection, vegetation management and situational awareness have occurred and will continue to unfold over the next 10 years. Over the three-year period of the WMP (2020-2022) PacifiCorp has not seen a change in the categories of ignition risk drivers, in that no new drivers have been identified and no drivers have been removed. Much of the three-year term of the WMP has been developing the framework necessary to properly quantify risk in a way that aligns with other utility processes and initiating risk reduction initiatives such as those described in the grid hardening initiatives (Section 7.3.3 on page 171~~161~~). To this end, PacifiCorp has not had the opportunity to observe a significant change

in ignition risk drivers. During 2022, PacifiCorp has committed to installing a significant portion of the grid hardening plan, after which the company can begin to gather data for evaluating the impact to ignition risk drivers. See Figure 4.6 for overlapping climate change, mitigation initiatives and PSPS risk.

The expectation is that grid hardening initiatives will impact the company's evaluation of risk through situational awareness thresholds by making the system more tolerant of elevated fire risk. Additionally, it is the expectation that ignitions due to ignition drivers such as contact by object will decrease over time as a result of grid hardening initiatives.

Wildfire consequence, which is generally driven by factors such as population, population location, wind speed, wind direction, overall dryness, and time to response, is not typically reduced or impacted by utility-related activities. However, PacifiCorp's initiatives, such as situational awareness, aim to better characterize dynamic risk and inform quick action to control risk, limit consequences, and mitigate escalation where possible. Additionally, in this 2022 WMP update, PacifiCorp is proposing a Wildfire Detection initiative that is expected to reduce the time until fire awareness.

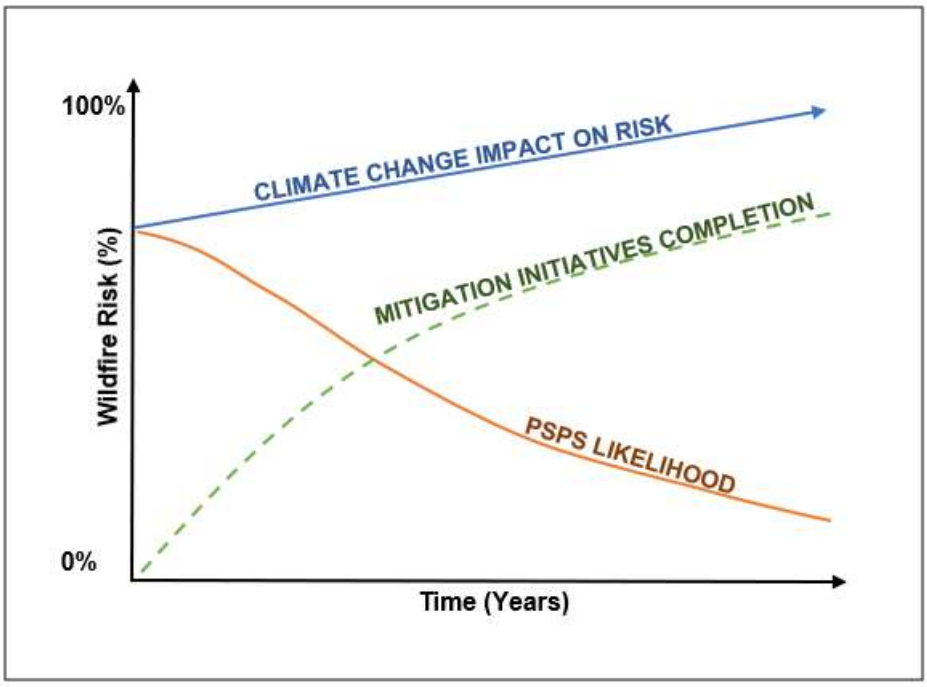


Figure 4.6 Climate change, mitigation initiatives and PSPS

Since the 2021 update, there have been no significant updates to the methodology for determining ignition probability from events, PacifiCorp employs the same process it has used since 2020 with refinement in the data inputs. Please refer to Section 4.3 of PacifiCorp's 2021 WMP for historical reference.

4.4 RESEARCH PROPOSALS AND FINDINGS

Report all utility-sponsored research proposals, findings from ongoing studies and findings from studies completed in 2020 and 2021 relevant to wildfire and Public Safety Power Shutoff(PSPS) mitigations.

4.4.1 Research Proposals

Report proposals for future utility-sponsored studies relevant to wildfire and PSPS mitigation. Organize proposals under the following structure:

1. ***Purpose of research** – brief summary of context and goals of research*
2. ***Relevant terms** - Definitions of relevant terms (e.g., defining "enhanced vegetation management" for research on enhanced vegetation management)*
3. ***Data elements** - Details of data elements used for analysis, including scope and granularity of data in time and location (i.e., date range, reporting frequency and spatial granularity for each data element, see example table below)*
4. ***Methodology** - Methodology for analysis, including list of analyses to perform; section must include statistical models, equations, etc. behind analyses*
5. ***Timeline** - Project timeline and reporting frequency to the Office of Energy Infrastructure Safety*

Example table reporting data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Comments
Ignitions from contact with vegetation in non-enhanced vegetation areas	2014 – 2021+ (ongoing)	Per ignition	Lat/long per ignition	Date, hour of ignition (estimated)	-
Ignitions from contact with vegetation in enhanced vegetation areas	2019 – 2021+ (ongoing)	Per ignition	Lat/long per ignition	Date, hour of ignition (estimated)	-

4.4.1 Research proposals

4.4.1.1 Wildfire Detection Pilot

Purpose of research

A wildfire detection network including equipment elements like cameras and smoke detectors, can assist fire agencies serving in the HFTD respond more quickly to ignition events. Additionally, with improved wildfire location awareness, PacifiCorp can respond quickly to support wildfire-reactive protocols. In 2021, PacifiCorp initiated an ongoing pilot in the company's Utah service territory where 14 ALERT wildfire cameras were installed to validate the technology. Additionally, PacifiCorp has partnered with forest agencies in Oregon to mount cameras on utility infrastructure. PacifiCorp plans to expand on this experience and initiate a pilot to its California service territory, using the lessons learned from the 2021 Alert Wildfire Camera installations in Utah. This pilot seeks to identify technology that can reliably and cost-effectively be used for wildfire detection.

Relevant terms

There are no specific, uncommon terms associated with the wildfire detection pilot.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
Event Video / Data Logs	2023-2025	Per ignition	Lat/lon per ignition	Date, hour of ignition (estimated)

Methodology

In terms of a data set, it will take some time to gather enough data to validate/invalidate the benefits of wildfire detection equipment types. PacifiCorp will evaluate how long it takes to respond to an ignition that is discovered by new wildfire detection equipment versus how long it takes to respond to an ignition discovered by another detection method.

Timeline

2022 — Plan wildfire detection program.

2023 — Complete installation of wildfire detection equipment.

2024 — Gather data.

2025 — Review preliminary results.

4.4.1.2 Enhanced Overhang Reduction Pilot

Purpose of research

The purpose of this enhanced vegetation management activity is to reduce the amount of vegetation and/or limbs overhanging high-voltage power lines and decrease the potential of wildfire ignitions due to vegetation and conductor contact. Current post clearances required by CPUC GO 95 are a minimum of 12 feet. In PacifiCorp's 2019 Standard Operating Procedures (version 6.1.2.) current specification clearance for overhanging limbs is 12 feet for slow-growing trees and 14 feet of clearance for moderate to fast-growing trees. Dead or defective limbs are also being identified to comply with the 2021 CAL FIRE Power Line Fire Prevention Field Guide, (Hazard Trees/Vegetation Clearance section). The purpose of this new effort is to determine efficacy of ground-to-sky pruning. Trees pruned during this effort would have increased overhang clearance, greater than the minimum CPUC required post-clearances, to achieve an anticipated outcome of reducing the potential of overhanging limbs dropping and contacting energized bare conductors. Due to the increased amount of crown removed to achieve increased overhang clearance, the subject trees would be evaluated within one year of work to assess tree health. PacifiCorp uses a Level 1 Assessment, as defined in ANSI A 300 (Part 9), to detect potential dieback, decay or other defects that can be associated with removing more than one third of the crown. PacifiCorp may also conduct additional monitoring as needed in subsequent years based on results and consider alternatives.

Relevant terms

ANSI A 300 Level 1 Assessment — This is a limited visual assessment of an individual tree or population of trees. It can be performed as a drive-by assessment in the case of many trees.

Data elements

Data elements may include:

- Tree location (latitude and longitude)
- Species
- Height
- Diameter at breast height (DBH)
- Date pruned

- Assessment notes (health of tree at time of pruning and subsequent assessment)
- Distance from conductor
- Estimated crown reduction

Methodology

Sections of power lines to be selected will be in HFTD Tier 2 and/or Tier 3 where there is a variety of coniferous and hardwood species. Plots will be completed in areas with noninsulated conductor to reduce ignition where primary bare wire is present. Horizontal construction with multiple phases (two-phase or three-phase) will also be prioritized.

Timeline

2022 — Potential plot areas will be identified after planned vegetation management activities have been conducted on Tier 2 and Tier 3 distribution circuits throughout the calendar year.

2023 — Enhanced overhang reduction work is targeted for implementation and completion.

2023 Post Work — Audit overhang mitigation work will be done to ensure compliance with specifications.

2024 — Tree health will be evaluated to determine the effect of crown removal. Trees will be assessed for dieback or other defects.

2025 — Preliminary results will be reviewed.

4.4.2 Research findings

Report findings from ongoing and completed studies relevant to wildfire and PSPS mitigation. Organize findings reports under the following structure:

1. ***Purpose of research*** *– Brief summary of context and goals of research*
2. ***Relevant terms*** *- Definitions of relevant terms (e.g., defining "enhanced vegetation management" for research on enhanced vegetation management)*
3. ***Data elements*** *- Details of data elements used for analysis, including scope and granularity of data in time and location (i.e., date range, reporting frequency and spatial granularity for each data element, see example table above)*
4. ***Methodology*** *- Methodology for analysis, including list of analyses to perform; section must include statistical models, equations, etc. behind analyses*
5. ***Timeline*** *- Project timeline and reporting frequency to the Office of Energy Infrastructure Safety. Include any changes to timeline since last update*
6. ***Results and discussion*** *– Findings and discussion based on findings, highlighting new results and changes to conclusions since last update*
7. ***Follow-up planned*** *– Follow up research or action planned as a result of the research*

Ongoing pilots

4.4.2.1 Distributed Fault Anticipation Pilot

Purpose of research

PacifiCorp is piloting the use of distribution fault anticipation (DFA) technology with Texas A&M University. The DFA devices are continuously monitoring to detect, classify and alert when high or low current fault conditions are measured. The alerts preemptively identify equipment along distribution circuits that could cause an outage.

Relevant terms

DFA — Distribution fault anticipation; this technology, which was initially tested at Texas A&M University in 2015, provides situational awareness of potential outages by measuring high and low current fault conditions on distribution circuits. Alerts from the DFA devices are communicated through cellular networks preemptively.

SCADA — Supervisory Control and Data Acquisition, which is in reference to the real time data collected by PacifiCorp's energy management system.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
DFA EVENT	Nov 2021-	Once	Distribution	1/100s

Report	Present		circuit	
Amps	Nov 2021 - Present	Continuous	Distribution circuit	1/100s
Voltage	Nov 2021 - Present	Continuous	Distribution circuit	1/100s
Circuit Line Miles	Installation Date	Once	0.01mi	Single Measurement
Wind Speed	Once	Per Event	MPH	Single Measurement
Wind Direction	Once	Per Event	Cardinal or intercardinal direction	Single Measurement
AVG Temperature	Once	Per Event	°C	Single Measurement
Humidity	Once	Per Event	%	Single Measurement

Methodology

PacifiCorp plans to install a sample of DFA devices on distribution circuits located within the HFTD with SCADA. Circuits with SCADA capability were selected so that the DFA data could be compared to SCADA events data. The comparison of these two sources will determine the effectiveness and cost associated with using this technology.

Timeline

Q4 2021 — DFA installation and data gathering initiated.

Q1 2023 — Complete DFA installation (approximately four circuits).

Q4 2023 — Collect a minimum of 12 months of data per device; evaluate program for expansion outside of the pilot.

Results and discussion

Since the first two DFA devices were installed in Q4 of 2021, two potential events were detected uniquely by DFA — the events were not identified by other SCADA equipment. One of the two events required an immediate correction on a jumper located at the capacitor bank. The second event classified a potential failure on a clamp or switch but could not be quickly located and has yet to be confirmed; a methodology is being created on how to locate the identified failure on the 126-mile circuit. The DFA provided insight into an issue that was not detectable with other equipment.

Follow-up planned

Currently, there are too few results to make a recommendation about the DFA technology. PacifiCorp is continuing to analyze the events generated by the DFA devices. If the pilot is successful, PacifiCorp will look to install DFA when replacing substation/circuit relays where there's a cellular or strong communication network connection.

4.4.2.2 Vegetation Management Data Analytics Pilot

Purpose of research

PacifiCorp has used publicly available vegetation data to estimate the amount of tree canopy near company equipment to inform risk management and improve situational awareness. PacifiCorp has evaluated several forms of canopy census approaches, including using public data sources, assessing LiDAR and analyzing satellite data. At this time, these data sets have yet to be operationalized in a manner that reduces or optimizes vegetation inspections (2021 WMP Pilot 3: LiDAR Vegetation Inspection), however they have proven helpful in supporting long-term risk assessment and to a lesser degree short-term situational awareness. The company's canopy census pilot used satellite imagery trained with available LiDAR to produce vegetation and strike tree maps over large areas.

Relevant terms

National Land Cover Database — The National Land Cover Database (NLCD) is a U.S. Geological Service-based resource that provides nationwide data on land cover and land cover change at a 30 meter resolution. The database is designed to provide cyclical updates of United States land cover and associated changes.

Salo — The vendor, Salo Sciences uses an AI model trained on satellite and LiDAR data to create high-resolution maps of vegetation characteristics.

Tree canopy — The branches, leaves or other foliage that form the upper layer of a plant community.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Comments
NLCD Canopy Cover Raster	2016	3-5 years	30m	One year	
Historic Vegetation Outages	2000-present	Daily	by isolation point, ~200m	outage timestamp, ~1 minute	
Salo Canopy Cover Raster	2020	1 year	10 m	One year	Augmenting 30m canopy cover where available
Historic Vegetation Maintenance	2000-present	Weekly	By circuit	weekly	

Methodology

A tree canopy census near PacifiCorp equipment was created by sampling the

NLCD Canopy Cover raster data at the per pixel area, 30 meter resolution. A point layer was then clustered to avoid oversampling at circuit branch points and aggregated according to circuit and subcircuit zones, specifically reconciled to ZOPs. As the Salo Sciences satellite/AI data was added, this process was replicated, with 10 meter resolution, again for each ZOP.

Timeline

2020 — Began pilot.

2021 — Initial proof of concepts was completed.

2022 — Plan the next project phase focusing on prior burn areas and augmenting canopy census data.

2023 — Evaluate the program for expansion or completion.

Results and discussion

Comparison of vegetation area to outages and vegetation maintenance costs showed weak correlations. The dataset was somewhat predictive of vegetation trimming costs, but with large margins of error. The comparison model is limited by the lack of spatial granularity in historic vegetation maintenance and outage records. As new vegetation maintenance records are established with high spatial accuracy, the dataset can be reassessed for its predictive power.

Attempts to use the NLCD Canopy Cover and LANDFIRE data layers for this purpose highlighted some of their inherent limitations: low update frequency, the 30-meter spatial resolution is too high to capture smaller tree stands, and heavy use of masking in some locations. Together, these limitations result in a systematic bias that underestimates tree coverage, with larger discrepancies occurring near roads or in developed areas.

However, satellite imagery was found to produce very usable data. Such data, however, need to be evaluated against two different use cases. First, in evaluating canopy density (to recognize proximity of vegetation to ZOPs for risk estimation), high confidence in canopy density was achieved, radically improving on publicly available data sources, but without the high costs associated with LiDAR. Second, when determining strike tree risk, results very similar to LiDAR were achieved at substantially lower cost and faster delivery.

LiDAR may be an important element to capture targeted areas of risk in future exercises, while satellite data appears to hold promise for systemic and periodic characterization of risk.

Follow-up planned

PacifiCorp is expanding upon this satellite canopy census by augmenting areas of interest studied during 2021, focused primarily on recently burned areas as well as other locales where vegetation outage history coincides with elevated fire threat.

4.4.2.3 Radio Frequency/ Handheld Infrared Pilot

Purpose of research

This pilot uses new radio frequency (RF) and IR tools to support ground-level visual inspections on distribution lines and equipment. The new tools are capturing information that can be used for condition identification that could be missed through the normal visual inspection. PacifiCorp has had success in the enhanced aerial IR inspection program discussed in Section 7.3.4.4 on page 186~~172~~ and the expectation is these tools will yield similar results for inspectors in the field.

Relevant terms

DoForm — Internal digital form for tracking inspections.

Infrared (IR) — wavelength emitted when objects are heated.

Radio Frequency (RF) — radio waves at certain frequencies.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
Ambient Temperature	2020-present	Per Inspection	Degree Celsius	Date of Inspection
Observation Point Temperature	2020-present	Per Inspection	Degree Celsius	Date of Inspection
Conductor Temperature (Left & Right)	2020-present	Per Inspection	Degree Celsius	Date of Inspection
Nearest Pole Temperature	2020-present	Per Inspection	Degree Celsius	Date of Inspection

Methodology

Lines are selected based on historical records that suggest a high occurrence of splices. Line patrolmen perform the ground-level inspection of the identified lines, gathering specific measurements at key points along the line, including all poles and any splices within spans. The inspection data is uploaded and available through electronic forms.

Timeline

2021 — Completed field personnel training with equipment.

2022 — IR inspections to occur in selected regions of California.

2023 — Expand areas of inspection.

Results and discussion

The RF data collection proved to be an inefficient and an unreliable technology for inspection program purposes at this time. Different weather environments, angle of data collections, and multiple attempts produced unreliable, differing and inaccurate conditions reported.

However, IR inspections have had success in detecting leakage current in aerial inspections. PacifiCorp expects that further use of handheld IR devices will produce similar results that would otherwise be undetected through a normal visual inspection. Early detection of latent conditions will result in avoided fault operations that have a direct impact on ignition probability.

Follow-up planned

Depending on the pilot's results, PacifiCorp may engage in further studies regarding applications on the distribution network.

4.4.2.4 LiDAR Pole Loading Assessment Pilot

Purpose of research

This pilot focuses on reviewing a new technology to expedite the review of pole loading using LiDAR and automated 3D evaluation software. LiDAR data can be gathered via drone or helicopter to provide 3D files on transmission assets. These 3D files can then be used in combination with pole loading assessment software to automate the pole load calculations, expediting the completion of pole load calculations on entire circuits.

Relevant terms

LiDAR — Light detection and ranging.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
LiDAR Point Cloud Data (X, Y, Z)	2019	Once	10 cm	Single date
Pole Locations	2019	Once	0.5 m	Single date
Pole Lean	2019	Once	0.5 m	Single date

Methodology

Lines are identified based on the fire risk, historic fault rates, inspection results and joint-use records that might indicate a pole too weak for its loaded equipment. The lines are then flown with LiDAR and the LiDAR data incorporated into PLS-CADD, a strength modeling program. Varying loading scenarios are modeled on the poles and pole lines to evaluate pole performance; Based on the modeling results, replacements or strengthening would be considered. In 2019 the LiDAR data collected was used to test the accuracy of LiDAR data in pole loading analysis.

Timeline

2019 — Flew test line.

2022 — Evaluate program for expansion or completion.

Results and discussion

This pilot resulted in the recommendation that 187 poles in the HFTD be replaced as a proactive measure to align with existing design and construction standards that may not have been in place during initial line construction. These poles were not an imminent threat and were not as high priority as other poles with Conditions that require more rapid replacement consistent with the California general orders. Additionally, due to the location of these poles within the HFTD, these poles were already in scope for evaluation as a part of the covered conductor projects. Therefore, these efforts are being combined to improve cost effectiveness and the proactive pole replacement is occurring concurrently with covered conductors. If the LiDAR assessment had identified 187 poles for replacement separately from an already occurring replacement, it would have cost approximately $2.2 million to replace all poles. While an equipment upgrade is a proactive action to prevent equipment failures, there is no indication that this work offers significant risk reduction, therefore it is recommended to not continue this pilot at this time.

Follow-up planned

Consistent with other initiatives, PacifiCorp plans to complete the replacement of the 187 poles identified through the pilot and conclude this pilot for the 2020-2022 WMP term.

Completed pilots

4.4.2.5 Advanced Weather Station Modeling and Weather Stations Pilot

Purpose of research

This pilot focuses on exploring of the benefits of remote automatic weather system (RAWS) stations versus micro weather stations (MWS). Additionally, this pilot sought to create a methodology to systematically identify areas with limited data in our weather station network and in the National Interagency Fire Center's (NIFC) datasets. The company is installing multiple RAWS stations, to participate in the RAWS weather network and to calibrate RAWS stations with previously deployed micro stations. Participation in the RAWS weather network may enhance coordination with public safety partners and utility situational awareness. Improved situational awareness may support modifications of system operations in response to risk periods that are weather dependent. Calibration between public and private weather systems may improve correlation between weather systems and their sensitivities to specific patterns, notably improving coordination between NIFC and the U.S. Forest Service (USFS) and utility situational awareness.

Relevant terms

GREATER — Company-designed mapping software used for risk mapping.

Micro weather station (MWS) — An MWS is a low-cost, small, portable, self-contained, wireless sensor that can detect precise meteorological data.

National Interagency Fire Center (NIFC) — The NIFC is a federal government agency that coordinates national resource mobilization for wildland fire and other U.S. fire incidents.

Remote Automatic Weather System (RAWS) — A network of automated weather stations run by the USFS and Bureau of Land Management (BLM) and monitored by the NIFC, mainly to observe potential wildfire conditions.

Zone of Protection (ZOP) — A ZOP is a module, i.e., subsection of a circuit with control, either programmatically, automatically or manually. Figure 4.16 shows the ZOPs of a portion of a circuit beginning at the black dot, representing the substation's circuit breaker.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
RAWS	1/2021	Hourly	Lat/lon per weather station	1min
Micro station	2019-12/2021	10mins	Lat/lon per weather station	1min

Methodology

PacifiCorp leveraged the LRAM (see Section 4.5.1.4 on page 8381) to site future weather stations in an objective and quantified manner. Using the LRAM, the company calculated a combined risk score for each ZOP; this risk score summarizes many aspects of wildfire risk including but not limited to fire weather history, fuel density, tree canopy cover, outage history, ignition history and arc energy calculations. The second step in this pilot was to obtain the locations of all RAWS, NWS, and PacifiCorp weather stations throughout our service territory and bring them together to create a combined risk score dataset from the LRAM. For each ZOP, we identified the nearest weather station and calculated the distance and difference in elevations to obtain a situational awareness score. Finally, PacifiCorp combined the situational awareness score with the combined risk score to create a risk blindness score. Using a map in GREATER to understand the blindness of the risk scores, the company identified locations with both low situational awareness and a high combined risk score; these locations are optimal for future micro weather stations.

Timeline

2019 — Installed micro weather stations as part of standard initiative.

2021 — Installed RAWS.

2022 — Evaluate RAWS for expansion or end of pilot.

Results and discussion

RAWS offer the installation benefit of providing data in locations that are not bucket truck accessible.

RAWS data is only provided once every day, as compared to micro weather stations, which provide data every 10 minutes. The granularity of the micro station data is better.

Follow-up planned

Due to the greater sensor capability, PacifiCorp plans to use MWS primarily and only plans to use RAWS where MWS could not be installed.

4.4.2.6 Fault Detection Line Monitoring Pilot

Purpose of research

This pilot explored the use of continuous monitoring sensors, including both line sensors and station relays, for fault identification and detection. It was determined to be a key element in advanced protection and operations, particularly supporting improved situational awareness.

Relevant terms

LineScope — Three-phase power monitoring system for use on circuits up to 138 kV.

Relay — An electrical device, typically incorporating an electromagnet or within a solid-state device, which is activated by a current or signal in one circuit to open or close another circuit.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
Relay Setting Element	since 2020	as needed	by protective zone	time during which setting was active (HH:MM)
Relay Event Record	since 2020	as needed	by protective zone	quarter cycles
Fault Analysis for Relay Event	TBD	as needed	by protective zone	quarter cycles
Outage Record	2003-present	as occurs	by protective zone	microseconds

Methodology

Lines and stations and their priorities were selected based upon their coincidence to fire risk, length of line (percentage in fire risk tier), consideration of whether distribution facilities were associated with PSPS areas, historic records of fault events with unknown locations and the impact to customer reliability when fault events occur. If communications technologies were not proximate to either line end, a smaller set of technology options exist.

Timeline

2021 — Completed most installations of transmission relays with fault detecting

relays) or line sensor piloting (LineScope).

2022 — Complete installations and evaluate program for expansion or completion.

Results and discussion

The primary benefit with fault detection devices that have been placed, is that they provide directionality when patrols are dispatched to locate faults. However, no widespread metrics have been created yet — due to the recent nature of the installations. When evaluating the use of this technology as a less expensive alternative to upgrading the protection devices on a line, the technology has been determined to not provide as much benefit as upgraded protection devices, which can more quickly address a fault.

Follow-up planned

While PacifiCorp experienced some benefits using this technology (fault directionality), when performing a cost-benefit analysis, the benefits of upgrading protection devices outweighed the benefits of the piloted technology. Therefore, PacifiCorp does not plan to prioritize the installation of future LineScope devices.

4.4.2.7 Vegetation Management Database Pilot

Purpose of research

PacifiCorp's historic vegetation records often lacked spatial granularity and were not centralized. The new vegetation management database allows vegetation management records to be centralized and incorporates GPS locations from field work.

Relevant terms

There are no uncommon, relevant terms for this subsection.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
Vegetation Work Records	2020-Present	Daily	10m	Daily

Methodology

Record templates are created by vegetation management and new work records are entered by contractors and staff foresters in the field on company-provided tablets. The database storing these records is maintained by a vendor with access and download options provided to PacifiCorp personnel.

Timeline

2020 —Initiated record system.

2021— Made additional refinements.

2022 —Evaluate for a standard program.

Results and discussion

Data generated by this system has been used for reporting purposes. Additional incorporation of these records into various vegetation analyses is anticipated as the volume of records increases.

Follow-up planned

This new system has been successfully implemented by field crews and is part of their standard processes.

4.4.2.8 Sophisticated Program Control Settings Pilot

Purpose of research

This pilot evaluates the optimal approaches in using sensitive and sophisticated device settings to reduce wildfire risk (and improve reliability). Devices, including relays, reclosers and fuses, all have methods by which they are programmed to operate in response to a fault condition. If there is limited coordination between devices, it can increase the probability of equipment damage, or delayed device operations which create and extend an ignition risk.

Relevant terms

Elevated Fire Risk (EFR) settings — EFR settings on reclosers can be used by PacifiCorp to address high wildfire risk situations.

Fast trip — An advanced protection capability that can be part of a setting profile, for example, setting profiles can be normal (fast trip followed by reclosing attempts), elevated risk (fast trip followed by single reclose attempt after sufficient time to limit persistence of heat).

Fault — Abnormal electrical current that if not interrupted within a certain time may damage the electrical system which is experiencing the abnormal current.

Protective zone — Part of the electrical system which is protected by a certain protective scheme established by the electrical system equipment (breakers, relays, etc.).

Relay — An electrical device, typically incorporating an electromagnet or within a solid-state device, which is activated by a current or signal in one circuit to open or close another circuit.

Relay event record — An electronic log recording a subset of values such as the date, time, recording interval, and pre-defined categories (voltage, amperage, etc.) when specific thresholds are out of programmed boundaries.

Setting group — A predetermined quantity of independent system protective settings contained within a defined group used by programmable devices such as substation relay or field recloser device.

Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity
Relay Setting Element	since 2020	as needed	by protective zone	time during which setting was active (HH:MM)
Relay Event Record	since 2020	as needed	by protective zone	quarter cycles

Methodology

As new relays and reclosers are set they are evaluated for their coincidence to elevated fire risk areas. In areas where this risk exists, remote (grid operations) device control and communications equipment upgrades to increase communication speeds between coordinating devices are planned for installation. For all installations, independent of fire risk area, the option for advanced settings, including high impedance fault relays will be deployed.

Timeline

2020 — Began to install reclosers and relays.

2021 — Used alternative recloser settings during elevated wildfire risk.

2022 — Evaluate use across the company.

Results and discussion

Based on field reports during the 2021 fire season, PacifiCorp observed benefits in the use of EFR settings on reclosers including a reduction of ignition potential through operation.

Follow-up planned

This program supported a reduction in ignition potential through elevated wildfire events therefore it is in the process of being implemented throughout the company where the potential for elevated fire risk exists.

4.5 MODEL AND METRIC CALCULATION METHODOLOGIES

4.5.1 Additional models for ignition probability, wildfire and PSPS risk

Each utility is required to report details on the models and methodologies used to determine ignition probability, wildfire risk, and PSPS risk. This must include the following for each model – a list of all inputs, details of data elements used in the analysis, modeling assumptions and methodologies, input from Subject Matter Experts (SMEs), model verification and validation (e.g., equation(s), functions, algorithms or other validation studies), model uncertainty and accuracy, output (e.g., windspeed model) and applications of model in WMP (e.g., in selection of mitigations, decision-making).

The narrative for each model must be organized using the headings described below. A concise summary of the model(s) must be provided in the main body of the WMP in this section, with additional detail provided for each model in an appendix.

1. ***Purpose of model*** *– Brief summary of context and goals of model*

2. ***Relevant terms*** *– Definitions of relevant terms (e.g., defining "enhanced vegetation management" for a model on vegetation-related ignitions)*

3. ***Data elements*** *– Details of data elements used for analysis. Including at minimum the following:*

    a. *Scope and granularity (or, resolution) of data in time and location (i.e., date range, spatial granularity for each data element, see example table above).*
    b. *Explain the frequency of data updates.*
    c. *Sources of data. Explain in detail measurement approaches.*
    d. *Explain in detail approaches used to verify data quality.*
    e. *Characteristics of the data (field definitions / schema, uncertainties, acquisition frequency).*
    f. *Describe any processes used to modify the data (such as adjusting vegetative fuel models for wildfire spread based on prior history and vegetation growth).*

4. ***Modeling assumptions and limitations*** *– Details of each modeling assumption, its technical basis, and the resulting limitations of the model.*

5. *Modeling methodology – Details of the modeling methodology. Including at minimum the following:*

    a. *Model equations and functions*
    b. *Any additional input from Subject Matter Experts (SME) input*
    c. *Any statistical analysis or additional algorithms used to obtain output*
    d. *Details on the automation process for automated models.*

6. ***Model uncertainty*** *– Details of the uncertainty associated with the model. This must include uncertainty related to the fundamental formulation of the model as well as due to uncertainty in model input parameters.*

7. ***Model verification and validation*** *– Details of the efforts undertaken to verify and validate the model performance. Including at minimum the following:*
   a. *Documentation describing the verification basis of the model, demonstrating that the software is correctly solving the equations described in the technical approach.*
   b. *Documentation describing the validation basis of the model, demonstrating the extent to which model predictions agree with real-world observations.*

8. ***Modeling frequency*** *– Details on how often the model is run (for example, quarterly to support risk planning versus daily to support on-going risk assessments).*

9. ***Timeline for model development*** *– Model initiation and development progress over time. If updated in last WMP, provide update to changes since prior report.*

10. ***Application and results*** *– Explain where the model has been applied, how it has informed decisions, and any metrics or information on model accuracy and effectiveness collected in the prior year.*

11. ***Key improvements from working group*** *– For each model, describe changes which have been implemented as a result of wildfire risk modeling working group discussions. Provide a high-level summary of recommendations from the wildfire risk modeling working group.*

4.5.1.1 Wildfire Analyst-Enterprise (WFA-E)

1. **Purpose of model – Brief summary of context and goals of model**

PacifiCorp recently began procuring Technosylva's Wildfire Analyst-Enterprise (WFA-E) to take advantage of already established modeling software in use at other utilities and fire agencies to support real-time operations and long-term planning. While still in development for full operational use at PacifiCorp, the WFA-E modeling solution includes a suite of wildfire risk analysis products, including FireCast, FireSim and the Wildfire Risk Reduction Model (WRRM).

FireCast leverages Technosylva's fire spread prediction modeling capabilities through integration with PacifiCorp's Weather Research and Forecast (WRF) model to derive daily territory-wide and utility asset wildfire risk ratings. This information is critical to operations throughout fire season and especially on the days leading up to an extreme fire weather event and potential PSPS. FireSim provides on-demand capability to simulate the potential spread and consequence of a reported fire, which critically supports decision-making for real-time operations and infrastructure protection. FireSim can also simulate the potential consequence of fires that were prevented due to operational actions such as PSPS. WRRM combines millions of fire behavior simulations with proprietary asset data to quantify risk from each asset and calculate

potential risk reduction for wildfire hardening projects. PacifiCorp's goal for WFA-E is to leverage cutting-edge fire science technology to better anticipate, prepare for, respond to, and recover from extreme fire weather events and long-term wildfire risk. This includes PSPS decision-making and the prioritization of fire-hardening projects.

While PacifiCorp has already procured FireCast and FireSim, the WRRM component of Technosylva is planned for procurement in 2022. With this suite of modeling tools, PacifiCorp can begin developing an aggregate index, such as the Fire Potential Index (FPI) used at other utilities, to drive activity changes based on elevated weather conditions and exceeded thresholds. The FPI will mature with time as the models evolve and as additional risk modeling guidelines are created by regulators. PacifiCorp anticipates that the procurement of Technosylva, which aligns with the general risk modeling methodology used by other utilities, will better prepare the company for the 2023 WMP guidelines — where updated risk modeling guidelines are anticipated, based on participation in the OEIS-hosted Wildfire Mitigation Risk Modelling workshop monthly series.

2. Relevant terms

Asset A — Specific feature on the electric utility infrastructure network such as a pole, conductor, capacitor, transformer, or fuse.

Asset class — A grouping of assets based on their characteristics, such as material type, size, orage, that reflects a specific likelihood for equipment failure and wildfire ignition.

Asset Index — A six-digit number used to delineate asset classes.

Burn probability — The probability of a wildfire burning into an area, sometimes referred to as a wildfire threat. Burn probability is the combination of numerous individual fire growth potential simulations to create an overall fire growth potential map using electrical assets as possible ignition sources.

Conditional impacts — The mean wildfire impact given that an equipment-related wildfire occurs at a specific location (also referred to as conditional risk). Conditional impacts are combined with ignition rate and wind factor characteristics to calculate the expected impacts. They are calculated for each asset and can be summed to quantify the conditional impacts for a specific hardening project.

Downfire — The location of a HVRA within the fireplain (fire growth from a specific ignition location)

Expected impacts — The mean annual equipment-related wildfire impact after incorporating the likelihood of equipment failure and subsequent wildfire (also referred to as expected risk). This is a primary output of the WRRM model. It is calculated for each asset and can be summed to quantify the expected impacts for a

specific hardening project.

Exposure — The placement of a Highly Valued Resources and Asset (HVRA) in a hazardous environment. For example, building a home within a flammable landscape.

Fireplain —The calculated, estimated area of a fire's spread if it is ignited at a particular location. A fireplain represents the spread area commonly referred to as Time of Arrival, a raster representation of the fire spread, while Fire Perimeters is the vector format representation of the fire spread.

GIS assets — The GIS database of assets used as the source of potential ignitions for the WRRM.

Hardening projects — A series of projects that may occur to change, repair, replace, or affect asset equipment. The intent of these projects is to "harden" the equipment so that it is more durable and less likely to fail. A project is a series of activities that may be combined under a single work order or field visit for planning, budgeting, and/or administrative management.

Highly Valued Resources and Asset (HVRA) — Resources and assets such as structures/homes or environmentally sensitive areas.

Ignition likelihood — The probability of an asset to start a fire ignition based on equipment failure or external weather conditions.

Replacement asset — The new asset class used to replace an existing asset class. Replacement assets have lower equipment failure rates and ignition rates than existing assets.

Risk reduction — The expected risk over a 20-year planning horizon for an asset. This is the primary WRRM model output to quantify risk reduction for an asset replacement. Risk reduction values are summed for assets in specific hardening projects to provide an overall risk reduction for that project.

Susceptibility — A measure of how easily an HVRA is damaged by wildfires of different types and intensities.

Values-at-risk — A general term that is commonly used to describe the HVRA and the risk assigned to them.

Vulnerability — A combination of exposure and susceptibility, Vulnerability is the measure of potential (sometimes called conditional) impacts to HVRA from wildfires of different intensities.

Wildfire hazard — A physical situation with potential for causing damage to resource or assets. Wildfire hazard is measured by two main factors: burn probability and

intensity.

Wildfire risk— Overall measure of the possibility for loss or harm caused by wildfire. Wildfire riskis a product of wildfire hazard and vulnerability.

3. **Data elements – Details of data elements used for analysis. Including at minimum the following:**

Data Element	Scope	Spatial Granularity	Temporal Granularity	Collection Period	Collection Frequency	Data Sources
FuelMoisture Data	Vegetation and fuel data cross PacifiCorp territory	2 km	Hourly	Daily	Daily	PacifiCorp WRF and Technosylva
Weather Forecast	Temperature, dewpoint, humidity, windspeed & gust, wind direction, etc. at the surface and aloft	2 km	Hourly	Daily	Daily	PacifiCorp WRF
Real-time Weather Observations	Weather provided from weather stations and other sources across the region which may impact PacifiCorp service territory.	Varies	Ranges from 10 minutes to 1 hour	Daily	Daily	Utility mesonets, ASOS, & RAWS
Historical Fires	Across PacifiCorp territory.	n/a	annual	All recorded	annual	Fire agencies
Fire behavior analysis	n/a	n/a	n/a	n/a	n/a	Provided by vendor
Fire Simulation modeling	n/a	n/a	n/a	n/a	n/a	Provided by vendor
PacifiCorp Distribution/Transmission assets	n/a	n/a	n/a	n/a	n/a	PacifiCorp GIS
Subjective 'values at risk' parameters	n/a	n/a	n/a	n/a	n/a	Provided by vendor

4. **Modeling assumptions and limitations – Details of each modeling assumption, its technical basis, and the resulting limitations of the model.**

- The WRRM model does not include system information such as outages, equipment failures, electric system conditions, or wildfire mitigation initiatives. PacifiCorp plans to incorporate the dynamic outage data as a separate model evolution after the

2023 Risk Modeling Guidelines are updated.

5. **Modeling methodology – Details of the modeling methodology. Including at minimum the following:**

   WFA-E consists of three wildfire risk analysis products: FireCast, FireSim and WRRM. WFA-E combines PacifiCorp's daily WRF forecast and 30-year reanalysis data with Technosylva's proprietary wildfire spread model to calculate wildfire behavior, risk and consequence metrics.

   Once fully operational, FireCast will ingest PacifiCorp's operational WRF data, then use Technosylva's wildfire spread model to perform millions of wildfire simulations daily across the service territory over a 96-hour forecast horizon. The results of the simulations are used to calculate both territory wide and asset level wildfire risk at three-hour time intervals across the forecast period.

   FireSim ingests PacifiCorp's operational WRF data then uses Technosylva's wildfire spread model to perform on-demand wildfire simulations at locations of interest (see Figure 4.7). The user defines the time and length of each simulation.

   WRRM was built on the quantitative risk model, developed between San Diego Gas & Electric (SDG&E) and Technosylva, that associates wildfire hazards with the location of electric distribution overhead assets. Development started with fire growth simulations that would identify both fire growth potential and vulnerability of impacted structures at each simulated fire location inside the service territory.

   Technosylva will provide key data inputs, such as surface and canopy fuels, topography, and climate data, and perform thousands of simulations for each potential ignition location in a Monte Carlo approach,[9] a random sampling simulation methodology that helps solve deterministic problems, to identify the total fire growth potential for that location (see Figure 4.7).

[9] Monte Carlo is a term for a broad set of computational algorithms that rely on repeated random sampling to obtain numerical results.

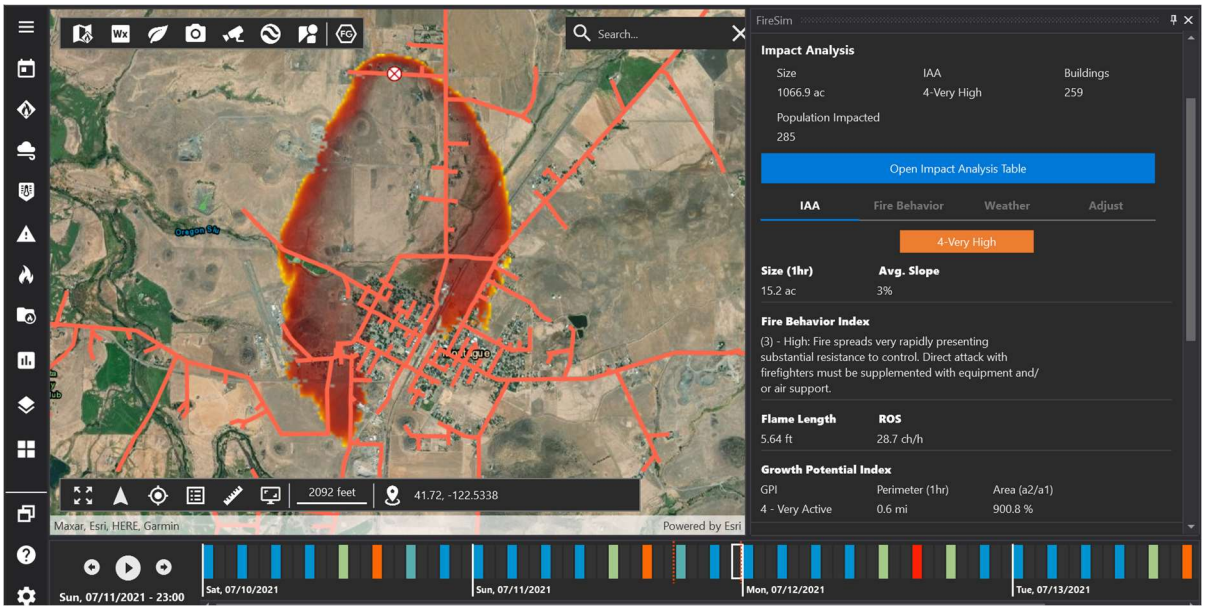


Figure 4.7 Wildfire growth simulation example

Once the fire growth potential for a location is determined, the geospatial simulation is overlaid with property and parcel information relating to the surrounding community to identify potentially impacted structures. Identifying the susceptibility of each structure type to a wildfire (i.e., residences, commercial spaces, parking lots) can be used to estimate a value of impacted square footage or structure damage if an ignition were to occur. This mean value of impacted structure damage generates the conditional impact value for that given location. Figure 4.8 shows wildfire growth simulation and structure values; Figure 4.9 displays the resulting fireplain from a simulation (left diagram). The right diagram shows structure values adjusted by percent loss associated with the fireplain from a wildfire simulation.

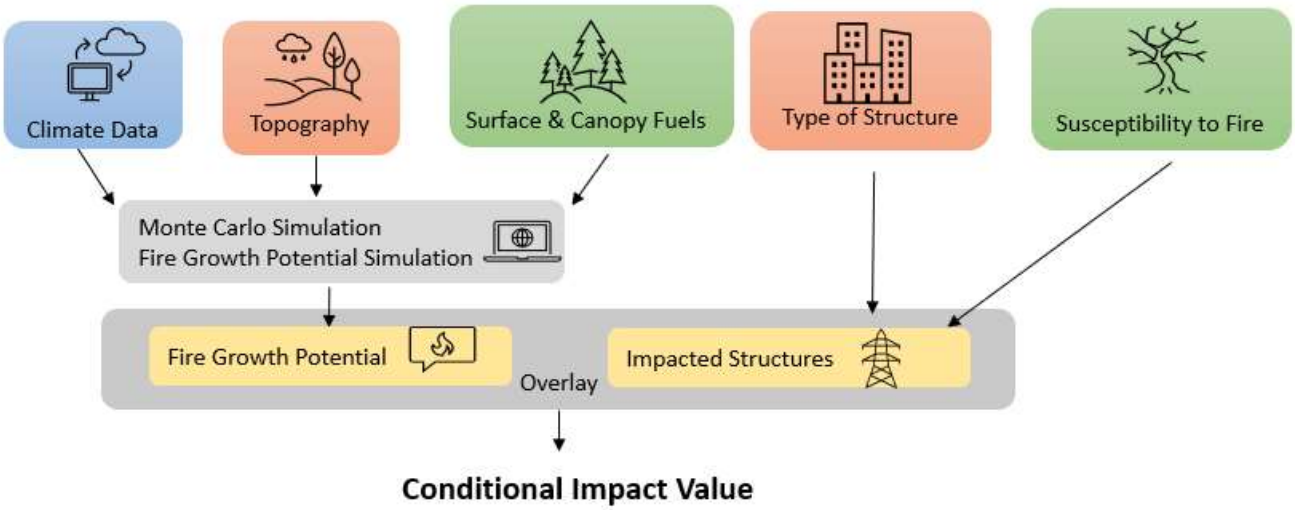


Figure 4.8 Wildfire growth simulation and structure values

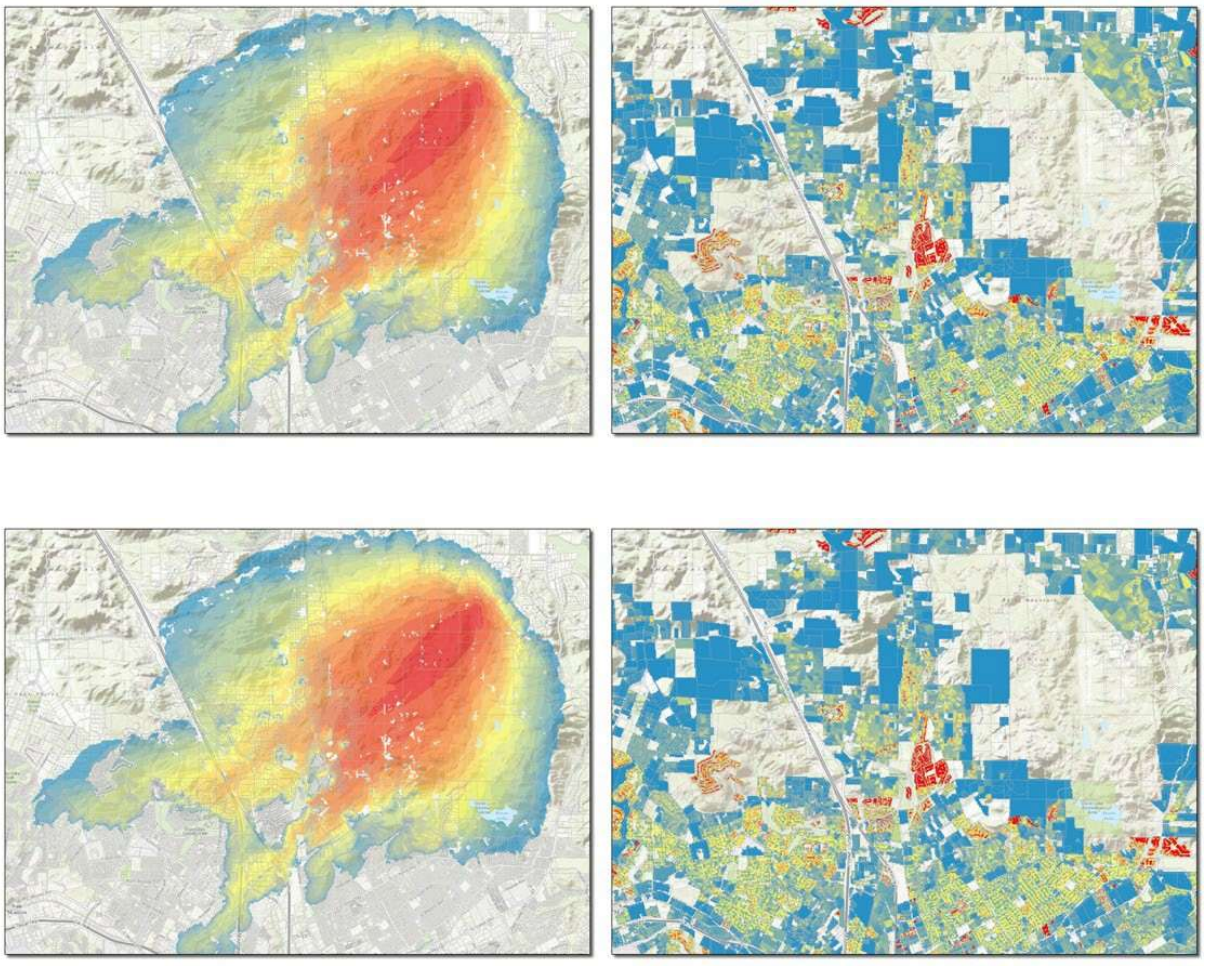


Figure 4.9 Fireplain simulation results

Once the conditional impact is determined, assets associated with the area are assigned an ignition likelihood. This ignition likelihood is the combination of asset failure rate and the ratiofor when those failures might result in an ignition (see Figure 4.10).

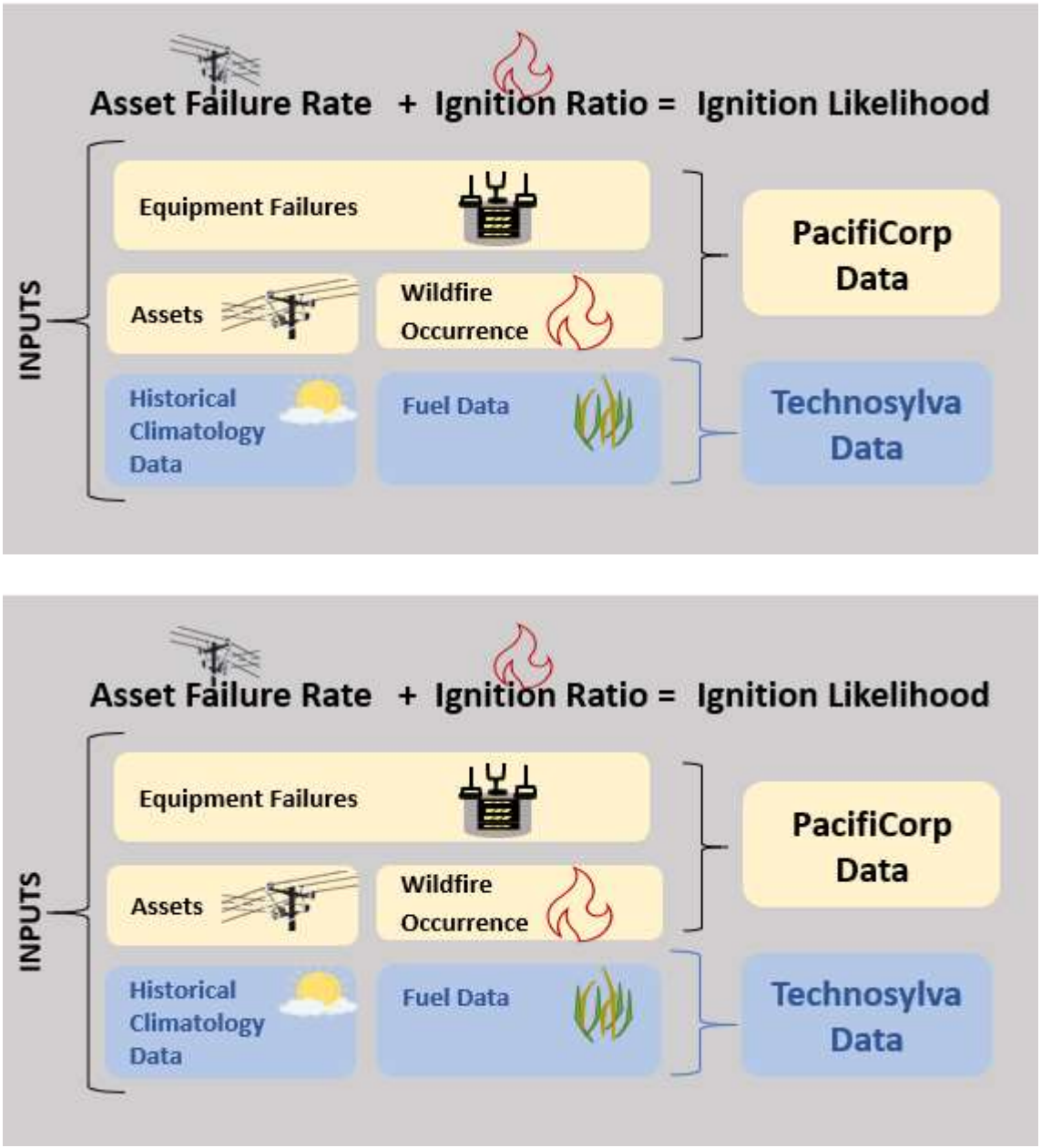


Figure 4.10 Ignition likelihood

As an initial step to demonstrate value, PacifiCorp provided some asset data to Technosylva, who, using a framework similar to that used by other utilities, modeled the number of historic failures and equipment ignitions. Equipment attributes in the GIS asset information were then categorized into the necessary bins to buildthe asset

classes with each developed equipment failure rate and ignition ratio. Once an asset was identified as belonging to a specific asset class, the associated equipment failure rate and ignition ratio wasassigned and combined to generate the ignition likelihood.

PacifiCorp plans to invest in the Technosylva model component in 2022, which will assign ignition likelihoods to all assets across the overhead distribution network and provide a combined number of predicted equipment failures and ignitions for comparison with historic records, including the locations of prior fire history. Then this data will be used to calibrate the failure rates and ignitions across the model to achieve a realistic result and relative ranking of where assets ofconcern exist in the electric distribution network.

When conditional impact and ignition likelihood are determined for each asset at each location, it is possible to calculate the overall expected impact of an equipment-related ignition. The expected impact accounts for the mean annual equipment-related wildfire impact after incorporating the data and methods discussed.

6. **Model uncertainty**

   The GIS data used in this model is captured via as-built drawings and reviewed according to set protocols according to the electric GIS production team standards. This data does not reflect ongoing switching or temporary configurations.

7. **Model verification and validation**

   Once implemented, WRRM data delivery will include GIS feature classes, which are visually inspected in a map environment when they are received to ensure the data results coincide with known conditions around the service territory.

8. **Modeling frequency**

   See the Data Elements Table in #3 for model frequency and data refresh rates.

9. **Timeline for model development**

   PacifiCorp did not actively participate in the model development of WFA-E. Instead, PacifiCorp plans to procure version 2.0, which includes updated GIS information, more granular asset data and enhanced GIS asset query functions to assist in project creation.

10. **Application and results**

    The WRRM and subsequent data tables are useful in identifying and prioritizing operational programs such as recloser settings and alternative work protocols.

11. **Key improvements from working group**

    Wildfire Risk Modeling working group discussions are underway. Direct improvements from the discussions have not yet been determined, but PacifiCorp anticipates incorporating recommendations or best practices learned through this collaboration into the evolution of the company's risk modeling suite. Additionally, PacifiCorp is already leveraging the benefits of general industry and industry partner collaboration through the incorporation of Technosylva into the company's risk modeling framework.

4.5.1.2 Contemporary fire weather risk model

1. **Purpose of model**

   The purpose of the fire weather risk model is to create a normalized relative ranking for the fire weather risk at a ZOP level, using recent historical gridded outputs. The main goal is to use the High Resolution Rapid Refresh (HRRR) model (3-km resolution)

to identify zones that have a high frequency of specific weather events such as strong winds and frequent droughts. The company then combines the weather component with the fuel density as quantified by the LANDFIRE 2020 remap to identify locations that have a coincidence of frequent fire weather and abundant fuel to sustain large wildfires.

2. **Relevant terms**

LANDFIRE —The LANDFIRE program provides 20+ national geospatial layers (e.g., vegetation, fuel, disturbance, etc.), databases and ecological models that are available to the public for the United States and insular areas.

Module — Subsection of a circuit.

Zones of Protection — A ZOP is a module, i.e., subsection of a circuit with control, either programmatically, automatically or manually Figure 4.16 shows the ZOPs of a portion of a circuit beginning at the black dot, representing the substation's circuit breaker.

3. **Data elements**

This layer is the combination of HRRR weather data going back to 2016 and the LANDFIRE 2020 Fuel Characteristic Classification System Fuelbeds (FCCS) dataset.

4. **Modeling assumptions and limitations**

Climatology can generally be inferred with limited measured assets, i.e., weather stations; models can be used to gauge local climate patterns.

5. **Modeling methodology**

PacifiCorp uses a combination of weather stations and hourly 3-km data to obtain localized and accurate weather history (see Figure 4.11) at the ZOP level, such as hourly wind speed, wind gusts, precipitation, relative humidity and temperatures going back to 2016. This data is then used in the following methodology to determine

Contemporary Fire Weather Risk (also called Fire Weather Risk).

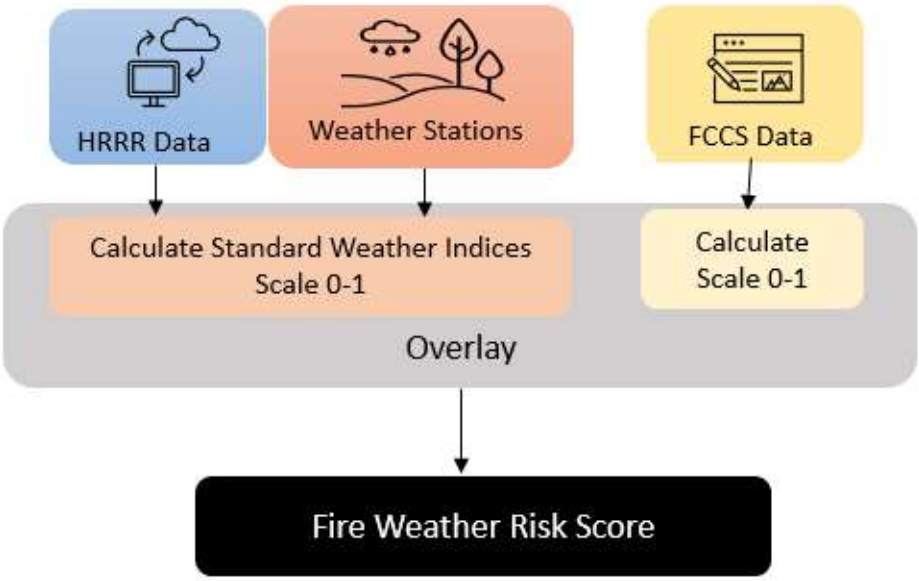


Figure 4.11 Fire weather risk

A step-by-step characterization of our methodology follows:

- Take the sum of the weather indices during the wildfire season at each location normalized by the number of years.
- Apply a min-max scaling to put the exposure measures onto the same 0-1 scale.
- Obtain fuel density measures by overlaying the ZOP shapefile over the Total Available Fuel sublayer from the FCCS and mapping it to a 0-1 scale.
- Combine the weather and fuel scores to get the final Fire Weather Risk Score using a simple linear combination of each subscore multiplied by its own respective coefficient shown as:

$$Fire\ Weather\ Risk\ Score = \sum_{i}^{Layers} x_i c_i$$

Where: x_i is the relative ranking between 0-1 for each sublayer and c_i is the respective chosen coefficient for each variable. After a few iterations we settled on the weather variables having a coefficient of 1 and the fuel component having a coefficient of 2 (weather variables carry 60% of the weight; fuel carries 40%).

6. **Model uncertainty**

   The data inputs to this model come from weather stations, and there can be uncertainty regarding the validity of that data. Therefore, weather station data is monitored by SMEs for anomalies and calibrated annually prior to wildfire season.

7. **Model verification and validation**

   Calibration using company and external weather sources to gauge local terrain impacts.

8. **Modeling frequency**

   The Fire Weather Risk layer is updated after each wildfire season is concluded. The metrics are calculated on a per year basis and used to identify trends across service territory as they emerge.

9. **Timeline for model development**

   This model was created in 2019 and is planned to be updated with 30yr WRF data in 2023.

10. **Application and results**

    The Fire Weather Risk Score can be used independently to identify ZOPs with a high frequency of fire weather coincident with dense fuel. Additionally, this Fire Weather Risk Score is a key element of LRAM (for more on LRAM, see Section 4.5.1.4 on page 8381). The weather components of this risk score are a factor that is reviewed to determine the necessity of a PSPS event. Consequently, the Fire Weather Risk score can also be thought of as the relative frequency of weather conditions that necessitate a PSPS event.

11. **Key improvements from working group**

    In 2023, PacifiCorp plans to incorporate the 30-year WRF data described in Section 7.3.2.4 on page 166156.

4.5.1.3 Available probabilistic arc energy risk model

1. **Purpose of model**

   The Available Probabilistic Arc Energy Risk model uses distribution system model simulations to arrive at arc energy values for studied locations. Higher arc energy from short-circuit events is associated with an increased risk of ignition. Arc energy is calculated from the available fault current (amps) and the time required for a

protective device to clear the fault event. Available fault current varies across the system due to circuit topology, length, and materials used. Line sections, and ultimately ZOPs and circuits, were scored based on arc energy values and line length (exposure). The score is a gauge of relative ignition risk and can identify locations where system improvements can be proposed to reduce said ignition risk.

2. Relevant terms

Arc flash analysis — Any of several engineering methods (IEEE 1584, NFPA-70E, CSA Z462, Lee Method, Wilkins Method) used to analyze electrical safety in power systems. The methods typically use heat transfer models, heat flux calculations and/or prescribed tables to assess risk level and help determine adequate safety procedures. A variety of parameters, including source impedance, equipment type, equipment location and clearing device are used to calculate total energy from an arc associated with a short circuit event.

CYME model — A software representation of a given power system, where simulations can be run to gain insight on system capability and behavior.

Load current — The current (Amperes) normally flowing through an energized power system to deliver power.

Protective device details — The applicable TCC curves for a protective device, together with logic-based settings.

Short circuit event — An occasion when one or more components of an electrical system contact one or more circuit return paths. Commonly used for arc flash analysis: a phase conductor contacting earth or system neutral. The result is typically a current value higher than load current.

Time current characteristic (TCC) — The specified relationship between applied current and operating time for a protective device such as a fuse, recloser or relay-controlled breaker. TCCs are often represented visually by curves for the purpose of studying device coordination, or for developing new settings. For example, a 100 Amp T-speed fuse will take more time to operate for a given current magnitude than will a 25 Amp T-speed fuse.

3. Data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Comments
CYME v9.0 distribution system model	2020	Collected once in 2020, held constant throughout analysis	Lat/lon for each node in the model	Not used	The system model includes source, line and protective device details (type, material, ratings, settings, etc.).

4. **Modeling assumptions and limitations**

   Requires accurate conductor registry in TCC/arc flash models

5. **Modeling methodology**

   A pilot simulation evaluated short-circuit scenarios where 5 Ohms of impedance was assumed for all short-circuit events, and applied voltage at the low end of ANSI A range (95% nominal). These values were chosen to represent an event whose arc energy was reasonably high. Simulating voltage higher than 95% nominal, or with fault impedance lower than 5 Ohms, generally results in faster clearing times and may result in lower total arc energy. A higher impedance value would generally result in slower clearing times and might result in higher total arc energy. The pilot results used relative, not absolute, arc energy value for final scores.

   For each protective device, downstream overhead lines in its ZOP were evaluated for composite scoring by arc flash results and line length (See Figure 4.12 for a schematic of available probabilistic arc energy risk.). That score was also aggregated to the circuit level. The result is a metric that helps the company focus on arc energy high-risk areas for remediation, and that can be used as a component within a more comprehensive score that accounts for risk from other categories.

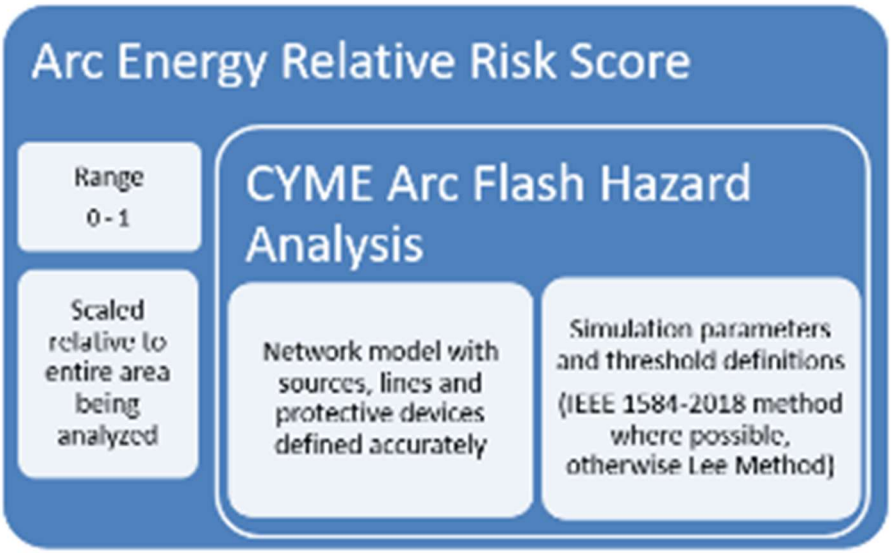
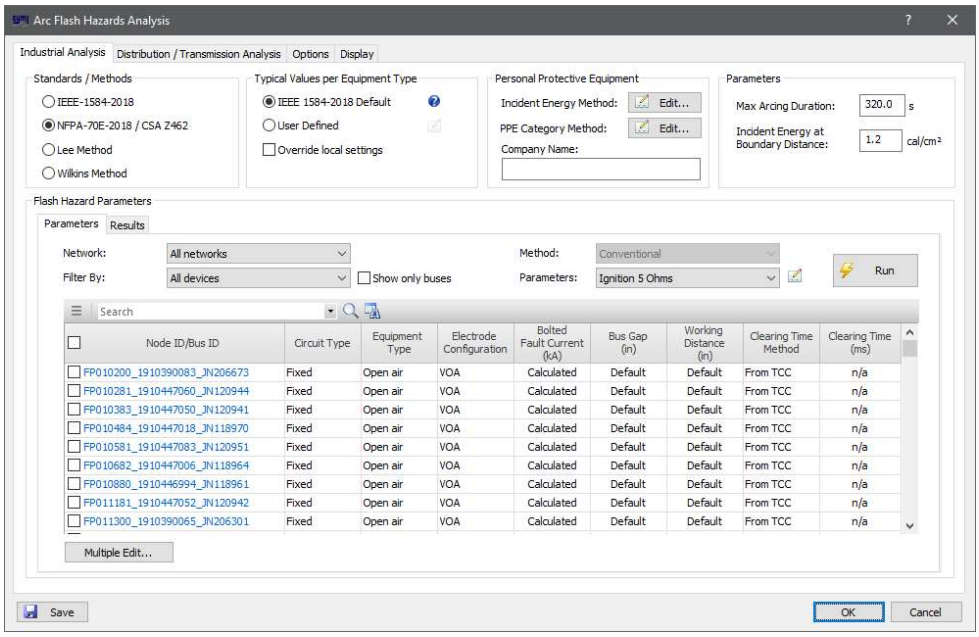


Figure 4.12 Available probabilistic arc energy risk


Arc Flash Hazards Analysis
Industrial Analysis
Distribution / Transmission Analysis
Options
Display
Standards / Methods
IEEE-1584-2018
NFPA-70E-2018 / CSA Z462
Lee Method
Wilkins Method
Typical Values per Equipment Type
IEEE 1584-2018 Default
User Defined
Override local settings
Personal Protective Equipment
Incident Energy Method:
Edit...
PPE Category Method:
Edit...
Company Name:
Parameters
Max Arcing Duration:
320.0
s
Incident Energy at Boundary Distance:
1.2
cal/cm²
Flash Hazard Parameters
Parameters
Results
Network:
All networks
Filter By:
All devices
Show only buses
Method:
Conventional
Parameters:
Ignition 5 Ohms
Run
Search
Node ID/Bus ID
Circuit Type
Equipment Type
Electrode Configuration
Bolted Fault Current (kA)
Bus Gap (in)
Working Distance (in)
Clearing Time Method
Clearing Time (ms)
FP010200_1910390083_JN206673 Fixed Open air VOA Calculated Default Default From TCC n/a
FP010281_1910447060_JN120944 Fixed Open air VOA Calculated Default Default From TCC n/a
FP010383_1910447050_JN120941 Fixed Open air VOA Calculated Default Default From TCC n/a
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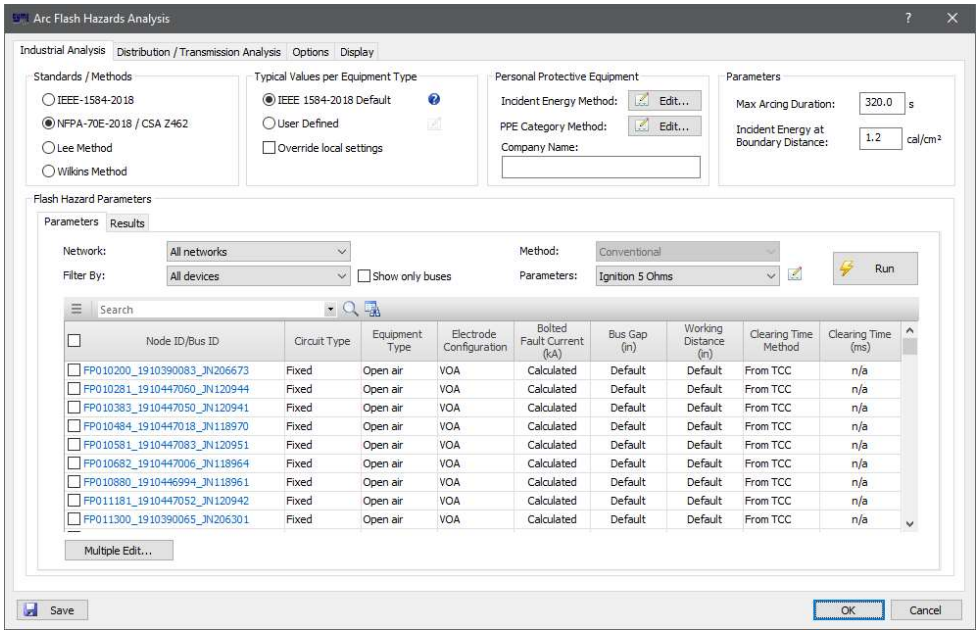
Arc Flash Hazards Analysis
Industrial Analysis
Distribution / Transmission Analysis
Options
Display
Standards / Methods
IEEE-1584-2018
NFPA-70E-2018 / CSA Z462
Lee Method
Wilkins Method
Typical Values per Equipment Type
IEEE 1584-2018 Default
User Defined
Override local settings
Personal Protective Equipment
Incident Energy Method:
Edit...
PPE Category Method:
Edit...
Company Name:
Parameters
Max Arcing Duration:
320.0
s
Incident Energy at Boundary Distance:
1.2
cal/cm²
Flash Hazard Parameters
Parameters
Results
Network:
All networks
Filter By:
All devices
Show only buses
Method:
Conventional
Parameters:
Ignition 5 Ohms
Run
Search
Node ID/Bus ID
Circuit Type
Equipment Type
Electrode Configuration
Bolted Fault Current (kA)
Bus Gap (in)
Working Distance (in)
Clearing Time Method
Clearing Time (ms)
FP010200_1910390083_JN206673 Fixed Open air VOA Calculated Default Default From TCC n/a
FP010281_1910447060_JN120944 Fixed Open air VOA Calculated Default Default From TCC n/a
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Figure 4.13 Example CYME arc flash analysis input

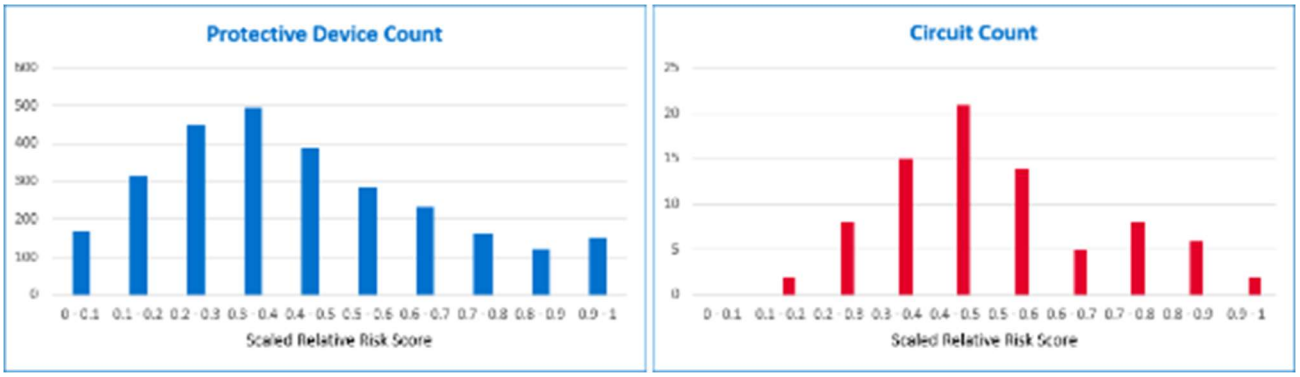


Figure 4.14 Summary of arc energy risk scores (scaled to the range 0-1)

6. **Model uncertainty**

   One of the model's inputs is line equipment. There can be a small time gap after the device is installed and before the model has accounted for it. Hence the model is updated frequently.

7. **Model verification and validation**

   Quality checked by central engineering SMEs.

8. **Modeling frequency**

   Available inputs to the model are updated once per week.

9. **Timeline for model development**

   PacifiCorp completed the pilot in PSPS areas described in the WMP. Based on a review of the pilot results and system records, certain equipment has been updated. PacifiCorp expanded the pilot to other HFTD during 2020, with long-term adoption intended over the next five years, including incorporation as a standard aspect of cyclical study processes.

10. **Application and results**

    The pilot results identified locations where the potential fault (based on the similarity to modeled configurations) reflected a higher risk of damaged conductors or ignition. PacifiCorp used the modeling results to identify locations where there was a higher risk of ignition from a fault condition to support system network changes to preempt such a risk condition.

11. **Key improvements from working group**

Current improvements to CYME do not include any adjustments to the model framework described in this section. Improvements planned include data import and processing improvements to streamline processes.

4.5.1.4 Localized Risk Assessment Model

The LRAM is an overarching model structure that incorporates other models, as well as a set of inputs and outputs. A simple schematic of LRAM looks like this (Figure 4.15):

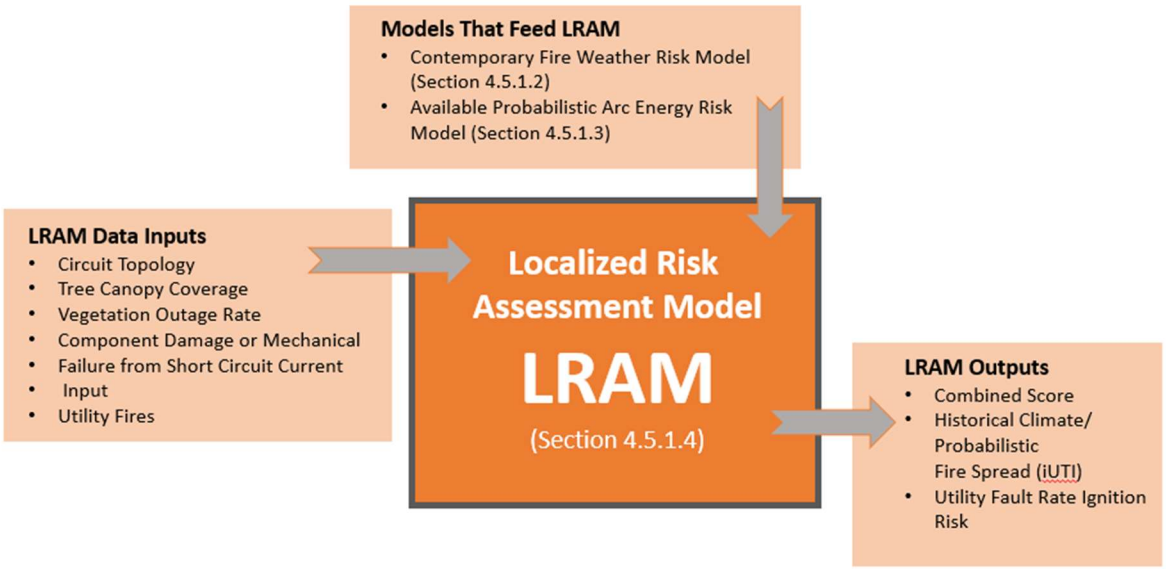


Figure 4.15 LRAM inputs and outputs

1. **Purpose of the model - model and metric calculation**

   From its 2020 Remedial Compliance Program (RCP) filing[10], the company outlined its road map for fire risk modeling, a deterministic method that relied on the HFTD in addition to company-developed climate risk drivers / historic fire risk and outage event analyses. That groundwork set the stage for model goals: establish a risk evaluation that could be utilized to scope Wildfire Mitigation initiatives and prioritize work based on potential for risk reduction.

2. **Relevant terms**

   13 Anderson Fire Behavior Fuel Model — These original 13 standard fire behavior fuel models serve as input to Rothermel's surface fire behavior and spread model. The model represents distinct distributions of fuel loading found among surface fuel components (live and dead), size classes, and fuel types. The fuel models are described by the most common fire-carrying fuel type (grass, brush, timber litter, or slash), loading and surface area-to-volume ratio by size class and component, fuelbed depth, and moisture of extinction.

   Arc flash analysis — Any of several engineering methods (IEEE 1584, NFPA-70E, CSA Z462, Lee Method, Wilkins Method) used to analyze electrical safety in power systems. The methods typically use heat transfer models, heat flux calculations and/or prescribed tables to assess risk level and help determine adequate safety procedures. A variety of parameters, including source impedance, equipment type, equipment location and clearing device are used to calculate total energy from an arc associated with a short-circuit event.

   Conductor damage — The material properties of overhead bare conductors include melting point, temperature coefficient, hardness and tensile strength. When performing engineering analysis on various sizes of copper, aluminum and steel conductors, these properties can be modeled in a 2D damage curve, where the axes are current and time (TCC). This curve can be used to show the duration in time that a conductor can sustain a given current without degradation of its material properties (softening, etc.). Beyond this duration, the conductor is said to have incurred damage.

   CYME model — A software representation of a given power system, where simulations can be run to gain insight on system capability and behavior.

[10] https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/WSD/R.18-10-007%20PacifiCorp%20Remedial%20Compliance%20Plan%20(7-27-20).pdf

Dispatch DoForm/Risk Save — An internal form created at the onset of a fire risk event.

ELMFire — Eulerian Level set Model of Fire spread - is an open-source geospatial model intended for simulating wildland fire.

High resolution rapid refresh (HRRR) — A NOAA, real-time 3-km resolved weather forecasting model updated hourly.

Load current — The current (Amperes) normally flowing through an energized power system to deliver power.

Point layer — GIS layer consisting of individual points with location information and vegetation attributes (point layer: raster data, gridded at 20 meters).

PowerMap — Company mapping system.

PROSPER — Outage record database.

Protective device details — The applicable TCC curves for a protective device, together with logic-based settings.

Short circuit event — An occasion when one or more components of an electrical system contact one or more circuit return paths. Commonly used for arc flash analysis: a phase conductor contacting earth or system neutral. The result is typically a current value higher than load current.

Source details — A numerical representation of impedance, typically at the head of a circuit or substation, of the upstream configuration and equivalent impedance to all connected current contributors (e.g., generation). A low impedance suggests that generation is relatively close and available fault current is relatively high.

Time current characteristic (TCC) — The specified relationship between applied current and operating time for a protective device such as a fuse, recloser or relay-controlled breaker. TCCs are often represented visually by curves for the purpose of studying device coordination, or for developing new settings. For example, a 100 Amp T-speed fuse will take more time to operate for a given current magnitude than will a 25 Amp T-speed fuse.

Zone of Protection (ZOP) — A ZOP is a module, i.e., subsection of a circuit with control, either programmatically, automatically or manually. Figure 4.16 shows the ZOPs of a portion of a circuit beginning at the black dot, representing the substation's circuit breaker. The ZOP is the smaller granule against which any location risk should be considered. Generally speaking, a ZOP goes from a protective device, like a circuit

breaker, to the next protective device(s), such as line recloser or a fuse. Integration of all risks, combined mathematically, using rationalized weighting factors provide rankings for each ZOP that can be used to prioritize efforts for wildfire mitigation actions.

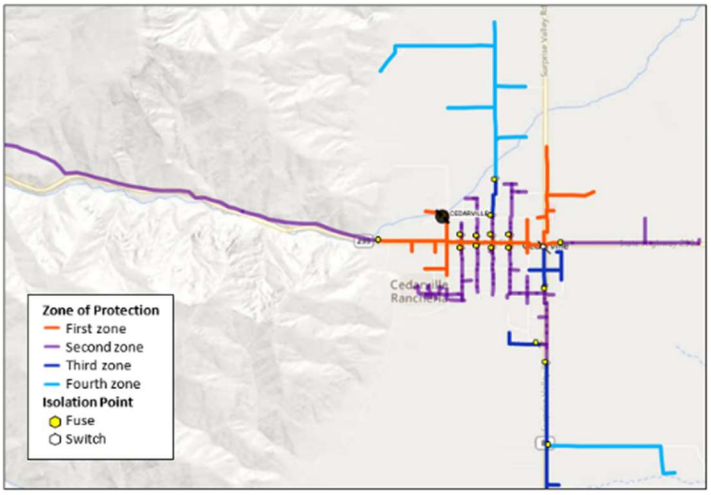


Figure 4.16 Example of a Zone of Protection

3. Data elements

Table 4.3 LRAM data elements

Data Element	Level of Granularity (a)	Frequency (b)	Data sources (c)	Data quality verification (d)	Data characteristics (e)	Data modification and/or future improvements (f)
Circuit Topology	Spatially, approximate 10' accuracy	Data is refreshed and maintained daily.	GIS Point and line features	Review by engineering team.	PacifiCorp base data containing spatial locations, facility and equipment details (e.g., conductor types, spacing, equipment). This data is managed and mapped by the GIS department, which updates records based on field personnel work orders. The data is used to apply model area findings to specific facilities.	Better locational precision; more hardware detail in GIS.
Contemporary Fire Weather Risk	See Section 4.5.1.2 on page 7574					
Utility Fires	GPS accuracy from field resource	data records are reviewed monthly. The model initiation and development progress over time.	Dispatch log, PROSPER outage records, risk save event forms, equipment location and asset details, in addition to event response personnel details and environmental drivers at the time of the event.	Quality checked by risk, operations and engineering SMEs.	Data from dispatch logs, PROSPER outage records, risk save event forms, equipment location and asset details, event response personnel details and environmental drivers at the time of the event are combined to create a recorded dataset of utility-caused fires. A detailed data source review consolidates the data into a single source. Data location is based on GIS equipment location at the time of the incident. When reviewed with other fire-risk influencers, this information can help determine potential trends and will help to determine where addition system and equipment risks, which can drive facility locations upgrades and placements for protective equipment See Figure 4.20.	Centralized database with information augmented by risk event investigation team.
Available Arc Energy and Short Circuit Ignition Likelihood	See Section 4.5.1.3 on page 7877.					

Data Element	Level of Granularity (a)	Frequency (b)	Data sources (c)	Data quality verification (d)	Data characteristics (e)	Data modification and/or future improvements (f)
Tree Canopy Coverage	30 m granularity	Data analysis will be refreshed based on updates to the NLCD Canopy Cover Layer (anticipated at 3 to 5-year intervals. Major changes to PacifiCorp asset locations would require a refresh in analysis.	NLCD Tree Canopy coverage and internal distribution GIS data. NLCD data has 30m2 resolution and extracted data layers maintain that resolution.	Comparison to historic vegetation outages and historic vegetation maintenance records.	A point layer created from distribution line GIS files with 30m spacing, clustered to avoid oversampling at line intersections. Data is extracted from the NLCD Tree Canopy Cover raster layer at each point, aggregated per circuit or subcircuit segment to provide distribution functions and statistical values for the tree canopy cover along each segment. Limitations from the NLCD data resolution and techniques result in lower accuracies in developed areas.	Augmenting NLCD cover data with higher resolution datasets in developed areas.
Historic Climate/ Probabilistic Fire Spread (iUTI)	30 m pixels rendered on circuit topology	Data analysis will be refreshed based on updates to LANDFIRE dataset. In addition, major changes to PacifiCorp asset locations would require a refresh in analysis.	LANDFIRE fuel data, 13 Anderson fuel models, weather re-analysis data.	Review by stakeholders/fire professionals.	Use of historic fire weather days to simulate current fire spread using random ignitions, modeling probability of spread with current vegetation and existing terrain. Randomly ignited cells model volume of acres burned from modeled ignitions accumulated for each 20 m grid. SMEs draw inferences re elevated areas, upon which iUTI was founded. This gridded raster dataset was overlaid on circuit ZOPs and length-weighted for the ZOP iUTI score.	Better integration of contemporary fuel situation; utility focus on ignitions rather than agnostic to source.

Data Element	Level of Granularity (a)	Frequency (b)	Data sources (c)	Data quality verification (d)	Data characteristics (e)	Data modification and/or future improvements (f)
Vegetation Outage Rate	Reconciles outage events to auto isolation point/ZOP; granularity in certain areas of model may not be particularly precise	Historic vegetation outages have been incorporated into the risk model in late 2020 and will continue to be updated periodically.	Historic outage records and circuit information.	Subject matter expertise.	Determined by counting the outages per ZOP and normalizing by length and time. The general framework is very flexible: an outage rate can be extracted for any outage type (car hit pole, animal contact, etc.) across all ZOPs. Vegetation outage frequencies normalized by line length have been incorporated into the risk model.	Reconciliation of tree canopy/vegetation performance would result in greater accuracy with causal relationship.
Utility Fault Rate Ignition Risk	Reconciles outage events to auto-isolation point/zones of protection; granularity in certain areas of model may not be particularly precise	Annually	The historical outage data is housed in PROSPER and joined with additional facility and asset data.	Quality checked by central engineering SMEs.	Data provides areas of concern and hot spots when historical events occurred as broken down by cause category. This models high risk outage areas and helps with prioritization. All records are reviewed based on the company's process for recording and categorizing outage events. The data for qualifying events is correlated and analyzed consistent with methods developed in response to the CPUC's Wildfire Safety Division's Wildfire Mitigation Plan Template requirements. Outage causes are captured to support segmentation. Certain unrecorded equipment type may be inferred. Changes in circuit topology and environmental impacts can yield substantially different incident rates. Submodule changes can result in substantial variations in ignition risk over time and may not be easily back-cast for comparison purposes, see Figure 4.17.	Finer detail on locations of damaged equipment when risk events occur, i.e., which span was the location at which vegetation contact occurred?
Component Damage or Mechanical Failure from Short Circuit Current	Device clearing time analysis overlaid on circuit topology	PacifiCorp completed the pilot CYME analysis for bare overhead	CYME v9.0 distribution system model, collected in 2020 and held constant throughout	Quality checked by local engineering SMEs.	Identify distribution system components where high current flow and/or heat from a short circuit event is predicted to damage overhead components based on simulation results. The metric will initially be associated with spans of overhead conductor and their protective devices. Simulations will be performed, at least, in CYME.	Cyclic process to validate modeling and performance as part of annual readiness check.

Data Element	Level of Granularity (a)	Frequency (b)	Data sources (c)	Data quality verification (d)	Data characteristics (e)	Data modification and/or future improvements (f)
		conductors in its California service territory in 2021. The yes/no output is not expected to be combined directly with other measures for composite risk scoring but may be used to prioritize improvements related to the composite scores. Over the next five years the conductor analysis is intended to be incorporated as a standard aspect of cyclical study processes in California.	the analysis. With a spatial granularity of Lat/long for each node in the module. This system model includes source, line and protective device details		Available short circuit current magnitude can be estimated by CYME as can time for a device to clear a given fault. The pilot simulation evaluated short circuit scenarios where 10 Ohms of impedance was assumed for all short circuit events, and applied voltage at the high end of ANIS A range (105% nominal). These parameters were found to better represent worst case damage than the 95% nominal voltage scenario. This metric will be measured as a simple yes or no – is the component likely to sustain damage from the fault events studied? Mitigation will be pursued for areas where the result is "yes." See Figure 4.18.	

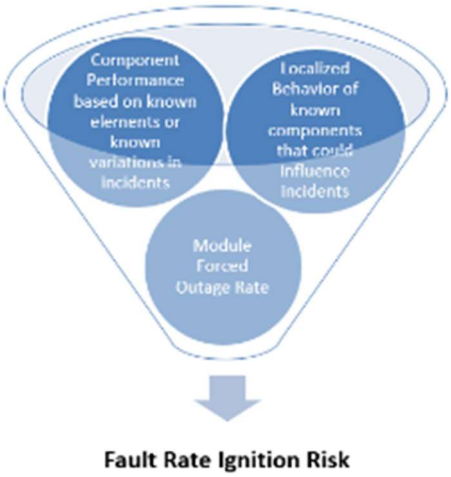


Figure 4.17 Fault rate ignition risk process

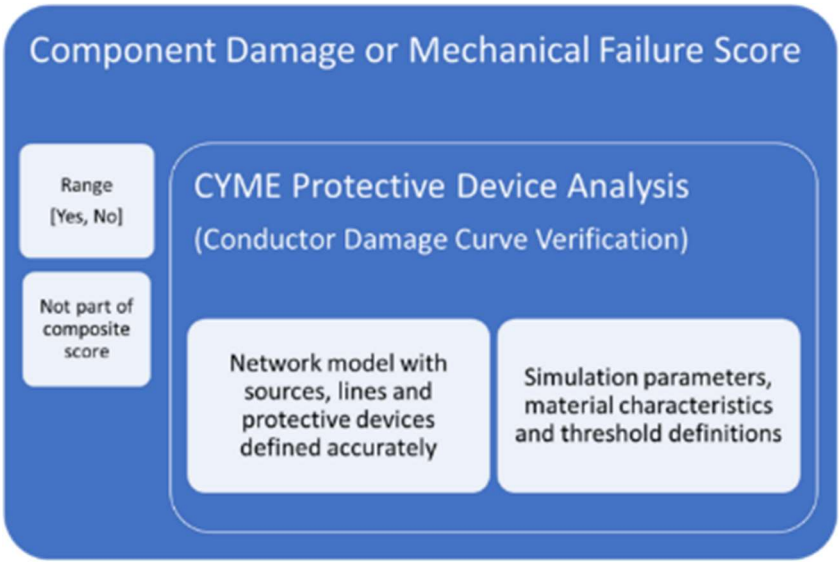


Figure 4.18 Component damage or mechanical failure from short circuit current methodology

4. Modeling assumptions and limitations

General LRAM modeling assumptions and limitations

- The model is not dynamic, it's static and continuously being updated.
- It does not incorporate recent weather, only looks at historical weather trends over time.

- It is based on the number of customers, not on property/property value which better ensures customer equity.

Input/Output element-specific assumptions and limitations

- Circuit topology — Conductor types, spacing, etc. are accurate.
- Historic climate/ probabilistic fire spread (iUTI) — Locations where climate has favored fire spread will continue to favor fire spread.
- Tree canopy coverage — Position errors are random and can be removed through statistical sampling. Techniques used by the NLCD base layer are consistent and accurate. Higher tree canopy density correlates to more trees and more risk.
- Vegetation outage rate — Outages with reference to outages (whether by sustaining or contributory causes) may not be as accurate as ideal; weather-influenced outages may mistake vegetation impactions.
- Utility fault rate ignition risk — Historic fault rates and locations have relationship to future risk events; circuit topology from year to year is relatively stable to enable translating history forward onto zonal expectations.
- Component damage or mechanical failure from short circuit current — Requires accurate source and conductor representation in Protective Device Analysis models.
- Utility fires — Requires manual reporting processes instituted since 2019.

5. **Modeling methodology including detailed construct of the model elements**

The LRAM modeling uses a combination of input layers, which provide a combined risk score at a ZOP level. The construct of the model and the ancillary data layers are detailed in Figure 4.19, as is the cycle for routine update and reassessment of model elements. Should any model elements fail their quality tests (each of which is separately identified), they would be appraised for alternate methods to incorporate the fundamental attributes they provide to the model output, and any substitution will be reported in future WMPs. Further, should additional data layers be identified and incorporated into wildfire risk assessment, the model elements for that layer will be outlined and model validation methods identified.

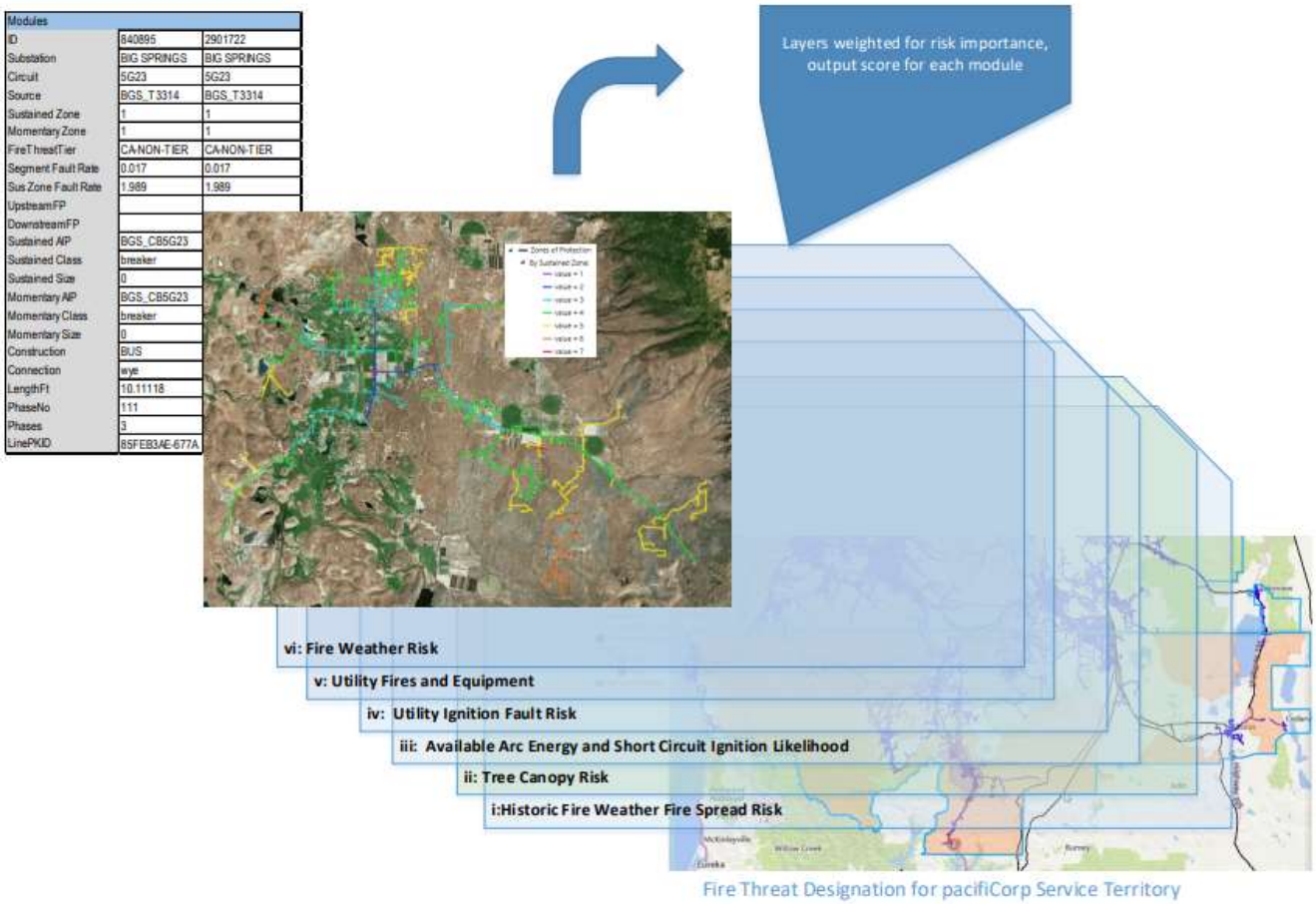


Figure 4.19 LRAM input layers

The combination of all layers if what PacifiCorp refers to as a composite "combined score," to reflect the total risk of a utility-related ignition occurring because of a ZOP fault. The combined score helps PacifiCorp target mitigation programs to the highest risk portions of PacifiCorp's grid. A variety of related factors mean that a higher combined score may not mean that a higher-scoring module will receive priority over a lower-risk-scored module. For example, it might not make sense to prioritize a module for certain types of mitigation in one year if the same module was scheduled for conversion to covered conductor in the following year.

Additionally, the combined score can be combined with a PSPS impact layer. Each module's relative PSPS impact is considered separately in terms of downstream customer counts (DCC). Factors in a DCC risk assessment include impacts of module de-energization on:

- Total number of customers impacted
- The number/type of critical facilities, including an assessment of backup generation capabilities

- The number/type of AFN customers, including an assessment of backup generation capabilities
- The economic impact to commercial customers

In each case, the number of customers is the sum of those customers directly served by the module as well as all downstream customers.

The PSPS impact layer reflects community impacts and helps PacifiCorp prioritize mitigation efforts. Mitigation activities that reduce the wildfire risk associated with a module can justify strategies to minimize the module's PSPS impact by either reducing PSPS likelihood or eliminating the module from PSPS consideration. Consequently, PacifiCorp's fire risk modeling strategy serves as a refreshable, quantifiable foundation for multiple fire-risk influencers within any ZOP.

6. LRAM uncertainty

PacifiCorp does not have the large history data set for outages and ignitions. The history is key to reducing the margin of error in any calculations related to risk reduction evaluations.

As the company can add more projects, time and operating experience it expects to improve these estimates.

7. LRAM verification and validation

Upon completion of the detailed LRAM framework the company conducted stress testing for the weight of each input. It chose "boundary condition" locations, specifically circuits within three areas it served having various fuel, fire weather, equipment characteristics and outage rates and performed comparisons of the model results. The company determined that only the Probabilistic Arc Energy should be weighed at a lower value because utility adjustments to arc energy are responses to relatively low frequency fault events; giving them equal weight with fire weather and fuel improperly tips the scale.

Evolution of the model toward S-MAP and RAMP products such as RSE. PacifiCorp intends to leverage the LRAM to deliver mitigation quantification to produce risk spend efficiencies.

As the company has responded to the deficiencies noted by the OEIS, it outlined the need to demonstrate the application of its LRAM to 1) reconcile its network's fire risk against the currently designated HFTD, 2) to evaluate and amend priorities for mitigation efforts currently on its multi-year plan, 3) to ensure that mitigations were properly aligned for any fire risks the model might detect, 4) to select the logical extent to which mitigation is conducted throughout its network, 5) to quantify the potential

impacts to customers served from portions of the network with elevated fire risk, 6) to evaluate credible impacts from climate change, and 7) to estimate the changes in fire risk as its mitigations are completed. Certain of these areas are still under development (such as future ignition risks as mitigations are completed), however many are now complete and detailed below.

1) Reconciling HFTD Tier with final score

In Figure 4.20 the company displays material applying its LRAM results at the ZOP and aggregated to the circuit served to broadly categorize the ranges of combined scores currently designated as Tier 3, Tier 2 and Non-Tier. This is displayed through a histogram of the final combined risk score for each ZOP and colored by its HFTD tier designation. The distribution of scores contrasted to the tier designation enables identification of locations that should either be moved from Non-tier to Tier 2 or Tier 2 locations to Tier 3. Using the histogram, the company evaluated the combined score threshold and observed that combined scores of below 0.55 separates Non-Tier and above 0.70 separates Tier 3 from Tier 2.

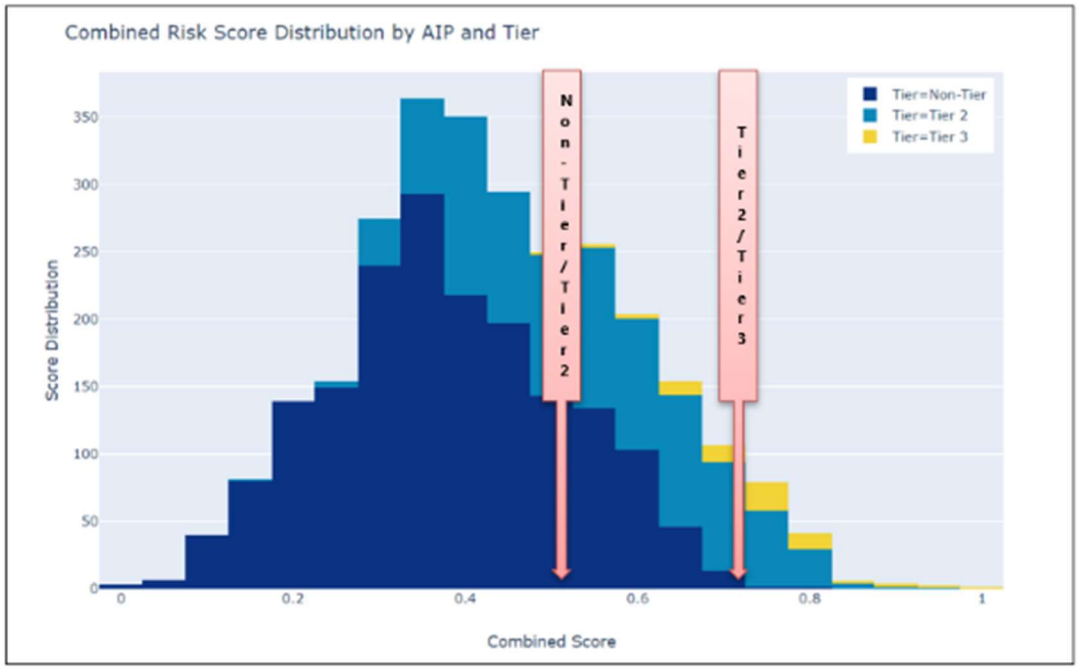


Figure 4.20 Distribution of the Combined Risk Score among the ZOP in California
The two arrows demonstrate where we see choose risk boundaries between Non-Tier/Tier 1 and Tier 1/Tier 2

2) Comparing to prioritization efforts

The next order of model usage focuses on the assessment and modification, where appropriate, of circuit priorities. Originally, the company used the HFTD Tier designation and the customer impacts from PSPS as criteria to establish mitigation

priorities. With LRAM, PacifiCorp can calibrate mitigation priorities at a finer level and with more risk elements consideration. Now each ZOP and circuit has a combined fire risk and PacifiCorp can begin to systematically prioritize future grid upgrades relative to those high-risk areas, particularly with respect to the use of covered conductor.

3) Circuitwide versus targeted efforts

LRAM also allows for evaluating specific ZOPs within circuits, particularly those outside the HFTD, but of substantial combined risk level to warrant targeted mitigation efforts. These specific ZOP, regardless of HFTD classification are shown in Figure 4.21. Each circuit is represented by a data series on the x-axis and the combined score for each ZOP is on the y-axis with every point representing a specific ZOP (colored by tier). While often the combined score may be appraised at the circuit level as a single unit, the graphic below allows for each circuit's ZOPs to be evaluated for their range of combined risk. Circuits with wide variations are candidates for zonal corrections, while those circuits with generally high zones are best addressed as a combined unit for fire risk mitigation.

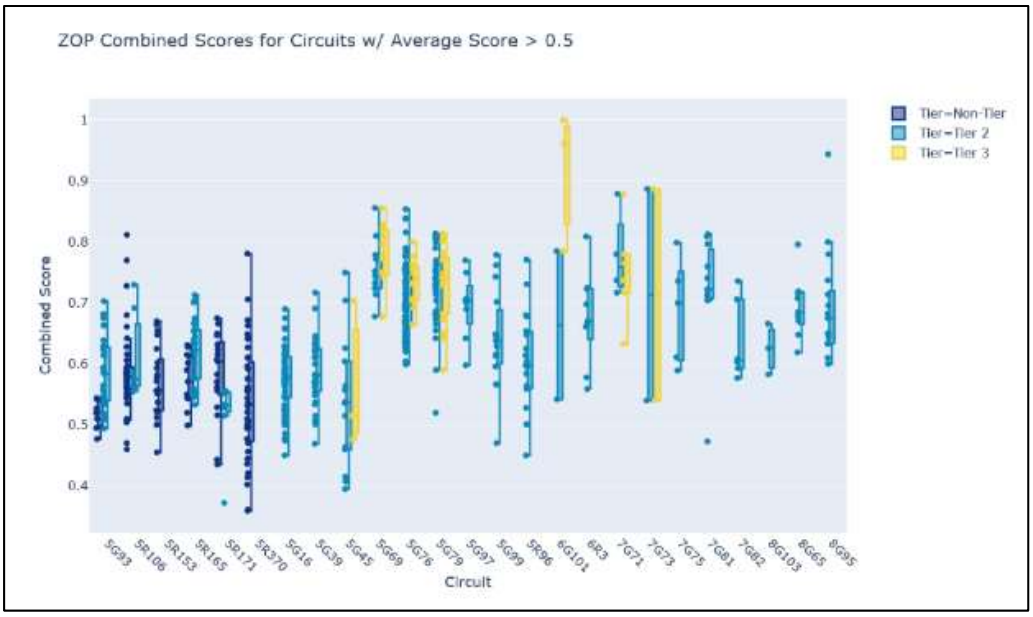


Figure 4.21 Box plot for the combined score of each circuit
colored by HFTD designation
where each point is the score for a specific ZOP

Circuits with a relatively low combined risk score, with outlier ZOP, highlight the necessity for targeted alternative mitigation techniques that are often part of the company's general reliability planning, including protective device coordination, equipment inspection, vegetation inspection, etc.

The tables below identify the extensive methodologies, programs, and techniques PacifiCorp uses to mitigate ignition risks.

Table 4.4 Identified methodologies, programs, and techniques PacifiCorp uses to mitigate ignition risks by fault response

Ignition Risk Driver		Fault Response							
		Coordinate protective equipment	Replace legacy protective equipment	Additional protective equipment	Current Limiting Fusing / Devices	Incipient Fault Detection	Fault Detection Enhancement	Fault Investigation	Proactive or Quickly Reactive Fault Response
Model or Legacy Risk Driver		**Arc Energy/Conductor Damage**							
Contact from object	Animal contact	x		x	x	x		x	
	Balloon contact	x		x	x	x		x	
	Other	x		x	x	x	x	x	
	Unknown	x		x			x		x
	Veg. contact	x	x	x	x	x		x	
	Vehicle contact	x		x			x		
Contamination		x	x		x	x	x	x	x
Equipment / Facility failure	Conductor	x	x		x			x	
	Crossarm					x	x	x	x
	Fuse	x	x		x	x		x	x
	Insulator					x		x	x
	Lightning arrestor					x		x	
	Other					x			
	Pole					x	x	x	x
	Sectionalizer	x	x		x	x		x	x
	Connectors					x		x	x
	Switch					x		x	
	Transformer								
	Voltage regulator					x		x	x
Normal Operation		x	x	x	x	x			
Other		x	x		x	x			
Unknown		x	x		x	x			
Vandalism/Theft									
Wire-to-wire contact		x		x				x	
Contact from 3rd party								x	

Table 4.5 Identified methodologies, programs, and techniques PacifiCorp uses to mitigate ignition risks by inspection maintenance and vegetation management

Ignition Risk Driver		Inspection/Maintenance					Vegetation Management				
		Reliability-Centered Inspection & Correction	Leakage Current Monitoring Pilot	RF/IR/ Resistance Detection of Connectors	Enhanced Inspection	Legacy Equipment Replacement	Vegetation Management	EVM	Radial Pole Clearing	Targeted Tree Removal	Veg Patrols
Model or Legacy Risk Driver		**Equipment Failure**					**Vegetation/Equipment Failure**				
Contact from object	Animal contact								x		
	Balloon contact								x		
	Other								x		
	Unknown	x		x	x	x			x		
	Veg. contact					x	x	x	x	x	x
	Vehicle contact								x		
Contamination		x	x	x	x	x			x		
Equipment / Facility failure	Conductor	x			x	x					
	Crossarm	x		x							
	Fuse	x	x		x	x			x		
	Insulator	x		x		x			x		
	Lightning arrestor		x			x					
	Other										
	Pole	x		x	x						
	Sectionalizer					x					
	Connectors	x			x	x			x		
	Switch	x				x					
	Transformer										
	Voltage regulator										
Normal Operation						x	x	x			
Other						x	x	x			
Unknown						x	x	x	x		
Vandalism/Theft											
Wire-to-wire contact						x					
Contact from 3rd party											

Table 4.6 Identified methodologies, programs, and techniques PacifiCorp uses to mitigate ignition risks by asset hardening

Ignition Risk Driver		Asset Hardening														
		Covered Conductor	Underground Conversion	Enhance theft / vandalism resilience	Neutral Extension / Grounding System	Enhance Insulation (BIL)	Pole relocation	Visibility enhancement	Pole protection	Animal guarding	Spread construction	Create Animal Habitat/Bird Poles	Interset Structures	Midspan spacers	Contractor & Public Education	Damage Prevention Programs
Model or Legacy Risk Driver		**Gust/Fire Weather/General Outage**						**Vehicle Contact**		**Animal Contact**			**Wire to Wire Contact**		**Third Party Interference**	
Contact from **object**	Animal contact	x	x			x				x	x					
	Balloon contact	x	x								x					
	Other	x	x													
	Unknown	x	x			x										
	Veg. contact	x	x									x	x	x		
	Vehicle **contact**	x	x				x	x	x						x	x
Contamination		x				x					x					x
Equipment **/ Facility failure**	Conductor	x	x									x	x	x		x
	Crossarm	x				x			x						x	x
	Fuse					x										x
	Insulator					x										x
	Lightning arrestor															x
	Other															x
	Pole	x				x			x						x	x
	Sectionalizer															x
	Connectors															x
	Switch															x
	Transformer															x
	Voltage regulator															x
Normal Operation		x	x		x			x								x
Other		x	x		x			x								
Unknown		x	x		x			x								
Vandal**ism/Theft**		x	x	x											x	
Wire-t**o-wire contact**		x	x			x	x				x	x	x	x	x	
Contact from 3rd party		x													x	x

8. LRAM modeling frequency

Each of the data elements that make up LRAM have their own frequencies. These are most simply explained in Table 4.3~~Table 4.3~~ but are re-presented here:

Circuit topology — Data is refreshed and maintained daily.

Historic climate/ probabilistic fire spread (iUTI) — Data analysis will be refreshed based on updates to LANDFIRE dataset. In addition, major changes to PacifiCorp asset locations would require a refresh in analysis.

Tree canopy coverage — Data analysis will be refreshed based on updates to the NLCD Canopy Cover Layer, which is anticipated at three to five-year intervals.

Vegetation outage rate — Periodic updates.

Utility fault rate ignition risk — Annually.

Utility fires — Data records are reviewed monthly.

9. LRAM timeline for model development

PacifiCorp expects to continuously improve the LRAM as the individual layers are updated or new layers are added. The company will also archive and evaluate the model annually — updating all the layers at that time. The annual reevaluation also establishes a baseline. The company plans to compare future to archived LRAM scores. This current-versus-future comparison illuminates model and network improvements and enables quantification of grid modernization efforts on utility risks for specific elements such as outage rates (risk events), arc energy calculations, and utility-caused ignitions. The annual baseline will also allow long-term climate monitoring (measured through the weather components of the Fire Weather Risk Layer). The company will then be able to combine these identified climate trends with California's 4th Climate Change Assessment for an informed view of the macro climate trends in PacifiCorp's service territory, which will support effective planning and prioritization.

Risk Modeling Refresh Process	
Annually	Evaluate the risk influencers to be quantified for the upcoming period
Annually	Develop the method for calculating the influencer for each risk influencer
Annually	Establish weighting for each influencer relative to some identified objective
Annually	Calculate module scoring for the combined influencers
Annually	Stress test the results against objective criteria
Annually	Modify calculation or weighting as necessary
Annually	Finalize the rating/ranking for each module
Annually	Compare against prioritization efforts for WMP, including PSPS operations
Annually	Modify prioritization where appropriate
Annually	Communicate the results of the risk scoring method
Annually	Archive results with appropriate version details
Ongoing	Review other risk influencers for inclusion in future assessment periods

Risk Modeling Refresh Process	
Annually	Evaluate the risk influencers to be quantified for the upcoming period
Annually	Develop the method for calculating the influencer for each risk influencer
Annually	Establish weighting for each influencer relative to some identified objective
Annually	Calculate module scoring for the combined influencers
Annually	Stress test the results against objective criteria
Annually	Modify calculation or weighting as necessary
Annually	Finalize the rating/ranking for each module
Annually	Compare against prioritization efforts for WMP, including PSPS operations
Annually	Modify prioritization where appropriate
Annually	Communicate the results of the risk scoring method
Annually	Archive results with appropriate version details
Ongoing	Review other risk influencers for inclusion in future assessment periods

Figure 4.22 LRAM annual refresh process summary

10. LRAM application and results

The LRAM application and results are best understood on a data element basis. The application and results for each of the nine data elements are described below:

Circuit topology – The data is used to apply model area findings to specific facilities.

Historic climate/ probabilistic fire spread (iUTI) – Historic fire spread, as a proxy for long-term fire spread risk has been integrated into the model.

Tree canopy coverage – The tree canopy coverage layer has been integrated into the fire risk model. The model results have also been incorporated into vegetation

trimming cost forecasts. Layer validation efforts compared coverage to historic vegetation outages and historic vegetation maintenance records. These showed weak, but non-negligible, correlations. Limitations from the NLCD data resolution and techniques result in lower accuracies in developed areas.

Vegetation outage rate — Vegetation outage frequencies normalized by line length have been incorporated into the risk model.

Utility fault rate ignition risk — This dataset forms the basis for module fault rate/outage type/component factors. Implement wildfire mitigation strategy in areas where outage history, causes and equipment result in elevated outage ignition risks and shown in the below graphic.

Component damage or mechanical failure from short circuit current — The results of the pilot were used to identify locations where the potential fault (based on the similarity to modeled configurations) created a risk of damaged bare overhead conductor. Use of this information allows for system network changes to preempt such a risk condition.

Utility fires — Implement wildfire mitigation strategy in areas where at risk equipment exists. The information can be used to determine any trends which may occur when analyzed with additional fire risk influencers. This data will help to determine where addition system and equipment risk exist to drive facility locations upgrades and placements for protective equipment.

11. LRAM key improvements from the working group

LRAM includes inputs from company utility ignition history. The history is used as a flag for the ZOP. The company is evaluating how to extend this limited dataset. Any new risks, layers, and model modifications will be reported in future WMP updates.

As noted previously, the company intends to extend the LRAM to calculate risk spend efficiencies. Using the methodology for assessment of risk event reduction, noted above, and with developed ignition probabilities, the company will be positioned to calculate the effectiveness of its mitigation measures, while it continues to refine costs of mitigation measures, which serve as a direct input also to the calculations. PacifiCorp will also look to leverage Technosylva's WRRM model to expand upon existing capabilities of LRAM and further evaluate RSE and long-term planning.

Additionally, as the requirements of the SMJUs evolve, the company anticipates integrating categorical risks from assets, as was provided in its 2018 general rate case (GRC) and further described in the 2023 GRC.

Key improvements for LRAM can also be understood on a data element basis. The key improvements for each of the nine data elements are described below:

Circuit topology — Better locational precision; more hardware detail in GIS.

Historic climate/ probabilistic fire spread (iUTI) — Better integration of contemporary fuel situation; utility focus on ignitions rather than agnostic to source.

Tree canopy coverage — Augmenting NLCD cover data with higher resolution datasets in developed areas.

Vegetation outage rate — Reconciliation of tree canopy/vegetation performance would result in greater accuracy with causal relationship.

Utility fault rate ignition risk — Finer detail on locations of damaged equipment when risk events occur, i.e., which span was the location at which vegetation contact occurred?

Component damage or mechanical failure from short circuit current — Cyclic process to validate modeling and performance as part of annual readiness check.

Utility fires — Centralized database with information augmented by risk event investigation team.

4.5.2 Calculation of key metrics

Report details on the calculation of the metrics below. For each metric, a standard definition is provided with statute cited where relevant. The utility must follow the definition provided and detail the procedure they used to calculate the metric values aligned with these definitions. The utility must cite all data sources used in calculating the metrics below. In addition, the utility must include GIS layers showing Red Flag Warning (RFW) frequency and High Wind Warning (HWW) frequency (use data from the previous 5 years, 2016-2021), as well as GIS layers for distribution of Access Functional Need (AFN) customers, and urban/rural/highly rural customers, and disadvantaged communities[11] in its service territory.

1. ***Red Flag Warning overhead circuit mile days*** *– Detail the steps to calculate the annual number of red flag warning (RFW) overhead (OH) circuit mile days. Calculate as the number of circuit miles that are under an RFW multiplied by the number of days those miles are under said RFW. Refer to the NWS Red Flag Warnings. For historical NWS RFW data, refer to the Iowa State University archive of NWS watch / warnings.[12] Detail the steps used to determine if an overhead circuit mile is under an RFW, providing an example of how the RFW OH circuit mile days are calculated for a RFW that occurred within the utility service territory over the last five years.*

2. ***High Wind Warning overhead circuit mile days*** *– Detail the steps used to calculate the*

[11] Energy Safety recommends using CalEnviroScreen and Senate Bill 535 to identify disadvantaged communities.
[12] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml

annual number of High Wind Warning (HWW) overhead circuit mile days. Calculate as the number of OH circuit miles that are under an HWW multiplied by the number of days those miles are under said HWW. Refer to High Wind Warnings as issued by the NWS. For historical NWS data, refer to the Iowa State University archive of NWS watch / warnings.[13] Detail the steps used to determine if an OH circuit mile is under an HWW, providing an example of how the OH HWW circuit mile days are calculated for a HWW that occurred within the utility service territory over the last five years.

3. ***Access and Functional Needs population*** *– Detail the steps to calculate the annual number of customers that are considered part of the Access and Functional Needs (AFN) population. Defined in Government Code § 8593.3 and D.19-05-042 as individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking,[14] older adults, children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant.*

4. ***Wildland-Urban Interface*** *– Detail the steps to calculate the annual number of circuit miles and customers in wildland-urban interface (WUI) territory. WUI is defined as the area where houses exist at more than 1 housing unit per 40 acres and (1) wildland vegetation covers more than 50% of the land area (intermix WUI) or (2) wildland vegetation covers less than 50% of the land area, but a large area (over 1,235 acres) covered with more than 75% wildland vegetation is within 1.5 mi (interface WUI) (Radeloff et al, 2005).[15]*

5. ***Urban, rural, and highly rural*** *– Detail the steps for calculating the number of customers and circuit miles in utility territory that are in highly rural, rural, and urban regions for each year. Use the following definitions for classifying an area highly rural/rural/urban (also referenced in glossary):*

    a. *Highly rural – In accordance with 38 CFR 17.701, "highly rural" must be defined as those areas with a population of less than 7 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" must be defined as census tracts.*

    b. *Rural – In accordance with GO 165, "rural" must be defined as those areas with a population of less than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" must be defined as census tracts.*

    c. *Urban – In accordance with GO 165, "urban" must be defined as those areas with a population of more than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" must be defined*

[13] https://mesonet.agron.iastate.edu/request/gis/watchwarn.

[14] Guidance on calculating number of households with limited or no English proficiency can be found in D.20-04-003

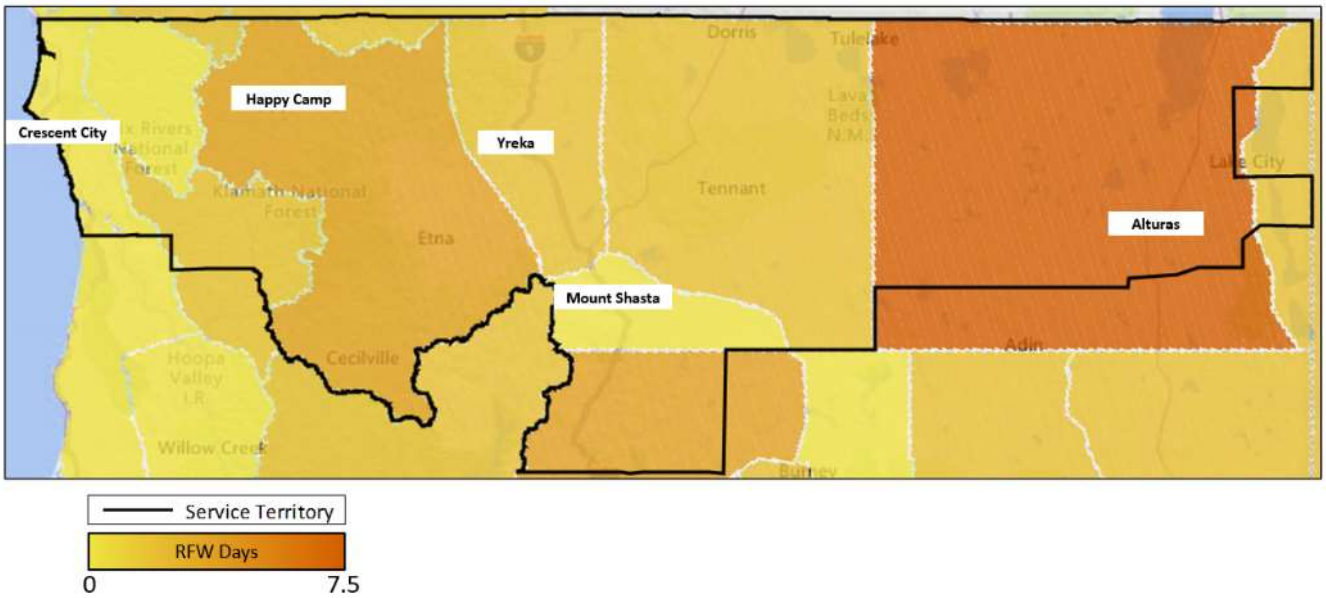
[15] Paper can be found here - https://www.fs.fed.us/pnw/pubs/journals/pnw_2005_radeloff001.pdf with the latest WUI map (form 2010) found here - http://silvis.forest.wisc.edu/data/wui-change/

as census tracts.

Population density numbers are calculated using the American Community Survey (ACS) 1-year estimates on population density by census tract for each corresponding year (2016 ACS 1-year estimate for 2016 metrics, 2017 ACS 1-year estimate for 2017 metrics, etc.). For years with no ACS 1-year estimate available, use the 1-year estimate immediately before the missing year (e.g., use 2019 estimate if 2020 estimate is not yet published, etc.)

~~1.~~12. Key metric: Red Flag Warnings

First the shapefiles for the Red Flag Warnings (RFW) are obtained from the Iowa State University archive of NWS watches and warnings, see example in Figure 4.23. Next an intersection between the distribution and transmission assets in California and Tier



2, Tier 3, Zone 1 and non-HFTD boundaries. Then, for each RFW and HFTD combination and designation the sum of the line lengths within the affected area are calculated for each warning's duration. Finally, the duration and the length of lines within each warning are multiplied to calculate the mile-days metric. These results were summarized in Figure 4.23.

Figure 4.23 Red Flag Warning days, example

1. Key metric: High Wind Warnings overhead circuit mile days

First the shapefiles for the High Wind Warnings (HWW) are obtained from the Iowa State University archive of NWS watches and warnings, see example in Figure 4.24. Next an intersection between the distribution and transmission assets in California and Tier 2, Tier 3, Zone 1 and non-HFTD boundaries. Then, for each HWW and HFTD combination and designation the sum of the line lengths within the affected area are calculated for each warning's duration. Finally, the duration and the length of lines

within each warning are multiplied to calculate the mile-days metric. These results were summarized. A GIS layer of this metric is attached as GIS Attachment 1 – HWW.

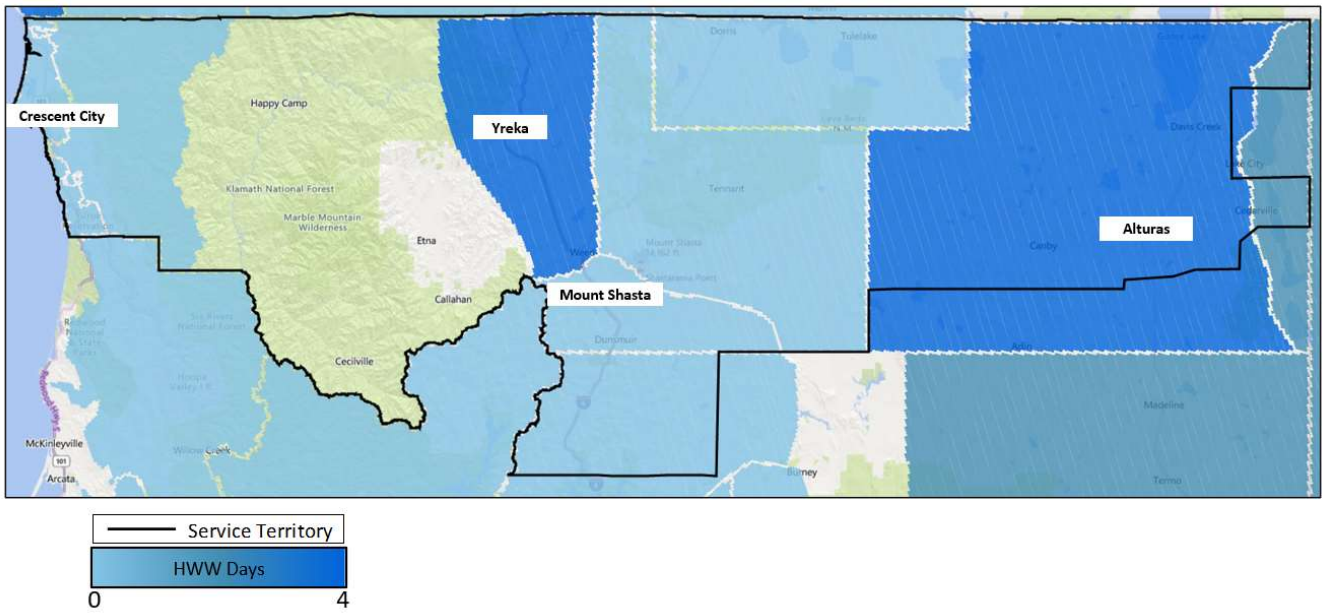


Figure 4.24 High Wind Warning days, example

2. Key metric: Access and Functional Needs population

In the 2022 Annual Access and Functional Needs Plan of PacifiCorp published on February 1, 2021, PacifiCorp fully defines the AFN metric and group:

> Leveraging *the FEMA Comprehensive Preparedness Guide 6 Step Process PacifiCorp along with the IOUs and SMJUs partnered collaboratively with the AFN Core Planning Team and have worked to engage the whole community and develop an overarching Statewide approach that meet the diverse needs of the individuals with AFN. Access and Functional Needs is defined by the California Government Code §8593.3 as: "individuals who have developmental disabilities, physical disabilities, chronic conditions, injuries, limited English proficiencies, who are non-English speakers, older adults, children, people living in institutional settings, or those who are low income, homeless, or transportation disadvantaged, including but not limited to, those who are dependent on public transit and those who are pregnant*.

PacifiCorp has provided the following map, Figure 4.25, of customers who meet the aforementioned criteria and have applied to the program.

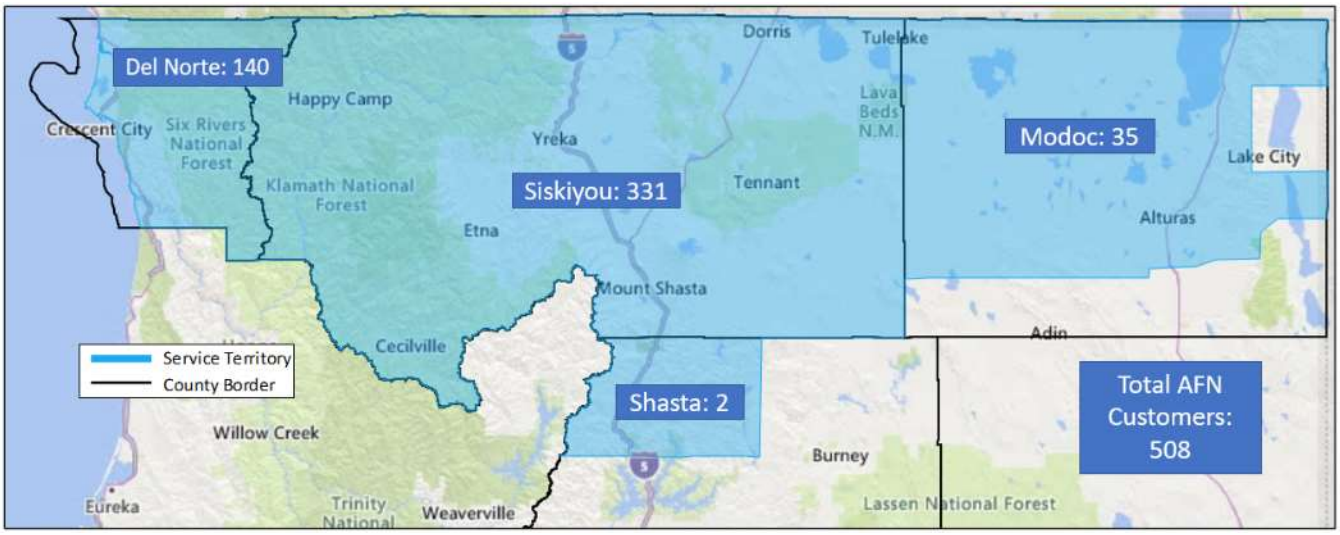


Figure 4.25 Access and Functional Needs population

3. **Key metric: Wildland-Urban Interface**

WUI is defined as the area where houses exist at more than one housing unit per 40 acres and where (1) wildland vegetation covers more than 50% of the land area (intermix WUI), or (2) wildland vegetation covers less than 50% of the land area, but a large area (over 1,235acres) covered with more than 75% wildland vegetation is within 1.5 mi (interface WUI) (Radeloff et al, 2005).[16]

4. **Key metric: Urban, rural, and highly rural**

- Highly rural – In accordance with 38 CFR 17.701, “highly rural” is defined as those areas with a population of less than seven persons per square mile as determined by the U.S. Bureau of the Census. For the purposes of the WMP, “area” must be defined as census tracts.

- Rural – In accordance with GO 165, "rural" must be defined as those areas with a population of less than 1,000 persons per square mile as determined by the U.S. Bureau of the Census. For the purposes of the WMP, “area” must be defined as census tracts.

- Urban – In accordance with GO 165, "urban" must be defined as those areas with a population of more than 1,000 persons per square mile as determined by the U.S. Bureau of the Census. For the purposes of theWMP, “area” must be defined as

[16] Paper can be found here - https://www.fs.fed.us/pnw/pubs/journals/pnw_2005_radeloff001.pdf with the latestWUI map (form 2010) found here - http://silvis.forest.wisc.edu/data/wui-change/

census tracts.

- Population density numbers (see Figure 4.26) are calculated using the ACS one-year estimates on population density by census tract for each corresponding year (2016 ACS one-year estimate for 2016 metrics, 2017 ACS 1-year estimate for 2017 metrics, etc.). For years with no ACS one-year estimate available, use the one-year estimate immediately before the missing year (e.g., use 2019 estimate if 2020 estimate is not yet published, etc.)

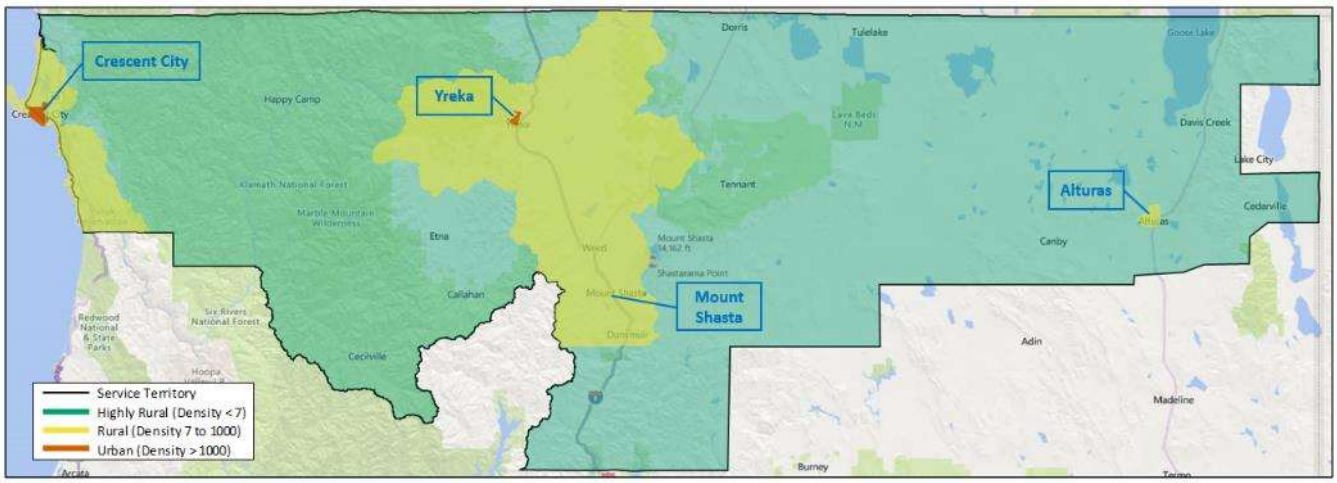


Figure 4.26 Population density[17]

4.6 PROGRESS REPORTING ON KEY AREAS OF IMPROVEMENT

Report progress on all key areas of improvement identified in Section 1.3 of the utility's 2021Action Statement. Provide a summary table of the actions taken to address these key areas and report on progress made over the year. Summarize the progress in a table using a high-level bullet point list of key actions, strategies, schedule, timeline for completion, quantifiable performance-metrics, measurable targets, etc. The table must also include a cross-referenced link to a more detailed narrative and substantiation of progress in an Appendix. The summary table must follow the format illustrated in Table 4.6-1.

Table 4.7 Progress on key areas of improvement and remedies, 2021 (WMP Table 4.6-1)

Utility-#	Issue title	Summary of Progress
PC-1	Failure to follow format for Section 7.3.b, subparts 1-5 of 2021 WMP	PacifiCorp has fully complied with the updated 2022 WMP guidelines; see Section 7.3 on page 152~~149~~.

[17] Highly rural, Rural and Urban in this document are calculated as per the definition provided in the 2022 WMP Guidelines, and not as per GO 165.

Utility-#	Issue title	Summary of Progress
	Guidelines	
PC-2	Lack of consistency in approach to wildfire risk modeling across utilities	PacifiCorp is currently participating in the monthly Wildfire Risk Modelling Working Group coordinated by OEIS to work towards understanding similarities and differences between the California utility plans. At the conclusion of these workshops in Q3 of 2022, OEIS has planned to provide updated guidelines to support consistency in the approach of wildfire risk modelling across the utilities. In the workplan guidelines provided by OEIS, OEIS acknowledges that the working group may not be able to resolve the approach to wildfire risk modelling prior to the 2022 WMP updates and that the working group will continue after this update. See Section 4.5.1 on page 65, Section 7.3.1 on page 153~~150~~, and Section 7.3.8.3 on page 238~~216~~ for more information on PacifiCorp's modeling efforts and evolution.
PC-3	GIS and nonspatial data discrepancy	As reported in the Action Statement Progress Report submitted on November 1, 2021, PacifiCorp has provided clarification on the discrepancy as well as a methodology for the improvement of QA/QC processes in the future. GIS GDB files that are submitted can be difficult to check, since only a few resources in the company can open and navigate GDB files. Therefore, PacifiCorp has initiated a mandatory walk-through review meeting between GIS and key internal stakeholders to check data submitted and connections are correct. Additionally, to continue supporting this effort, PacifiCorp is planning to recruit an additional program manager. This is further described in Section 7.3.7.1 on page 229~~212~~.
PC-4	Limited evidence to support the effectiveness of covered conductor	PacifiCorp has been participating in Covered Conductor effectiveness workstream where the utilities prepared a joint response to this issue/remedy. Please refer to Attachment 2, Covered Conductor Effectiveness Joint Utility Response
PC-5	Reconductoring projects not prioritized based on wildfire risk	PacifiCorp has provided a response to this in the Action Statement Progress Report submitted on November 1, 2021. See Section 7.3.3.3 on page 172~~161~~ for additional reconductoring prioritization information.
PC-6	No separate process for replacing expulsion fuses and tracking progress	As a result of this issue, PacifiCorp included in the 2021 Change Order submitted on November 1, 2021, an update which included a separate process for replacing expulsion fuses. Additionally, PacifiCorp has provided a response to this in the Action Statement Progress Report submitted on November 1, 2021. See Section 7.3.3.7 on page 176~~164~~ for more information on this new program.
PC-7	Limited explanation for how initiatives reduce PSPS impacts	In addition to the response provided in the Action Statement Progress Report submitted on November 1, 2021, PacifiCorp has included two new initiatives in the 2021 Change Order to further reduce the impact of PSPS impacts. The two new initiatives in the change order directly reduce PSPS impacts by providing free portable batteries to Medical Baseline Customers and providing a generator rebate program. See Section 7.3.3.11 on page 179~~168~~.
PC-8	Lack of details on automatic recloser settings	PacifiCorp has provided a response to this in the Action Statement Progress Report submitted on November 1, 2021. For additional information, see Section 7.3.6.1 on page 221~~207~~ and Section 7.3.6.2 on page 222~~208~~.
PC-9	Inadequate justification of initiative-selection process	PacifiCorp has provided a response to this in the Action Statement Progress Report submitted on November 1, 2021. This is also described in Section 7.3.8.1 on page 235~~214~~.
PC-10	Inadequate approach to PSPS	PacifiCorp has provided a response to this in the Action Statement Progress Report submitted on November 1, 2021. See Section 8.3, page 267~~237~~ for more information.

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5

INPUTS TO THE PLAN AND DIRECTIONAL VISION FOR WMP

5 INPUTS TO THE PLAN AND DIRECTIONAL VISION FOR WMP

5.1 GOAL OF WILDFIRE MITIGATION PLAN

The goal of the WMPs are shared across Energy Safety and all utilities: Documented reductions in the number of ignitions caused by utility actions or equipment and minimization of the societal consequences (with specific consideration to the impact on AFN populations and marginalized communities) of both wildfires and the mitigations employed to reduce them, including PSPS.

The following subsections report utility-specific objectives and program targets towards the WMP goal. No utility response is required for Section 5.1.

5.2 THE OBJECTIVES OF THE PLAN

Objectives are unique to the utility and reflect the 1, 3, and 10-year projections of progress towards WMP goals. Objectives are determined by the portfolio of mitigation strategies proposed in the WMP. The objectives of the plan must, at a minimum, be consistent with the requirements of California Pub. Util. Code §8386(a) – Each electrical corporation shall construct, maintain, and operate its electrical linesand equipment in a manner that will minimize the risk of catastrophic wildfire posed by those electrical lines and equipment.

Describe utility WMP objectives, categorized by each of the following timeframes, highlighting changes since the prior WMP:

1. *Before the next Annual WMP Update*
2. *Within the next 3 years*
3. *Within the next 10 years – long-term planning beyond the 3-year cycle*

Table 5.1 PacifiCorp's one, three and ten-year objectives

Category	Before the Next Annual WMP Update	Within the next three years	Within the next 10 years
Risk Assessment and Mapping	• Continue implementation of Technosylva's WFA-E Modeling Suite. • Begin implementation of WRRM module for project identification. • Develop all season risk assessment capability. • Identify and develop plan to augment or update tools based on revised OEIS risk modeling guidance.	• PacifiCorp anticipates the updated CA WMP Guidelines, based on collaborative workshops, will provide a guide for adjusted risk-mapping to better align across California utilities. • Based on the workshops, PacifiCorp anticipates a significant shift in risk mapping based on these updated guidelines.	• Risk-map updates occur on an update cycle and occur as routine edits. • New technology is evaluated and potentially incorporated into risk mapping processes.
Situational Awareness and Forecasting	• Complete installations of additional weather stations with 100% correlation for HFTD circuits. • Substantially progress 2023 annual weather station calibration in anticipation of the 2023 fire season. • Begin implementation of wildfire detection pilot project. • Implement semi-automated process to validate weather station data leveraging multiple sources. • Operationalize situational awareness with a visual, configurable map to support decision making.	• Operate a fully established, weather station network. • Weather station correlation for 100% of circuits in CA (inside and outside of HFTD). • Implement a fully automated process to validate weather station data via multiple sources. • Complete wildfire detection pilot and advance technologies based on findings. • Continue improving dynamic situational awareness and risk visualization to support decision-making.	• Work towards using AI and machine learning to create a more automated weather forecasting system. • Have a complete weather station network developed. • As new technology becomes available evaluate and potentially incorporate it into situational awareness processes.
Grid Design and System Hardening	• Continue execution of grid hardening plans. • Reprioritize work as needed based on the evolution of risk modeling. • Evaluate scope beyond PSPS zone mitigation. • Evaluate risk-based, strategic undergrounding and feasibility. • Evaluate expansion of the generator rebate and free portable battery program.	• Complete all grid hardening scope to mitigate existing PSPS zones. • Begin risk-based grid hardening beyond PSPS zones, most likely within Tier 2 locations. • Expand risk-based, strategic undergrounding where feasible and appropriate. • Complete DFA pilot project and inform systemwide potential applications. • Improve remote operability of equipment through substation SCADA and line communication backbone upgrades as a part for the installation of system automation initiative.	• Risk-based deployment of grid hardening complete. • Broader deployment of DFA (pending pilot project results). • Significantly improved remote operability of equipment through substation SCADA and line communications backbone upgrades as a part of the installation of system automation initiative.
Asset Management and	• Complete all CY2022 planned inspections and progress the CY2023 planned asset	• Pending the results of the pilot project, full incorporation of IR technology into distribution detailed inspections.	• Pilot new inspection technology as it becomes available and potentially incorporate this new technology into asset

Category	Before the Next Annual WMP Update	Within the next three years	Within the next 10 years
Inspections	inspections. • Complete the planned IR inspections of transmission lines. • Begin implementation of the distribution IR inspection pilot project.	• Continue planned inspection programs.	management and inspections programs and practices.
Vegetation Management and Inspections	• Continue progressing programs (annual patrols, routine cycle work and annual pole clearing). • Continue to gather an inventory of vegetation work completed based on most recent inspections to inform vegetation management planning. • Incorporate the use of a vegetation density and height "heat map" as a tool (LRAM) to inform prioritization and scheduling of vegetation management activities. • Use a mobile data management software to manage and confirm work completed by subcontractors.	• Continue progressing programs (annual patrols, routine cycle work and annual pole clearing). • Implement Enhanced Overhang Reduction pilot project. • Continue to implement use of and improve mobile data management software capabilities regarding work identification, release, and tracking. • Enhance QA/QC program.	• Continue progressing programs (annual patrols, routine cycle work and annual pole clearing). • Pilot new technology as it becomes available and potentially incorporate this new technology into vegetation management programs and practices or augment current practices.
Grid Operations and Operating Protocols	• Improve processes to better track elevated wildfire risk protocols and activities. • Enhance protocols for post-outage restoration and patrols during time periods of elevated risk. • Continue to use augmented work practices. • Continue use of EFR settings and protocols and incorporate any updates as needed before the 2023 fire season.	• Leverage enhanced remote operability based on grid hardening upgrades to SCADA and communication backbones. • Have a more mature process with few false positive forecast predictions, increased communication completion of PSPS events and quick response to forecasts.	• Continue to leverage enhanced remote operability based on grid hardening upgrades to SCADA and communications backbones.
Data Governance	• Develop additional documentation to support decision making and reporting. • Continue expanding data reporting capabilities. • Continuing quarterly data reporting to meet compliance requirements. • Increase documentation around fire-related data, algorithms, analysis, and data processes.	• Improve thoroughness of documentation, including decision-making, data processing and data analysis. • Continue expanding data reporting capabilities. • Continuing quarterly data reporting to meet compliance requirements.	• Data processes and documentation centrally located. • Data practices consistent across multiple business units. • Full data reporting capabilities. • Continuing quarterly data reporting to meet compliance requirements.

Category	Before the Next Annual WMP Update	Within the next three years	Within the next 10 years
Resource Allocation Methodology	• Develop implementation plan to incorporate new OEIS RSE requirements into modeling and tools by 2024. • Fully implement WRRM model, including RSE calculations. • Update and include RSE calculations in the 2024 WMP Update. • Continue evaluating organizational needs to support WMP implementation.	• Update RSE values to align with the new 2023 OEIS Guidelines. • Improve RSE calculation granularity. • Leverage RSE to evaluate grid hardening scope outside of the PSPS zones. • Evaluate a framework to assess new technologies or pilot projects in terms of RSE.	• Use RSE to evaluate initiatives throughout service territory.
Emergency Planning and Preparedness	• Continued use of tabletop exercises to prepare for emergencies and PSPS events. • Continued evolution and enhancement of the Public Safety Partner Portal. • Incorporate 2022 fire season lessons learned into 2023 protocols. • Continue offering customer support programs during emergencies, such as bill adjustments, extended payment plans, and suspension of disconnection and nonpayment fees.	• Continued use of tabletop exercises to prepare for emergencies and PSPS events. • Incorporate feedback and industry best practices into emergency management practices.	• Continued use of tabletop exercises to prepare for emergencies and PSPS events. • Incorporate feedback and industry best practices into emergency management practices.
Stakeholder Cooperation and Community Engagement	• Continue improvements to internal and external customer and community facing forecast of PSPS status (website). • Continue partnering with public safety partners in communities throughout California regarding wildfire and PSPS preparedness. • Continue collaborating with industry experts and other utilities through working groups and consortiums. • Complete post season wildfire mitigation survey.	• Continue improvements to internal and external customer and community facing forecast of PSPS status (website). • Enhance customer outreach based on survey feedback and industry best practices.	• Continue improvements to internal and external customer and community facing forecast of PSPS status (website). • Enhance customer outreach based on survey feedback and industry best practices.

5.3 PLAN PROGRAM TARGETS

Program targets are quantifiable measurements of activity identified in WMPs and subsequent updates used to show progress towards reaching the objectives.

List and describe all program targets the electrical corporation uses to track utility WMP implementation and utility performance over the last five years. For all program targets, list the 2019 to 2021 performance, a numeric target value that is the projected target for end of year 2022 and 2023, units on the metrics reported, the assumptions that underlie the use of those metrics, update frequency, and how the performance reported could be validated by third parties outside each utility, such as analysts or academic researchers. Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of each targeted preventive strategy and program.

Pub. Util. Code Section 8386.3(c)(5) requires a utility to notify Energy Safety "after it completes a substantial portion of the vegetation management (VM) requirements in its wildfire mitigation plan." To ensure compliance with this statue, the utility is required to populate Table 5.3-1 with VM program targets that the utility can determine when it has completed a "substantial portion"[18] and that Energy Safety can subsequently audit. Energy Safety has provided some required, standardized VM targets below. It is expected that the utilities provide additional VM targets beyond those required. The identification of other VM targets and units for those targets (e.g., for inspections, customer outreach, enhanced vegetation management, etc.) are at the discretion of the utility.

Additionally, in Table 5.3-1, utilities must populate the column "Target%/ Top-Risk%" for each 2022 performance target related to initiatives in the following categories: Grid design and system hardening; Asset management and inspections; and Vegetation management and inspections. This column allows utilities to identify the percentage of the target that will occur in the highest risk areas. For example, if a utility targets conducting 85% of its vegetation management program in the top 20% of its risk-areas, it should input "85/20" in this column. In the "Notes" column, utilities must provide definitions and sources for each of the "Top-Risk%" values provided. In the given example above, an acceptable response would be: "The top 20% of risk areas used for this target relate to the circuit segment risk rankings from [Utility Company's] Wildfire Risk Model outputs, as described in [hyperlink to Section XX] of the 2022 WMP Update."

[18] Energy Safety intends to define "substantial portion" in its forthcoming Compliance guidelines. This definition may be included in the Final version of the 2022 WMP Update Guidelines.

Table 5.2 List and description of program targets, last five years (WMP Table 5.3-1)

Table 5.2 list and description of program targets, last 5 years Program target	2019		2020		2021		2022		Units	Audited by third-party (Y/N)	Notes (Including definitions and sources for Top-Risk%)
	Target	Perf.	Projected	Perf.	Projected	Perf.	Projected	Target % / Top-Risk%			
Advanced weather monitoring and weather stations	N/A	10	10	2	21	21	50	T3: 2%/3% T2: 46%/38% Non HFTD: 52%/59%	# of weather monitors and weather stations		-
Continuous monitoring sensors	N/A	0	4	0	22	2	2	T3: 0%/3% T2: 100%/38% Non HFTD: 0%/59%	# of sensors		-
Fault indicators for detecting faults on electric lines and equipment	N/A	N/A	N/A	0	0	0	500	T3: 11%/3% T2: 51%/38% Non HFTD: 20%/59%	# of fault indicators		The remaining 18% of fault indicators will be decided in the field as they are found and replaced for 2022.
Covered conductor installation	N/A	0	38	1.4	81.22	20	112	T3: 23%/3% T2: 77%/38% Non HFTD: 0%/59%	# of miles		
Distribution pole replacement and reinforcement, including with composite	N/A	0	39	29	128	87	2020	T3: 23%/3% T2: 77%/38% Non HFTD: 0%/59%	# of poles		

Table 5.2 list and description of program targets, last 5 years Program target	2019		2020		2021		2022		Units	Audited by third-party (Y/N)	Notes (Including definitions and sources for Top-Risk%)
	Target	Perf.	Projected	Perf.	Projected	Perf.	Projected	Target % / Top-Risk%			
poles											
Expulsion fuse replacement	N/A	N/A	N/A	0	0	0	2269	T3: TBD/3% T2: TBD/38% Non HFTD: TBD/59%	# of expulsion fuses		Expulsion fuse locations are determined as they are found needing to be replaced as part of a circuit-by-circuit engineering review.
Installation of system automation equipment	N/A	10	31	28	27	31	51	T3: 2%/3% T2: 53%/38% Non HFTD: 45%/59%	# of installations		
Detailed inspections of distribution electric lines and equipment	N/A	473	605	10155	9213	9217	8777	T3: 4%/3% T2: 57%/38% Non HFTD: 39%/59%	# of inspections		
Patrol inspections of distribution electric lines and equipment	2002	2002	1941	46281	50603	50667	46338	T3: 2%/3% T2: 41%/38% Non HFTD: 57%/59%	# of inspections		100% of Tier 3 and Tier 2 distribution facilities are inspected annually as part of this program. The numerator of this calculation accounts for the % of total inspections within each area and not the percentage of that area which is inspected within the year.

Table 5.2 list and description of program targets, last 5 years Program target	2019		2020		2021		2022		Units	Audited by third-party (Y/N)	Notes (Including definitions and sources for Top-Risk%)
	Target	Perf.	Projected	Perf.	Projected	Perf.	Projected	Target % / Top-Risk%			
Patrol inspections of transmission electric lines and equipment	681	681	657	1654	98	12418	12367	T3: 4%/3% T2: 44%/38% Non HFTD: 48%/59%	# of inspections		100% of Tier 3 and Tier 2 distribution facilities are inspected annually as part of this program. The numerator of this calculation accounts for the % of total inspections within each area and not the percentage of that area which is inspected within the year.
Substation inspections	444	439	444	444	444	438	444	T3: 4%/3% T2: 42%/38% Non HFTD: 54%/59%	# of inspections		
Detailed inspections of transmission electric lines and equipment	62	62	122	1188	666	1439	2545	T3: 10%/3% T2: 67%/38% Non HFTD: 23%/59%	# of inspections		
Infrared inspections of transmission electric lines and equipment	784	1246	232	866	700	700	700	T3: 3%/3% T2: 46%/38% Non HFTD: 51%/59%	# of miles		The current IR inspection program is on Transmission lines only.
Intrusive pole inspections	92	92	150	3208	2668	4692	4759	T3: 0%/3% T2: 21%/38% Non HFTD: 76%/59%	# of inspections		Distribution Pole Test and Treat (PTT) is on a 20-year cycle while Transmission PTT is on a 10-year cycle. Due to the cycle timing and the small percentage of PacifiCorp

Table 5.2 list and description of program targets, last 5 years Program target	2019		2020		2021		2022		Units	Audited by third-party (Y/N)	Notes (Including definitions and sources for Top-Risk%)
	Target	Perf.	Projected	Perf.	Projected	Perf.	Projected	Target % / Top-Risk%			
											service territory, there is likely to be some years with no T3 structures are inspected as part of the PTT program.
Patrol inspections of vegetation around distribution electric lines and equipment	N/A	N/A	N/A	784	1369	1167	1007	T3: 1%/3% T2: 59%/38% Non HFTD: 40%/59%	# of miles		100% of Tier 3 and Tier 2 circuits have a vegetation management inspection completed annually. The numerator of this calculation accounts for the % of total patrol inspections within each area however does not account for detail inspections that are scheduled to be completed prior to the height of the fire season as part of routine cycle maintenance.
Patrol inspections of vegetation around transmission electric lines and equipment	N/A	N/A	N/A	323	348	354	163	T3: 0%/3% T2: 42%/38% Non HFTD: 58%/59%	# of miles		Patrol inspections of transmission lines take place in years in which routine maintenance work is not scheduled, generally every other year. Due to timing or routine maintenance and the small percentage of PacifiCorp service territory, there is likely to be some years with no T3 structures are inspected as part of this program.

Table 5.2 list and description of program targets, last 5 years Program target	2019		2020		2021		2022		Units	Audited by third-party (Y/N)	Notes (Including definitions and sources for Top-Risk%)
	Target	Perf.	Projected	Perf.	Projected	Perf.	Projected	Target % / Top-Risk%			
Quality assurance / quality control of vegetation management	N/A	N/A	N/A	1107	1717	1383	1169	T3: 1%/3% T2: 57%/38% Non HFTD: 42%/59%	# of miles		
Detailed inspections and management practices for vegetation clearances around distribution electrical lines and equipment	N/A	825	825	909	1380	1376	1158	T3: 3%/3% T2: 34.3%/38 % Non HFTD: 65.4%/59 %	# of miles		
Vegetation management to achieve clearances around electric lines and equipment	N/A	3195	3195	0	0	1513	1169	T3: 1%/3% T2: 57%/38% Non HFTD: 42%/59%	# of miles		
Detailed inspections and management practices for vegetation clearances around transmission	N/A	345	345	185	181	181	354	T3: 20%/3% T2: 54%/38% Non HFTD: 26%/59%	# of miles		

Table 5.2 list and description of program targets, last 5 years Program target	2019		2020		2021		2022		Units	Audited by third-party (Y/N)	Notes (Including definitions and sources for Top-Risk%)
	Target	Perf.	Projected	Perf.	Projected	Perf.	Projected	Target % / Top-Risk%			
electrical lines and equipment											
Fuel management (including all wood management) and management of “slash” from vegetation management activities	N/A	N/A	N/A	2164	3047	2872	3047	T3: 2%/3% T2: 37%/38% Non HFTD: 61%/59%	# of activities		

5.4 PLANNING FOR WORKFORCE AND OTHER LIMITED RESOURCES

Report on worker qualifications and training practices regarding wildfire and PSPS mitigation for workers in the following target roles:

1. *Vegetation inspections*
2. *Vegetation management projects*
3. *Asset inspections*
4. *Grid hardening*
5. *Risk event inspection*

For each of the target roles listed above:

1. *List all worker titles relevant to target role (target roles listed above)*
2. *For each worker title, list and explain minimum qualifications with an emphasis on qualifications relevant to wildfire and PSPS mitigation. Note if the job requirements include the following:*
   a. *Going beyond a basic knowledge of General Order 95 requirements to performrelevant types of inspections or activities in the target role*
   b. *Being a "Qualified Electrical Worker" (QEW) and define what certifications, qualifications, experience, etc. is required to be a QEW for the target role forthe utility.*
   c. *Include special certification requirements such as being an International Society of Arboriculture (ISA) Certified Arborist with specialty certification as a Utility Specialist*
3. *Report percentage of Full Time Employees (FTEs) in target role with specific job title*
4. *Provide a summarized report detailing the overall percentage of FTEs with qualifications listed in (2) for each of the target roles.*
5. *Report plans to improve qualifications of workers relevant to wildfire and PSPS mitigation. The utility must explain how they are developing more robustoutreach and onboarding training programs for new electric workers to identify hazards that could ignite wildfires.*

5.4.1 Target role: Vegetation inspections

PacifiCorp conducts inspections and/or patrols to identify vegetation maintenance that must be performed to align with the company's Transmission and Distribution Vegetation Management Program Standard Operating Procedures (Vegetation SOP).

Table 5.3 and Table 5.4 present PacifiCorp worker and contractor titles in target roles active in PacifiCorp's California service territory, their minimum qualifications, FTE percentages by title in target roles and percentages by high-interest qualification. PacifiCorp's plans to improve worker qualifications follow these tables.

Table 5.3 PacifiCorp-conducted vegetation inspections – target roles and qualifications

Worker Titles	Minimum Qualifications relevant to wildfire and PSPS mitigation	FTE Percent by Target Role	FTE Percent by High-Interest Qualification
Senior Utility Forester	ISA Arborists; See below	50%	100%
Utility Forester	ISA Arborists; See below	50%	100%

Senior utility foresters and utility foresters must be International Society of Arboriculture (ISA) Certified Arborists with an added Utility Specialist certification. Both senior utility and utility foresters must: perform post-work audits to meet PacifiCorp's program standards (e.g., conductor-to-line clearance specifications) along distribution rights-of-way; investigate vegetation-related outages; identify work required, and review work conducted along transmission rights-of-way.

Table 5.4 Contractor-conducted vegetation inspections – target roles and qualifications

Worker Titles	Minimum Qualifications relevant to wildfire and PSPS mitigation	FTE Percent by Target Role	FTE Percent by High-Interest Qualification
Pre-Listers	See below	44%	25%
General Foreperson	See below	56%	60%

PacifiCorp hires contractors to help implement the vegetation management program, including pre-listers and general forepersons.

Pre-listers conduct patrols and/or inspections to identify vegetation work needed to meet PacifiCorp program standards; they also conduct post-audit inspections. At a minimum, they must have a current ISA Arborist certification or the ability to obtain one within six months of their hire date.

General forepersons serve as front-line managers for PacifiCorp's independent contractors. Like senior utility foresters and utility foresters, they must be ISA Certified Arborists with an added Utility Specialist certification.

Plans to improve qualifications of workers relevant to wildfire and PSPS mitigation

PacifiCorp strives for continuous improvement. Utility and senior utility foresters are encouraged to get ISA Board Certified Master Arborist credentials and tree risk assessment certifications. They are also encouraged to participate in arboriculture-related seminars/conferences and complete other related certifications from accredited institutions. PacifiCorp utility and senior utility foresters provide training, hold regular performance-related discussions with pre-listers and other contractor positions to review expectations and job requirements, identify areas for improvement, ensure work consistency, and review post-audit findings. PacifiCorp helps contractors lacking ISA certifications to obtain them; PacifiCorp will continue to require these certifications.

PacifiCorp also provides environmental awareness training to company employees and contractors. This training minimizes potential harm to sensitive environments and increases general understanding of environmental considerations.

5.4.2 Target role: Vegetation management projects

PacifiCorp seeks to collaborate with communities and agencies in implementing projects with defined scopes that promote wildfire resiliency — for example, projects that reduce fuels or establish fire breaks in and around power line rights-of-way.

The same worker titles, qualifications and additional information provided in Section 5.4.1 on page 123~~121~~ is applicable.

5.4.3 Target role: Asset inspections

PacifiCorp field inspection specialists and field inspectors conduct asset inspections. Table 5.5 describes their minimum qualifications and their FTE percent by both target role and high-interest qualification. Descriptions of their work follow the table. PacifiCorp plans to improve worker qualifications follow these descriptions.

Table 5.5 Asset inspections – target roles and qualifications

Worker Titles	Minimum Qualifications relevant to wildfire and PSPS mitigation	FTE Percent by TargetRole	FTE Percent by High- Interest Qualification
Field Inspection Specialist	See Below	50%	n/a
Field Inspector	See Below	50%	n/a

Field inspection specialists evaluate and document inspection data on overhead (distribution, transmission, communications, municipality and private ownership) and underground facilities. Inspections include, but are not limited to, pole attachment inspections, bird damage assessments, condition verification, pole plating, pole stub removal assessments, pole attachment transfer requests, ground-line pole testing and visual/safety inspections. These specialists are familiar with the National Electric Safety Code and PacifiCorp construction standards and can apply their knowledge to recommend appropriate corrective actions.

They use measuring sticks and wheels, binoculars and handheld electronic devices to gather data. Field inspection specialists also work with maps, data sheets, work requests and engineered drawings.

In addition to field inspection specialists, PacifiCorp contracts with field inspectors to perform either Visual Assurance or full, Detailed inspections, including cyclical pole testing. These inspectors are trained to identify all code compliance conditions (NESC and GO 95). Their work is comprehensive without regard to the type of risk (public safety, worker safety, reliability, fire threat, etc.).

Plans to improve qualifications of workers relevant to wildfire and PSPS mitigation

Field inspection support annual refresher training incorporates changes or focus areas related to the wildfire mitigation plan efforts. This ensures all inspectors are aware of new equipment and the related construction standards. Additional elements of this annual training, which include a focus on wildfire mitigation and continuous improvement, appear in Section 7.3.4.14 on page 192~~178~~.

5.4.4 Target role: Grid hardening

PacifiCorp's grid hardening initiatives generally involve retrofitting overhead lines and substation components with more fire-resilient materials, including covered conductor, non-wooden poles, relays/reclosers and advanced communication devices. PacifiCorp employees and contractors work on and around these new devices as either part of planned maintenance and inspections or emergency response efforts. Table 5.6 describes the front-line workers that maintain or repair equipment associated with grid hardening. Brief job descriptions and company plans to improve worker qualifications follow the table.

Table 5.6 Grid hardening – target roles and qualifications

Worker Titles	Minimum Qualifications relevantto wildfire and PSPS Mitigation	FTE Percent by Target Role	FTE Percent by High-Interest Qualification
Journeyman/Lineman	Qualified Electrical Worker (See Below)	88%	100%
Highline Patrolman	Qualified Electrical Worker (See Below)	4%	100%
Technician	Qualified Electrical Worker (See Below)	8%	100%

Journeyman/lineman perform routine maintenance of overhead and underground facilities, poles and wires and respond to emergency outages or PSPS events. PacifiCorp journeyman/linemen are qualified electrical workers. They must have: (1) working experience as a lineman or (2) and graduated from a sanctioned apprenticeship program. They also need to pass a pre-hire physical assessment. Skills and abilities required by this job are normally acquired through job-related high school courses and the lineman apprenticeship program.

Highline transmission patrolmen are journeyman lineman who patrol, inspect and ensure assigned transmission lines are properly maintained. PacifiCorp highline transmission patrolmen understand: (1) equipment, tools, techniques and methods used in the construction, installation, maintenance and repair of overhead line facilities, roads, trails and rights-of-way; (2) stresses, strains and rigging; safety regulations (3) capabilities and limitations of insulator washing equipment; (4) transmission overhead circuitry and switching. The knowledge, skills, and abilities required for this job are comparable with those acquired through a high school education, supplemented by technical study and extensive training and experience as a journeyman, patrolman or lineman. Additionally, highline patrolman have

been trained to use detection equipment that locates static or voltage leakage during visual inspection patrols.

Meter Relay Technicians perform routine maintenance of protection and control devices and advise on emergency response operations. Meter relay techs have a working knowledge of company substation protection and control schemes. They may also install, maintain, adjust, test, troubleshoot and repair substation protection and control equipment, which includes but is not limited to apparatus, meters, relays, controls and remote control equipment.

Plans to improve qualifications of workers relevant to wildfire and PSPS mitigation

Beginning in 2019, PacifiCorp's training program included an annual review of operating practices that reduce wildfire risk during routine work and a review that confirms fire mitigation / suppression tools are available before fire season. This refresher training occurs annually. It has successfully raised awareness of PSPS events, wildfire risk, and how procedures must adapt to that risk.

While effective, this training has been procedural. Full incorporation of grid hardening into PacifiCorp's formal training program is an area of planned improvement. Specifically, this improvement will enhance existing programs, ensuring workers are properly trained to work around materials such as covered conductor, non-wooden poles, and advanced protection and control devices.

5.4.5 Target role: Risk event inspections

At this time PacifiCorp hasn't developed a specific work force dedicated to risk event inspections. Rather, this role has been fulfilled by a combination of field inspectors, field engineers, foresters and journeymen linemen who pass the baton through the risk event inspection process. The minimum qualifications, FTE percentages by title and qualification, and plans to improve qualifications are discussed for each of these titles in sections 5.4.1 through 5.4.3 on pages 123~~121~~–125~~123~~.

5.4.5.1 Utility approach

PacifiCorp has developed operational "watchlist" items that notify operational team members that specific follow-up actions are needed. This internal watchlist tool, commonly referred to as the frequent interrupters requiring evaluation tool, notifies employees on the following business day that an investigation needs to be completed. The watchlist triggers can be modified based on a variety of conditions the company can change, for example, vegetation outages are notified to foresters the day after a tree caused outage is completed.

5.4.5.2 Summary of achievements

PacifiCorp has successfully trained and began to use this tool in their field.

5.4.5.3 Challenges

The company is evaluating whether additional steps should be taken to ensure that all relevant investigations are completed.

6

PERFORMANCE METRICS AND UNDERLYING DATA

6 PERFORMANCE METRICS AND UNDERLYING DATA

Instructions: Section to be populated from Quarterly Reports. Tables to be populated are listed below for reference.

NOTE: Report updates to projected metrics that are now actuals (e.g., projected 2021 spend will be replaced with actual unless otherwise noted). If an actual is substantially different from the projected (>10% difference), highlight the corresponding metric in light green.

6.1 RECENT PERFORMANCE ON PROGRESS METRICS, LAST SEVEN YEARS

Instructions for Table 1 of Attachment 3:

In the attached spreadsheet document, report performance on the following metrics within the utility's service territory over the past seven years as needed to correct previously reported data. Where the utility does not collect its own data on a given metric, each utility is required to work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in the "Comments" column.

This table has been provided in Table 1 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.2 RECENT PERFORMANCE ON OUTCOME METRICS, ANNUAL AND NORMALIZED FOR WEATHER, LAST SEVEN YEARS

Instructions for Table 2: of Attachment 3:

In the attached spreadsheet document, report performance on the following metrics within the utility's service territory over the past seven years as needed to correct previously reported data. Risk events and utility-related ignitions are normalized by wind warning status (RFW & HWW). Where the utility does not collect its own data on a given metric, the utility is required to work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in "Comments" column.

Provide a list of all types of findings and number of findings per type, in total and in number of findings per circuit mile.

This table has been provided in Table 2 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.3 DESCRIPTION OF ADDITIONAL METRICS

Instructions for Table 3: of Attachment 3:

In addition to the metrics specified above, list and describe all other metrics the utility uses to evaluate wildfire mitigation performance, the utility's performance on those metrics over the last seven years, the units reported, the assumptions that underlie the use of those metrics, and how the performance reported could be validated by third parties outside the utility, such as analysts or academic researchers. Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of each preventive strategy and program.

This table has been provided in Table 3 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.4 DETAILED INFORMATION SUPPORTING OUTCOME METRICS

Enclose detailed information as requested for the metrics below.

Instructions for Table 4: of Attachment 3:

In the attached spreadsheet document, report numbers of fatalities attributed to any utility wildfire mitigation initiatives, as listed in the utility's previous or current WMP filings or otherwise, according to the type of activity in column one, and by the victim's relationship to the utility (i.e., full-time employee, contractor, of member of the general public), for each of the last seven years as needed to correct previously reported data. For fatalities caused by initiatives beyond these categories, add rows to specify accordingly. The relationship to the utility statuses of full-time employee, contractor, and member of public are mutually exclusive, such that no individual can be counted in more than one category, nor can any individual fatality be attributed to more than one initiative.

This table has been provided in Table 4 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

Instructions for Table 5 of Attachment 3:

In the attached spreadsheet document, report numbers of OSHA-reportable injuries attributed to any utility wildfire mitigation initiatives, as listed in the utility's previous or current WMP filings or otherwise, according to the type of activity in column one, and by the victim's relationship to the utility (i.e., full-time employee, contractor, of member of the general public), for each of the last seven years as needed to correct previously -reported data. For members of the public, all injuries that meet OSHA-reportable standards of severity (i.e., injury or illness resulting in loss of consciousness or requiring medical treatment beyond first aid) must be included, even if those incidents are not reported to OSHA due to the identity of the victims.

For OSHA-reportable injuries caused by initiatives beyond these categories, add rows to specify accordingly. The victim identities listed are mutually exclusive, such that no individual victim can be counted as more than one identity, nor can any individual OSHA-reportable injury be attributed to more than one activity.

This table has been provided in Table 5 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.5 MAPPING RECENT, MODELED, AND BASELINE CONDITIONS

The utility must provide underlying data for recent conditions (over the last five years) of the utility's service territory in a downloadable shapefile GIS format, following the spatial reporting schema attachment[19]. All data is reported quarterly, this is a placeholder for quarterly spatial data.

This spatial data has been provided in the Q1 quarterly filing submitted on May 2, 2022.

6.6 RECENT WEATHER PATTERNS, LAST SEVEN YEARS

Instructions for Table 6 of Attachment 3:

In the attached spreadsheet document, report weather measurements based upon the duration and scope of NWS Red Flag Warnings, High wind warnings and upon proprietary Fire Potential Index (or other similar fire risk potential measure if used) for each year. Calculate and report 5-year historical average as needed to correct previously reported data.

[19] https://energysafety.ca.gov/wp-content/uploads/energy-safety-gis-data-reporting-standard_version2.1_09072021_final.pdf

This table has been provided in Table 6 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.7 RECENT AND PROJECTED DRIVERS OF OUTAGES AND IGNITION PROBABILITY

Instructions for Table 7.1 and Table 7.2 of Attachment 3:

(Table 7.1) In the attached spreadsheet document, report recent drivers of outages according to whether or not risk events of that type are tracked, the number of incidents per year (e.g., all instances of animal contact regardless of whether they caused an outage, an ignition, or neither), the rate at which those incidents (e.g., object contact, equipment failure, etc.) cause an ignition in the column, and the number of ignitions that those incidents caused by category, for each of last seven years as needed to correct previously reported data. Calculate and include 5-year historical averages. This requirement applies to all utilities, not only those required to submit annual ignition data. Any utility that does not have complete 2021 ignition data compiled by the WMP deadline is required to indicate in the 2021 columns that said information is incomplete. (Table 7.2) Similar to Table 7.1, but for ignition probability by line type and HFTD status, according to if ignitions are tracked.

This table has been provided in Table 7.1 and 7.2 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.8 BASELINE STATE OF EQUIPMENT AND WILDFIRE AND PSPS EVENT RISK REDUCTION PLANS

6.8.1 Current baseline state of service territory and utility equipment

Instructions for Table 8: of Attachment 3:

In *the attached spreadsheet document, provide summary data for the current baseline state of HFTD and non-HFTD service territory in terms of circuit miles; overhead transmission lines, overhead distribution lines, substations, weather stations, and critical facilities located within the territory; and customers by type, located in urban versus rural versus highly rural areas and including the subset within the Wildland-Urban Interface (WUI) as needed to correct previously reported data.*

The totals of the cells for each category of information (e.g., "circuit miles (including WUI and non-WUI)") would be equal to the overall service territory total (e.g., total circuit miles). For example, the total of number of customers in urban, rural, and highly rural areas of HFTD plus those in urban, rural, and highly rural areas of non-HFTD would equal the total number of customers of the entire service territory.

This table has been provided in Table 8 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

6.8.2 Additions, removal, and upgrade of utility equipment by end of three-year plan term

Instructions for Table 9 of Attachment 3:

In the attached spreadsheet document, input summary information of plans and actuals for additions or removals of utility equipment as needed to correct previously reported data. Report net additions using positive numbers and net removals and undergrounding using negative numbers for circuit miles and numbers of substations. Report changes planned or actualized for that year – for example, if 10 net overhead circuit miles are added in 2020, then report "10" for 2020. If 20 net overhead circuit miles are planned for addition by 2022, with 15 being added by 2021 and 5 more added by 2022, then report "15" for 2022 and "5" for 2021. Do not report cumulative change across years. In this case, do not report "20" for 2022, but instead the number planned to be added for just that year, which is "5".

This table has been provided in Table 9 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

Instructions for Table 10: of Attachment 3:

Referring to the program targets discussed above, report plans and actuals for hardening upgrades in detail in the attached spreadsheet document. Report in terms of number of circuit miles or stations to be upgraded for each year, assuming complete implementation of wildfire mitigation activities, for HFTD and non-HFTD service territory for circuit miles of overhead transmission lines, circuit miles of overhead distribution lines, circuit miles of overhead transmission lines located in Wildland-Urban Interface (WUI), circuit miles of overhead distribution lines in WUI, number of substations, number of substations in WUI, number of weather stations and number of weather stations in WUI as needed to correct previously reported data.

If updating previously reported data, separately include a list of the hardening initiatives included in the calculations for the table.

This table has been provided in Table 10 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx, in the Q1 quarterly filing submitted on May 2, 2022.

7

MITIGATION INITIATIVES

7 MITIGATION INITIATIVES

7.1 WILDFIRE MITIGATION STRATEGY

Describe organization-wide wildfire mitigation strategy and goals for each of the following time periods, highlighting changes since the prior WMP:

1. *By June 1 of current year*
2. *By September 1 of current year*
3. *Before the next Annual WMP Update*
4. *Within the next 3 years*
5. *Within the next 10 years*

The description of utility wildfire mitigation strategy must:

A. *Discuss the utility's approach to determining how to manage wildfire risk (in terms of ignition probability and estimated wildfire consequence) as distinct from managing risks to safety and/or reliability. Describe how this determination is made both for (1) the types of activities needed and (2) the extent of those activities needed to mitigatethese two different groups of risks. Describe to what degree the activities needed to manage wildfire risk may be incremental to those needed to address safety and/or reliability risks.*

B. *Discuss how risk modeling outcomes are used to inform decision-making processes andused to prioritize mitigation activities. Provide detailed descriptions including clear evaluation criteria[20] and visual aids (such as flow charts or decision trees). Provide an appendix (including use of relevant visual aids) with specific examples demonstrating how risk modeling outcomes are used in prioritizing circuit segments and selecting mitigation measures.*

C. *Include a summary of achievements of major investments and implementation of wildfire mitigation initiatives over the past year, lessons learned, changed circumstances during the 2020-2022 WMP plan cycle, and corresponding adjustment in priorities for the current year. Organize summaries of initiatives by the wildfire mitigation categories listed in Section 7.3.*

D. *List and describe all challenges associated with limited resources and how these challenges are expected to evolve over the next 3 years.*

E. *Outline how the utility expects new technologies and innovations to impact the utility's strategy and implementation approach over the next 3 years, including the utility's program for integrating new technologies into the utility's grid. Include utility research listed above in Section 4.4.*

[20] "Evaluation criteria" should include all points of considerations including any thresholds and weights thatmay affect the outcome of their decision, as well as a descriptor of how it is evaluated (i.e., given a risk score, using SME expertise to determine that score, using a formula).

F. *Provide a GIS layer[21] map showing generalized wildfire risk (e.g., MAVF) data should be as granular as possible.*
G. *Provide GIS[22] layers for the following grid hardening initiatives: covered conductor installation;[23] undergrounding of electrical lines and/or equipment; and removal of electrical lines. Features must have the following attributes: state of hardening, type of hardening where known (i.e., undergrounding, covered conductors, or removal), and expected completion date. Provide as much detail as possible (circuit segment, circuit- level, etc.). The layers must include the following:*
    a. *Hardening planned for 2022*
    b. *Hardening planned for 2023*
    c. *Hardening planned for 2024*
H. *Provide static (either in text or in an appendix), high-level maps of the areas where the utility will be prioritizing Grid Design and System Harding initiatives for 2022, 2023, and by 2032.*
I. *Provide a GIS layer for planned Asset Management and Inspections in 2022. Features must include the following attributes: type, timingand prioritization of asset inspection. Inspection types must follow the same types described in Section 7.3.4, Asset Management and Inspections, and as applicable, should not be limited to patrols and detailed inspections.*
J. *Provide a GIS layer illustrating where enhanced clearances (12 feet or more)were achieved in 2020 and 2021 and where the utility plans to achieve enhanced clearances in 2022. Feature attributes must include clearance distances greater than or equal to 12 feet, if such data is available, either in ranges or as discrete integers (e.g., 12-15 feet, 15-20 feet, etc. OR 12, 13, 14, 15, etc.).*

[21] GIS data that has corresponding feature classes in the most current version of Energy Safety GIS Data Reporting Standard will utilize the format for submission. GIS data that does not have corresponding feature classes shall be submitted in an ESRI compliant GDB and include a data dictionary as part of the metadata.

[22] Energy Safety acknowledges potential security concerns regarding aggregating and presenting critical electrical infrastructure in map form. Utilities may provide maps or GIS layers required by these Guidelines as confidential attachments when necessary.

[23] For a definition of "covered conductor installation" see Section 9 of Attachment 2.

Table 7.1~~Table 7.1~~ describes the wildfire mitigation strategy by June 1 of current year and by September 1 of current year. For Annual initiative targets, please see in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

Table 7.1 June 1 and September 1 current year wildfire mitigation strategy

Category	By June 1 of this year	By September 1 of this year
Risk Assessment and Mapping	• Begin implementation of Technosylva's WFA-E tools.	• Continue implementation of Technosylva's WFA-E tools. • Identify potential impacts to tools based on revised OEIS guidance / requirements for risk assessment and modeling.
Situational Awareness	• Integrate newly installed weather stations into the situational awareness model. • Complete annual calibration of existing weather stations to ensure functionality. • Perform verification and validation of forecast vs. actual fire weather data from 2021 to improve forward looking forecast.	• Complete installation of additional weather stations. • Substantially advance the company's risk modeling capabilities and inform prioritization of work in 2022-2023. • Begin plan development for wildfire detection pilot project for execution in 2023.
Grid Hardening	• Reprioritize programs needed before the next fire season and annual update based on the evolution of risk modeling to ensure inclusion in the CY2023-2025 execution plan. • Continue progressing grid hardening construction projects such as installation of covered conductor and system automation equipment for advanced protection and control. • Continue gathering continuous monitoring, DFA data for pilot. • Continue expansion of the free-portable battery program to mitigate the impact of PSPS.	• Review and finalize the 2023-2025 grid hardening scope for inclusion in the 2023 WMP. • Plan corrective work identified through the pole loading infrastructure hardening program. • Construct and commission additional transmission and distribution system automation devices. • Continue construction of covered conductor installation.
Asset Management	• Complete the CY2022 planned inspections within the HFTD. • Complete transmission line IR inspections scheduled in Q2 targeting peak loading or near peak loading conditions.	• Continue asset inspections and corrections in compliance with GO 95 and GO 165. • Prepare to implement distribution IR inspection pilot.
Vegetation Management	• Conduct annual readiness patrols in Tier 3 where cycle work is not planned.	• Conduct annual readiness patrols in the HFTD where cycle work is not planned.

Category	By June 1 of this year	By September 1 of this year
Grid Operations and Protocols	• Review existing operating protocols and ensure preparedness for 2022 fire season. • Continue evolving protocols to better track elevated wildfire risk protocols.	• Review 2022 fire season operating protocols and evaluate areas for improvement in 2023.
Data Governance	• Recruit and hire an additional program manager to manage and delivery complex GIS datasets for reporting. • Complete Q1 Quarterly Reports.	• Complete Q2 Quarterly Reports. • Continue expanding data reporting capability.
Resource Allocation Methodology	• Complete initial RSE evaluation at the initiative level. • Continue participating in OEIS led workshops and utility working groups to evolve RSE calculations.	• Begin implementation of Technosylva's WRRM model to support RSE calculations. • Develop plan to incorporate revised OEIS guidance / requirements for RSE calculations.
Emergency Planning and Preparedness	• Perform tabletop exercises in preparation for the 2022 fire season. • Stand up a Public Safety Partner portal with critical infrastructure information.	• Advance the Public Safety Partner Portal capabilities. • Plan to incorporate 2022 fire season lessons learned.
Stakeholder Cooperation and Community Engagement	• Continue partnering with public safety partners in communities throughout California regarding wildfire and PSPS preparedness. • Update the PSPS website to include the Spanish translation. • Conduct quarterly Wildfire Safety Advisory Board meetings to inform PSPS planning and protocols. • Conduct Wildfire Mitigation and PSPS Planning Webinar.	• Continue improvements to internal and external customer and community facing forecast of PSPS status (website). • Continue partnering with public safety partners in communities throughout California regarding wildfire and PSPS preparedness.

The wildfire mitigation strategy for the end of this year, three years and 10 years can be found in Section 5.2 on page 112~~110~~.

A. Utility's Approach to Managing Wildfire Risk

PacifiCorp manages wildfire risk through the implementation of its WMP mitigation measures to influence ignition probability as described in Section 4.2 beginning on page 35. This section includes more detailed information regarding these ignition probability drivers as well as what mitigation activities are implemented to mitigate wildfire risk. Further details can be found in

Table 4.4~~Table 4.4~~ on page 97~~95~~, Table 4.5~~Table 4.5~~ on page 98~~96~~, and Table 4.6~~Table 4.6~~ on page 99~~97~~, which include detailed mapping of methodologies, programs, and techniques to mitigate that various ignition risk drivers.

At this time, PacifiCorp does not make a specific distinction between programs that manage safety and reliability risks and those that manage wildfire risk; safety and reliability risks are strongly related to wildfire risk. Many of the risk drivers can be the same, such as faults or outages, and many can be different, such as climbing hazards identified near a pole. All PacifiCorp initiatives mitigate at least one of these types of risks and often more than one. An example of this can be found in any of the asset inspection subsections included in Section 7.3.4 beginning on page 185~~171~~. These subsections describe how PacifiCorp's traditional inspection and correction programs maintain regulatory compliance and manage routine operational risk; they also mitigate wildfire risk by identifying and correcting conditions which, if uncorrected, could result in an outage or ignite a fire. Therefore, PacifiCorp's inspection programs mitigate all three types or risk: safety, reliability and wildfire.

While all company programs are required to properly mitigate risk, the incremental programs proposed through PacifiCorp's WMP process are specifically designed to mitigate wildfire risk; they incrementally reduce safety and reliability risk differently than traditional programs, which focused more on reliability and safety first, with additional benefits in terms of wildfire risk mitigation. When reviewing the initiatives, programs that were included in the company's 2019 GRC reflect the traditional programs designed to reduce safety and reliability risk with incremental benefits to wildfire risk mitigation, while newly proposed programs in the WMP represent programs specifically designed to reduce wildfire risk.

B. Mitigation Activity Decision-Making Process

Figure 7.1 depicts PacifiCorp's general decision-making processes related to selecting initiatives and prioritizing mitigation activities. This process, which is very high level and generally aligns with processes at other utilities, includes: evaluation, identification, selection, scope development and deployment. While the flowchart doesn't clearly indicate it, any step in the process can "kick back" a mitigation program to previous step. For example, if engineering design discovers unplanned cost or scope creep, the program may be reverted to the *selection phase*.

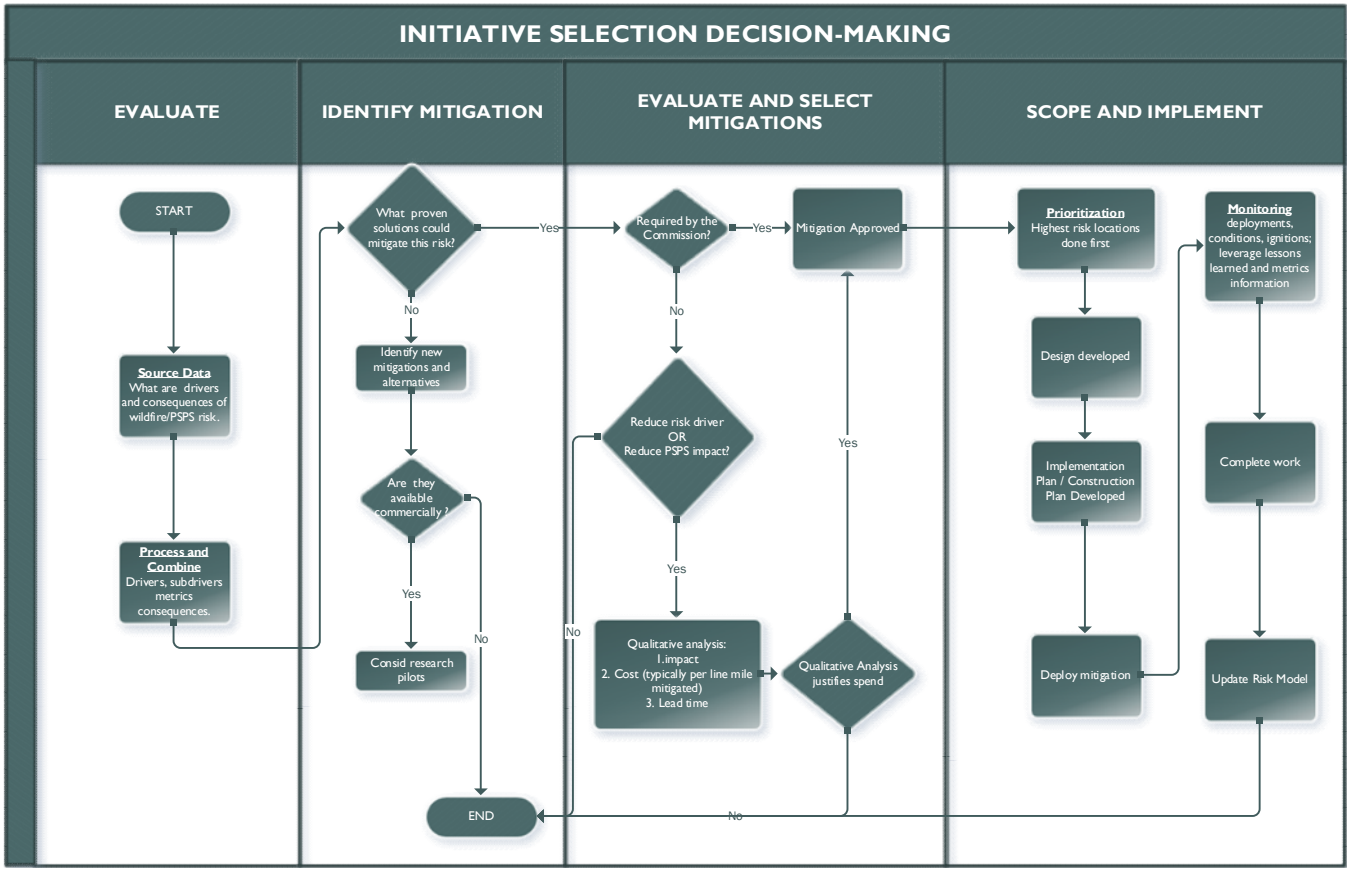


Figure 7.1 Initiative selection decision-making flowchart

Step 1: Evaluation

PacifiCorp begins the initiative decision-making process by identifying trends in risk events. Risk events are identified using the company's outage data, which is aligned with IEEE 1366 and IEEE 1782 and has been mapped to risk drivers based on outage cause categories. After the risk drivers are categorized, PacifiCorp used the outage data to quantify the frequency of each risk driver, as presented in Figure 7.2.

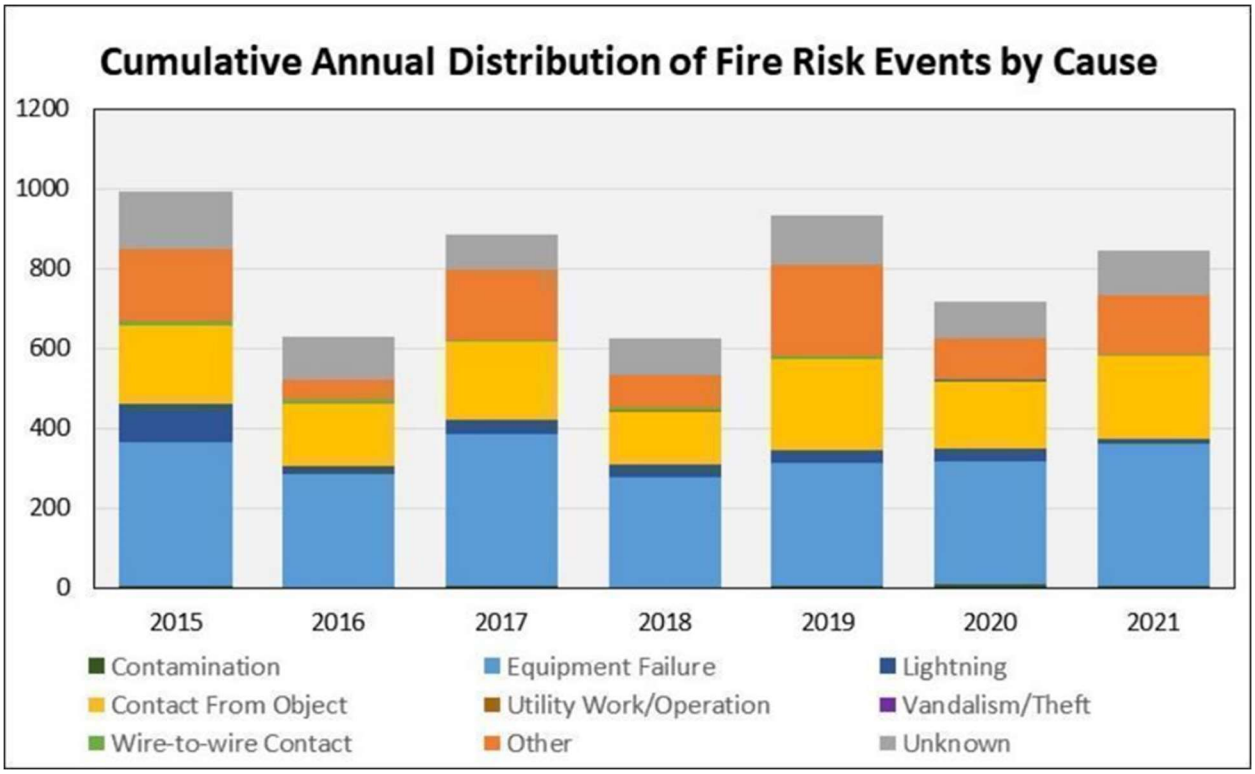


Figure 7.2 Cumulative annual distribution of fire risk events by cause

From this data, it was observed that priority should be placed on initiatives that address the most commonly occurring risk drivers.

Step 2: Identify Mitigations

To identify mitigations, an evaluation of current industry practices and new technology is performed. As other utility wildfire mitigation plans become available, PacifiCorp reviews them for pilot results and initiative progression, which supply valuable information on proven industry solutions. Additionally, PacifiCorp has developed relationships with other utilities across multiple states; these relationships facilitate discussions about industry practices and learning from each other. Proven solutions are then evaluated for selection as a mitigation program.

Step 3: Evaluating and Selecting

Mitigations are evaluated for implementation based on the following criteria:

- Commission or *regulatory requirements*
- Wildfire Risk impact
- Customer impact

- Ease of implementation

Programs approved by upper management then progress to be scoped and deployed.

Step 4: Scoping and Implementation

Program scoping can vary greatly depending on the type of program. Generally, PacifiCorp reviews the type of ignition risk factor the program is planned to address, reviews other simultaneous programs and prioritizes how the work is sequenced to address higher risk locations first. Addressing wildfire risks in PacifiCorp's Tier 3 and Tier 2 areas is a higher priority than addressing the risk in non-HFTD areas. After program prioritization, the program moves to the design stage, which can vary depending on the project. For grid hardening programs, this stage includes developing a formal engineering design (for vegetation management this is the step where the plan is developed). Following the design step, the detailed implementation plan is developed and the mitigation is initiated. Before, throughout the implementation of, and after completion of the program, a variety of metrics are collected and recorded. Metrics vary, depending on the specific program, and can include installation dates, completion dates, conditions, ignitions reported and / or outages reported. This data is all gathered with the plan that it can be incorporated into future revisions of risk modeling.

C. Summary of Changed Circumstances and Adjustment to Priorities

A summary of major investments can be found in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx. Additional information regarding major accomplishments is included in Section 5.3 starting on page 116~~114~~. Lessons learned associated with the various initiatives has been reported in Section 4.1 on page 31.

Table 7.2 Programs and their modifications based on changing circumstances and priorities

Category	Changed Circumstances (2020-2022)	Adjustment to Priorities
Risk Mapping	Pivoting to Technosylva	Prioritizing RSE
Situational Awareness	• Built and implemented an in-house WRF model; daily WRF output ingested by the company's geospatial analysis application, GREATER. • Created of situational awareness website for internal and external consumption of weather station observations and forecast data. • Completed five years of a 30-year WRF reanalysis of historical weather conditions. • Piloted Technosylva's Wildfire Analyst-Enterprise in 2021. • Created a meteorology program with five full-time staff meteorologists to provide daily weather briefings and decision support.	• Expansion of Situational Awareness initiatives beyond weather stations to include the creation of an impacts-based forecasting system and web-based displays. • Increasing the density and pace of new weather station installations across the HFTD.

Category	Changed Circumstances (2020-2022)	Adjustment to Priorities
Grid Design and System Hardening	Obtained materials, began completing engineering design work and began installing in the field.	Covered conductor prioritization has remained the same.
Asset Management and Inspections	N/A	N/A
Vegetation Management and Inspections	Completed roll out and implementation of mobile data management software and continue to improve data collection process.	The changed circumstance has not resulted in an adjustment to priorities, but rather increased capabilities to track and execute work to accomplish goals.
Grid Operations and protocols	Identified a need for separate tracking of patrols related to elevated risk situations.	N/A
Data Governance	Development of Wildfire Safety team	N/A
Resource Allocation Methodology	N/A	Prioritizing RSE
Emergency Planning and Preparedness	N/A	N/A
Stakeholder Cooperation and Community Engagement	N/A	N/A

D. Resource challenges

PacifiCorp has encountered challenges related to limited field resources, particularly as it related to construction activities. The business plans to address these challenges through the hiring on additional contractors, as described in Section 9.3 starting on page 290~~255~~.

Additionally, sufficient resources are needed to support plan development, monitoring and control. In 2021, PacifiCorp began planning to meet these unique challenges and established a wildfire safety department as described in Section 7.2 on page 146~~144~~. An additional FTE is also being added, as reported in the 2021 Change Order submitted on November 1, 2022, to support data management and reporting. Further changes over the next three years are expected as the new 2023 guidelines are evaluated. PacifiCorp plans to further evaluate resources at that time.

E. Technology Evolution and Transformation

The company anticipates that it will continue piloting and researching new technologies with a focus on how these new technologies can transform existing initiatives or inform the need for new initiatives. This is further described in Section 4.4.1 on page 48 and imbedded in the wildfire mitigation strategy goals discussed in this section.

New technologies can provide information that isn't already available with current equipment or methods. For example, enhanced inspections view the equipment through IR allowing for information to be gathered that can't be detected visually. The weather stations that have been installed have allowed for weather modeling within the HFTD and the territory, which

has informed real-time operational decisions. PacifiCorp recognizes that it is vital to continue to learn about and evaluate new technologies and innovations over the next three years.

As new technologies and innovations become available, PacifiCorp plans to evaluate them for piloting or full implementation. It is anticipated that new technologies will add additional insight into the conditions or operational practices for the equipment in the service territory. The data gained will be interpreted in a way that a systematic approach of actions can follow the information gained.

F. GIS layer map showing generalized wildfire risk

A GIS layer map showing generalized wildfire risk, as per LRAM, has been provided in Attachment 1: GIS Wildfire Risk.

G. GIS layer showing grid hardening initiatives

Covered conductor installation undergrounding of electrical lines and/or equipment and removal of electrical lines has been provided in Attachment 2, which includes GIS Layer Covered Conductor, Covered Conductor 2022 and Covered Conductor 2023. These attachments provide grid hardening planned for 2022 and 2023.

Plans for grid hardening beyond 2023 are planned to be scoped in the future based on the 2023 WMP Guidelines and updated risk planning methodologies. Within the GIS layers, all hardening efforts are "in progress" and expected to be completed within the year of the designated file. GIS layers include the circuit ID. All work scoped is for covered conductor except for circuit 5G79, which is planned to be undergrounded.

H. Static high-level maps

Generally, grid hardening initiative work in 2022 and 2023 is prioritized in the HFTD areas (see Figure 4.2 for a map of the HFTD). Upon completion of these areas, PacifiCorp plans to address the next highest risk areas for grid hardening work.

I. GIS layer for planned asset management and inspections, 2022

PacifiCorp has provided, in Attachment 3: GIS Layer Inspections, a GIS layer for planned asset management and inspections in 2022. This layer includes the planned inspection date and inspection type (IR inspections, PTT, detail or visual). Work is prioritized based on the initiative prioritization in Section 7.3.4 starting on page 185~~171~~, which describes the asset management and inspection program.

J. GIS layer illustrating enhanced clearances

Attachment 5 provides a map of where PacifiCorp plans to perform vegetation management work in 2022. Additionally, Attachment 4 provides a map of where vegetation management work was completed in 2020 and 2021.

7.2 WILDFIRE MITIGATION PLAN IMPLEMENTATION

Describe the processes and procedures the electrical corporation will use to do all the following:

A. *Monitor and audit the implementation of the plan. Include what is being audited, who conducts the audits, what type of data is being collected, and how the data undergoes quality assurance and quality control.*

B. *Identify any deficiencies in the plan or the plan's implementation and correct those deficiencies.*

C. *Monitor and audit the effectiveness of inspections, including inspections performed by contractors, carried out under the plan and other applicable statutes and commission rules.*

D. *Ensure that across audits, initiatives, monitoring, and identifying deficiencies, the utility will report in a format that matches across WMPs, Quarterly Reports, Quarterly Advice Letters,[24] and annual compliance assessment.*

A. Monitoring, auditing, quality assurance, quality control

PacifiCorp's WMP reflects a broad and thorough wildfire mitigation approach to meet the heightened risk and growing impact to communities in the company's California service territory. As a result, the plan contains many elements and touches nearly every department in the company. In recognition of this significant effort, PacifiCorp developed a new department, commonly referred to as Wildfire Safety. This new department consists of thirteen full-time employees, is led by a Managing Director, and includes both a project management office, focused on delivery of line rebuilds and system hardening, and a program delivery team, responsible for overall plan development, monitoring, and implementation. The overall organization is depicted below in Figure 7.3.

[24] General Rule for filing Advice Letters is available in General Order 96-B: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M023/K381/23381302.PDF

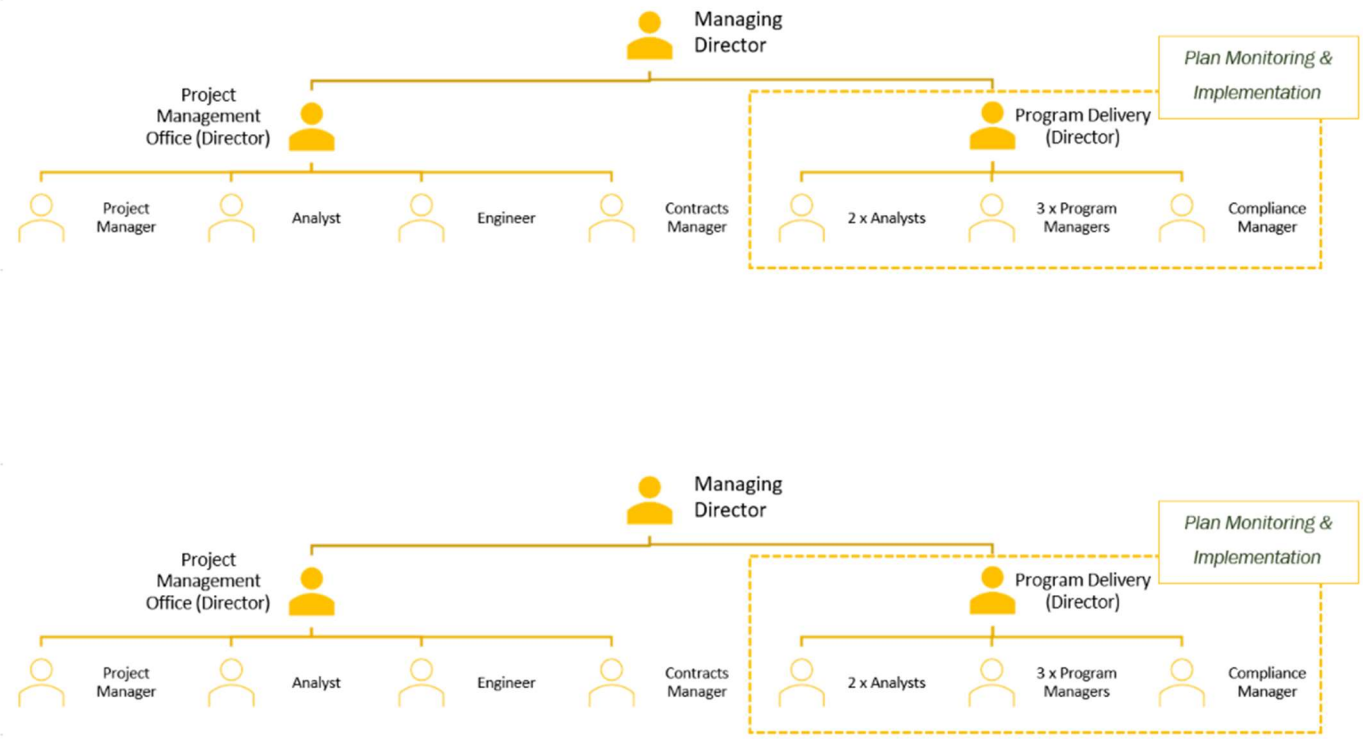


Figure 7.3 PacifiCorp's newly formed wildfire safety department

While the broader Wildfire Safety team is tasked with supporting all types of wildfire mitigation initiatives and strategies across the company's entire service territory, a key function of Wildfire Safety Program Delivery team is to develop, implement, monitor, and improve the company's Wildfire Protection Plan in Oregon. It is the responsibility of Wildfire Safety Program Delivery to coordinate with other internal departments such as Asset Management, Vegetation Management, Field Operations, and Emergency Management to ensure all aspects of the plan are delivered. While utilities have always needed to work to prevent wildfire sparked by an electric facility, this extensive approach reflects a new way for PacifiCorp to tackle this elevated risk.

As is true with any plan or program, monitoring plan implementation is just as critical as the plan elements itself. PacifiCorp combines company processes, tools, and site work to monitor program activities; individual departments are responsible for delivering specific portions of the plan. A few key management areas include local operations, emergency management, construction activity, and non-construction programs such as inspections and maintenance.

The emergency management department ensures an annual preparedness review of ongoing tasks and processes such as Wildfire Prevention Practices for operations employees and PSPS

processes. Part of this annual review includes desktop exercises and after-event reports for lessons learned that can inform and improve plans. This is further described in Section 7.3.9 starting on page 239~~217~~.

To facilitate WMP construction projects (generally reflected in the system hardening programs) PacifiCorp established a wildfire mitigation project management office. This office monitors all aspects of construction (engineering, permitting, standards, estimating, materials, and post-audit quality assurance) to ensure the plan deliverables are achieved. PacifiCorp uses company processes, tools, and site work to monitor these activities. For example, weekly coordination meetings are held and costs and progress are tracked and monitored monthly. Additionally, internal engineering audits and verifies all contracted design work to ensure projects meet the necessary scope as well as company and industry standards.

Other aspects of the WMP are overseen by existing program offices such as vegetation management, asset management, and corporate communications. These offices collect all pertinent information (inspection records, etc.) to ensure compliance. All collected data is maintained in the company's corporate enterprise systems. Details regarding program oversight and management are included in the detailed program elements.

While individual departments can monitor individual elements of the company's WMP, PacifiCorp has identified a gap: the WMP lacks a clear plan and process to monitor collective implementation. This gap became more obvious during 2020 plan implementation due to both the increase in reporting requirements and frequency as well a heightened need for coordination between departments to ensure programs reflect the WMP's overall strategy and vision.

PacifiCorp is continually evaluating methods it can employ to ensure greater structure within the PMO to ensure that proper delivery, monitoring and auditing practices are put in place.

B. Deficiencies

Plan deficiencies are generally identified through self-audits, after-action reviews and progress updates. As described above, each department can monitor progress and identify deficiencies. For example, emergency management conducts after-action reviews that include, as a component, action items to close gaps that were found. Audits conducted following asset inspections include detailed reports on findings that are then added to annual inspector training.

One area currently identified for improvement at PacifiCorp and identified by the OEIS is data governance. PacifiCorp has been working diligently to improve data delivery consistent with the GIS Data Schema requirements published by the OEIS. To date, the company has been able to deliver a substantial portion of the asset data, PSPS event data and risk event data in the format requested.

However, improving data governance requires retrieving and translating nonspatial data into GIS format. Like monitoring and auditing the WMP, the evolution of the company's GIS data capability touches many departments and requires an intense amount of input and coordination. While individual departments may have policies, processes and procedures to manage key operations data, PacifiCorp does not have a single, overarching data governance plan. However, the company recognized the need to develop a plan to close this gap, which will continue to be reported in quarterly updates.

Another area identified for improvement, has been the installation of covered conductor in the field, which has been slow to complete on target, and is likely to continue missing targets for the year, despite ample planning and prioritization of current resources. To address this, the business strategy has shifted to fundamentally increase resources using a Construction Management contractor, as described in Section 9.3 on page 290~~255~~, and PacifiCorp plans to award the contract at the beginning of 2023.

C. Inspections

The effectiveness of these programs at reducing operating risk — which includes wildfire risk — relies on inspection quality and proper interpretation of findings. PacifiCorp monitors inspections through its quality assurance and quality control (QA/QC) program. This program generally includes desktop and field audits designed to identify gaps in the inspection programs and inspector capabilities. QA/QC also includes corrections that increase inspection accuracy and reliability, which is critical to ensure effectiveness and to support risk reduction.

To perform QA/QC of inspections, PacifiCorp uses a combination of process controls, software tools, company policy and physical record checking to quickly identify inaccuracies for corrections, evaluations, root cause analyses and system improvements. These activities provide a cost-effective way to minimize inaccurate of unreliable inspection results. Inspection results are reviewed continuously to confirm that inspections in the HFTD are meeting acceptable standards of performance.

The main components of this program, including enhancements to mitigate wildfire risk, are:

- Physical audits of at least 5% of planned facility inspections with a focus on fire threats and Tier 2 and Tier 3 prioritization
- Software controls that prohibit freeform Condition assignment, allowing for result controls, minimizing the amount of human error possible
- Quarterly review of already audited results as a secondary check
- Annual inspector training to address audit findings and improve inspection reliability and accuracy

Additional details about these components, program management, cost, evolution and new

enhancements to reduce wildfire risk in recognition of PC-4 are included in Section 7.3.4 starting on page 185~~171~~.

D. Reporting format

PacifiCorp has taken OEIS guidance and begun matching its current programs to older named programs, as requested in earlier updates. Where programs have been realigned, the company has referred to the older program name as well as the current name. This realignment is still evolving. As the company and stakeholders evaluate its plan and become familiar with the programs, how the programs are evolving and aligning with stakeholder directions will become clearer.

7.3 DETAILED WILDFIRE MITIGATION INITIATIVES

In this section, describe how specific wildfire and PSPS mitigation initiatives execute the strategy set out in Section 5. The initiatives are divided into 10 categories, with each providing a space for narrative descriptions of the utility's initiatives. The initiatives are organized by the following categories provided in this section:

1. *Risk assessment and mapping*
2. *Situational awareness and forecasting*
3. *Grid design and system hardening*
4. *Asset management and inspections*
5. *Vegetation management and inspections*
6. *Grid operations and protocols*
7. *Data governance*
8. *Resource allocation methodology*
9. *Emergency planning and preparedness*
10. *Stakeholder cooperation and community engagement*

It is not necessary for a utility to have every initiative listed under each category.

Financial data on mitigation initiatives

Report actual and projected WMP expenditure, as well as the risk-spend-efficiency (RSE), for each initiative by HFTD tier (territory-wide, non-HFTD, HFTD zone 1, HFTD tier 2, HFTD tier 3) in Table 12. of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx. For each item in this category, provide relevant maps within the report or appendices.

Detailed information on mitigation initiatives

Report detailed information for each initiative. For each initiative, organize details under the following headings:

2. ***Risk to be mitigated** / problem to be addressed*
2. ***Initiative selection** ("why" engage in initiative) – include reference to and description of a risk informed analysis and/or risk model on empirical (or projected) impact of initiative in comparison to alternatives and demonstrate that outcomes of risk model are being prioritized*
3. ***Region prioritization** ("where" to engage initiative) – include reference to a risk informed analysis in allocation of initiative (e.g., veg clearance is done for trees tagged as "high-risk") and demonstrate that high-risk areas are being prioritized*
4. ***Progress on initiative** since the last WMP submission and plans, targets, and/or goals for the current year*
5. ***Future improvements to initiative** - include known future plans (beyond the current year) and new/novel strategies the utility may implement in the next 5 years (e.g., references to and strategies from pilot projects and research detailed in Section 4.4).*

7.3.1 Risk assessment and mapping

7.3.1.1 A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment

1. **Risk to be mitigated**

   In Section 4.5, starting on page 65, PacifiCorp explained its evolution toward a comprehensive risk modeling approach that supports evaluating a variety of fire risks in the context of its network overlaid on the appropriate land features. This risk modeling approach also allows for estimating the impacts of various mitigation measures on future fire risks. As it unfolded that approach, it created a single modeling tool through its LRAM that addresses utility ignition, climate risks (historic, current and forecast) and the impacts of fire spread. As result, PacifiCorp consolidated all aspects of the risk assessment mapping (sections 7.3.1.1 and 7.3.1.3, starting on page 153~~150~~) into this initiative, Section 7.3.1.1, which serves as an enabling technology and foundational element upon which to rationalize the risks, costs and benefits for a variety of mitigation approaches designed to result in improvements in utility fire risk.

2. **Initiative selection**

   In its review of PacifiCorp's application of established HFTD, OEIS and other stakeholders provided feedback on the lack of RSE methods underlying the identification and prioritization of mitigation activities. The company heeded this feedback and took prompt action to begin building out its capability to model a variety of inputs that could inform its risk identification on both a short- and long-term basis. The company has previously reminded OEIS that its obligations through S-MAP and RAMP are still in development in R.18-10-007. To move its WMP forward, the company leapfrogged its risk modeling ahead; it will align LRAM with non-fire elements later, as necessary consistent with rulemaking. For the OEIS definition of this initiative, Risk Mapping and Assessment, see Appendix 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   PacifiCorp designed the LRAM to be broadly extended throughout its electrical network. It used Tier 3 areas for prioritizing and validating of its model, Tier 2 are subject to PSPS due to local climatology and a Non-Tier area.

4. **Progress on initiative**

   The company has materially delivered Phase 1 of its LRAM.

5. **Future improvements to initiative**

   The company outlined several areas planned for further development, including the incorporation of variable impact of certain equipment or components on localized

wildfire risk.

7.3.1.2 Climate-driven risk map and modeling based on various relevant weather scenarios

1. Risk to be mitigated

PacifiCorp recognizes the value in understanding climate driven risks based on relevant weather scenarios. Currently, PacifiCorp's LRAM tool includes a layer designated as "Fire Weather," the climate driven risk element based on various relevant weather scenarios described in Section 4.5.1.2. This layer is relatively static and based on a combination of available datasets such as the HRRR weather data and the LANDFIRE 2020 FCCS datasets. To complement this layer and incorporate a wider array of weather scenarios, PacifiCorp is in the process of procuring a WRF model of the service territory and implementing Technosylva's WFA-E suite discussed in Section 4.5.1.1. Through procurement and implementation of these tools and datasets, this initiative is planned to support a wildfire risk-based resource allocation methodology.

2. Initiative selection

~~See Section 7.3.1.1 on page 150. Climate-driven risk map and modeling, as well as ignition probability mapping have been incorporated into the summarized risk map described in that section.~~Historically, PacifiCorp initiatives were prioritized based on the HFTD map, where areas inside the HFTD are worked first. However, as the wildfire mitigation programs mature, the Company is moving towards a quantitative risk-based methodology to identify and prioritize mitigation activities, such as through RSE, as recommended by OEIS and other stakeholders. To develop an RSE, PacifiCorp first began developing a wildfire risk model, LRAM, consisting of layers of data weighted for risk importance such as:

- Fire Weather Risk, which maps to a climate-driven risk based on various relevance weather scenarios
- Utility Fires and Equipment
- Utility Ignition Fault Risk
- Available Arc Energy and Short Circuit Ignition Likelihood
- Tree Canopy Risk
- Historic Fire Weather Fire Spread Risk

Fire weather risk uses a combination of the High-Resolution Rapid Refresh (HRRR) model tool from NOAA, which is a 3km resolution of weather data which is updated

every hour and LANDFIRE 2020 Fuel Characteristic Classification System Fuel beds (FCCS) dataset. This combination allows for the incorporation of wildfire-relevant impacts such as weather trends and fuel data into LRAM. PacifiCorp has provided a map of the of the LRAM fire weather scores below.

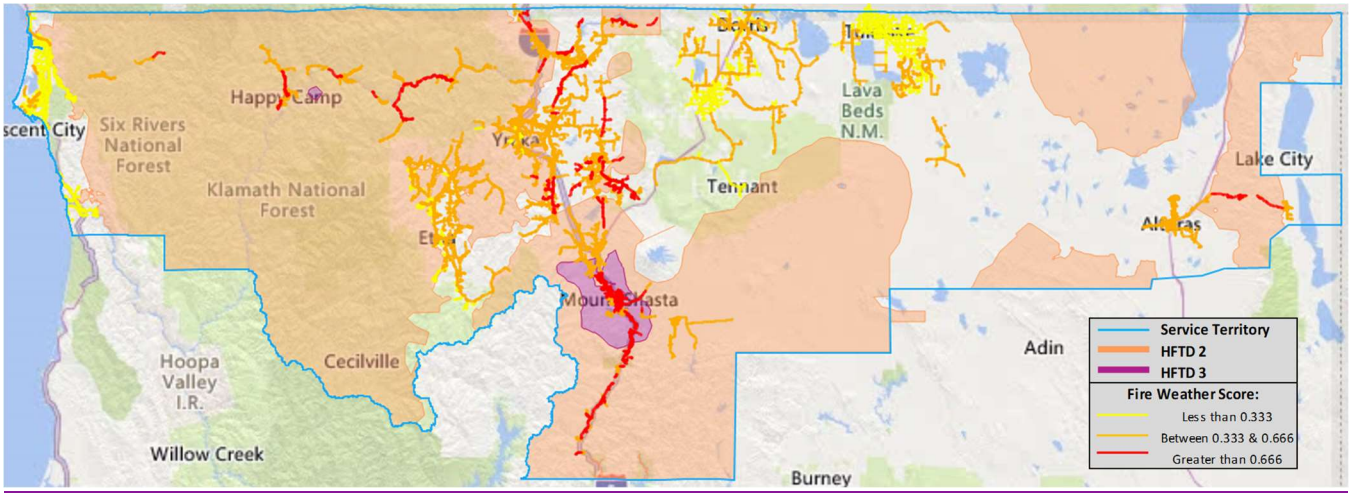


Figure ~~430~~ : Map of LRAM Fire Weather Score

This initiative was selected to be developed as a data element of LRAM to support RSE development, therefore the spend associated with this initiative has been accounted for in initiative 7.3.1.1 which supports the overall development of LRAM and related data elements.

3. Region prioritization

Wildfire risk mapping and modelling encompasses the entire PacifiCorp service territory, where tier 3 and tier 2 areas are used to validate that model risks align with the HFTD.

4. Progress on initiative

The company has materially delivered Phase 1 of its LRAM, and has "Combined Scores," at the ZOP level. Climate data and models are rapidly evolving to improve; therefore, LRAM is not seen as a fully operationalized simulation and modeling tool, but rather a tool which can be updated as needed for continuous improvement.

As new and improved data elements are made available, PacifiCorp will evaluate those elements and consider updates to risk models. Specifically related to the climate driven risks and models, PacifiCorp plans to update from the HRRR model to WRF model in 2023, which will provide a 30yr, 2km resolution, hourly, reanalysis of weather variables across PacifiCorp territory. WRF looks at 30yrs of data and provides a more granular resolution of data than the HRRR model.

The WRF data is being procured as a mandatory component of the operational tool being developed for the development of the fire potential index (FPI), described in initiative 7.3.2.4 Forecast of Fire Risk Index, Fire Potential Index, or similar. Therefore, the progress on this initiative does not have spend associated with it, as the spend is captured under initiative 7.3.2.4.

5. Future improvements to initiative

PacifiCorp anticipates that the update to WRF in 2023 will be a significant improvement to the climate risk elements climate driven risk modelling. While there are no specific climate risk updates planned in the future, PacifiCorp does plan to continuously be learning about improved updates and will incorporate them as the benefit is worth the cost.

7.3.1.3 Ignition probability mapping showing the probability of ignition along the electric lines and equipment

1. Risk to be mitigated

A comprehensive view of Wildfire Risk includes an ignition probability or ignition likelihood factor. Ignition likelihood, as a component of baseline risk, helps to inform long term project selection and prioritization. Additionally, ignition likelihood, as a component of dynamic risk, helps to inform the impacts of fire weather scenarios to inform real time decision making. In both applications, the assessment of ignition probability helps to reduce overall wildfire risk through informed mitigation tactics. PacifiCorp's initial development of ignition probability mapping was included in LRAM as discussed in Section 4.5.1.4.

2. Initiative selection

~~See Section 7.3.1.1 on page 150. Climate-driven risk map and modeling, as well as ignition probability mapping have been incorporated into the summarized risk map described in that section.~~

Historically, PacifiCorp initiatives were prioritized using the HFTD map where work inside the HFTD, and specifically Tier 3, was worked first. As PacifiCorp's risk mapping and resource allocation methodologies evolve, the Company is moving towards a quantitative methodology to prioritize work, more granularly, based on wildfire risk. Additionally, PacifiCorp is seeking to understand the RSE associated with initiatives selected for implementation and understanding the likelihood of ignition, through the selection of this initiative, is a foundational step towards the development of RSE.

As described in section 4.5.1.4, Localized Risk Assessment Model, LRAM consists of a combination of layers, weighted for risk importance, to produce the output of a

"combined score." Contributing layers to Combined Score include both the Utility Risk Layer and Environmental Risk Layer.

The Utility Risk Layer describes, as a quantitative ranking, the likelihood that utility infrastructure would experience a fault or spark, using the following inputs:

- Outage rates which are derived from historic fault data attributed to causes such as contact with object or equipment failure,
- Tree canopy data from satellite tree canopy data to determine the potential for fall in risks that could result in outage events,
- Ignition history on a circuit and
- Available probabilistic arc energy risk modelled level of potential energy that could be released during a fault event.

The Environmental Risk Layer quantifies, as a relative ranking, the potential for escalation of a spark to an ignition using the following inputs:

- iUTI: Integrated Utility Threat Index that depicts long term, climatological fire weather patterns.
- Contemporary Fire Weather Risk Model (Wildfire Risk Score): Nearer term assessment of frequency and intensity of fire weather events paired with location specific fuel density information.
- Historic Fire Area: Incorporates known wildfire perimeter areas to highlight where large wildfire growth and spread have occurred.

The Combined Score then describes the likelihood, as a quantitative ranking, of a utility spark or fault occurring and escalating into an ignition. This combined score is generally used to understand ignition probability and target long term investment in grid hardening to mitigate the risk of ignition probability.

As development of this initiative supports the overall objectives of LRAM to represent wildfire risk, which can be further developed to support RSE, therefore portions of the spend associated with this initiative has been accounted for in initiative 7.3.1.1 which supports the overall development of LRAM and related layers which constitute LRAM.

While LRAM presents a first step at assessing ignition probability for long term planning and baseline risk, PacifiCorp is also making investments and advancing dynamic risk assessment capabilities through the implementation of Technosylva's WFA-E tools accounted for in initiative 7.3.2.4. These tools, once fully operational, will be providing an ignition likelihood to PacifiCorp within 2022, across the overhead

distribution system.

3. **Region prioritization**

Wildfire risk mapping and modelling encompasses the entire PacifiCorp service territory, where tier 3 and tier 2 areas are used to validate that model risks align with the HFTD.

4. **Progress on initiative**

The company has materially delivered Phase 1 of its LRAM and has "Combined Scores" at the ZOP level. The next phases of development include using the LRAM foundation alongside Technosylva's WRM module to create a quantifiable resource allocation methodology, risk reduction and RSE.

At this time, PacifiCorp does not plan to change the methodology or data inputs for ignition probability used within LRAM, but PacifiCorp isstreamlining those processes. For example, in Section 4.5.1.3, PacifiCorp notes that key improvements planned include data import and processing improvements. These improvements to data importing will automate some processes, freeing up valuable resource time for other initiative developments.

PacifiCorp has begun to develop operational tools through the procurement of Technosylva which includes a model of ignition likelihood, as mapped in Figure 4.10. Moving forward, PacifiCorp plans to validate the ignition likelihood model being provided from Technosylva and incorporate the use of it in the development of RSE, resource allocation methodology and risk reduction. Additionally, ignition likelihood is a component of the operational tool, Technosylva, described in section 7.3.2.4 Forecast of a fire risk index, fire potential index or similar, therefore the spend associated with this Technosylva module has been included in that section.

5. **Future improvements to initiative**

With the purchase of Technosylva WFA-E, PacifiCorp is further aligning with the methodologies of other utilities in the OEIS Risk Modelling utilities workshops. As PacifiCorp continues to attend these workshops, it is anticipated that further improvements for greater alignment and model improvements may be scoped, planned and implemented, particularly after the release of updated 2023 Risk Modelling guidelines.

7.3.1.4 Initiative mapping and estimation of wildfire and PSPS risk reduction impact

1. **Risk to be mitigated**

PSPS is a tool used as a measure of last resort to mitigate risk. PacifiCorp recognizes the impact that a PSPS implementation can have, including on irrigation, public transportation and other facilities. This initiative seeks to develop a tool to support

wildfire and PSPS risk information which can be used to inform PSPS decision making.

2. Initiative selection

Once fully operation, PacifiCorp plans to use Technosylva's WFA-E tools to estimate risk reduction efficacy described in section 7.3.1.2, 7.3.1.2 and detailed in 7.3.2.4, where the spend is also captured. This initiative was selected for implementation, based on its capabilities to advance quantitative decision-making and RSE calculations and feedback from OEIS and other stakeholders.

3. Region prioritization

Wildfire risk mapping and modelling encompasses the entire PacifiCorp service territory, where tier 3 and tier 2 areas are used to validate that model risks align with the HFTD.

4. Progress on initiative

Historically, PacifiCorp has taken a qualitative approach to decision making and RSE assessments that incorporates subject matter expertise and input from public safety partners. Through participation in the OEIS hosted Risk Modelling workshops, PacifiCorp learned that several utilities are leveraging Technosylva's expertise to advance methodologies for quantitative assessments. After PacifiCorp procures Technosylva WFA-E, plans for the development of a PSPS risk tool using it can begin.

5. Future improvements to initiative

As PacifiCorp obtains more information from other utilities and more familiarity with the procured Technosylva WFA-E module, it is anticipated that a tool will be developed, aligned with learnings from other utilities, where feasible, and that the tool will be continuously evaluated for improvements.

7.3.1.5 Match drop simulations showing the potential wildfire consequence of ignition that occur along the electric lines and equipment

1. Risk to be mitigated

A component of Wildfire Risk includes the match drop simulations to indicate the potential wildfire consequence of an ignition. These simulations can support both resource allocation methodologies such as RSE calculations and project prioritization or other, more dynamic, decision-making processes. For these reasons, PacifiCorp recognizes the need for a comprehensive view of wildfire risk which includes match drop simulations to gain an understanding of the consequences associated with an ignition.

2. Initiative selection

In the 2020, PacifiCorp engaged Pyregence and participated in a technical advisory committee to support further development of practical tools for utility operations and engineering personnel in the areas of "match drop" simulations along specific corridors.[25] The Pyregence Ignition Modelling research helped inform the understanding of how fire-affecting climate change may impact PacifiCorp's service territory, specifically in terms of changes to ignition probability and estimated wildfire consequence as discussed in 4.2.1 beginning on page 38. While direct applications of this research were more static and not fully operationalized at PacifiCorp, this research demonstrated the potential value and usefulness of ignition simulation modeling. Therefore, PacifiCorp's first pass at assessing the potential wildfire consequence of ignitions was incorporated into the company's risk model, LRAM, financially accounted for in Section 7.3.1.1. Additionally, as further described below, this initiative has evolved to include more dynamic components of wildfire consequences of ignition through implementation of Technosylva's FireSim product, financially accounted for in Section 7.3.2.4 and technically described in Section 4.5.1.1.

3. Region prioritization

Wildfire risk mapping and modelling encompasses the entire PacifiCorp service territory, where tier 3 and tier 2 areas are used to validate that model risks align with the HFTD.

4. Progress on initiative

Historically, PacifiCorp initiatives were prioritized based on the HFTD map, where areas inside the HFTD are worked first. However, as the wildfire mitigation programs mature, the Company is moving towards a quantitative risk-based methodology to identify and prioritize mitigation activities, such as through RSE, as recommended by OEIS and other stakeholders. To develop an RSE, PacifiCorp first began developing a wildfire risk model, LRAM.

As described in section 4.5.1.4 Localized Risk Assessment Model, page 91, LRAM consists of a combination of layers, weighted for risk importance, to produce the output of a "Combined Score". Contributing layers to Combined Score include both the Utility Risk Layer and Environmental Risk Layer:

The Utility Risk Layer describes, as a quantitative ranking, the likelihood that utility infrastructure would experience fault or spark using the following inputs:

- Outage Rates: Historic fault data attributed to causes such as contact with object or equipment failure.
- Tree Canopy: Satellite tree canopy data to determine the potential for fall in

[25] See Section 4.3 of PacifiCorp's 2021 WMP Update at page 52 for more information.

risks that could result in outage events.

- Ignition History: History of ignitions on a circuit.
- Available Probabilistic Arc Energy Risk Model: Calculated/modeled level of potential energy that could be released during a fault event.

The Environmental Risk Layer quantifies, as a relative ranking, the potential for escalation of a spark to an ignition using the following inputs:

- iUTI: Integrated Utility Threat Index that depicts long term, climatological fire weather patterns.
- Contemporary Fire Weather Risk Model (Wildfire Risk Score): Nearer term assessment of frequency and intensity of fire weather events paired with location specific fuel density information.
- Historic Fire Area: Incorporates known wildfire perimeter areas to highlight where large wildfire growth and spread have occurred.

The Combined Score then describes the likelihood, as a quantitative ranking, of a utility spark or fault occurring and escalating into an ignition. This combined score is generally used to understand ignition probability and target long term investment in grid hardening to mitigate the risk of ignition probability.

While helpful to inform project prioritization and overall risk model development, LRAM does not include full simulation capabilities, such as "match-drop" simulations. Specifically, the Environmental Risk Layer is helpful to understand the relative potential escalation for a spark using key factors and data, but does not allow for multiple, operational simulations using updated, or real time information.

With the procurement of Technosylva, as financially accounted for in Section 7.3.2.4 (Forecast of a fire risk index, fire potential index, or similar) and technically described in Section 4.5.1.1, PacifiCorp will obtain the Technosylva FireSim product and build upon this initial research. The FireSim product will specifically model wildfire spread through the simulation of millions of wildfires across the service territory, similar to "match-drop" simulations. These simulations will then be incorporated into the Wildfire Risk score at three-hour time internals across the forecast period.

5. Future improvements to initiative

With the procurement of Technosylva WFA-E, PacifiCorp will have achieved a significant progression in maturity of this initiative. It is anticipated that the continued maintenance costs of Technosylva will continue to provide the most updated Match Drop simulation in its wildfire risk scores.

7.3.2 Situational awareness and forecasting

7.3.2.1 Advanced weather monitoring and weather stations

1. **Risk to be mitigated / problem to be addressed**

   A key component of wildfire risk mitigation is making informed decisions during dynamic weather situations that could impact power infrastructure. Dynamic weather situations require quality data, communicated remotely across the service territory. While there is some publicly available weather data, it can have gaps and/or not be recorded with the sensitivity needed to make more accurate forecasts. Therefore, PacifiCorp began to develop its own weather network to address these gaps and to provide reliable, accurate weather data to support better forecasting and more informed decision-making.

2. **Initiative selection**

   In its evaluation to establish a cost-benefit analysis to support its weather network expansion, the company found itself unable to find a way to quantifying the proper level of weather station density; however, PacifiCorp plans to keep working to identify weather station circuit density. PacifiCorp's focus has been on establishing a network of weather stations to provide situational awareness for each circuit in the HFTD by the end of 2022.

   The alternative to establishing a weather station network, is to use generalized public weather data, which has been available for many years. Additionally, public weather data can be less reliable or less frequently calibrated than company-owned and collected data. Therefore, PacifiCorp began to develop a weather station network.

   For the OEIS definition of the advanced weather monitoring initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   PacifiCorp outlined its process to begin building out its weather network in its September 9, 2020, Quarterly Report filing. Because of the importance of localized, real-time weather data to any PSPS program, PacifiCorp's main priority in 2019 was locating weather stations in and around defined proactive de-energization zones. The company engaged REAX to advise on the best placement of stations, considering topography and climate trends. After the target locations were established, PacifiCorp reviewed those locations with the NWS office in Medford, Oregon (which supports Siskiyou County, California for much of its weather forecasting). All data collected by these stations is communicated into MesoWest (operated by the University of Utah), which aggregates all climate data and makes it publicly available, on a 10-minute refresh.

In 2020, PacifiCorp focused on better coverage across its whole service territory and near populated communities bordering Tier 2 areas. PacifiCorp expanded the system to establish a more macro understanding across its service territory, including outside the PSPS areas. Also in 2020, the company used distance and elevation change from a particular circuit ZOP to the closest weather stations in the area to find data gaps that would help determine locations for weather station placement. Thereafter, the company engaged weather experts, including those at the NWS and Pyregence Project participants, and fire response professionals, including at the BLM and the NIFC, to consider the proposed locations. The company integrated the BLM's RAWS network (by installing RAWS stations throughout California, Oregon and Washington). The weather station network expansion will increase PacifiCorp's general situational awareness, improve risk modeling efforts in those areas, and as suggested by the OEIS, improve understanding of how weather systems move across the entire territory. In 2020, the company used the LRAM to identify areas where climate-driven fire risk and utility equipment risks resulted in elevated combined scores; the company then calculated distances to available weather stations, using elevation and absolute measurements to score those areas with greater risk but limited weather information. Finally, its new meteorologists calibrated those locations to refine target locations.

In 2021 and continuing into 2022, the meteorological team began placing weather stations in locations with forecast gaps. Sometimes an extreme weather pattern will originate outside the high-risk areas; the earlier the forecast is able to capture data related to that event, the better forecast we have. This guiding principle helped the PacifiCorp meteorologists identify best new weather station locations.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

PacifiCorp has continued to develop the weather station network based on informed placement recommendations from the meteorology forecasters who develop the situational awareness reports. Additionally, PacifiCorp has initiated the plan to establish the weather station network density and systematic methodology for placement.

As described in Section 4.4.2.7 on page 61, PacifiCorp piloted the use of different types of weather stations. Due to the greater sensor capability, PacifiCorp plans to use MWS primarily and only plans to use RAWS where MWS could not be installed.

Additionally, this year PacifiCorp plans to initiate planning for a wildfire detection pilot (see Section 4.4.1.1 on page 48).

5. **Future improvements to initiative**

While PacifiCorp has piloted multiple weather station types, and implemented weather stations along HFTD circuits, additionally improvements to this initiative

include further expansion of weather station placement via the methodology that is planned to be developed in 2022.

7.3.2.2 Continuous monitoring sensors

7.3.2.2.1 Distribution Fault Anticipation

1. **Risk to be mitigated / problem to be addressed**

   As discussed in Section 4.2.1, starting on page 38, utility ignition risks are correlated with fault events. Fault events occur due to some form of contact, equipment failure or damage or other short circuit event occurring on the system. Monitoring of waveforms can identify an incipient condition, allowing pre-emptive action to potentially avoid a fault event.

2. **Initiative selection**

   DFA equipment (see Section 4.4.2.1 on page 51) serves as a continuous monitoring tool that applies machine-learning processes. While the company continues to look for opportunities to improve its inspection process, there are situations that may not be detectable, even using some of the newly adopted tools that are part of the enhanced inspection program. DFA is anticipated to provide a full-time monitoring function to complement routine patrol and equipment inspection.

3. **Region prioritization**

   The company began development of a DFA pilot program in 2019; DFA devices were commissioned on two of the highest priority circuits in 2021. As the opportunity arises to use this technology at locations, particularly those having high combined fire risk scores where the substation equipment lends itself to placement of the DFA devices and where communication networks exist, the company will extend the application of this pilot technology.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp completed the installation of DFA devices on two circuits outside of the Weed substation (5G45 and 5G83). Two additional circuits out of Lassen substation (5G77 and 5G79) had DFA devices installed during 2021 covering PacifiCorp's Weed and Mt. Shasta service areas. The goal is to record data as per the DFA pilot (see Section 4.4.2.1 on page 51).

5. **Future improvements to initiative**

   PacifiCorp plans to evaluate the results of the pilot before making a recommendation on the next steps of the initiative.

7.3.2.2.2 Wildfire Cameras

1. **Risk to be mitigated / problem to be addressed**

   As discussed in Section 7.3.2.1 on page 162~~151~~, a key component of wildfire risk mitigation is making informed decisions during dynamic weather situations that could impact power infrastructure. While the more granular weather station information discussed in Section 7.3.2.1 on page 162~~151~~ is valuable it cannot provide an actual view of the situation on the ground. In the WSD-017 OEIS Action Statement expressed concern that PacifiCorp was not collecting data on active wildfires in the area. PacifiCorp plans to investigate the development of a wildfire detection network to mitigate this data gap through the wildfire detection pilot program (see Section 4.4.1.1 on page 48).

2. **Initiative selection**

   The wildfire detection pilot (Section 4.4.1.1 on page 48) will address the OEIS recommendation to incorporate HD camera deployment and fire detection technology for ignition recognition.

3. **Region prioritization**

   In 2022, PacifiCorp plans to develop a new Wildfire Detection program, consisting of wildfire cameras and smoke detectors, strategically placed in remote locations of the HFTD where there are no other wildfire detection capabilities.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   This year PacifiCorp plans to initiate planning for a wildfire detection pilot (see Section 4.4.1.1 on page 48) that will include the use of HD cameras.

5. **Future improvements to initiative**

   PacifiCorp plans to evaluate the results of the pilot before making a recommendation on the next steps of the initiative.

7.3.2.3 Fault indicators for detecting faults on electric lines and equipment

1. **Risk to be mitigated / problem to be addressed**

   Based on heightened risk during fire season, PacifiCorp may deploy alternate relay settings that incorporate more sensitive fault detection and isolation capabilities. Alternative settings may include the disabling of reclosing. Use of alternate settings, however, can result in more frequent outages on a given circuit. And longer patrols can extend the duration of outages. Consequently, circuits can experience more frequent and longer outages, especially where traditional equipment and technology

cannot pinpoint fault locations. Therefore, this initiative was developed to mitigate the potential impact to customers associated with other wildfire mitigation tactics by facilitating faster restoration through the implementation of communicating fault circuit indicators (CFCI) and fault circuit indicators.

2. **Initiative selection**

   While alternate settings can be an effective strategy to reduce the risk of wildfire, PacifiCorp recognizes the disruption of outages on customers and communities. Therefore, PacifiCorp introduced a new initiative to install CFCIs on circuits where more sensitive settings may be deployed during periods of heightened risk in the 2021 Change Order submitted on November 1, 2021, and provided in attachment 8. These CFCI devices sense faults and communicate these results back to PacifiCorp's central grid operations center. When placed strategically along circuits, the results can be used to help pinpoint fault locations and target operations response and patrols, reducing restoration times and mitigating the impact to customers. Because of their impact in reducing the amount of time required to patrol lines when a device with reclosing functionality opens, CFCI devices facilitate the use of more sensitive fire settings. For the OEIS definition of the fault indicators initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   CFCIs are installed in more remote areas, with an installation priority for those fault indicators located in the HFTD.

4. **Progress on initiative since the last WMP submission and plans, targets, and/or goals for the current year**

   PacifiCorp developed this initiative in 2021 and plans to install CFCIs in 2022.

5. **Future improvements to initiative**

   Continued exploration of the use of intelligent electric devices is part of the company's approach to grid design and system hardening (Section 4.1.3 starting on page 32).

7.3.2.4 Forecast of a fire risk index, fire potential index, or similar

1. **Risk to be mitigated / problem to be addressed**

   Generalized public weather data is and has been available for many years and limited company data is also available. However, in particularly dynamic situations that pose an increased wildfire risk, this data is insufficient and not reliable enough to fully understand localized ignition risks, particularly in rural locations. As such, data limitations present challenges for making localized emergency management decisions, like whether to initiate a PSPS. Additionally, data alone is not enough to understand

and evaluate risk. Data must be aggregated, evaluated and applied locally to the electrical system and surrounding areas to inform decision-making, which is the objective of this initiative.

2. **Initiative selection**

Implementation of impact-based forecast software solutions will position PacifiCorp to take better informed actions in advance of severe weather. This will help the company to reduce restoration times and increase reliability, while reducing the risk of wildfire. The solutions PacifiCorp chose for implementing this initiative will greatly improve its ability to prepare for and respond to extreme fire weather events. Data from these forecasting systems will also be integrated with existing utility data and advanced wildfire models to manage real-time fire risk, prioritize fire-hardening infrastructure projects, and quantify the risk reduction of PacifiCorp's wildfire mitigation efforts throughout its California service territory. For the OEIS definition of this initiative see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

HFTDs have been prioritized for implementation of the impact-based software solutions described in this section. For example, these areas were prioritized over others for initial implementation of Technosylva's wildfire modeling software solutions (described below).

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

High performance computing clusters (HPCC) — PacifiCorp built and implemented two custom, fully redundant HPCCs that became operational in November 2021. They run an operational weather forecast model and will create a high resolution, 30-year historical record of weather across PacifiCorp's California service territory by 2023. Because the system is fully redundant, it will not go down when it is needed most; namely, in emergency situations.

Operational weather forecast model — PacifiCorp is building a high-resolution WRF model that:

- Provides twice-daily high-resolution forecasts across a 96-hour time horizon and generates greater than one terabyte of weather forecast data daily
- Makes limited data publicly available through PacifiCorp's situational awareness websites
- Began computing a 30-year, high-resolution, hourly reanalysis of weather and fuels across PacifiCorp's California service territory, which is expected to be

complete by year-end 2022

Wildfire modeling —PacifiCorp partially implemented Technosylva's WFA-E software package to model daily wildfire consequence in its California service territory HFTD from July 1, 2021, through December 31, 2021. It produced millions of daily wildfire simulations throughout the highest fire risk areas. A post-season analysis is currently underway to evaluate improvement of operational decisions made during the pilot project.

By year-end 2022, PacifiCorp plans to implement the full suite of Technosylva's WFA-E software throughout its California service territory. (See discussion in Section 4.5.1.1. on page 66) FireCast will provide indicators of risks to all assets based on a thorough assessment of initial attack conditions in fire spread simulations. FireSim will produce fire spread simulations that will give PacifiCorp a more comprehensive ability to identify destructive fires. Technosylva's WRRM software will integrate with PacifiCorp's climatology data to provide a comprehensive analysis of risk to all assets in its service territory. Finally, the WRF model described above will work in tandem with FireCast and FireSim to provide a detailed map of weather and fire information. Taken together, all the information produced by these applications will drive operational decisions, like whether to initiate a PSPS, and prioritization of vegetation management, grid-hardening, and asset management projects/maintenance work.

Situational awareness websites — In 2021, PacifiCorp built situational awareness websites for use by its employees, customers and public safety partners. These websites integrate real-time observations with weather forecast data to monitor real-time trends, highlight when conditions become extreme, and provide an internal PSPS dashboard for real-time decision-making during PSPS events. Ongoing enhancements to these sites are expected to take place through 2022.

5. **Future improvements to initiative**

LRAM — PacifiCorp's LRAM enables more refined understanding of the unique risk profile at each ZOP, which informs long- and short-term wildfire mitigation strategies. This planning model currently uses HRRR data, which is a historical five-year set of data. After the WRF model is completed, LRAM can be updated to include a more encompassing 30-year set of historical weather data.

Operational weather forecast model — Integration of the WRF models into Technosylva is critical to meeting the 48–72-hour CPUC PSPS customer communication requirements.

Results of the 30-year weather data reanalysis will ultimately serve as a foundation for an all-weather outage prediction model that will provide PacifiCorp with the information it needs to forecast the number of outages that may occur in each ZOP. Beginning in 2023, these machine-learning models will support improved PSPS

decision-making. Further improvements are anticipated through 2026. In 2024, the operational WRFs will provide probabilistic forecasts that address the inherent uncertainty of single, deterministic forecasts to answer questions like:

Wildfire modeling — Beyond 2022, PacifiCorp expects that Technosylva will continue to provide ongoing ad hoc support, enhancements, and customization to continue to meet PacifiCorp's needs.

Situational awareness websites — Beyond 2022, PacifiCorp expects to continue its partnership with StormGeo to provide ongoing enhancements to its existing situational awareness websites.

7.3.2.5 Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions

PacifiCorp trains and deploys personnel when there is elevated fire risk, activating "watches" or "activations" depending on how much fire climatology indicates elevated fire risk. These personnel go on readiness patrols and may modify system protection settings and monitor the network during the elevated fire risk period.

1. **Risk to be mitigated**

   As discussed in Section 4.2.1 starting on page 38, utility ignition risks are tied to fault events. Fault events are more likely when it is very windy. High winds that occur when it is also dry can lead to ignitions that spread. This initiative focuses on providing a local, real-time risk assessment to inform decision-making and mitigate the potential for a fault event and subsequent ignition.

2. **Initiative selection**

   To mitigate the risk associated with the potential increased fault event rate during weather events, personnel are deployed to the field during high-risk situations to participate in 'watches.' For the OEIS definition of this personnel monitoring initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   PacifiCorp personnel are deployed throughout the service territory based on company situational awareness and local operations experience, with a priority for HFTD-designated areas.

4. **Progress on initiative**

   Personnel have previously been trained on the process and protocols for monitoring during elevated fire risk conditions, however PacifiCorp has limited experience with this type of patrol compared to other California utilities. In 2021, PacifiCorp observed

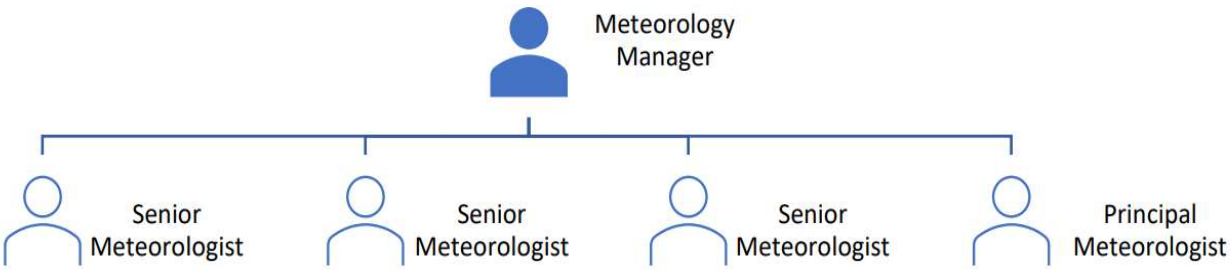
a need for greater accounting of these activities. In 2022, PacifiCorp plans to initiate a separate tracking mechanism so field personnel can document spend and activities for wildfire mitigation patrols, separate from other activities. This will help PacifiCorp better report on activities and identify future room for improvement.

5. **Future improvements to initiative**

In 2022, PacifiCorp will gather information to drive future improvements to this initiative. The company is considering the use of phone/tablet applications, like other California utilities, to reduce reporting times.

7.3.2.6 Weather forecasting and estimating impacts on electric lines and equipment

The ability to gather, interpret and translate data into an assessment of utility-specific risk and to inform decision-making is key component of PacifiCorp's situational awareness. To support this effort, PacifiCorp has created a meteorology department (Figure 7.5~~Figure 7.4~~) within the company's broader emergency management department. This new team consists of four experienced professionals and one



manager.

Figure 7.5~~4~~5 Meteorology team

1. **Risk to be mitigated / problem to be addressed**

This initiative is foundational to inform other key initiatives such as Section 7.3.6.2 Protective Equipment and Device Settings on page 222~~208~~, and Section 7.3.6.4 Personnel Work Procedures and Training on page 224~~210~~ by providing for a team of personnel to develop tools, manage datasets, and evaluate risk throughout the year. It is represented separately as an initiative here for transparency and tracking purposes but mitigates the same risk as these other, linked initiatives.

2. **Initiative selection**

Current artificial intelligence models cannot accurately predict weather behavior; there is still a need for human review by personnel, such as meteorologists, to review modeling reports models and use their expertise to inform and improve the company's

situational awareness. The meteorology team supplements the company's longer-term risk analysis with real-time risk assessment and forecasting, identifies and closes forecasting data gaps, manages day-to-day risks, and recommends changes to operational protocols during periods of elevated risk as depicted in Figure 7.6~~Figure 7.5~~. For the OEIS definition of the weather forecasting initiative, see Section 9.1 starting
on page 278~~244~~.

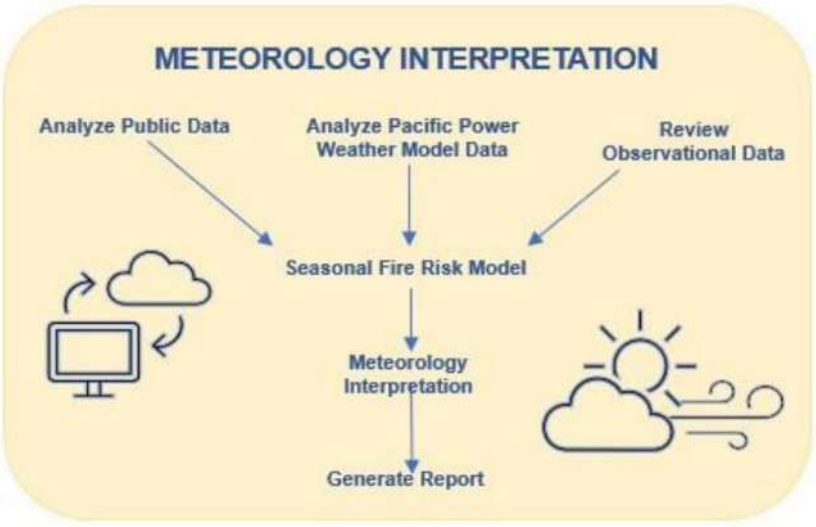


Figure 7.6~~5~~6 Meteorology Interpretation

3. **Region prioritization**

   Meteorologists inform on weather forecasts for PacifiCorp's entire service territory with a focus on HFTD areas.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Since the last submission of the WMP, PacifiCorp has developed a meteorology team that consists of one meteorologist manager and four meteorologists.

5. **Future improvements to initiative**

   PacifiCorp plans to further develop this team and expand it if necessary.

7.3.3 Grid design and system hardening

7.3.3.1 Capacitor maintenance and replacement program

See sections 7.3.4.1 and 7.3.4.2 on pages 185~~171~~-186~~172~~, which include

maintenance of overhead distribution and transmission lines. Capacitor maintenance and replacement are included as a part of these maintenance programs.

7.3.3.2 Circuit breaker maintenance and installation to de-energize lines upon detecting a fault

See Sections 7.3.4.15 on page 195~~181~~, which include maintenance of overhead distribution and transmission lines. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault are included as a part of these maintenance programs.

7.3.3.3 Covered conductor installation

1. **Risk to be mitigated / problem to be addressed**

PacifiCorp overhead distribution equipment and lines are designed to meet current compliance requirements. However, under certain conditions, such as high wind speeds, these lines can become more vulnerable to the "contact by object" risk drivers. PacifiCorp plans to address this risk through a line rebuild program, more commonly referred to as the installation of covered conductor in the WMP.

2. **Initiative selection**

PacifiCorp's line rebuild program includes deployment of the following main techniques:

Reconductor with covered conductor: Specialized overhead covered conductors can be constructed with additional shielding and enhanced insulating properties to aid in wildfire mitigation. Covered conductor is less susceptible to incidental contact with foreign objects, such as branches or Mylar balloons. While covered conductor does not prevent incidental contact from occurring, it reduces the potential that incidental contact will result in a fault event, thereby reducing the wildfire risk. For the OEIS definition of the covered conductor installation initiative, see Section 9.1 starting on page 278~~244~~.

Pole replacement: PacifiCorp included pole replacement with the covered conductor projects as an efficient use of resources. In some cases, poles need to be replaced to accommodate the additional weight of covered conductor; replacing wooden poles with stronger nonwooden solutions such as fiberglass or steel also increases grid resiliency and eliminates the need to return later. This approach also ensures that pole replacements are prioritized effectively. This proposed change will provide the additional clarity and transparency sought in the WSD-017 OEIS Action Statement.

Undergrounding: While an underground design does not eliminate every ignition potential (i.e., because of aboveground junctions), it is the most effective strategy for reducing the risk of any utility-related ignition. Unfortunately, the cost of underground

construction often makes it difficult to apply on a widespread basis. Therefore, PacifiCorp evaluates the potential to convert overhead lines to underground lines for rebuild projects on a project-by-project basis. Through the design process, each individual project is assessed to determine whether sections of the rebuild should be completed with underground construction. For example, a more remote, heavily forested location with few customer connections could be an ideal candidate for undergrounding. PacifiCorp will also learn from other utilities that may be using undergrounding more broadly as a wildfire mitigation tactic. Where implemented, the use of undergrounding will be reported for transparency under Section 7.3.3.16 on page 183~~171~~.

Small Diameter Copper Replacement: Small diameter copper and iron conductors coordinate with devices and line equipment under normal operating conditions and standard protection and control schemes to identify and isolate faults. However, this small diameter conductor is often not able to be compatible with the upstream fusing and relay settings required for fault detection programs, in particular those contemplated in sections of PacifiCorp's plan, creating an arc energy risk under fault conditions. Specifically, under certain fault conditions, the small diameter conductor with fail before the protection scheme is able to operate. As PacifiCorp's advanced fault detection programs reduce wildfire risk, the company's small diameter copper and iron conductor replacement program is viewed as a necessary element of these programs, thereby reducing wildfire risk. Through the line rebuild design process, small diameter copper shall be replaced.

3. **Region prioritization**

Covered conductor was prioritized using LRAM, as depicted in Figure 7.7~~Figure 7.6~~ below

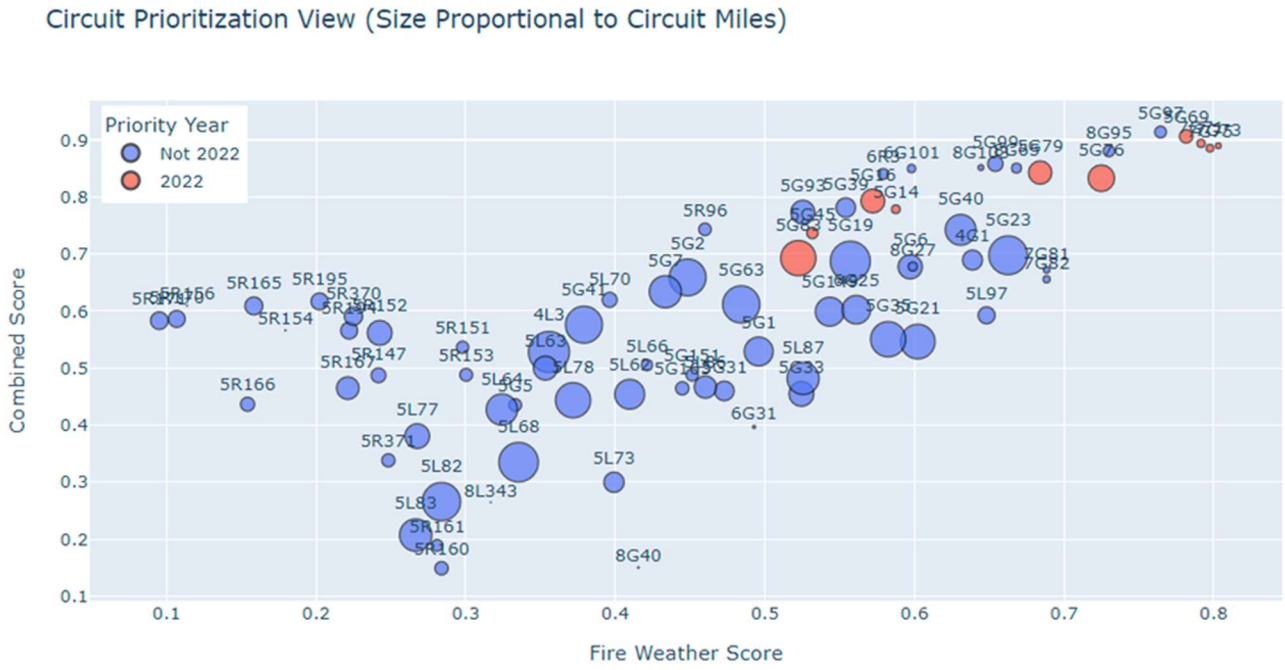


Figure 7.767 Pre-LRAM priority is shown by color using the projected year of construction

The climate risk is shown on the x-axis, the combined score (which integrates utility ignition risk with fire climate risk) is shown on the y-axis

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp has progressed past the initial plan and development phase; as part of the implementation phase, covered conductor installation has begun. In 2022, PacifiCorp plans to ramp up the installation of covered conductor, based on lessons learned from 2021.

5. **Future improvements to initiative**

   PacifiCorp plans to complete the current covered conductor plan and then explore the expansion of the initiative outside of the highest fire-risk areas. For additional information on covered conductor installation see Section 9.3 on page 290255.

7.3.3.4 Covered conductor maintenance

1. **Risk to be mitigated / problem to be addressed**

   This initiative addresses the risk drivers associated with equipment failure or contact by object.

2. **Initiative selection**

In its WSD-017 OEIS Action Statement, OEIS recommended that PacifiCorp enhance current operations to provide maintenance to covered conductor. For the OEIS definition of the covered conductor maintenance initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   The prioritization of this initiative shall align with the Section 7.3.4.1 on page 185~~171~~ detailed inspections of distribution electric lines.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp plans to initiate this effort as an element of the detailed inspections of distribution electric lines, Section 7.3.4.1 on page 185~~171~~. The goal of this is to update the company's inspection methodology and condition assessment criteria to ensure adequate inclusion of covered conductor. PacifiCorp will also update field inspection service training materials to include covered conductor by 2023.

5. **Future improvements to initiative.**

   Covered conductor maintenance will become a standard part of inspections; no additional future improvements are anticipated at this time.

7.3.3.5 Crossarm maintenance, repair and replacement

See sections 7.3.4.1 and 7.3.4.2 on pages 185~~171~~-186~~172~~, which include maintenance of overhead distribution and transmission lines. Crossarm maintenance, repair and replacement are included as a part of these maintenance programs.

7.3.3.6 Distribution pole replacement and reinforcement, including with composite poles

~~See Section 7.3.3.3 on page 161 on covered conductor installation for additional information about distribution pole replacement and reinforcement. Targets and progress on this initiative will be tracked through this initiative, 7.3.3.6, however spend will roll up into the Line Rebuild Program described in Section 7.3.3.3 on page 161.~~

1. **Risk to be mitigated / problem to be addressed**

   Some materials are more susceptible to fire and ignition than others, PacifiCorp can build a more resilient system by utilizing equipment which is more fire resistant by using alternate materials such as fiber glass or steel poles. As PacifiCorp identifies poles for replacement through the Line Rebuild program, described in section 7.3.3.3. PacifiCorp plans to mitigate the risk associated with wood poles by replacing them with more fire resilient materials.

2. **Initiative selection**

Through the line rebuild program, a significant number of poles in the HFTD are planned for replacement to accommodate the higher loads (or heavier weight) of covered conductor. As poles are replaced through the line rebuild program, they will be replaced with non-wood materials, which are more fire resistant, such as fiber glass or steel.

3. **Region prioritization**

Region prioritization of pole replacement aligns with the covered conductor program, which aligns with tier 3 and tier 2 circuits being worked first.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

The line rebuild program is a multi-year initiative, including an engineering design phase, procurement phase and installation phase. Since the previous WMP submission, PacifiCorp has completed the engineering design phase on several projects and identified poles for replacement. Additionally, since the last WMP submission, 87 poles have been replaced, as stated in the 2022-05-02_PC_2022_Q1-QDR_R1 submission of Table 12.

5. **Future improvements to initiative**

PacifiCorp plans to complete the current line rebuild plan, which includes the replacement of poles in the HFTD areas and then explore the expansion of the initiative outside of the highest fire-risk areas.

7.3.3.7 Expulsion fuse replacement

1. **Risk to be mitigated / problem to be addressed**

This initiative is to mitigate the equipment facility failure risk driver associated with fuses.

2. **Initiative selection**

In the 2021 WMP, PacifiCorp planned to replace expulsion with non-expulsion fuses concurrently with other grid hardening programs, namely the covered conductor initiative. In basic terms, this approach was driven by efficiency considerations, to save on labor cost by completing all work at one time. Thus, this approach did not expedite expulsion fuse replacements. As described in the Change Order Report, PacifiCorp is both (a) expediting the replacement of expulsion fuses on lines where covered conductor installation is planned and (b) expanding the expulsion fuse replacement program to circuits in the HFTD where installation of covered conductor is not

currently planned. For the OEIS definition of the expulsion fuse initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   PacifiCorp plans to replace all expulsion fuses located in HFTD Tier 3 and Tier 2 as part of a multi-year effort; this is a new program, developed based on feedback received in the WSD-017 OEIS Action Statement. This risk-informed strategy will fully address the risk ignition probability due to expulsion fuses in the HFTDs.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Since the last WMP submission, PacifiCorp implemented a separate expulsion fuse replacement program, as described in the Change Order Report.

5. **Future improvements to initiative**

   When all expulsion fuses in the prioritized areas have been replaced, PacifiCorp plans to evaluate additional replacements, such as those outside of the HFTD, based on risk.

7.3.3.8 Grid topology improvements to mitigate or reduce PSPS events

1. **Risk to be mitigated**

   Generally, this initiative is to mitigate the risk associated with PSPS to reduce the scale and scope of a PSPS using line segmentation such as through the use of microgrids.

2. **Initiative selection**

   As many of the communities that PacifiCorp serves are within the HFTD and PSPS zones, it is challenging to reduce any possibility of PSPS events through grid topology improvements alone. Grid topology improvements to reduce PSPS events focus on evaluating and improving existing circuitry as opposed to complete relocation of assets. Therefore, the existing grid hardening initiatives mitigate or reduce PSPS events as a function or reducing wildfire risk. For the OEIS definition of the grid topology initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   Generally, the existing grid hardening initiatives prioritize the HFTD.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   While PacifiCorp only implemented one PSPS event in the state of California during the 2021 fire season, PacifiCorp monitored elevated risk all year. When risky

conditions appeared, the company was vigilant while still maintaining the ability to implement a PSPS event. During these times, PacifiCorp learned that efficiently and effectively implementing a PSPS event in a way that keeps customer and community impacts as low as practical is about being flexible, understanding the system, and making informed decisions based on accurate information to take appropriate action in the moment.

PacifiCorp anticipates that the planned asset hardening projects provide the system flexibility and that as weather patterns and specific risks change, the company will be able to implement reactive switching or isolation points during an event. Reactive switching and isolation points allow the company to use a switch, for example, to turn power off for only 10 customers rather than 100, minimizing customer impact.

5. **Future improvements to initiative**

PacifiCorp has completed reactive switching plans for the PDZ and continues to look at other areas for the future development of plans outside the PDZ. At this time, no specific scope or budget has been set aside for this program.

7.3.3.9 Installation of system automation equipment

1. **Risk to be mitigated / problem to be addressed**

Various risks can be mitigated by shutting off power to segments of the system. System automation equipment allows for this power shut off to happen very quickly, reducing the fire potential and happen for a short period of time, allowing for power to be restored more quickly.

2. **Initiative selection**

PacifiCorp interprets system automation equipment to mean all equipment, schemes, engineering and processes to facilitate advanced detection and coordination on the company's distribution circuits. For the OEIS definition of the system automation initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

PacifiCorp's installation of system hardening wildfire mitigation program includes the deployment of distribution and transmission protection and control schemes and equipment, such as relays, circuit breakers, reclosers and communications equipment, to enhance fault detection capabilities, reduce fault isolation time, improve fault location and record availability, and speed up restoration efforts. Equipment that is electrically connected to the HFTD has been prioritized.

4. **Progress on initiative**

PacifiCorp is currently implementing the field installations of this equipment and progress against targets has been reported in quarterly filings as well as the 2022-05-02_PC_2022_Q1-QDR_R1.xlsx of this filing.

5. **Future improvements to initiative**

PacifiCorp will continue to monitor new technology developments for solutions which may provide a better alternative to the reclosers and relays selected in this program.

7.3.3.10 Maintenance, repair, and replacement of connectors, including hotline clamps

1. **Risk to be mitigated / problem to be addressed**

This initiative addresses the risk drivers associated with equipment failure or contact by object due to unmaintained equipment.

2. **Initiative selection**

This initiative describes the repair and replacement of connectors as they are identified during the Line Rebuild program. For the OEIS definition of this maintenance initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

Connector repair is prioritized in conjunction with the company's covered conductor and detailed distribution line inspection programs, see sections 7.3.3.3 on page 172~~161~~ and 7.3.4.1 on page 185~~171~~.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

Since the last WMP, PacifiCorp updated this narrative to better describe the methodologies that PacifiCorp uses to perform this work and better describe the initiative to address recommendations in the OEIS Evaluation of 2021 Wildfire Mitigation Plan Update for PacifiCorp.

5. **Future improvements to initiative**

Currently, PacifiCorp is completing the proactive replacement of connectors along the Line Rebuild Program. As PacifiCorp progresses other initiatives, connectors will be evaluated for concurrent work.

7.3.3.11 Mitigation of impact on customers and other residents affected during PSPS event

7.3.3.11.1 Free portable battery program

1. **Risk to be mitigated / problem to be addressed**

   PSPS events are implemented as a last resort during high fire-risk situations; they supplement — not replace — existing wildfire mitigation strategies. To minimize the impact of PSPS events on medical baseline customers, PacifiCorp implemented a program to provide backup batteries at no cost to its customers who depend on medical equipment powered by electricity.

2. **Initiative selection**

   This initiative was prioritized in response to Decision 21-06-034, to "*Provide support for customers that rely on electricity to maintain necessary life functions, including durable medical equipment and assistive technology'*. For the OEIS definition of this mitigation initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   The first phase of the free portable battery program focused delivery of batteries to PacifiCorp's medical baseline customers located in HFTD Tier 2 and Tier 3 areas. In its next phase, PacifiCorp expanded outreach to all medical baseline customers in its California service territory.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp delivered 34 batteries to 28 qualifying registered medical baseline customers within PSPS areas by December 31, 2021. On January 5, 2022, the program was expanded to include medical baseline customers in remaining areas of PacifiCorp's California service territory; the goal of the program's next phase is to deliver batteries to 50 customers by May 31, 2022.

5. **Future improvements to initiative.**

   PacifiCorp is conducting research into program sustainability; future improvements may include a battery replacement program as portable battery systems age and expire.

7.3.3.11.2 Generator rebate program

1. **Risk to be mitigated / problem to be addressed**

   PSPS events are implemented as a last resort during high fire-risk situations; they supplement — not replace — existing wildfire mitigation strategies. PacifiCorp's generator rebate program sought to mitigate the risk customers face during an outage.

2. **Initiative selection**

   This initiative was prioritized in response to the CPUC's current PSPS guidelines "*to ensure utilities continually improve planning, preparation and access to resources during PSPS events.*"

3. **Region prioritization**

   Under this new program, customers located in HFTD Tier 2 and Tier 3 areas who purchase a qualified generator and/or portable power station will be eligible to receive a rebate of up to $200. Customers registered in either the CARE or Medical Baseline programs run by PacifiCorp and required by the state of California will be eligible for an additional $200 in rebates, or a total of $400; rebates cannot exceed the total purchase price of the qualified product.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp began offering this new rebate in 2021. PacifiCorp is working to increase awareness of the programs in place to lessen the impact of PSPS events.

5. **Future improvements to initiative**

   PacifiCorp is continuously learning from other utilities and plans to explore the costs and benefits of expanded offerings.

7.3.3.12 Other corrective action

See Section 7.3.3.3, page 172~~161~~, on covered conductor installation for additional information about other corrective actions such as small diameter copper replacement. Targets and progress on this initiative will be tracked through this initiative, 7.3.3.12, however spend will roll up into the Line Rebuild Program described in Section 7.3.3.3, page 172~~161~~.

7.3.3.13 Pole loading infrastructure hardening and replacement program based on pole loading assessment program

1. **Risk to be mitigated**

   Older installations may not meet current design and strength standards for new construction. Lower strength margins pose wildfire risk as these lines may become susceptible to extreme weather events. However, modeling and evaluating the strength of older installations can be difficult because relevant information like exact pole height, diameter, lean, and attachment height and characteristics, may not be available.

2. **Initiative selection**

   LiDAR data, which allows for highly accurate 3D depictions of pole assets, can replace existing models and assumptions allowing PacifiCorp to identify real-time loading concerns for poles already in-service. This enhanced analysis can also help recommend and prioritize corrective work such as pole or insulator replacements and pole reinforcement. For the OEIS definition of the pole loading initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   PacifiCorp has piloted the use of LiDAR to create structural models for calculating pole leading capacity four miles of 1978-vintage transmission line and 19 miles of a 1920/1950-vintage transmission line located within the HFTD.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Detailed progress on this program is further described in Section 4.4.2.4 on page 56.

5. **Future improvements to initiative**

   Currently, PacifiCorp does not plan to continue this pilot due to the large cost and minimal benefit to risk reduction. More information can also be found in Section 4.4.2.4 on page 56.

7.3.3.14 Transformer maintenance and replacement

See sections 7.3.4.1 and 7.3.4.2 on pages 185~~171~~-186~~172~~, which include maintenance of overhead distribution and transmission lines. Transformer maintenance and replacement are included as a part of these maintenance programs.

7.3.3.15 Transmission tower maintenance and replacement

See sections 7.3.4.1 and 7.3.4.2 on pages 185~~171~~-186~~172~~, which include maintenance of overhead distribution and transmission lines. Transmission tower maintenance and replacement are included as a part of these maintenance programs.

7.3.3.16 Undergrounding of electric lines and/or equipment

~~See Section 7.3.3.3, page 161, on covered conductor installation for additional information about undergrounding electric lines and/or equipment. Targets and progress on this initiative will be tracked through this initiative, 7.3.3.16, however spend will roll up into the Line Rebuild Program described in Section 7.3.3.3 (page 161).~~

1. Risk to be mitigated / problem to be addressed

PacifiCorp overhead distribution equipment and lines are designed to meet all industry standards and compliance requirements. Under certain conditions, such as high wind speeds, these lines can become more vulnerable to the "contact by object" risk drivers. On higher risk lines, PacifiCorp plans to address this risk through a line rebuild program, which may include the installation of covered conductor, undergrounding of electric lines, replacement of poles and/or replacement small copper diameter conductor. While undergrounding is the most effective methods for reducing utility related ignition risks and nearly eliminates "contact by object" risks, both undergrounding and covered conductor substantially mitigate the ignition risk associated with "contact by object." Other benefits included improved reliability and PSPS avoidance. Covered conductor is generally a more cost-effective mitigation strategy. In certain scenarios, however, there are specific topological cost drivers which can make undergrounding more cost effective than covered conductor. Undergrounding can be the appropriate solution for many instances, including to improve reliability in remote or rugged terrain locations. In addition, land-owners may bear some of the cost because of land-owner preferences for undergrounding, making an underground strategy more cost effective. In the circumstance that undergrounding lines is more cost effective and/or culturally appropriate, PacifiCorp plans to use an underground design in conjunction with the line rebuild program.

2. Initiative selection

While an underground design does not eliminate every ignition potential (i.e., because of aboveground junctions), it is the most effective strategy for reducing the risk of any utility-related ignition. Unfortunately, the cost of underground construction often makes it difficult to apply on a widespread basis. Undergrounding involves increased expenses related to additional equipment needs, procurement of land, and additional labor requirements. In general PacifiCorp estimates that undergrounding costs range between $1 million- $6 million per line mile based on existing potential projects evaluated to date. However, PacifiCorp recognizes that the range could be much bigger depending on each project and the specific location evaluated. Therefore, PacifiCorp evaluates the potential to convert overhead lines to underground lines for rebuild projects on a project-by-project basis. Through the design process, each individual project is assessed to determine whether sections of the rebuild should be

completed with underground construction. For example, a more remote, heavily forested location with few customer connections could be an ideal candidate for undergrounding. PacifiCorp will also learn from other utilities that may be using undergrounding more broadly as a wildfire mitigation tactic. In table 12, spend for the line rebuild program is accounted for in initiative 7.3.3.3 however where undergrounding is implemented, the line miles will be reported for under this initiative, 7.3.3.16.

3. Region prioritization

Region prioritization of undergrounding aligns with the covered conductor program, which aligns with tier 3 and tier 2 circuits being worked first, as these circuits represent the greatest ignition risk.

4. Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year

The line rebuild program is a multi-year initiative, including an engineering design phase, procurement phase and installation phase. In previous WMP submissions, PacifiCorp had not identified any circuits which met the criteria for undergrounding conductor, however since the previous submission of the WMP, PacifiCorp has completed the engineering design phase on several higher priority circuits, which includes the cost evaluation of covered conductor versus undergrounding, and identified two projects where undergrounding provided the following benefits:

- Reduced maintenance cost and improved access in a heavy tree canopy area with limited access,
- Avoided cost increase that would be experienced with overhead construction at higher elevations where the additional pole loading requirements result in substantially more pole replacements
- Avoidance of important cultural areas with permitting and construction constraints.

5. Future improvements to initiative

PacifiCorp plans to complete the current line rebuild plan, which includes the select installation of undergrounded lines, in the HFTD areas and then explore the expansion of the initiative outside of the highest fire-risk areas. For additional information on underground installation see Section 9.4.

7.3.3.17 Updates to grid topology to minimize risk of ignition in HFTDs

At this time, PacifiCorp does not have any specific grid design and system hardening

programs focused on updates to grid topology intended to minimize risk of HFTD ignition that are not included in other programs.

7.3.4 Asset management and inspections

7.3.4.1 Detailed inspections of distribution electric lines and equipment

PacifiCorp's detailed inspections of distribution electric lines and equipment is a critical program required to maintain regulatory compliance with California GO 165 and 95. These inspections also mitigate some wildfire risk by identifying and correcting conditions which, if uncorrected could potentially ignite a fire. Table 1 in Attachment 2.3 includes a more extensive breakdown of conditions identified.

1. **Risk to be mitigated / problem to be addressed**

This initiative addresses the risk drivers associated with equipment failure and addresses the compliance requirements from GO 165.

2. **Initiative selection**

PacifiCorp's detailed inspection program, which includes a careful visual inspection accomplished by visiting each structure, as well as inspecting spans between structures, is the company's most appropriate initiative related to the inspection of overhead distribution lines. The program identifies potential nonconformance with the NESC or other applicable state requirements such as California general orders, nonconformance with PacifiCorp construction standards, infringement by other utilities or individuals, defects, potential safety hazards, and deterioration of the facilities that need to be corrected to maintain reliable and safe service. For the OEIS definition of this detailed inspection initiative, see Section 9.1 starting on page 278~~244~~.

During an evaluation, an inspector documents potential violations and noteworthy observations — including potential fire threats — by assigning a condition code and priority level. The priority levels align with GO 95, Rule 18; the conditions codes are specifically designed to predetermine fire threat as well as other types of conditions. In a typical year, PacifiCorp performs approximately 13,000 detailed inspections of electric distribution facilities and has historically identified approximately 7,000 conditions that require corrective action.

PacifiCorp defines a fire risk condition as having at least moderate potential impact to safety or reliability. As a result, the company assigns a condition code priority level A or B to these fire risk conditions; priority level A conditions must be addressed within 30 days. Therefore, accelerated correction timeframes for fire risk conditions that include specific rules based on geographic wildfire risk location cannot apply to C conditions.

3. **Region prioritization**

   During a given calendar year, PacifiCorp prioritizes inspections of facilities located within the HFTD to occur earlier in the year, specifically Tier 3 areas. While all required inspections are completed within the prescribed cycle, the intent of this prioritization is to inspect facilities located in the highest fire threat areas prior to fire season where the risk is the greatest.

4. **Progress on initiative**

   PacifiCorp will continue to complete inspections on a cycle and continue to comply with GO 165. Actual performance for 2021 and targets for 2022 for this initiative are provided in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

5. **Future improvements to initiative**

   PacifiCorp plans to continue this effective detailed inspection of lines at the same pace and aligned with current compliance requirements.

7.3.4.2 Detailed inspections of transmission electric lines and equipment

See Section 7.3.4.1, page 185~~171~~, on Detailed Inspections of Distribution Electric Lines and Equipment for additional information. Targets and progress on this initiative will be tracked through this initiative, 7.3.4.2.

7.3.4.3 Improvement of inspections

At this time, PacifiCorp does not have any additional improvement of inspection programs other than the ones described by other initiatives and pilot programs.

7.3.4.4 Infrared inspections of distribution electric lines and equipment

1. **Risk to be mitigated / problem to be addressed**

   Certain issues with electrical connections and equipment cannot be seen during traditional inspections. Connections are difficult to fully assess from the ground or air as it is not possible to visually see the electrical flow. If connections look secure but are not truly tight, the electrical flow may all follow one path resulting in potential premature failure of a connection. Left undetected, these issues could cause an equipment failure.

2. **Initiative selection**

   This initiative was selected for development in the RF and Handheld IR pilot (see Section 4.4.2.3 on page 55) due to the success of the transmission IR inspection initiate to identify Conditions for correction. For the OEIS definition of this IR

inspection initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   The region for the pilot is described in RF and Handheld IR pilot (see Section 4.4.2.3 on page 55) and represents a portion of the HFTD with some ease-of-deployment criteria.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   In 2021, the handheld IR vendor held a training with PacifiCorp field personnel likely to work with the equipment. The company's 2022 goal will modify this initiative by developing the specific action plan for the field to begin collecting information.

5. **Future improvements to initiative**

   PacifiCorp plans to continue the pilot for this program in a small, select area to determine the best methodology for inspecting and collecting the resulting condition information for correction. The results of this pilot will inform the future full distribution IR program.

7.3.4.5 Infrared inspections of transmission electric lines and equipment

1. **Risk to be mitigated / problem to be addressed**
   The purpose of PacifiCorp's IR inspection program on overhead transmission lines is to reduce ignition probability associated with equipment failure using enhanced detection tools which can identify hot spots not detectable through visual inspections. Hot spots on power lines and equipment can be indicative of loose connections, deterioration and/or potential future fault locations. Therefore, identification and removal of hot spots on high-risk overhead transmission lines can prevent further deterioration, reduce the potential for equipment failure and faults, and reduce ignition probability related to equipment failure.

2. **Initiative selection**

   PacifiCorp has implemented the enhanced transmission line inspection program with a focus on proactive identification and prevention of equipment failures. The inspections are performed annually using a helicopter on all overhead transmission lines in the state of California. The frequency of the inspections is informed by prudent utility practices using a risk-based approach to identify intervals. The risk-based approach involves flying the lines during peak loading when the equipment is under the highest potential stress increasing the probability of finding issues via an infrared inspection. For the OEIS definition of this transmission IR inspection initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   This program flies all California transmission lines, with prioritization set by the technological need to fly during peak load times.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Enhanced IR inspection has identified 10 issues since the initial pilot was presented in 2019. Those benefits turned the IR inspection into an initiative covering 700 line miles of transmission lines within the state of California including all the lines within the HFTD region. The inspections identified two issues in 2021 with each corrective action reducing the ignition risk probability from equipment failure. Moving forward the lines will be inspected annually during the peak loading intervals with refinements made to the number of intervals determined. Reports found have been implemented into the standard work processes allowing for quick planning and resolution of issues discovered.

5. **Future improvements to initiative**

   Future improvements involve simplifying the peak loading intervals to inspect the lines with the most overlapping peak intervals. Simplifying the number of intervals determined streamlines the inspection process by capturing more of the lines during a single inspection timeframe and reduces the helicopter costs to fly the lines.

7.3.4.6 Intrusive pole inspections

1. **Risk to be mitigated / problem to be addressed**

   PacifiCorp's intrusive pole inspection program, which may include pole-sounding, inspection hole drilling and excavation tests, is designed to identify decay, wear or woodpecker damage, assess the condition of wood poles and identify the need for any treatment, repair or replacement. Like other inspection programs, intrusive

inspections mitigate some wildfire risk by identifying and correcting conditions. In this case, the inspections identify poles for replacement or reinforcement to prevent potential structural failure of a pole that could lead to a potential wire down event and ignition risk.

2. **Initiative selection**

   PacifiCorp's existing intrusive pole inspection program is the initiative most closely aligned with this document subsection. The existing program initiative may include pole-sounding, inspection hole drilling, and excavation tests. It identifies decay, wear or woodpecker damage; assesses wood pole conditions; and identifies the need for any treatment, repair or replacement. While PacifiCorp's intrusive testing can be performed as a standalone inspection, it is most often performed with a detailed inspection described in Sections 7.3.4.1 and 7.3.4.2 on page 185~~171~~. For the OEIS definition of this intrusive pole inspection initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   PacifiCorp's intrusive poles inspections are performed consistent with the cycle prescribed in California GO 165.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   In 2021, PacifiCorp continued implementing intrusive inspections in California. In a given year, PacifiCorp consistently observes between a 2% and 4% reject rate across its entire service territory through the intrusive pole inspection program. These findings demonstrate the value that the inspection provides through the identification of corrective work. Additionally, when poles are located within a Tier 3 or Tier 2 area, pole replacements and/or reinforcement is performed on an accelerated schedule to reduce wildfire risk.

5. **Future improvements to initiative**

   PacifiCorp plans to continue this effective intrusive pole inspection initiative at the same pace over the next five years.

7.3.4.7 LiDAR inspections of distribution electric lines and equipment

Currently, PacifiCorp does not intend to initiate LiDAR inspections of distribution electric lines and equipment. Generally, LiDAR has proven to be a more expensive method of line inspection. LiDAR inspection work, as noted in Section 7.3.4.8 on page 190~~176~~ is being done on transmission lines.

7.3.4.8 LiDAR inspections of transmission electric lines and equipment

6. **Risk to be mitigated / problem to be addressed**

   LiDAR inspections provide measurements that can be analyzed to identify safety concerns with equipment when analyzed against current engineering standards. The LiDAR data collection allows for accurate, 3) depictions of assets measured. The results can identify poles with loading concerns allowing for corrective work to be performed.

7. **Initiative selection**

   The lines identified with LiDAR were based upon the fire risk, historic fault rates, and inspection results that might indicate potential for weakened poles. The lines were flown with LiDAR and the data incorporated into PLS-CADD, which is a strength modeling program. For the OEIS definition of this LiDAR inspection initiative, see Section 9.1 starting on page 278~~244~~.

8. **Region prioritization**

   LiDAR inspections took place on lines with higher fault rates that had an increased fire risk potential.

9. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year.**

   The program identified multiple poles that would need to be replaced. The poles identified have been scheduled to be replaced as part of the reconductoring initiative or other endeavors. LiDAR inspection is an expensive means compared to the risks that it can mitigate. PacifiCorp has not historically experienced pole failures in its California service territory.

10. **Future improvements to initiative**

    At this time, PacifiCorp does not intend to pursue this initiative further.

7.3.4.9 Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations

At this time, PacifiCorp does not have any specific asset management and inspections wildfire mitigation programs focused on other discretionary inspection of distribution lines not included in other programs.

7.3.4.10 Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations

At this time, PacifiCorp does not have any specific asset management and inspections wildfire mitigation programs focused on other discretionary inspection of distribution lines not included in other programs.

7.3.4.11 Patrol inspections of distribution electric lines and equipment

1. **Risk to be mitigated / problem to be addressed**

Inspections of distribution facilities are designed to reduce wildfire risk by identifying and correcting conditions prior to equipment failure.

2. **Initiative selection**

PacifiCorp's existing patrol inspection program involves viewing each facility from a location with reasonable site lines. The inspection identifies damage or defects to the distribution system, or other potential hazards or right-of-way encroachments that may endanger the public or adversely affect the integrity of the electric system, including items that could potentially cause a spark.

PacifiCorp's patrol inspections of electric lines and equipment is a critical program in maintaining compliance with California GO 165 and 95. PacifiCorp's patrol inspection program is also critical to reducing wildfire risk through the identification of conditions. Additionally, the identification of any conditions during a patrol inspection demonstrates that this program provides broad value. For the OEIS definition of this patrol inspection initiative, see ~~Section 9.1~~Section 9.1 starting on page 278~~244~~.

3. **Region prioritized**

During a given calendar year, PacifiCorp prioritizes inspections of facilities located within the HFTD to occur earlier in the year, specifically Tier 3 areas. While all required inspections are completed within the prescribed cycle, the intent of this prioritization is to inspect facilities located in the highest fire threat areas prior to fire season where the risk is the greatest.

4. **Progress on initiative**

PacifiCorp plans to continue this effective distribution patrol inspection initiative as per policy, 2021 actuals and 2022 planned numbers can be found in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

5. **Future improvements to initiative**

PacifiCorp plans to continue this effective patrol inspection initiative at the same pace over the next five years.

7.3.4.12 Patrol inspections of transmission electric lines and equipment

See Section 7.3.4.11, page 191~~177~~, on Patrol Inspections of Distribution Electric Lines and Equipment for additional information. Targets and progress on this initiative will be tracked through this initiative, 7.3.4.12.

7.3.4.13 Pole loading assessment program to determine safety factor

At this time, PacifiCorp does not have any specific asset management and inspections wildfire mitigation programs focused on pole loading assessment as a way of determining safety factors which is not included in other programs.

7.3.4.14 Quality assurance / quality control of inspections

1. **Risk to be mitigated**

Inspection quality assurance and quality control (QA/QC) at PacifiCorp aims to ensure this effectiveness. PacifiCorp QA/QC generally includes desktop and field audits designed to identify gaps in the inspection programs, inspector capability, and corrective actions, thereby increasing inspection result accuracy and reliability.

2. **Initiative selection**

To perform QA/QC of inspections, PacifiCorp uses a combination of process controls, software tools, company policy, and physical record checking to quickly identify inaccuracies for corrective action, evaluation, root cause analysis and system improvements. Engaging in these initiatives is a cost-effective means to minimize the risk that inspection results are inaccurate or unreliable. For the OEIS definition of this QA/QC initiative, see Section 9.1 starting on page 278~~244~~.

Inspection results are reviewed continuously to confirm that inspections in the HFTD are meeting acceptable standards of performance.

PacifiCorp's main QA/QC components, including enhancements to mitigate wildfire risk, are:

- Physical audits of at least 5% of planned inspections of facilities with a focus fire threats and Tier 2 and Tier 3 prioritization
- Software controls that prohibit freeform condition assignment, allowing for result controls, minimizing the amount of human error capable

- A quarterly review of already audited results as a secondary check, including desktop audits

- Annual training with inspectors to address audit findings and improve inspection reliability and accuracy

These components are described in more detail below, including any program enhancements, costs, and evolution consistent with feedback from the OEIS and PC-4.

Physical Audits

PacifiCorp's QA/QC physical audits are conducted on a random selection of inspected facilities, where corrections due to inspection results are prioritized by GO 95 priority levels, including expedited correction timelines for conditions classified as a fire risk and in the Tier 2 and Tier 3 districts.

PacifiCorp emphasizes audits in wildfire risk areas by prioritizing Tier 2 and Tier 3 regions for inspection in the first half of the year. This means these regions go through the QA/QC process first. After a physical audit is done, the audit results are compared with the original inspection results to see if they conform to the set condition reporting criteria, data entry, and work performance in accordance with company specifications. Nonconforming results are sent to the inspection contractor for reinspection along with the required reinspection timeline.

Software Controls

In recent years, PacifiCorp began using cellphones and tablets to make inspection records and findings. A renewed focus on inspection QA/QC in 2020 led to the enhancement of the inspection programs and structure along with added software controls to ensure inspections and findings are recorded consistently with internal procedures. Nonconforming results are denied. For example, if the inspection program is designed to only allow either an A or B priority assigned to a certain type of finding, an inspector can't enter a C Priority. This ensures that findings are not accidentally mischaracterized with a lower priority level.

Quarterly Desktop Reviews

Two macro-level desktop audits were conducted quarterly; one desktop audit was conducted by the field inspection support group (standard process as per PacifiCorp internal policy) and another was conducted by a cross-functional team of asset management, work planning and operational performance management. The cross-functional team desktop audit prioritized review of "fire risk" conditions and conditions in Tier 2 and Tier 3 regions for QA/QC and correction.

To support these ongoing reviews, a new internal tool was developed to evaluate inspection results, automatically isolate open fire risk conditions in plots, facilitate quick data export, provide insight about trends, and drive a deeper understanding of the fire risk conditions.

Historically, desktop reviews consisted of all open conditions generally grouped together without specific focus areas. The new tool automatically identifies potential misalignment with internal procedures, including alignment with fire risk priorities and types. Initial rollout of this new tool proved useful and, as part of the 2021 plan, desktop review of inspection results continued to use this tool and grow to review inspection results within 30 days of input. This will ensure that potential mismatches or mischaracterization of conditions and risk can be immediately addressed. This new quick QA/QC response is projected to address issues while they are fresh in the minds of inspectors, drive continuous improvement and learning opportunities, increase record accuracy and inspection result reliability.

PacifiCorp intends to continue quarterly desktop reviews, which typically include a deep dive into trends and risk.

Annual Training

PacifiCorp field inspection support conducts annual field inspector training in January. This training includes technical content such as NESC code or California General Order requirements as well as program content, such as how to record findings, assess priorities, ensure effectiveness of an inspection, and facilitate corrective action. In January 2022, this training included additional content regarding fire risks and broader participation from asset management to ensure alignment in content and priorities. While this training covers PacifiCorp's total service territory, the training did include focused on the specific Tier 2 and Tier 3 planned inspections in California and the potential challenges and risks associated with the HFTD. PacifiCorp intends to continue to grow this training with a focus on wildfire mitigation and incorporate lessons learned through the other QA/QC components to foster continuous improvement.

3. **Region prioritization**

As previously described, PacifiCorp emphasizes audits in wildfire risk areas by prioritizing Tier 2 and Tier 3 regions for inspection in the first half of the year, which also leads to these regions going through the QA/QC process first. Additionally, an increase of audits within Tier 2 and Tier 3 has scaled with the increased volume of inspections within Tier 2 and Tier 3.

4. **Progress on initiative**

For the 2021 inspection cycle, approximately $36k was spent on physical audits, desktop audits and updating inspector training. The entirety of the 2021 fulfilled QA/QC inspection plan included all of California, including the Tier 2 and Tier 3 fire risk areas. PacifiCorp has included initiative specific progress and spending in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

5. **Future improvements to initiative**

In 2022, PacifiCorp plans to incrementally improve the QA/QC of inspection results by evaluating audit results at the end of the year, identifying gaps or misalignments, conducting a root cause analysis of how to best address issues and correcting them (typically through the annual inspector training in January). At the end of 2022, PacifiCorp will evaluate if additional spend is needed or if gaps can be addressed with revised inspector training.

As part of PacifiCorp's dedication to heightened focus on wildfire mitigation, there are plans for the QA/QC of inspection results to include evaluating methodologies that further speed up fire risk region QA/QC through prioritization of field audits in Tier 2 and Tier 3 regions.

7.3.4.15 Substation inspections

1. **Risk to be mitigated**

While differently located than overhead equipment, misoperation of substation equipment has the potential to create an arc. Additionally, substation equipment, such as circuit breakers, are critical components of protection and control schemes and normal system operations. Like other inspection programs, substation inspections, which assess both the substation security and key equipment condition, identify potential correction work or maintenance needed. This corrective work and maintenance prevents equipment misoperation that could negatively impact system operation and protection and control schemes in place or result in an ignition risk.

2. **Initiative selection**

PacifiCorp's standard substation inspection initiative best addresses the subsection of this plan. These inspections are considered standard operations; they provide incremental reduction to wildfire risk. Table 7.3 describes the types and frequency of inspections performed as a part of this program and planned frequency for each. For the OEIS definition of this substation inspection initiative, see Section 9.1 starting on page 278~~244~~.

Table 7.3 Types of substation inspections performed as a part of this program and planned frequency for each

Type of Inspection	Voltage Class	Frequency
Substation Inspection(including IR)	Bulk Transmission	Annual (12 months)
	Other Transmission	Annual (12 months)
	Distribution	Biennial (24 months)
Substation & SecurityInspection[26]	Bulk Transmission	Monthly
	Other Transmission	At least 8 times per year
	Distribution	At least 8 times per year

3. **Region prioritization**

   PacifiCorp performs substation inspections on a routine basis consistent with California General Order 174 requirements. As a part of this program, qualified personnel inspect PacifiCorp's substations in California monthly. These inspections include the assessment of physical safety, security, and performance of substation components, including fencing, grounding, and major equipment, as well as the performance of minor housekeeping tasks to ensure safe and reliable service.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   Substations are inspected eight times per year. Over the course of 2022, the goal is to complete 444 inspections.

5. **Future improvements**

   PacifiCorp plans to continue this substation inspection initiative at the same pace over the next five years.

7.3.5 Vegetation management and inspections

PacifiCorp's vegetation management program is modeled on industry best practices, including systematic maintenance, scientifically based pruning to maintain safe vegetation to conductor clearances, tree removal (both incompatible species and hazard trees), tree replacement, cover-type conversion, herbicide use, tree growth regulator applications, and the use of specialized tools and equipment. PacifiCorp contracts with vegetation management service providers to perform this work.

The program is designed to identify and correct vegetation conditions that are inconsistent with distinct distribution and transmission specifications in the company's Vegetation Management Standard Operating Procedures (SOP). Correcting these

[26] On average, substation and security inspections are typically performed on all substations monthly. However, internal policies require that non bulk transmission substations are to be inspections at least 8 times per year.

conditions minimizes and/or eliminates safety and reliability risks posed by trees and other incompatible vegetation that could encroach upon or grow near power lines. The overall objective of the vegetation management program is to minimize vegetation-related faults, including any faults that could be a source of fire ignition. PacifiCorp's vegetation management program is compliant with GO 95, Rule 35, and is described in detail in the Vegetation SOP.

Vegetation management conducted in or adjacent to distribution circuit corridors is mainly cyclical. In areas located outside of the HFTD, vegetation management work circuit is currently conducted every two years; full clearance work is done on a four-year cycle, with interim work at the two-year mark between each cycle. In the HFTD, certain vegetation management work is conducted annually, including an annual vegetation inspection. Where scheduled program work has not been completed before the fire season, an incremental patrol is conducted to identify and correct potential wildfire ignition risks. See Section 7.3.4.11 on page 191~~177~~.

Vegetation management conducted on or near transmission line corridors focuses on maintaining extended clearances. Work also attempts to employ industry practices, such as integrated vegetation management (IVM) where practicable, to promote cover-type conversion, thereby preventing any future incompatible vegetation growth disrupting clearances. Transmission lines generally have broader rights-of-way, which allows PacifiCorp to generally maintain clearances well over the Minimum Vegetation Clearance Distance (MVCD) required in Table 2 of FAC-003-04. Vegetation maintenance activities are scheduled on an as-needed basis, dependent on results of regular inspections and specific local conditions.

Integral to vegetation management activities for distribution and transmission is the identification and removal of hazard trees. In addition, consistent with California Public Resource Code (PRC) § 4292, PacifiCorp addresses vegetation adjacent to "subject" poles in state-regulated areas to further reduce wildfire ignition risks and increase wildfire resiliency. When appropriate, bare-ground herbicide treatments are used to keep the 10-foot cylinder clear of vegetation. Vegetation management crews working in fire-prone areas are required to adhere to fire restrictions and to receive training related to fire prevention and suppression.

Through implementing the vegetation management program, wildfire ignition risk of vegetation to energized conductor contact is minimized.

7.3.5.1 Additional efforts to manage community and environmental impacts

As part of PacifiCorp's vegetation management program, PacifiCorp representatives and contractors interact with members of the community daily. PacifiCorp has processes in place to manage, minimize, or avoid community and environmental impacts.

1. **Risk to be mitigated**

   Vegetation management activities may result in impacts on communities and/or the environment where work is conducted. Impacts may be expressed in both the planning and implementation phases of the work. Implementation of vegetation management activities may require obtaining approvals from authorizing agencies at the local, state and federal levels, and stakeholders including concerned customers or communities that may result in inefficiencies or delays.

2. **Initiative selection**

   Coordination with authorizing agencies and customers is a critical component to successfully delivering a compliant vegetation management program. PacifiCorp strives to conduct vegetation management actions while maintaining environmental compliance and customer relations. PacifiCorp wants customers and authorizing agencies to be informed of its vegetation management program. For the OEIS definition of this community and environmental impact initiative, see Section 9.1 starting on page 278~~244~~.

   Customers are typically notified, as a courtesy, at least five business days in advance of vegetation management work. Notification includes personal notification, door hangers, mail and consent forms. These forms of notification also facilitate customer questions, concerns and requests for further coordination in executing the work. When a tree is identified to be removed or herbicide or growth regulators are to be used, PacifiCorp makes reasonable attempts to obtain customer consent and has a robust escalation process. The goal is to find resolution between the customer and the company. If this coordination is unsuccessful, PacifiCorp will determine course in conducting the required work.

   Through this customer interaction, PacifiCorp takes opportunities to provide or discuss educational materials regarding tree-power line conflicts and planting the right tree in the right place. This coordination minimizes impacts to the community. Where larger-scale projects are planned that will have community impacts, PacifiCorp coordinates with leadership at the state and local levels, including cities, counties and neighborhood associations or groups, such as fire safe councils. Additional forms of notifications may also be used, such as automated callouts to customers, letters, social media, and other news media outlets to inform community member of planned activities. Where work will take place on municipal, county, state or federal properties, the appropriate authorizing officer or agency representative is notified.

   PacifiCorp routinely collaborates with local land managers in obtaining permits, scheduling work, and addressing issues as they arise. PacifiCorp works closely with various local offices of federal agencies to ensure there are approval processes in place for vegetation management work, including hazard tree removals. Annual meetings

are held with agencies where applicable, to enhance communication, discuss scope of work, and identify permit requirements and potential environmental impacts of scheduled vegetation management work.

To minimize environmental impacts and impacts to other sensitive resources, PacifiCorp conducts environmental reviews (biological and cultural) of vegetation management activities where warranted. To facilitate these reviews, minimize the timeframe to acquire agency approvals and ensure consistent implementation of process between PacifiCorp and federal land managing agencies, PacifiCorp continues to develop its Operations and Maintenance Plans (O&M Plan) in accordance with passage of legislation by the United States Congress; Section 211 of the Omnibus Appropriations Act of 2018 amended Title V of the Federal Land Policy and Management Act, which established a formal procedure for submission and approval of vegetation management plans, with an emphasis on standardized, consistent plans and minimizing the need for case-by-case approvals for hazard tree removal, pending implementation procedures to be established by applicable land managing agencies.

O&M Plan(s) establish agreed-upon agency review times of proposed maintenance activities based on activity type and presence or absence of sensitive resources that may be impacted. Even with an established O&M Plan, depending on the scope of the activity and potential for environmental impacts, agency approval timeframes may be prolonged and take several months or longer. The O&M Plan outlines PacifiCorp measures implemented for the protection of sensitive resources based on maintenance activity type, including vegetation management activities. The O&M Plan also includes PacifiCorp and land management agency roles and responsibilities in supporting PacifiCorp's rapid response to correct conditions identified in a timely manner. Development of these plans also supports company outreach to land managing agencies to inform and educate them on utility practices.

3. Region prioritization

Implementation of initiatives described above, including current process to notify communities of vegetation management activities, takes place where work is planned and is focused in areas where significant vegetation management work is needed (e.g., efforts to remove fire-impacted trees/hazard trees). Notification and coordination are also focused with customers and organizations that have previously requested advanced notice and increased coordination.

To manage environmental compliance PacifiCorp prioritizes environmental reviews and agency coordination based on project schedule considering agency review and permitting timelines. Projects are reviewed and packaged together where feasible to streamline review and coordination with authorizing agencies.

4. **Progress on initiative**

PacifiCorp's vegetation management department works closely with PacifiCorp's environmental, right-of-way, and legal departments to minimize and manage community and environmental impacts.

Developing O&M Plans is a multi-year effort. PacifiCorp is currently coordinating with the Klamath National Forest (KNF) to develop an O&M Plan. The O&M Plan with the KNF was targeted for completion in 2021 and is now undergoing final reviews by the KNF and other agency stakeholders; and is planned to be finalized in 2022. PacifiCorp has initiated discussions with the Region 5 of the USFS to develop strategy for developing O&M Plans for the remaining forests within PacifiCorp's California service territory. PacifiCorp continues to implement process improvements (standardized biological and cultural reviews) for environmentally screening and evaluating projects to manage environmental compliance and streamline agency reviews.

5. **Future improvements to initiative**

PacifiCorp will continue to seek opportunities to enhance community relations and manage community expectations. PacifiCorp will continue to engage with other land managing agencies within its service territory in 2022 to initiate O&M Plan development, including process improvements. In 2021, PacifiCorp hired additional staff as part of a non-wildfire mitigation compliance requirement, to oversee development and long-term implementation of O&M Plans and associated environmental screening process. In 2022, PacifiCorp plans to explore other opportunities, such as use of letters, to notify customers along a distribution circuit of upcoming vegetation management work.

7.3.5.2 Detailed inspections and management practices for vegetation clearances around distribution electrical lines and equipment

As part of the vegetation management program, PacifiCorp conducts inspections of all distribution lines that are scheduled as part of routine vegetation management maintenance.

1. **Risk to be mitigated**

Trees and other vegetation growing under or near power lines within striking distance of conductors and electrical equipment, can create safety, service reliability and ignition risks.

2. **Initiative selection**

As part of vegetation program maintenance, PacifiCorp conducts inspections of vegetation around distribution lines and equipment to identify imminent threats or

hazards and vegetation conditions that do not meet PacifiCorp's program standards/specifications. These pre-work inspections are typically conducted within weeks to one to two months by contractors before the scheduled program work. Inspectors/pre-listers use tablets to record vegetation conditions to be corrected. For the OEIS definition of this distribution inspection initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   PacifiCorp's service territory in California is divided into three districts. The distribution lines are inspected and managed at the circuit level. PacifiCorp senior utility foresters prioritize scheduling inspections and subsequent corrective work considering the HFTD, efficient workload distribution, weather conditions and resource availability.

4. **Progress on initiative**

   In 2021, PacifiCorp completed rollout of the electronic planning and tracking system. PacifiCorp conducted inspection and corrective work of 909 miles of distribution line that were scheduled for routine cycle and interim maintenance within our service territory in California, which resulted in pruning over 19,000 trees and removal of over 2,800 trees. PacifiCorp has included initiative specific progress and spending in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

5. **Future improvements to initiative**

   As PacifiCorp continues to implement its multi-year WMP, the company will continue to evaluate how inspections may be improved by either change to scope, tools, frequency or correction timeframes.

   PacifiCorp will continue to use its electronic planning and tracking system by incorporating all vegetation management activities in California and will continue to identify improvements to the system. PacifiCorp will also continue to investigate and evaluate other technologies to improve distribution inspections.

7.3.5.3 Detailed inspections and management practices for vegetation clearances around transmission electrical lines and equipment

See Section 7.3.5.2, page 200~~186~~, on Detailed Inspections and Management Practices for Vegetation Clearances Around Distribution Electrical Lines and Equipment for additional information. Targets and progress on this initiative will be tracked through this initiative, 7.3.5.3.

7.3.5.4 Emergency response vegetation management due to red flag warning or other urgent weather conditions

1. **Risk to be mitigated**

   Weather conditions, such as heat and/or high winds have the potential to generate and spread wildfire when an ignition occurs.

2. **Initiative selection**

   While PacifiCorp is committed to executing the company's planned vegetation management programs, circumstances may still arise where, due to unexpected conditions such as weather, additional risk can be mitigated through supplemental vegetation inspections and corrective work. PacifiCorp does not have emergency response vegetation management actions specific to RFW, however, does adhere with local requirements and restrictions to mitigate ignition risk. During RFWs, PacifiCorp may move resources to work in other areas that are not impacted by the RFW or are outside of the HFTD, where feasible. Vegetation management personnel also follow local guidance and requirements as they pertain to fire restrictions, such as work hours, using a fire watch following work and using equipment that minimize potential to cause sparks. For the OEIS definition of this emergency response initiative, see Section 9.1 starting on page 278~~244~~.

   PacifiCorp also has emergency response protocols associated with PSPS events. At times of elevated risk, PacifiCorp vegetation management may perform patrols to identify and address potential ignition risks due to vegetation and inform PSPS decision making. These patrols, typically referred to as PSPS alert patrols, may be performed throughout the weather event and/or PSPS event.

3. **Region prioritization**

   Emergency response vegetation management associated with potential PSPS events, is focused in proactive de-energization zones where the weather event is occurring. Patrols are also initiated and prioritized based on risk and situational awareness.

4. **Progress on initiative**

   In 2021 vegetation management conducted PSPS alert patrols during one weather event. PacifiCorp also improved implementation of PSPS patrols through use of its mobile data management software. When PSPS vegetation management patrols are conducted, a separate project within the mobile data management software is created specific to the potential PSPS or weather event. This allows for patrol findings to be separate from routine maintenance or other wildfire mitigation actions that may be implemented on the circuit(s) being patrolled under a PSPS event.

5. **Future improvements to initiative**

PacifiCorp will continue performing risk-based PSPS patrols in 2022 and leverage the new data management software process.

7.3.5.5 Fuel management (including all wood management) and management of "slash" from vegetation management activities

PacifiCorp manages slash through a combination of chipping, lop and scatter and hauling off site.

1. **Risk to be mitigated**

The completion of both planned and emergency vegetation management work can, in some instances, create smaller vegetation materials such as brush, tree limbs or shrubs less than 6 inches in diameter, a byproduct also referred to as "slash." The presence of slash from vegetation management activities can contribute to the overall fuel availability along a utility right-of-way.

Similarly, vegetation growing at the base of poles can contribute to fuel loading.

2. **Initiative selection**

PacifiCorp conducts fuel management through removal of slash from the tree canopy, chipping debris where accessible, and removes (recycles where practicable) slash in developed areas unless the property owner indicates otherwise. In rural, off-road areas PacifiCorp uses a lop and scatter and chipping practice to reduce the volume of available fuel within the right-of-way and adheres with land managing agency requirements. For the OEIS definition of this fuel management initiative, see Section 9.1 starting on page 278~~244~~.

An integral component of PacifiCorp's vegetation program that influences fuel management and reduction of slash are the appropriate use of herbicide and tree-growth regulators as part of IVM. By preventing and/or inhibiting undesirable vegetation growth, the volume of slash can be further reduced. PacifiCorp uses herbicides and tree-growth regulators, where approved by the property owner or land managing agency in targeted areas.

PacifiCorp also annually conducts pole clearing, removal of vegetation around subject poles which further reduces fuel volume.

3. **Region prioritization**

Slash management is conducted throughout PacifiCorp's service territory and Expanded pole clearing activities take place in the LRA.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

In 2021, PacifiCorp implemented slash management in accordance with the company's Vegetation SOP and through expanded pole clearing. PacifiCorp conducted vegetation clearing of 2,164 poles outside of SRA (CAL FIRE state-regulated areas), which is incremental to mandated pole clearing activity. In 2022, PacifiCorp plans to clear vegetation at 3,047 poles under the expanded pole clearing project.

In addition, PacifiCorp partners with communities and/or agencies to implement fuel reduction projects. In 2020, PacifiCorp partnered with the Shasta Trinity National Forest on a fuel reduction and highway safety enhancement project. PacifiCorp contractors removed trees adjacent to a transmission right-of-way, which parallels the highway. PacifiCorp also mowed vegetation within the right-of-way to further reduce fuel loading. This work was in conjunction with the forest service while they removed additional trees near the highway for the goals of fuel reduction and decreasing shade for highway safety. In 2022, PacifiCorp will continue to seek opportunities to partner with communities and/or agencies to support fuel reduction projects. In addition, PacifiCorp continued to implement IVM to promote compatible low-growing vegetation to minimize ignition risks, slash management and expanded pole clearing activities.

PacifiCorp vegetation management has expanded pole clearing to include Local Responsibility Area (LRA) subject equipment poles located in the HFTD in additional to its existing program in compliance with regulations of clearing State Responsibility Area (SRA) subject poles.

Expanded pole clearing involves the removal of all vegetation within a 10-foot radius cylinder of clear space around a subject pole and the application of herbicides to prevent any vegetation regrowth (unless prohibited by law or the property owner), see Figure 7.8~~Figure 7.7~~ below.[27]

[27] Illustration of pole-clearing requirements (California Department of Forestry & Fire Protection 2008, Figure 3, PRC 4292, 14 CCR 1254, Fire Break Clearance Requirement Around Poles and Towers

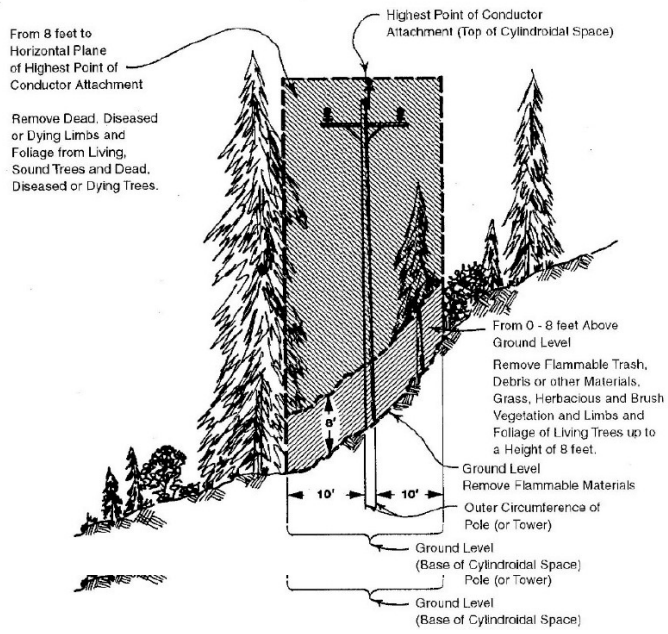


Figure 7.8~~7~~8 Pole clearing

This strategy is distinct from additional clearance and removal activities and requirements because it is not designed to prevent contact between vegetation and a power line. Instead, like "slash management," pole clearing reduces the risk of fire ignition if sparks are emitted from electrical equipment. PacifiCorp intends to implement pole clearing on wildland vegetation in the HFTD around poles that have fuses, air switches, clamps or other devices that could create sparks.

After a pole has been cleared, a spark falling within the 10-foot radius would be much less likely to ignite a fire.

5. **Future improvements to initiative**

PacifiCorp will continue to seek opportunities to responsibly expand use of herbicide and tree growth regulators as a component to IVM through the development of O&M plans and agreements with land managing agencies to reduce slash and promote low-growing, right-of-way compatible species.

PacifiCorp will track this activity electronically to develop an inventory of poles to be cleared. The inventory will allow the company to efficiently manage an expanded pole clearing project.

7.3.5.6 Improvement of inspections

1. **Risk to be mitigated**

   Vegetation may grow more quickly than expected and may encroach on conductor clearances; vegetation that needs to be pruned per the company Vegetation SOP or addressed on some other way may not be appropriately identified.

2. **Initiative selection**

   PacifiCorp has initiated incremental inspections before the height of the fire season, see Section 7.3.4.11 on page 191~~177~~. In addition, PacifiCorp conducts post-audit inspections of completed work and addresses any conditions that do not meet the vegetation program standards/specifications; see Section 7.3.4.14 on page 192~~178~~. For the OEIS definition of this inspection improvement initiative, see Section 9.1 starting on page 278~~244~~.

   These audits serve as quality control and provide opportunities for PacifiCorp senior utility and utility foresters to engage with the vegetation management contractors — opening discussions about the required specifications and working to improve inspections.

3. **Region prioritization**

   Audits and contractor coordination/reviews are conducted throughout PacifiCorp's service territory.

4. **Progress on initiative**

   In 2021, PacifiCorp foresters increased engagement with vegetation management contractors by establishing recurring meetings to discuss inspection and vegetation management quality and execution. PacifiCorp foresters also provide training to inspectors as discussed in Section 5.4.3 starting on page 125~~123~~.

   PacifiCorp continues to seek opportunities for improving inspection quality and using technology to improve inspections and identify changes that may be needed. In 2021, inspections improved through an electronic planning and tracking system. See Section 7.3.5.18 on page 217~~203~~.

   Historically, PacifiCorp tracked vegetation management activities at the local level, generally relying on paper forms, maps, documents and local knowledge. To move toward improved transparency, efficiency and data analytics, PacifiCorp incorporated the use of a work planning and tracking system. Inspectors use tablets to document vegetation maintenance activity requirements by location (for example, parcel or parcels). This information is then available to maintenance contractors, which allows for improved planning and documentation. Once the work is done, it is recorded in

the field via tablets used by tree crews. Post-audits are then conducted, and findings identified. This increased connectivity between inspector/pre-lister, vegetation management crews and post-auditor (PacifiCorp foresters or designated third-party contractor) results in greater communication and ability to identify recurring issues with inspections and the execution of the work. This also allows for additional granularity in reporting, records retention, and contractor performance.

5. **Future improvements to initiative**

In 2020 PacifiCorp completed initial rollout and implementation of the planning and tracking system and will continue to use and improve this system to allow for increased data collection and accuracy, analysis, and efficiencies. PacifiCorp will continue to investigate use of other technologies such as LiDAR to augment inspections.

7.3.5.7 Remote sensing inspections of vegetation around distribution electric lines and equipment

1. **Risk to be mitigated**

Vegetation contact can occur due to tree growth, tree limbs falling or blowing into lines, or uprooted trees falling into lines. Vegetation pruning or removals mitigate these contact risks; remote sensing inspections potentially identify where mitigation should be performed and quantify the relative risk for vegetation issues between areas.

2. **Initiative selection**

PacifiCorp has previously investigated using LiDAR around vegetation and is currently evaluating remote inspection via satellite imagery and AI models. Satellite imagery combined with modeling has the potential to be more cost-effective over larger areas than LiDAR inspections. For the OEIS definition of this remote sensing initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

Regions were selected to provide a mix of vegetation and terrain type for initial assessment, by areas with available comparison data, and further prioritized based on fire risk. At the time of the initiative, the most recent available satellite imagery was from the summer of 2020. Regions with significant burning after that date were, therefore, excluded from the initial phase.

4. **Progress on initiative**

PacifiCorp evaluated several forms of technology pilots to support and streamline vegetation inspection processes. At this time, the technology has not resulted in

reduced visits; it has, however, proven viable for other pilot efforts outlined in the company's WMP, as outlined in Section 4.4.2.2 on page 53. The company recently completed a pilot using satellite imagery trained with LiDAR data to produce vegetation and strike tree maps. Assessment showed high accuracy on strike tree locations, with significant cost savings over LiDAR. Vegetation height and canopy coverage maps have higher resolution and less masking than publicly available data, resulting in more accurate and extensive tree capture.

5. **Future improvements to initiative**

PacifiCorp will have some additional short-term work in 2022, and then will evaluate the expansion of this initiative for 2023 onward. The expanded plans include satellite imagery-derived vegetation maps to cover the remaining HFTD tiers, areas with 2020 burn damage, and locations with large gaps in publicly available data. Future LiDAR initiatives may be conducted if use cases warrant more targeted information than can be generated by satellite imagery and AI models alone, and if they offer business value in terms of risk management, situational awareness or reduced vegetation management or facility inspection costs.

7.3.5.8 Remote sensing inspections of vegetation around transmission electric lines and equipment

See Section 7.3.5.7, page 207~~193~~, on Remote sensing inspections of vegetation around distribution electric lines and equipment for additional information. Targets and progress on this initiative will be tracked through this initiative, 7.3.5.8.

7.3.5.9 Other discretionary inspections of vegetation around distribution electric lines and equipment beyond inspections mandated by rules and regulations

At this time, PacifiCorp does not have any specific vegetation management and inspection wildfire mitigation programs focused on other discretionary inspections of vegetation that grows around distribution lines.

7.3.5.10 Other discretionary inspections of vegetation around transmission electric lines and equipment beyond inspections mandated by rules and regulations

At this time, PacifiCorp does not have any specific vegetation management and inspection wildfire mitigation programs focused on other discretionary inspection of vegetation that grows around transmission lines.

7.3.5.11 Patrol inspections of vegetation around distribution electric lines and equipment

1. **Risk to be mitigated**

   Risk of wildfire ignition is greater during certain times of the year, such as the height of the fire season, considering weather conditions.

2. **Initiative selection**

   To further reduce wildfire risk in the HFTD, PacifiCorp vegetation management implemented annual vegetation patrols incremental to scheduled program routine maintenance on lines within the HFTD. Correction work is subsequently conducted based on those inspection results. For the OEIS definition of this patrol inspection initiative, see Section 9.1 starting on page 278~~244~~.

   In 2019, PacifiCorp implemented a "readiness patrol" of overhead distribution lines initiative in the HFTD. This initiative supports removal and or pruning of vegetation that may pose an ignition risk, such as hazard trees. Before the height of the fire season, PacifiCorp conducts readiness patrols located within HFTD on lines not scheduled for regular maintenance work in that year. Consistent with existing procedures, a Level 1 assessment (ANSI A300 Part 9) is conducted to identify any trees that may have become hazard trees over the course of the past year and target these trees for removal. In addition, inspectors identify for pruning or removal fast-growing vegetation that is likely to violate minimum clearance distances before the end of the current growing season.

   In conjunction with such annual patrols, vegetation management annually completes correction work based on the patrol results.

3. **Region prioritization**

   These patrols are conducted in the HFTD where program cycle work has not been completed or is not scheduled before fire season.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   In 2020, PacifiCorp inspected 1,059 miles of distribution line in the HFTD. Specific targets are provided in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

5. **Future improvements to initiative**

   PacifiCorp will continue investigating use of technology to augment these patrols.

7.3.5.12 Patrol inspections of vegetation around transmission electric lines and equipment

1. **Risk to be mitigated**

   Refer to Section 7.3.5.11 on page 209~~195~~ for additional inspection details related to risks to be mitigated and initiative selection. For the OEIS definition of this transmission patrol inspection initiative, see Section 9.1 starting on page 278~~244~~.

2. **Initiative selection**

   PacifiCorp conducts an additional vegetation management inspection of overhead lines in the HFTD. For transmission, this inspection is specific to the segments of line that are within the HFTD.

3. **Region prioritization**

   PacifiCorp conducts an additional vegetation management inspection of overhead lines in the HFTD. For transmission, this inspection is specific to the segments of line that are within the HFTD. Refer to Section 7.3.5.11 on page 209~~195~~ for additional inspection details.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp has included initiative specific progress and spending in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx.

5. **Future improvements to initiative**

   PacifiCorp will continue investigating use of technology to augment these patrols.

7.3.5.13 Quality assurance / quality control of vegetation management

1. **Risk to be mitigated**

   Vegetation may not be appropriately identified or may not be pruned or removed in accordance with PacifiCorp's Vegetation SOP.

2. **Initiative selection**

   Quality control actions such as audits are critical to ensure vegetation requiring work (pruning and/or removal) is properly identified and the work is subsequently conducted in accordance with vegetation program standards/specifications. An additional definition For the OEIS definition of this QA/QC initiative, see Section 9.1 starting on page 278~~244~~.

PacifiCorp currently uses internal staff with ISA certifications to conduct post-work audits of routine maintenance, readiness patrol corrective actions, and pole clearing. PacifiCorp also conducts ad hoc tree crew audits or crew visits where a PacifiCorp forester engages with the vegetation management contractor, such as a crew leader, and/or supervisor to review work and/or discuss opportunities for improvement.

PacifiCorp does not formally conduct specific audits of the inspections (vegetation work prescribed by the pre-listers) as an explicit part of the audit program. Instead, audits are conducted after tree work is done. While the audits focus on the execution of the vegetation management actions (e.g., pruning and removals), the post-audits do result in findings that relate to the initial inspection, such as trees needing work that may have been missed by the pre-lister (which ought to also be caught by the work crew). PacifiCorp foresters then address applicable post-audit findings with pre-listers who conducted the inspections.

During post-audits, observations and instruction about corrections are documented in the mobile data management software system, observations are discussed, and feedback is provided to the vegetation management contractor. Like PacifiCorp's other programs, if an exception is identified that poses an imminent safety or reliability risk, the audit will be suspended, the exception addressed through corrective actions, and the crew may be shut down.

3. **Region prioritization**

Post-audits are performed throughout PacifiCorp's service territory on routine maintenance work and incremental work conducted because of readiness patrols, while prioritizing post-audit completion within the HFTD.

4. **Progress on initiative**

In 2019, PacifiCorp hired four utility foresters to conduct post-audits of vegetation management work completed by PacifiCorp's vegetation management contractors. In 2021, PacifiCorp also implemented centralized tracking of post-audit progress.

PacifiCorp has continued to refine its work management process, specifically filing specific, work-related milestone-type documentation including contractor accepted work release, work completed documentation, contractor signed completed work release, post-audit completion and audit findings, or exceptions addressed and corrected. In 2021, PacifiCorp converted a contractor to a full-time employee position to oversee this tracking documentation and to coordinate with vegetation management contractors among other job duties.

Post-audits benefit both PacifiCorp and the vegetation management contractor and are considered a best management practice.

5. **Future improvements to initiative**

   In 2022, PacifiCorp plans to take steps in expanding its QC capabilities by increasing internal staff resources (supervisor and auditors) to conduct post-audits and other QA/QC functions to help improve and achieve desired outcomes of the vegetation management program. PacifiCorp will continue to develop and refine its QA/QC program.

7.3.5.14 Recruiting and training of vegetation management personnel

1. **Risk to be mitigated**

   A fully trained workforce is an important part of any successful wildfire mitigation initiative. Specific to vegetation management, personnel are needed to ensure program work such as inspections or tree trimming is completed properly and on schedule to mitigate the risk of vegetation-related wildfire ignitions and outages.

2. **Initiative selection**

   PacifiCorp continues to work with initiatives related to contractor-based training, internal training, ISA certification and the use of a Vegetation Management Process Checklist. For the OEIS definition of this training and recruitment initiative, see Section 9.1. starting on page 278~~244~~.

   Vegetation management contractors are responsible for providing a trained and competent workforce to address vegetation along PacifiCorp's transmission and distribution system, in accordance with PacifiCorp's specifications. They also coordinate training with Joint Apprenticeship Training Committees where present. Contractors also provide training on an as-needed basis to their personnel including herbicide use, fire prevention and suppression, general environmental requirements, customer service/communication, safety practices and tree felling procedures. Contractors have fire suppression tools and equipment in place. Contractors also conduct training in a variety of venues including classroom settings, conference calls or during job briefings at the work site. Contractor personnel are required to have ISA certifications and are required to conduct continuing education to maintain such certifications.

   PacifiCorp facilitates annual environmental awareness training of vegetation management contractors focusing on restrictions and requirements related to laws and regulations pertaining to avian species. PacifiCorp provides informal training and discussion on topics including regarding work scope specifications, changes in work scope or PacifiCorp processes, and PacifiCorp's mobile data management system. PacifiCorp also participates in benchmarking discussions with contractors to review expectations, best practices, and opportunities for improvement. Training opportunities also arise during post-work audits conducted by the foresters.

PacifiCorp has developed a Vegetation Management Process Checklist (contained within its SOP) as a guide for both internal and external personnel to serve as a process job-aid.

PacifiCorp's internal vegetation management foresters must maintain arborist and utility specialist ISA certifications, which means foresters receive ongoing training. PacifiCorp also provides annual training to foresters including environmental awareness, wildfire preparedness, prevention and response and safety. PacifiCorp foresters conduct job shadowing or "ride-alongs" to cross-train one another. In addition to this, regularly recurring meetings are held with PacifiCorp foresters to discuss ongoing work, opportunities for improvement, share best practices, etc. PacifiCorp foresters are encouraged through discussions and planning sessions with their supervisor to identify and take vegetation management related courses and certifications such as ISA Tree Risk Assessment Qualification to foster and identify opportunities for professional development.

3. **Region prioritization**

   Training and recruiting practices are implemented and consistent throughout PacifiCorp's California service territory.

4. **Progress on initiative**

   In 2021, PacifiCorp initiated cross-training opportunities for internal vegetation management staff. This includes identifying other internal work groups to discuss or provide training on their work functions as they relate to vegetation management (e.g., training on internal software programs) to increase work process efficiencies and drive continuous improvement.

5. **Future improvements to initiative**

   In 2022, PacifiCorp will provide training and discussion on PacifiCorp's wildfire mitigation plan to both internal and external vegetation management personnel.

7.3.5.15 Identification and remediation of "at-risk species"

1. **Risk to be mitigated**

   Vegetation contact with conductors, whether through grow-in, blow-in, or fall-in creates an ignition and outage risk.

2. **Initiative selection**

   At-risk species, with fast growth rates, can increase the risk of electrical contact. In addition to growth rates, other risk factors — being prone to structural failure (trunk, branch, roots) and environmental factors, such as wind — are considered when

prescribing remedial actions, including discretionary removal. Remediation of at-risk trees is a subset to the company's vegetation management's clearance around electric lines and equipment program. A PacifiCorp vegetation maintenance program objective is to prevent vegetation from growing-into, and contacting, power lines. PacifiCorp has established post-work clearance specifications categorized by tree growth rates (see Section 7.3.5.19) to prevent vegetation-to-conductor contacts. Vegetation inspections categorize growth by species as: slow, moderate, fast (cycle-buster). Within the HFTD, pruning is performed to prevent vegetation from breaching a 4-foot minimum clearance within one year. This may require additional pruning for at-risk species with very fast growth rates. Pre-listers also identify discretionary removals of at-risk species to eliminate ignition risk and need for cyclical pruning. For the OEIS definition of this remediation initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   At-risk species inspection is performed along with other vegetation maintenance inspections. These are performed annually in the HFTD, and in accordance with routine maintenance schedules in other areas.

4. **Progress on initiative and plans for next year**

   PacifiCorp completed vegetation inspection, including at-risk species, of lines within HFTD areas in 2021, and will continue to inspect these areas annually. In late Q4 of 2021, PacifiCorp updated its mobile data management software to collect additional information at the time of inspection, including quantifying the number of "cycle-busters" (trees that may not maintain clearance from conductor for the full cycle).

5. **Future improvements to initiative**

   The company is investigating the use of remote sensing to expand identification of at-risk tree species. PacifiCorp is conducting a pilot study (refer to Section 4.4.2.4 on page 56) using LiDAR, Satellite and publicly available datasets to identify potential clearances encroachments, potential strike trees, and to identify areas with higher risk of vegetation contact and/or greater need for vegetation maintenance work. These pilot studies could be useful in the future in the dentification of high-risk trees, including "cycle-busters" to develop incremental modification to the existing program. Removal and remediation of trees with strike potential to electric lines and equipment

1. **Risk to be mitigated**

   Hazard trees, (dead, dying, diseased, deformed, or unstable) have an increased risk of failure, and therefore a higher strike likelihood. Risks to be mitigated include outages, wildfire ignition, property damage, and safety concerns posed by hazard trees.

2. **Initiative selection**

   PacifiCorp identifies hazard trees based on visual inspection by pre-listers with knowledge of species identification and hazard tree identification/assessment as part of detailed inspections (routine maintenance) and readiness patrols. Identified trees are removed, topped, or pruned to eliminate risk of contact with conductors. For the OEIS definition of this strike tree removal and remediation initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   All areas within PacifiCorp's California service territory are inspected for hazard trees and mitigated during detailed inspections (routine maintenance). In addition, areas within the HFTD are inspected for hazard trees annually as a part of the annual patrols described in sections 7.3.5.11 and 7.3.5.12 on pages 209~~195~~-210~~196~~.

4. **Progress on initiative and plans for next year**

   PacifiCorp completed hazard tree inspections in the HFTD in 2021 and will continue to inspect annually, targeting inspections to be completed by the end of August. In late Q4 2021, PacifiCorp updated is mobile data management software to collect additional information during inspections regarding hazard trees. Species and quantity information is now collected; this will better inform tree crews and allow PacifiCorp to better track hazard tree removals versus inventory reduction removals and trends through time.

5. **Future improvements to initiative**

   The company is collecting data on potential strike trees as part of the LiDAR and remote sensing pilots (Section 4.4.2.4 on page 56 and PacifiCorp's 2021 Pilot 3: LiDAR Vegetation Inspection Pilot program). The company is also investigating the use of remote sensing techniques to augment the traditional identification of hazard trees. Additionally, as presented in Section 7.3.5.15 on page 213~~199~~, PacifiCorp is conducting pilot studies (refer to Section 4.4.2.4 on page 56) using LiDAR and publicly available datasets to identify potential clearances encroachments, potential strike trees, and identify areas with higher risk of vegetation contact and/or greater need for vegetation maintenance work. These pilot studies could include identification of high-risk trees, including tree species, within strike distance to develop a future program incremental to the existing program to address fall-in risk. PacifiCorp is continuing to pursue this tactic through implementation of these pilot studies to support strategic efforts.

   Section 4.4.2.4 on page 56 and PacifiCorp's 2021 Pilot 3: LiDAR Vegetation Inspection Pilot program have shown that both LiDAR and satellite vegetation models can identify trees with strike capability, though not trees with various 'hazard' traits. The

use of remote sensing technologies to identify tree mortality is not yet a mature technology but is under development and may be available in the future.

7.3.5.16 Substation inspections

1. **Risk to be mitigated**

   Vegetation contact with conductors creates an ignition risk, and a risk of fire damage to substation equipment. Substation inspections determine where vegetation may pose a current or future risk to substation equipment.

2. **Initiative selection**

   PacifiCorp performs substation inspections for vegetation along with regular cycle and interim vegetation maintenance. For the OEIS definition of this substation inspection initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   Substation vegetation inspections are performed throughout our service territory as part of regular cycle or interim maintenance.

4. **Progress on initiative**

   PacifiCorp performs regular inspections on all substations. Substations within the HFTD are inspected for vegetation annually and other substations are inspected bi-annually.

5. **Future improvements to initiative**

   PacifiCorp plans to continue implementation of substation vegetation inspections as a part of regular cycle work.

7.3.5.17 Substation vegetation management

1. **Risk to be mitigated**

   Vegetation contact with conductors poses a risk of arcing and of damage to substation equipment. Removal of vegetation encroachments mitigates this risk.

2. **Initiative selection**

   PacifiCorp removes or prunes any vegetation identified in the substation inspection consistent with cycle work. For the OEIS definition of this substation vegetation management initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

Substation vegetation management is performed throughout our service territory.

4. **Progress on initiative**

   PacifiCorp completed substation vegetation removals and overhang trimming for all fire areas in 2021 and will continued to perform annual mitigation.

5. **Future improvements to initiative**

   PacifiCorp plans to continue performing substation vegetation management activities as a part of routine cycle work.

7.3.5.18 Vegetation management system

1. **Risk to be mitigated**

   Vegetation contact risks are primarily mitigated through trimming or removals. Maintaining clear and complete records of vegetation work needed and performed helps ensure thorough and accurate mitigation of vegetation risks throughout the company's service territory. Refer to Section 4.4.2.7 on page 61.

2. **Initiative selection**

   In 2021, PacifiCorp continued its work with a records system introduced in 2020. The system includes GIS data and more detailed records for vegetation work. The same records system was successfully implemented in other states. These records will provide the backbone for the vegetation inventory. For the OEIS definition of this vegetation management system initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   PacifiCorp is using one, service territory-wide system of vegetation records management. GIS records will begin accumulating in the new system in specific locations as those areas are due for previously determined vegetation maintenance work, including regular mitigation in the HFTD.

4. **Progress on initiative**

   PacifiCorp began implementing more detailed records system in 2020 and have implemented updates to the forms and information collected for 2022. This record system now includes GIS data and is in use by both PacifiCorp staff and contract workers. The company also began characterizing general vegetation location and volume near assets using publicly available data on tree canopy and more specific information from remote sensing pilot programs. This information provides knowledge of vegetation risks at a system level while more specific data accumulates through ongoing vegetation management field records.

5. **Future improvements to initiative**

PacifiCorp is investigating options to improve vegetation data using remote sensing technologies, particularly as a means for growth forecasting. For example, the pilot project in Section 4.4.2.7 on page 61 was recently completed using Salo Sciences data to detect general growth. However, several years-worth of data for each location must be gathered before growth estimates can be calculated.

7.3.5.19 Vegetation management to achieve clearances around electric lines and equipment

1. **Risk to be mitigated**

Risk of ignition due to contact (grow-in, blow-in and fall-in) of vegetation with energized conductors and equipment.

2. **Initiative selection**

To minimize wildfire risk, PacifiCorp's vegetation management program uses multiple methods to maintain vegetation clearances including identification and removal of hazard trees, line patrols, expanded clearance distances, spatial pruning distinctions, and natural target pruning. For the OEIS definition of this vegetation management clearance initiative, see Section 9.1 starting on page 278~~244~~.

The company conducts cycle-based maintenance to achieve clearances around electric lines and equipment consistent with Appendix E Guidelines of GO 95, Rule 35. The company identifies and removes hazard trees and conducts patrols of lines in the HFTD where cycle maintenance has not been completed.

PacifiCorp has adopted expanded post-work minimum clearance distances, of at least 12 feet for all distribution lines and at least 20 feet for transmission lines under 115 kV and 30 feet for any transmission lines of 115 – 230 kV.

PacifiCorp also prunes vegetation beyond minimum required clearances in multiple ways. First, PacifiCorp uses increased clearance distances on distribution lines for certain species of trees, depending on tree growth rate. PacifiCorp separates vegetation into three categories: (a) slow-growing; (b) moderate growing; and (c) fast growing. In all cases, PacifiCorp applies the 12-foot minimum clearance for slow-growing species. In certain cases, PacifiCorp applies an increased clearance for moderate growing and fast-growing species.

Second, PacifiCorp integrates spatial concepts to distinguish between (i) side clearances, (ii) under clearances, and (iii) overhang clearances. Recognizing that certain trees grow faster vertically than other trees, it is appropriate to use an increased clearance when moderate- or fast-growing trees are under a conductor. Increasing overhang clearances also reduces the potential for faults due to overhang.

Third, as a practical matter, PacifiCorp will often prune beyond the minimum required distances because of the physical structure of the tree. PacifiCorp uses natural target pruning. Natural targets are the final pruning cut location at a strong point in a tree's disease defense system, which are branch collars and proper laterals. Pruning at natural targets protects the joining trunk or limb. This technique is drawn from ISA Best Management Practices: Tree Pruning.[28]

Through conducting patrols of lines in the HFTD, see Section 7.3.5.11 on page 209~~195~~, PacifiCorp maintains minimum clearance distances and increases frequency of hazard tree identification and removal. Hazard trees identified during annual inspections are removed or pruned sufficiently to eliminate the hazard. As a result, some hazard trees will be identified and removed earlier than under the regular program (i.e., which would have then occurred during the next regular cycle).

PacifiCorp's existing SOPs require the removal of hazard trees. Consistent with California law, removal is required when "dead, rotten or diseased trees or dead, rotten or diseased portions of otherwise healthy trees overhang or lean toward and may fall into a span of supply or communication lines."[29] Furthermore, the SOP encourages removal, when allowed, even when removal is not required under GO 95, Rule 35 or PRC § 4293.

Hazard trees are identified through detailed inspections and patrols by field crews performing work. PacifiCorp uses an initial Level 1 assessment, as defined in ANSI A300 (Part 9). Suspect trees are targeted for removal. In many circumstances, obtaining property owner consent to removal is often part of the process. PacifiCorp goes to great lengths to obtain property owner permission, making repeated and reasoned requests by different representatives of the company.

3. **Region prioritization**

Vegetation management actions are conducted throughout PacifiCorp's service territory.

4. **Progress on initiative**

PacifiCorp conducted vegetation management activities consistent with its Vegetation SOP and this WMP in 2021 and will continue implementing this initiative in 2022.

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[28] (Gilman and Lilly 2002) and A300 (ANSI 2008). (See also Miller, Randall H., 1998. Why Utilities "V-Out" Trees. Arborist News. 7(2):9-16.)

[29] GO 95, Rule 35; see also Public Resources Code § 4293 "Dead trees, old decadent or rotten trees, trees weakened by decay or disease and trees or portions thereof that are leaning toward the line which may contact the line from the side or may fall on the line shall be felled, cut, or pruned so as to remove such hazard."

5. **Future improvements to initiative**

PacifiCorp will continue to review opportunities to use technology that augments the vegetation management program (such as LiDAR and satellite imagery). In 2022, PacifiCorp will identify a distribution circuit or portion of a distribution circuit to implement enhanced overhang clearances, as indicated in Section 4.4.1 starting on page 48 with the intent to identify resources needed to execute this enhanced practice including equipment, vegetation management crews, increased customer coordination, work management and tracking. Species prone to limb failure would be targeted for enhanced overhang clearances.

7.3.5.20 Vegetation management activities post-fire

1. **Risk to be mitigated**

Trees with sufficient height to strike distribution and transmission electric infrastructure that are impacted by wildfire create an ignition, outage, and safety risk.

2. **Initiative selection**

PacifiCorp foresters and/or vegetation management contractors patrol wildfire-impacted areas adjacent to electrical infrastructure to identify trees impacted by fire within strike distance of electrical infrastructure, determine risk, and determine strategy for mitigating the identified risk. Trees that pose an imminent risk are topped or felled to eliminate the risk as soon as practicable. Depending on the risk identified and considering other factors such as land ownership and environmental concerns, other mitigation efforts to address remaining fire-impacted trees may occur. In all cases, safety is paramount; vegetation post-fire work is done to reduce safety risks to the public and PacifiCorp crews or contractors that may be responding to repair infrastructure damaged or destroyed by fire. For the OEIS definition of this post-fire vegetation management initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

Post-fire vegetation management, including inspection and risk mitigation (topping or felling or fire-impacted trees within strike distance of infrastructure), is conducted throughout PacifiCorp's service territory.

4. **Progress on initiative**

No changes to post-fire inspection and mitigation activities occurred in 2021.

5. **Future improvements to initiative**

Through responding to the catastrophic wildfires of 2020, PacifiCorp identified opportunities for improvement regarding coordination and mitigation strategies. The QA/QC supervisor identified in Section 7.3.5.13 on page 210~~196~~and planned to be

hired in 2022, will oversee vegetation management response to wildfires in the field and will further develop and refine post-fire response strategies.

7.3.6 Grid operations and protocols

7.3.6.1 Automatic recloser operations

1. **Risk to be mitigated**

   Line protective devices, such as line reclosers, are currently deployed on various transmission and distribution lines throughout PacifiCorp's service territory. When a line trips open due to fault activity, reclosers can be programmed to momentarily open, allow the fault to dissipate, and then reclose to test if the fault is temporary. The reclosing function gives the ability to restore service on a line that has tripped while maintaining the option to open again if the fault persists. In general, recloser operation is beneficial because it reduces the number of sustained outages and improves customer reliability. The reclosing function, however, implicates some degree of ignition risk because additional energy can be released if a fault persists. When a fault is detected on the line, a recloser will trip and reclose based on predetermined settings to re-energize the line. If the fault is temporary in nature and is no longer present upon the reclose operation, the line will re-energize resulting in limited impact to customers. If the fault persists, however, reclosing can, depending on the circumstances, potentially cause arcing or an emission of sparks. Accordingly, a strategic balance between customer reliability and wildfire mitigation is required.

2. **Initiative selection**

   PacifiCorp's reclosing protocols generally apply a "fast trip setting" protocol as per Section 4.4.2.8 on page 62, where multiple reclose attempts are made. The protocols where reclosing is disabled are reserved for only extreme weather events, transmission lines, or certain distribution configurations where EFR settings discussed in Section 7.3.6.2 on page 222~~208~~ are not compatible with the hardware installed. For the OEIS definition of this automatic recloser initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   Generally PacifiCorp does not disable reclosing seasonally. Instead, reclosing may be disabled based on situational awareness reports during periods of extreme risk, which can happen throughout the company's California service territory. Additionally, PacifiCorp prioritizes other mitigation tactics, such as grid hardening or increased patrols, over recloser disabling where possible, to not overuse the tool and cause unintended impacts to customers.

4. **Progress on initiative since the last WMP submission and plans, targets, and/or goals**

for the current year

In the 2022 updates to the WMP guidelines, OEIS has added a new section, 7.3.6.2 on page 222~~208~~, which aligns with the protocols.

5. **Future improvements to initiative**

Implementing and continuously improving this program requires advanced investigation of fault events to understand the nature and type of faults and whether this program is properly mitigating these events.

7.3.6.2 Protective equipment and device settings

1. **Risk to be mitigated / problem to be addressed**

In general, a more sensitive setting can reduce the energy released as a result of a fault. At the same time, less sensitive settings, in conjunction with recloser operations, reduce the number of sustained outages and improve service reliability.

2. **Initiative selection**

With protective device settings that result in reduced potential for arcing or emission of sparks, there are likely to be more outages. Again, a strategic balance between customer reliability and wildfire mitigation is required. For the OEIS definition of this protective equipment initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

Operating protocols designate that identified areas with a high risk in the situational awareness forecast may have alternative settings applied to protective device settings.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

This is a relatively new initiative. PacifiCorp plans to continue using EFR settings in situations of high wildfire risk using a more standardized application informed by advancements in situational awareness.

5. **Future improvements to initiative**

PacifiCorp is taking steps to increase situational awareness efforts, such as the installation of CFCIs described in Section 7.3.2.3 on page 165~~155~~, to support quicker locating of faults and restoration of power. PacifiCorp communications, describing how these settings reduce wildfire risk and impact, are provided to communities such that they are informed. Similar to the implementation of PSPS, PacifiCorp plans for the implementation of EFR aim to find the appropriate balance between mitigating

wildfire risk and providing reliable power to communities and will be applied where appropriate and feasible.

7.3.6.3 Crew-accompanying ignition prevention and suppression resources and services

1. **Risk to be mitigated**

   Utility support of ignition prevention and suppression resources can reduce the potential for wildfires and provide electrical safety support during wildfire.

2. **Initiative selection**

   This initiative includes PacifiCorp personnel accompanying suppression resources in the event of a wildfire as well as personnel carrying fire extinguishers. In the extremely unlikely event that a fire ignition occurs while field crews or other PacifiCorp personnel (collectively "field personnel") are working in the field, such field personnel are equipped with basic tools to extinguish small fires. For the OEIS definition of this ignition prevention and suppression initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   Firefighting equipment resources may be moved into affected areas as needed to support other districts. For example, Medford, Oregon resources are available for use in Yreka, California.

   Table 7.4 lists of resources and their location:

Table 7.4 List of firefighting equipment and locations

Equipment Description	Location
500 gallon water tanker and pump with ¾ inch high pressure hose	Bend
250 gallon water skid-tank on trailer	Grants Pass
500 gallon water trailer, 2 inch hose	Klamath Falls
250 gallon water skid-tank (requires trailer for movement)	Klamath Falls
500 gallon water trailer, 2 inch hose	Medford
250 gallon fire tank and pump (trailer or pickup loaded)	Pendleton
500 gallon water tanker, 3 inch hose, firefighting equipment	Roseburg
250 gallon fire tank and pump *(trailer or pickup loaded)*	Walla Walla
250 gallon fire tank and pump *(trailer or pickup loaded)*	Yakima

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   During the 2021 year, PacifiCorp found the existing level of resources to be adequate therefore, there are no changes to this initiative in 2021 and none are expected to be needed in 2022.

5. **Future improvements to initiative**

   PacifiCorp plans to continue maintaining its own firefighting equipment, listed above, over the next five years.

7.3.6.4 Personnel work procedures and training in conditions of elevated fire risk

1. **Risk to be mitigated / problem to be addressed**

   During fire season, PacifiCorp modifies field operations to further mitigate wildfire risk to reduce the risks associated with ignitions.

2. **Initiative selection**

   During fire season, PacifiCorp field personnel mitigate wildfire risk by using a variety of tactics. Routine work, such as condition correction and outage response, poses some degree of ignition risk, and, in certain circumstances, crews modify their work practices and equipment to decrease this risk. Additionally, field personnel may mitigate wildfire risk through increased patrols, or adjusting reclosers to EFR settings. For the OEIS definition of this personnel work procedure and training initiative, see Section 9.1 starting on page 278~~244~~.

   Operating Conditions include:

   • Normal Condition: Standard operating protocols

   • Elevated Condition: Specific work activities may require additional mitigation measures to proceed with work, such as operating machinery at low-risk times of day, watering areas prior to work, keeping water tanks on site, etc.

   • Extreme or RFW Condition: Most overhead work is stopped, except where not performing the work would create a greater risk

3. **Region prioritization**

   As a part of the forecast effort and daily meteorology briefings, field operations considers the local weather and geographic conditions that may create an elevated risk of wildfire. These practices reduce the potential of direct or indirect causes of ignition during planned work activities, fault response and outage restoration and can be applied across any portion of the service territory.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   During the 2021 year, PacifiCorp found the existing level of resources to be adequate therefore, there are no changes to this initiative in 2021 and none are expected to be needed in 2022.

5. **Future improvements to initiative**

   PacifiCorp will continue the successful practices established in this initiative.

7.3.6.5 Protocols for PSPS re-energization

PacifiCorp describes its PSPS process, including "all clear" designation to facilitate re-energization in Chapter 8, starting on page 256~~232~~. It further describes its emergency plans including restoration actions in Section 7.3.9.5 on page 246~~224~~.

1. **Risk to be mitigated / problem to be addressed**

   PacifiCorp will execute a PSPS as a last resort mitigation during extreme fire weather conditions where the probability of weather-related system impacts is much higher than normal and the consequences of ignitions due to high winds and dry conditions can lead to a catastrophic wildfire. While power lines are de-energized, they are still exposed to strong winds and the potential for damage. Even after the wind has dropped below levels associated with system impacts, fire weather conditions are typically still extreme, therefore before re-energizing a line, post-event patrols are completed to determine whether any damage has occurred to the line which needs to be corrected prior to re-energization.

2. **Initiative selection**

   Post-event patrols and restoration of a de-energized circuit will not begin until the risk reduces, generally indicated by the reduction in wind speed below impactful levels as measured by local weather stations paired with continued reduction of forecasted wind speeds as determined by the meteorology department.

   After a potential PSPS event has been identified, advanced restoration planning activities begin on circuits or portions of circuits identified by meteorology that may be part of the PSPS event, before the event even occurs. Proactive patrols of the identified circuits or portions of circuits are initiated pre-event to gather additional information about the circuits that may be included in PSPS event. Depending on the needs, both local and regional resources may be leverages. Additionally contracted resources may also be used depending on the volume of work required. Increased resource levels used to perform pre-event inspections will be maintained to support re-energization activities for circuits or portions of circuits that experienced a PSPS.

During the restoration planning activities, the Emergency Coordination Center (ECC) will work with other departments to prioritize restoration activities. While there will be restoration focus on critical infrastructure and services, the ECC will also be evaluating weather, system impacts, and outage duration. During the PSPS event, field personnel may be actively patrolling the de-energized circuits for damage (i.e. line down, broken crossarms, tree through line, etc.) and debris (i.e. tree branches and other items blown into the line). Repairs will be made if issues are discovered. While the de-energized circuit will still have to be patrolled prior to re-energization, these activities will reduce the time necessary to restore service.

3. Post-event patrols and restoration of a de-energized circuit will not begin until weather stations in the area indicate that winds have fallen below impactful levels and are forecasted to remain below impactful levels. Once the meteorology department has indicated the conditions are favorable to re-energize and no other risk has been identified, field personnel will begin ground patrols of the de-energized circuits. As they patrol, the circuit will be restored in a stepped process so customers can be re-energized as the patrol progresses. Patrols will not occur during nighttime hours given the difficulty of seeing damage or items in the line that could cause an ignition. Patrol personnel will rest during this time and be prepared to re-start re-energization activities once there is adequate daylight. It should be noted that the quantity and/or severity of the damage found on a circuit during final patrol can delay re-energization.

4. **Region Prioritization**

All lines de-energized as part of a PSPS event will be patrolled in their entirety, using a step restoration process. The step restoration process allows certain customers, usually closer to the substation, to be restored as the patrol progresses and not have to wait for the entire circuit to be patrolled. PacifiCorp works with emergency and public safety partners to identify critical customers for prioritization, when possible.

5. **Progress on initiative since the last WMP submission and plans, targets, and/or goals for the current year**

PacifiCorp is continuously looking for opportunities to reduce event restoration time to balance potential impacts to customers with wildfire risk. In 2021, reduce patrols times and aerial patrols were utilized during the 2021 PSPS event in Dunsmuir, California and were found to expedite the re-energization process. While aerial patrols were possible during the 2021 PSPS event in Dunsmuir, there are times where it is not safe to utilize aerial patrols. However, this event highlighted that, when feasible and available, aerial patrols can be utilized to minimize de-energization duration. For 2022, PacifiCorp will continue to explore the use of aerial patrols, when safe to do so, as a means to expedite patrols prior to re-energization.

5. **Future improvements to initiative**

PacifiCorp is continuously evaluating opportunities to minimize restoration timeframes. Circuit hardening, more granular de-energization capability, and the introduction of other patrol methods are planned to support timely re-energization.

7.3.6.6 PSPS events and mitigation of PSPS impacts

1. **Risk to be mitigated / problem to be addressed**

PSPS reduces the risk of powerline-caused wildfires but also introduces the potential for economic and societal impacts in the affected communities. PacifiCorp recognizes the need to reduce these impacts as much as is reasonable and feasible. As described in Section 8.3, reducing the impact of PSPS is a significant goal of PacifiCorp's WMP and PacifiCorp perceives the best way to reduce PSPS impacts is to reduce the number, geographic scope, and duration of PSPS events. While recognizing the general application of all mitigation initiatives to help reduce the impact of PSPS, PacifiCorp also acknowledges that certain initiatives are more directly tied to the PSPS Program.

~~7.3.6.6~~2. **Initiative selection**

PacifiCorp's mitigation of PSPS impacts is included in the grid design and system hardening wildfire mitigation program focused on mitigation of impact on customers and other residents affected during PSPS event outside of the initiatives described in Section 7.3.3 on page 171~~161~~. PacifiCorp's additional programs or efforts to mitigate the impact on customers and other residents affected during a PSPS event are described in Section ~~4.4 starting on page 47.~~7.3.3.11. These programs include the free portable battery to promote alternative power sources to mitigate the impacts of a PSPS on customers who rely on electric power for medical equipment. For the free portable battery program, outreach is performed to offer medical baseline customers free portable batteries, custom sized for their medical equipment, and training on the equipment. Should this customer experience a PSPS, they have a backup battery to mitigate the impact of the PSPS.

In addition to the free portable battery, PacifiCorp is increasing the density of its weather station network to provide more granular observations along its distribution circuits and transmission lines in areas of wildfire risk. This, in combination with existing sectionalizing devices, should allow for more targeted PSPS, reducing the number of customers impacted by a PSPS. Further, PacifiCorp will be able to use the results of its 30-year WRF reanalysis and Wildfire Risk Reduction Model (WRRM) outputs to inform the installation of new sectionalizing devices to isolate the highest risk portions of a circuit, further reducing the PSPS impacts to the affected communities.

3. **Region prioritization**

PacifiCorp grid design and system hardening programs are focused on prioritizing the HFTD areas, these programs include the targeted installation of reclosers and relays to support more targeted PSPS events, instead of a broad full circuit approach, further reducing the impact of PSPS.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

Since the 2021 WMP, PacifiCorp has initiated the free portable battery program, as further described in Section 7.3.3.11. To minimize the impact on PSPS events on medical baseline customers, PacifiCorp has implemented a program to provide backup batteries at no cost. Customers who depend on medical equipment powered by electricity can receive the backup battery through this program. This is PacifiCorp's initiative and response to the Decision 21-06-034, to "*Provide support for customers that rely on electricity to maintain necessary life functions, including durable medical equipment and assistive technology'*. Phase 1 of the free portable battery program began delivery to the medical baseline customers who met the criteria that were located in the HFTD Tier 2 and 3 areas. Next phases of the battery program will expand outreach to all medical baseline customers in the California service territory.

For 2022, PacifiCorp plans to expand the program based on learnings from other utilities.

5. **Future improvements to initiative**

PacifiCorp plans to be continually improving PSPS events and will continue to reduce the impact of PSPS, primarily through grid hardening efforts but also through more granularity in situational awareness initiatives.

7.3.6.7 Stationed and on-call ignition prevention and suppression resources and services

1. **Risk to be mitigated**

Ignitions, under specific conditions can spread quickly and uncontrollably, therefore there is a benefit to having suppression resources available.

2. **Initiative selection**

PacifiCorp equips field personnel with fire extinguishers such that should an ignition

occur, that can safely be suppressed with the extinguisher they have, they will do so. For the OEIS definition of this ignition and suppression resource initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   There is no region prioritization for this initiative.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   During the 2021 year, PacifiCorp found the existing level of resources to be adequate therefore, there are no changes to this initiative in 2021 and none are expected to be needed in 2022.

5. **Future improvements to initiative**

   PacifiCorp does not have any planned future improvements for this initiative.

7.3.7 Data governance

7.3.7.1 Centralized repository for data

1. **Risk to be mitigated / problem to be addressed**

   ~~Gathering, maintaining and reporting accurate data is important to plan development and evaluation~~The utility operates with a wide range of both new and legacy database systems that pertain to wildfire mitigation efforts and reporting. For example, risk event data is captured through the company's outage reporting system while asset inspection data is captured and stored in a mainframe type, asset management system. Furthermore, sensitive customer information is stored in an alternate, secure, and restricted database used by customer service and other customer facing organizations such as billing. While the company is not planning to move to a centralized database for all potential data used by the company day-to-day, PacifiCorp does recognize the value in consistent reporting and aggregation of critical datasets pertaining to wildfire mitigation. Due to the large volume of data related to wildfire mitigation initiatives and the complexity associated with processing and validating this data, a well-designed platform to visualize and systematically extract key data can improve access and retrieval of data, enhance reporting capabilities and accuracy, supplement compliance, and tracking of programs.

2. **Initiative selection**

   As of now, utility data related to wildfire mitigation initiatives is collected through a variety of applications, often which are custom made for the contractor, resource group, and/or task as described above. And while it may not make sense to combine

databases from an operations management, information security, and customer data protections perspective, PacifiCorp developed an-in house tool that provides visualization of data that is stored in many databases or repositories through the use of layers. Examples of such data include multi-layered access to PacifiCorp's line maps, risk maps, location of weather stations, location of completed grid hardening projects, outage data and risk scores through the LRAM data layer. This tool is a helpful planning tool for integrated visualization of multiple layers of static data, including risk layers. This enhanced capability to have a map view of circuits, risk and equipment locations also includes the ability to retrieve the data in excel format for reporting, compliance checks and program tracking.

Additionally, compliance checks and program tracking can better be managed with a central repository of wildfire mitigation initiative targets previously reported. This initiative also includes developing and maintaining a central repository of initiative data, such as targets, filings, and data request responses which is managed by the new, Wildfire Program Delivery Team accounted for in Section 7.2.

~~2.1. Initiative selection~~

~~This initiative is to develop a protocol for data management related to wildfire mitigation initiatives. For the OEIS definition of this centralized repository initiative, see Section 9.1 starting on page 244.~~

3. **Region prioritization**

This ~~protocol~~initiative has no region prioritization, the same process is used across all data. However, more data pertaining to the HFTD is generally used in evaluating and reporting~~. Therefore, additional effort is dedicated toward governance of~~, therefore this data ~~in the~~can be reviewed more than non HFTD data.

4. **Progress on initiative since the last WMP submission and plans, targets, and/or goals for the current year**

When the last WMP was submitted, in 2021, PacifiCorp had not established a specific central repository for all WMP related filings and data requests. Data collected for WMP filings were stored in multiple locations and data collected for data requests were stored by a different group, instead of centrally located. At the beginning of 2022, with the establishment of a Wildfire Mitigation Program Delivery group, PacifiCorp was able to allocate resources to start the development of a centralized Sharepoint site where all the information that is used to support fillings and data requests is currently stored, which is already showing positive results in terms of consistency and clarity of the data provided for field audits and desktop verifications.

2021 progress is described in the 2021 Change Order filed on November 1, 2021:

Through experience gained in 2021, PacifiCorp learned that this effort requires the extraction and translation of nonspatial data into GIS format. Like monitoring and auditing the WMP, the evolution of the company's GIS data capabilities touches many departments throughout the company and requires an intense amount of input and coordination for all WMP initiatives. For example, data governance touches of initiatives include risk assessment and mapping initiatives in Section 7.3.1 on page 153~~150~~ (to ensure data is consistent across the various platforms), grid hardening initiatives in Section 7.3.3 on page 171~~161~~ (to ensure that projects are properly categorized and represented spatially), and vegetation management initiatives in Section 7.3.5 on page 196~~182~~ (to demonstrate completion of key vegetation management initiatives and monitor compliance).

PacifiCorp had underestimated the resources needed to meet the compliance reporting requirements, which are continuously evolving to meet the needs or regulators and stakeholders.

For 2022, PacifiCorp plans to add resources specifically to manage and deliver complex GIS datasets on a quarterly basis.

5. **Future improvements to initiative**

PacifiCorp anticipates that this new central repository of filings and data requests will further progress the company's ability to make quantitative based updates to initiatives and is the first step towards consistent reporting and efficient data sharing. Incremental improvements to data management are expected to occur over the next five years to further progress towards a more streamlined process.

Additionally, PacifiCorp ~~anticipates that the~~plans to expand this repository of data ~~and reporting requirements will continue evolving~~for all collected wildfire mitigation data which can be accessed and utilized by engineering, project management, and management. Some applications of this data could ~~require additional utility resources and focus~~include:

- Data informed updates to system operation procedures;
- Outage informed project prioritization and risk reduction evaluation; and
- Development of dashboards and reports to support wildfire mitigation initiatives and alignment with recent discussions with other IOUs in the ~~future.~~ joint workstreams.

7.3.7.2 Collaborative research on utility ignition and/or wildfire

PacifiCorp has provided details regarding its collaboration on research projects in Section 4.4.1 starting on page 48. During these activities the company has extracted data appropriate to the organization's needs and made it available in the method best serving their analysis.

7.3.7.3 Documentation and disclosure of wildfire-related data and algorithms

1. ~~At this time, PacifiCorp does not have any specific~~**Risk to be mitigated / problem to be addressed**

   Situational awareness tools utilize wildfire ~~mitigation programs focused on documentation and disclosure of wildfire-~~related data through the Technosylva models described in Section 4.5.1.1 Wildfire related data should be accurate and promptly integrated into modelling to best inform tools and decisions.

2. **Initiative selection**

   Utility fire data utilized in LRAM comes from a centralized data base of field records, augmented by the risk event investigation team, as described in Table 4.3. Additional wildfire related data, such as historical fires across PacifiCorp territory are provided directly to Technosylva by various fire agencies, as described in the table found in Section 4.5.1.1.

   PacifiCorp utilizes commonly available algorithms~~. to model wildfire spread and does not have custom algorithms related to wildfire. LRAM, described in 4.5.1.4 utilizes ELM Fire, an open-source geospatial model intended for simulating wildland fire; and Technosylva utilizes their FireSim model algorithms, which is also utilized by other utilities in California~~.

3. **Region prioritization**

   This initiative has no region prioritization, the same process is used across all data.

4. **Progress on initiative since the last WMP submission and plans, targets, and/or goals for the current year**

   Since last year's WMP update, PacifiCorp plans have pivoted to incorporate the use of Technosylva modelling in plans to develop new tools, as described throughout this 2022 WMP update. The procurement of Technosylva WFA-E supports a common algorithm to that used by other California utilities.

5. **Future improvements to initiative**

   With the procurement of Technosylva WFA-E, PacifiCorp will have obtained a

significant advancement in wildfire algorithms and plans to continue attending the OEIS hosted Risk Modelling workshops to learn of future improvements and recommendations from other utilities.

7.3.7.4 Tracking and analysis of near-miss data

1. **Risk to be mitigated / problem to be addressed**

   Problems and issues that manifest fully are typically easier to track. It is hard to prove a negative. However, near-miss data, which is much easier to overlook, represents valuable, critical experience necessary for fully managing risk.

2. **Initiative selection**

   PacifiCorp has used existing resources to produce data that supports its WMPs. Some of these resources are company-owned, some others are external. For the OEIS definition of this near-miss data initiative, see Section 9.1 starting on page 278~~244~~.

   When circumstances have required the development of new databases (such as in the 2019 Decision approving the SMJU WMPs relating to Fire Incident Data Collection Reporting) the company has structured new applications that can be fed as much as possible by existing resources.

3. **Region prioritization**

   This protocol has no region prioritization, the same process is used across all data.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   ~~PacifiCorp has continued to record required information into a newly created database developed following the 2019 Decision.~~

   PacifiCorp continues to leverage existing data sources to produce metrics supporting its WMPs, some of which are its data sources while others may be external data sources. The core data relates to outage data, which is collected and categorized consistent with IEEE 1366 & IEEE 1782 as well as Commission Decisions D.96-09-045 and D.16-01-008. Additionally, PacifiCorp performs data reviews to identify opportunities for further data quality improvements when outage data is refreshed, which occurs on an annual basis.

5. **Future improvements to initiative**

   Incremental improvements to data management are expected to occur over the next five years to further progress towards a more streamlined process to improve efficiency. PacifiCorp's long-term plan also includes the evaluation of existing tracking databases and capability to identify any additional information that should be captured and analyzed. Additionally, PacifiCorp intends to review existing classifications of ignition risk drivers, which is generally a function of outage cause codes and categorization, and assess whether additional environmental or operational risk information can be ascertained by analyzing non-ignition risk driver data. While not directly tied to ignition risk, this data may offer insight into other types of utility risks.

7.3.8 Resource allocation methodology

~~7.3.8.11.1.1.1 Allocation methodology development and application~~

PacifiCorp's resource allocation methodology relies on ~~a~~the general approach for informed decision-making, described in Section 7.1.B in which the available resources, ~~outlined and~~ date-specific deliveries and estimated labor (or material) requirements are outlined. To the extent these volumes exceed available capacity (internally and using standard external resources), the company identifies the need for 1) greater prioritization efforts, 2) establishment of nontraditional resource pools, and 3) reassessment of scheduled work. Compliance-based activities are prioritized first, other activities are prioritized based on geographic wildfire Tier (Tier 2 versus Tier 3)

and overall availability of materials. Instead of prioritizing a certain type of program, PacifiCorp prioritizes the location of work and groups all potential program aspects applicable at that location into projects. This ensures that all programs on an applicable circuit, line, or combination of circuits and lines are completed at the same time to make efficient use of resources. Where a wildfire mitigation program requires capital funding and construction, PacifiCorp established a Wildfire Project Management Office in 2020 with a dedicated Wildfire Mitigation Delivery Director responsible for managing resources and execution of programs.

7.3.8.1 Allocation methodology development and application

~~6.1. Risk to be mitigated / problem to be addressed~~

1. Risk to be mitigated / problem to be addressed

This initiative addresses the ~~problem associated with needing~~need for a consistent methodology for prioritization of wildfire mitigation resources and applying this information to initiative decision-making. PacifiCorp also recognizes the incremental value a resources allocation strategy can have as deployment of multiple wildfire mitigation initiatives are ramping up. As PacifiCorp is continuing to tackle new initiatives and ramp up existing initiatives, further development of a resource allocation strategy will be important.

~~7.~~**2. Initiative selection**

~~This~~

By engaging in this initiative, PacifiCorp's main goal is ~~foundational~~ to ~~initiative selection~~develop and ~~prioritization; therefore, it is required~~apply a methodology to ~~engage in this activity to describe~~monitor, prioritize, direct, and optimize the ~~"why engage~~use of resources in ~~initiative" for all other initiatives~~order to successfully deliver its wildfire mitigation plan. For the OEIS definition of this allocation initiative, see Section 9.1 starting on page 278~~266~~.

~~8.~~**3. Region prioritization**

This methodology is applied across all wildfire mitigation initiatives across all PacifiCorp territories. Generally, for initiative investment, the methodology prioritizes compliance requirements, then work with the greatest risk reduction potential. ~~Work~~In California, work with the greatest risk reduction potential is then prioritized to complete in Tier 3 and Tier 2 HFTD areas first, with consideration for project management to prevent re-do of work and re-visiting of sites. For human resources allocation, PacifiCorp focuses on the identification, acquisition, and adequate allocation of expertise that aligns with the needs for managing wildfire mitigation

work. Additionally, PacifiCorp promotes awareness of its wildfire mitigation plans and compliance requirements throughout the company's organization to ensure resources are prioritized and assigned to wildfire mitigation activities as expected.

~~9.~~4. Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year

Throughout 2021, PacifiCorp has continued to use ~~this~~the general methodology ~~and~~described in Section 7.1.B to prioritize investment and address wildfire risk in PacifiCorp's Tier 3 and Tier 2 areas and will continue to do so during the current year. In line with the human resources allocation methodology, in 2021 PacifiCorp created a new Wildfire Mitigation Program Delivery group and opened new positions with its PMO group to ensure adequate resources are hired and assigned to manage wildfire mitigation initiatives. These resources play a key role in developing plans and assigning and managing resources to execute those plans. Additionally, PacifiCorp has attended the related OEIS and IOU workshops to learn from other utilities~~.~~, shared best practices and lessons learned as initiative implementation progresses

~~10.~~5. Future improvements to initiative

~~As~~PacifiCorp will assess the results of its most recent investment in additional human resources and adjust allocation as needed according to demands posed by individual initiatives. In addition to that, starting in 2022 PacifiCorp is performing a series of presentations and meetings as part of its Internal Stakeholder Engagement plan to ensure prioritization of wildfire mitigation activities throughout the organization. For initiative investment, as PacifiCorp matures risk modeling elements, and learns more from other utility practices, ~~there~~changes to the existing methodology will be ~~updates to this process~~evaluated and implemented. .

7.3.8.2 Risk reduction scenario development and analysis

1. Risk to be mitigated / problem to be addressed

~~This initiative addresses the need for a consistent methodology of prioritizing wildfire mitigation resources and informing initiative decision making.~~ Risk reduction scenario development and analysis can help inform decision making, particularly when selecting initiatives or prioritizing projects. While not a complete replacement to subject matter expertise, the ability to model various scenarios and understand impacts on risk, particularly risk reduction, can also bring additional transparency to the decision-making process. This initiative includes PacifiCorp's efforts to develop such modeling capabilities for application to different risk reduction scenarios based on implementing wildfire mitigation initiatives implementation and informing utility decision-making.

2. Initiative selection

PacifiCorp understands the need to evaluate different risk reduction scenarios. To

date, this initiative has been directly tied to the development and use of

~~2.1. Initiative selection~~

~~This initiative is foundational to initiative selection and prioritization; therefore, it is required to evaluate the effectiveness of initiatives. This initiative includes the development and implementation of the~~ LRAM, which is discussed in Section 4.5.1.4 starting on page 83~~81~~. The Combined Score for each zone of protection, calculated by LRAM, helps to select assets, evaluate projects, and prioritize implementation of projects based on risk. While helpful to inform project prioritization and overall risk model development, LRAM does not include full simulation or modeling capabilities. As PacifiCorp ramps up the implementation of Grid Hardening initiatives, assessment of different risk reduction scenarios becomes essential to understand the efficiency of mitigation strategies. Therefore, PacifiCorp is investing in additional tools, data, and modeling capabilities through procurement of the Technosylva WFA-E suite of tools discussed in Section 4.5.1.1 and accounted for in initiative 7.3.2.4.

For the OEIS definition of this risk reduction scenario development initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

This methodology is applied across all wildfire mitigation initiatives across PacifiCorp territories. Generally, the methodology prioritizes compliance requirements, then work with the greatest risk reduction. Work with the greatest risk reduction is then prioritized to complete in Tier 3 and Tier 2 HFTD areas first, with consideration for project management to prevent redo of work and revisiting of sites.

4. **Progress on initiative since the last WMP submission and plans, targets, and/or goals for the current year**

~~In PacifiCorp's 2021 Progress Report, submitted to OEIS on November 1, 2021,~~

PacifiCorp ~~describes the plan to evolve~~ continued using LRAM~~, which has been primarily used to~~ to assess risk reduction and prioritize work within the HFTD. ~~The next phase of~~ Updates to LRAM ~~is to use it to evaluate the risk reduction~~ layers were performed as ~~initiative work is completed this year~~required to ~~see whether~~keep the ~~impact of~~data current. Certain initiatives under development such as Expulsion Fuse Replacements can ~~be seen~~benefit from the use of updated LRAM combined risk scores. While LRAM presents a first step toward assessing risk reduction scenarios to inform project prioritization, PacifiCorp is also making investments and advancing modeling capabilities through the implementation of Technosylva's WFA-E tools discussed in ~~the data.~~Section 4.5.1.1 and accounted for in initiative 7.3.2.4. These tools, once fully operational, will include a project selection tool called WRRM. Additionally development of WRRM will also be critical to inform risk spend efficiency calculations discussed in Section 7.3.8.3.

5. **Future improvements to initiative**

PacifiCorp is continuously improving risk modeling to better evaluate risk reduction. As mentioned in section 4.5.1.4, PacifiCorp plans to evolve the LRAM model toward S-MAP and RAMP products which will align with other utilities practices and improve assessment of risk reduction scenarios. Additionally, PacifiCorp intends to implement Technosylva's WFA-E modelling in 2022, with continues, expanded use in 2023.

7.3.8.3 Risk-spend efficiency analysis – not to include PSPS

1. **Risk to be mitigated / problem to be addressed**

PacifiCorp recognizes it is important to develop a methodology to estimate the cost-effectiveness of an initiative. An RSE score is calculated by dividing the mitigation risk reduction of an initiative by the mitigation cost, which is a useful tool for continuously evaluating mitigation options, selecting and planning scope of work, and can be applied to ~~evaluate~~compare various initiatives.

2. **Initiative selection**

PacifiCorp is developing RSE ~~calculation is a useful tool~~calculations to assess performance of individual initiatives ~~or to evaluate scope changes of deployed program. It can also~~and compare multiple initiatives based on ~~their~~ cost-effectiveness ~~to mitigate risk.~~. For the OEIS definition of this RSE initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

PacifiCorp will prioritize grid hardening activities for RSE calculations since it is important that they are evaluated and performed in a way that reduces risk efficiently in consideration of the capital invested.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

PacifiCorp has developed ~~a~~the methodology described in Figure 35 to calculate RSE using outage data and LRAM's environmental risk score as inputs. Upon completion of a verification process, PacifiCorp plans to report objective RSE values ~~in 2023~~ for line rebuilds (covered conductors~~,~~), and possibly other Grid Hardening initiatives~~, weather stations, and possibly also expulsion fuse replacement)~~. in 2023.

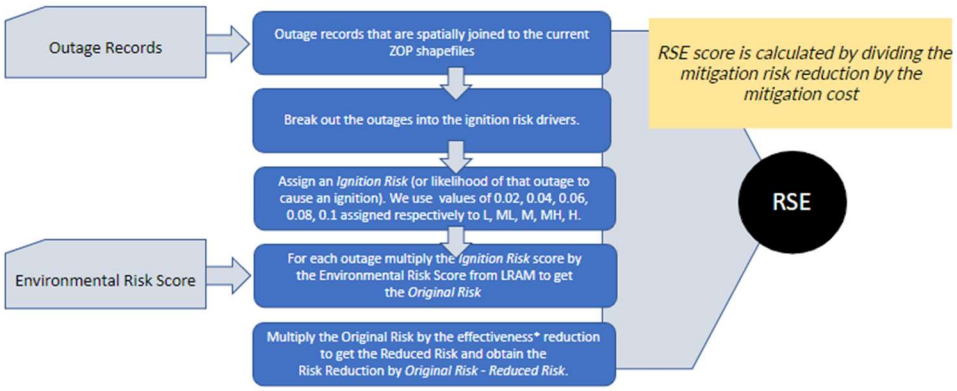


Figure ~~935~~ : RSE Flowchart

5. **Future improvements to initiative**

The methodology for RSE and calculation parameters will be refined throughout 2022~~.~~ ~~After that, PacifiCorp will add RSE calculations for other initiatives.~~, PacifiCorp understands there is inherent uncertainty in the RSE calculations and plans to develop a verification process that will enable the assessment of factors that influence the estimated RSE values. PacifiCorp also aims to leverage Technosylva's WRRM model to expand upon existing capabilities of RSE. Once these improvements are implemented, PacifiCorp will calculate RSE for initiatives in other categories. Additionally, PacifiCorp plans to continue learning from other utilities through working groups and workshops to refine RSE over time.

7.3.9 Emergency planning and preparedness

7.3.9.1 Adequate and trained workforce for service restoration

Wildfire mitigation refresher training is prioritized for, and provided annually to, applicable field employees within the HFTD. The refresher training includes operating practices that reduce wildfire risk while performing routine work and confirming the availability of fire mitigation/suppression tools before fire season. To ensure enough people are available to work when required, PacifiCorp may draw workers from other parts of its service territory as needed (sometimes crews needed to respond during or restore service after an event can exceed standard local district crew sizes). If an event exceeds the local district's capability to respond, PacifiCorp must have access to additional resources to mitigate or respond to the wildfire event. This potential need for additional resources during an emergency means that PacifiCorp provides the training to all applicable employees that might respond to a wildfire event.

Responding to an emergency involving a wildfire can pose specific challenges. System operators or local emergency response crews may need field operations personnel to gather more extensive information and assess local conditions differently than with

other type emergencies or normal operating conditions. Field personnel may also need specialized tools or the ability to monitor and react to changing weather patterns.

PacifiCorp is also a member of mutual assistance agreements with partnering utilities that provide more resources when responding to an event. When an emergency or major event occurs, it is critical that there are enough workers available to rebuild infrastructure and restore service, so the service restoration does not escalate risk. As with performing planned or routine work, PacifiCorp field operations mitigates some wildfire risk by following specific procedures during fire season in heightened fire risk areas.

1. **Risk to be mitigated / problem to be addressed**

   Effective training programs can reduce the wildfire risk by preparing the workforce to perform and fulfill wildfire mitigation initiatives.

2. **Initiative selection**

   Engaging in this initiative sets the groundwork for other initiatives, to ensure that they are fulfilled according to standards and in such a way that reduces wildfire risk. For the OEIS definition of this service restoration training initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   There is no region prioritization for this initiative, it occurs across California.

4. **Progress on initiative since the last WMP submission and plans, targets, and/or goals for the current year**

   This successful initiative will be maintained, and potentially updated/expanded on based on joint utility collaborative efforts.

5. **Future improvements to initiative**

   As part of its emergency management program, PacifiCorp evaluates exercises and actual response events, by identifying issues raised during the event and documenting lessons learned and corrective action plans. The company uses multiple methods to gather exercise and post-action reviews, including participant and observer evaluation forms, remedial action tracking, and incident reviews. PacifiCorp may implement lessons learned in its response and restoration procedures and incorporate them into emergency response documentation. Future initiative improvements hinge on this specific situational feedback and lessons learned.

7.3.9.2 Community outreach, public awareness, and communications efforts

As part of its PSPS program, PacifiCorp has its Plan to Support Populations with Access and Functional Needs During Public Safety Power Shutoffs, which fully describes community outreach and communication efforts taken to identify and contact key community stakeholders. Overall, PacifiCorp's plan includes information that can be heard, watched and read in a variety of ways with the goal of accessibility and understandability.

1. **Risk to be mitigated / problem to be addressed**

   This initiative seeks to reduce the impact to the customer who may experience a de-energization through preparation and awareness.

2. **Initiative selection**

   As a component and last resort of wildfire mitigation, PacifiCorp may de-energize lines, which will always impact customers. PacifiCorp seeks to reduce the impact due to this loss of power by providing wildfire preparedness education to its customer. For the OEIS definition of this community outreach initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   Advertisements related to PSPS preparedness are run in the HFTD. However, additional community outreach programs, which include a webinar and various other videos, are available across the company's service territory.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp continues to refine and enhance both identification of AFN customers and ongoing communication targeted to reach more AFN customers. While all medical baseline customers are identified as AFN customers, in 2022, PacifiCorp intends to increase outreach to all customers to identify more customers relying on medical equipment and to broaden the scope of customers who self-identify as AFN. Customers will receive communications about the medical baseline rate and a Spanish version of the medical baseline application will be available on the website this year. California Alternate Rates for Energy (CARE) applications are sent to all residential customers. In 2021, PacifiCorp added a check box on the CARE application asking customers to identify as AFN. The check box added an additional 193 AFN customers throughout the service territory and 43 AFN customers in the Power De-Energization Zones (PDZ).

5. **Future improvements to initiative**

   PacifiCorp plans to continually evaluate the community outreach plans and improve it

based on feedback from customers, public safety partners, and to align with regulatory requirements.

7.3.9.3 Customer support in emergencies

In reporting outages, PacifiCorp will continue its customer outage management protocols and real-time outage maps to inform customers about the presence and location of outages as well as the estimated restoration plans. While the specifics of the frequency, content, and use of the messaging may change, the overall tools and processes will be the same. Details regarding PacifiCorp's PSPS-specific notifications, tools, messaging, and notifications have been included in Section 8. Additionally, PacifiCorp has the following wildfire emergency-related customer support programs.

Outage reporting — PacifiCorp intends to enhance wildfire mitigation-specific outreach through its customer contact center to provide impacted customers with information regarding service interruptions, restoration efforts, along with relief support by adding to the telephone scripts a high-level overview of customer protections, including directing the caller to the company webpage(s).

Support for low-income customers — PacifiCorp's support for low-income customers program includes the ability to:

- Freeze all standard and high-usage reviews for the CARE program eligibility until the 12-month period has lapsed, or potentially longer.
- Contact all community outreach contractors and community-based organizations who assist in enrolling hard-to-reach low-income customers, to better inform customers of these eligibility changes.
- Partner with program administrators of the customer-funded emergency assistance program for low-income customers and increase the assistance limit amount for affected customers during the following 12-month period.

Billing adjustments — PacifiCorp can adjust billing, including prorating monthly bill to the date of the emergency or subsequent damage to customer premises and recalibrating energy usage estimates when premises are unoccupied because of a disaster.

Deposit waivers — PacifiCorp can waive deposit and late fee requirements for one year from the declared emergency.

Extended payment plans — Affected customers with existing service or those seeking to establish service at a new residence, who have an old bill, are offered a payment plan with 20% due, with equal installments for the remainder for at least 12 billing cycles with no interest.

Suspension of disconnection and nonpayment fees — PacifiCorp may suspend disconnection for nonpayment and associated fees and eliminate reporting to credit reporting agencies or any collection services for unpaid bills.

Repair processing and timing — Immediately after the emergency, the company assesses the premises of affected customers whose utility service had been disrupted or degraded and, if applicable, the meter is removed.

Access to utility representatives — PacifiCorp will directly contact customers with damaged facilities after the meter is removed from the damaged property and will expedite any work required to reinstate electrical service. Additionally, PacifiCorp will closely coordinate with local agencies to facilitate any permitting requirements and ensure work is completed as quickly as practical.

Community support centers — PacifiCorp has logistical support for deployment of community support centers, if necessary, during a PSPS event. Community support centers will be established upon recommendation of the Unified Command. The center(s) will be open from 8 a.m. to 8 p.m. with the potential to stay open longer based on community needs. The community support center tent (if needed) is approximately 33 feet × 18 feet and can sustain winds of 55 mph gusting to 65 mph. PacifiCorp personnel will staff the center(s) to assist and provide information to community members of Siskiyou County. A community support center location is established within each PDZ and will provide the ability for the community to have specific needs met.

Services provided include:

- Shelter from environment
- Air conditioning
- Potable water
- Seating and tables
- Restroom facilities
- Refrigeration for medicine and/or baby needs
- Interior and area lighting
- On-site security
- Communications capability such as Wi-fi access, SatPhone, radio, cellular phone etc.
- Televisions
- On-site medical support (EMT-A at a minimum, Paramedic preferred)
- Charging stations for Cell Phones, AM/FM/Weather radios, computers, etc.
- Ice

Locations of CRCs include:

- Happy Camp PDZ – Happy Camp Community Center
- Shasta PDZ - Mt Shasta Community Center
- Weed and Snowbrush PDZ- Weed Community Center
- Dunsmir PDZ - Dunsmuir Community Center

1. **Risk to be mitigated / problem to be addressed**

   During emergencies, such as wildfires, customers could need additional support.

2. **Initiative selection**

   It is a PacifiCorp priority to provide reliable, safe power to its customers, and customer satisfaction is important to maintaining the business. Therefore, PacifiCorp sees the importance of an initiative, such as this one, where the company provides support to customers. For the OEIS definition of this customer support initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   PacifiCorp emergency planning programs cover all California service territory except for the community support centers, which are centrally located in the HFTD.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp has also implemented a variety of consumer protections and procedures to assist customers when a disaster impacts their communities, consistent with CPUC Rule D.18-03-011. These protections are in addition to routine customer service protections as provided in communicating outages and restoration time estimates as are supported through the company's web portal and customer service organization. Program and protection responses and their duration are determined based on the type, scale, and size of the event of the disaster. Some disasters will warrant greater relief than others. In the case of a larger, vast and far-reaching disaster, it may be reasonable to provide greater relief for a longer duration.

5. **Future improvements to initiative**

   At this time, PacifiCorp does not have plans to improve this initiative, however the company is constantly gathering customer feedback and will take lessons learned from experiences and integrate them into future programs and plans.

7.3.9.4 Disaster and emergency preparedness plan

Pacific Power actively monitors real-time weather conditions and tries to provide customers with additional notifications if de-energization is likely. When real-time observations and weather forecasts indicate that the three triggers for "de-

energization watch" have been evaluated, and the Wildfire Risk Index is elevated, a de-energization watch protocol is initiated. The protocol includes activation of an Emergency Coordination Center (ECC), communication with local public safety partners, and implementation of additional monitoring activities.

The ECC is staffed by specialized staff who assemble during de-energization warning and implementation to provide critical operations support through the collection and analysis of data. The ECC makes decisions to maintain the safety and reliability of the transmission and distribution system and helps facilitate cross-organization incident coordination. The ECC is led by an ECC Director and has the support of a safety officer, a joint information team, emergency management, meteorology and operational stakeholders representing field operations, system operations, vegetation management, engineering, and other specialties.

When the ECC is activated, PacifiCorp emergency management gathers input from public safety partners to properly characterize and consider impacts to local communities and send notifications to the operators of pre-identified critical facilities, partner utilities, and adjacent local public safety partners. The PacifiCorp customer service team then coordinates through the ECC to confirm customer lists for the area to develop a communication plan for those customers potentially impacted.

Local patrol and inspection of lines during a PSPS watch can include a variety of methods depending on the accessibility of locations, the reliability of the line, area conditions and other factors. The ECC reviews these factors to determine necessary tasks such as the deployment of crews or remote monitoring by system operations.

Because of the public desire for reliable electric service, together with public safety concerns associated with de-energization, a PSPS is a measure of last resort. Nonetheless, consistent with existing regulations and the general mandate to operate the electrical system safely, the ECC has discretion to determine when a PSPS is appropriate.

The ECC Director considers all available information, including real-time feedback and input from other ECC participants and field operations to determine whether PSPS should be executed. Additionally, the ECC Director may decide to further refine the PSPS areas described above. As a matter of practical reality, the ECC Director cannot know whether a PSPS will prevent a utility-related ignition. If a PSPS is not implemented and an ignition occurs, the ignition itself is not proof that a PSPS should have been implemented. Likewise, if a PSPS is implemented, the event itself does not prove that an ignition that would have otherwise occurred was prevented.

1. **Risk to be mitigated / problem to be addressed**

When there's a potential for wildfire, it is important to be prepared to respond in an organized and quick manner.

2. **Initiative selection**

   This initiative describes how PacifiCorp prepares for a wildfire emergency. For the OEIS definition of this disaster preparedness initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   PacifiCorp has de-energization plans prepared for the areas of the highest risk, designated as the PDZ, however an ECC can be activated in any part of the service territory.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   In 2021, PacifiCorp began to host Practice ECC rounds to improve response times. This year, PacifiCorp plans to continue the Practice ECC, as well as include some important lessons learned from 2021 related to tracking and reporting.

5. **Future improvements to initiative**

   As PacifiCorp gains more experience with the ECC protocols, the program will evolve.

7.3.9.5 Preparedness and planning for service restoration

1. **Risk to be mitigated / problem to be addressed**

   Service restoration after a PSPS poses additional risk as compared to standard service restoration. Extreme fire weather can cause damage to infrastructure during the PSPS event itself while lines are de-energized. Therefore, additional patrols may be required during restoration to mitigate incremental ignition risk that this potential damage can have during re-energization.

2. **Initiative selection**

   This initiative is foundational to PSPS efforts and is not directly connected to risk drivers or other metrics. For the OEIS definition of this service restoration preparedness initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   PacifiCorp has prepared plans for service restoration in the PSPS zones, to expedite the steps for service restoration.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

PacifiCorp does not have targets related to the initiative other than to implement the PSPS plans which have already been developed.

5. **Future improvements to initiative**

PacifiCorp plans to continue to review other utilities plans with more de-energization experience for improvements.

7.3.9.6 Protocols in place to learn from wildfire events

Effective response to any event is determined by the ability to implement a controlled incident command structure and to take responsibility for restoration and recovery activities. It is critical that responsible individuals within the incident command system are familiar with their responsibilities and have practice performing those responsibilities. Individuals identified with primary or secondary responsibility within the command center structure complete an annual review of the overall disaster response and recovery plan. These individuals are required to contribute to post-crisis and emergency reporting, outlining any issues or concerns regarding their role and responsibilities.

1. **Risk to be mitigated / problem to be addressed**

Wildfire events are fast-moving, high-stakes emergency circumstances that PacifiCorp and its personnel are not called upon to manage on a day-to-day basis. Without established methods to learn from wildfire events, the company and its staff are at a greater risk of missteps based on the need to make quick decisions without routine experience. For the OEIS definition of this wildfire event learning protocol initiative, see Section 9.1 starting on page 278~~244~~.

2. **Initiative selection**

PacifiCorp leverages existing systems and processes included in the company's Emergency Response Plan to learn from wildfire events in the same way it learns from any emergency event. Therefore, PacifiCorp does not have a specific program for incorporation of lessons learned that is not already covered in an existing program or through ongoing process improvement.

That said, PacifiCorp evaluates exercises and actual response incidents by identifying issues raised during the exercise or incident and documenting lessons learned and corrective action plans. Multiple methods are used to gather exercise and post-action reviews, including participant and observer evaluation forms, remedial action tracking, and post-exercise or after-incident reviews. Lessons learned may be implemented for inclusion in PacifiCorp's response and restoration procedures and incorporated in the emergency response plans.

3. **Region prioritization**

   There is no region prioritization for this initiative. Incorporation of lessons learned may be prioritized in high-risk areas, such as PSPS zones where appropriate.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   The incident command system is activated periodically throughout the year in the normal course of operations. Additionally, an annual exercise is conducted to ensure that individuals otherwise not involved in incident management on a regular basis are practiced in responding.

5. **Future improvements to initiative**

   PacifiCorp has a goal of continuous incident management improvement.

7.3.10 Stakeholder cooperation and community engagement

7.3.10.1 Community engagement

PacifiCorp provides wildfire safety and preparedness and PSPS public outreach and education through a variety of channels. Some communication efforts target the company's entire customer base, while other communications target communities in the HFTD with some overlap into non-HFTD locations depending on media market and distribution channel. PacifiCorp maintains a flexible, dynamic education and awareness strategy that is informed by customer survey data, community stakeholder input, and community needs. Overall, PacifiCorp's outreach includes information that can be heard, watched, and read in a variety of ways with the goal of accessibility and understandability.

1. **Risk to be mitigated / problem to be addressed**

   This initiative seeks to reduce the impact to the customer who may experience a de-energization.

2. **Initiative selection**

   As a component and last resort of wildfire mitigation, PacifiCorp may de-energize lines, which will always impact customers. PacifiCorp seeks to reduce the impact due to this loss of power by providing wildfire preparedness education to its customer. For the OEIS definition of this community engagement initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

Advertisements related to PSPS preparedness are run in the HFTD. However, additional community outreach programs, which include a webinar and various other videos, are available across the company's service territory.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   For 2022, PacifiCorp plans to update its survey to include an evaluation of PSPS impact reduction programs. For the past several years, the company has deployed some form of paid media campaign to raise awareness and action on wildfire safety. The company plans to expand this effort in 2022 as part of the broader community engagement strategy. The company will deploy radio, newspaper, digital, and social media ads, as a minimum, to promote wildfire safety and preparedness.

5. **Future improvements to initiative**

   PacifiCorp plans to continually evaluate the communication plan and improve it based on feedback from customers and public safety partners as pictured in Figure 7.10~~Figure 7.8~~.

Figure 7.10~~810~~ Communications feedback loop

7.3.10.2 Cooperation and best practice sharing with agencies outside California

1. **Risk to be mitigated**

   Industry collaboration is another component of PacifiCorp's Wildfire Protection Plan. Through active participation in workshops, international and national forums, consortiums, and advisory boards, PacifiCorp maintains an understanding of existing best practices and collaborates with industry experts regarding new technologies and research.

2. **Initiative selection**

Through our lessons learned we have been able to develop processes and procedures that are being adopted in other states and countries in coordination with other agencies and jurisdictions. Some key industry collaboration channels are shown in Figure 7.11~~Figure 7.9~~. For the OEIS definition of this cooperation-related initiative, see Section 9.1 starting on page 278~~244~~.

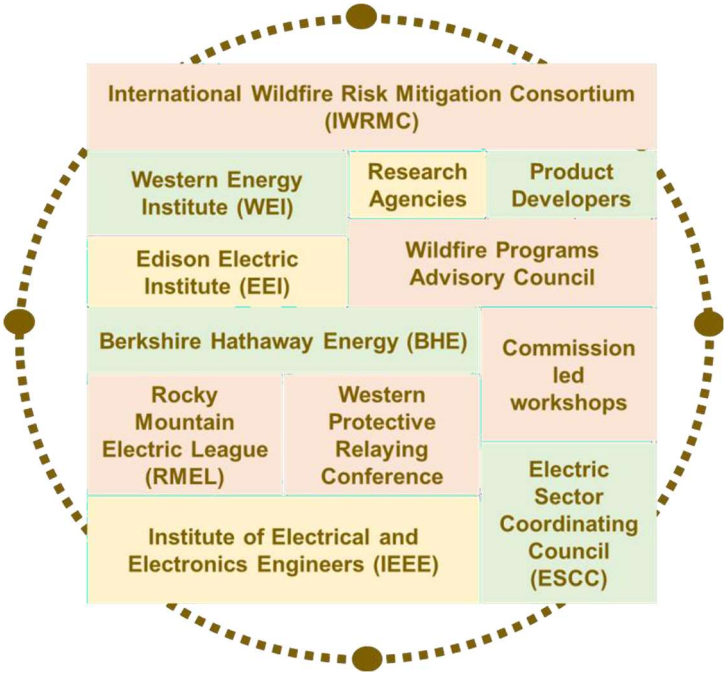
3. **Region prioritization**

PacifiCorp has used lessons learned and best practices to expand the PSPS process into other parts of our service territory such as areas deemed a high fire threat in Oregon, Washington and Utah.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

Pacific Power is an active member of the International Wildfire Risk Mitigation Consortium, an industry-sponsored collaborative that shares wildfire risk mitigation insights and discoveries of innovative, unique utility wildfire practices from across the globe. This consortium, with working groups focused in the areas of asset management, operations and protocols, risk management, and vegetation management, supports working and networking channels between members of the global utility community to support the ongoing sharing of data, information, technology, and practices.

Additionally, PacifiCorp plays leadership and support roles through other organizations such as the Edison Electric Institute, the Electric Sector Coordinating Council, and the Institute of Electrical and Electronics Engineers (IEEE). Within the western United States,



PacifiCorp also engages with the Western Energy Institute and the Rocky Mountain Electric League as well as the Western Protective Relaying Conference.

Figure 7.11~~9~~11 Key industry collaboration channels

Furthermore, PacifiCorp partners with certain research and response agencies to develop and test new technologies, such as existing efforts with the with the Oregon Department of Forestry to install wildfire cameras on utility infrastructure in key, high-risk locations. Additionally, PacifiCorp is working with Texas A&M University on a DFA pilot (see Section 4.4.1.1 on page 48).

Through these various engagement channels, PacifiCorp maintains industry networks, understands the evolution of technologies, discovers broader applications for such advancements, freely shares data to enable scientists and academics, collaborates with developers to push the boundaries of existing capabilities, and expands its research network through support of advisory boards or grant funding.

5. **Future improvements to initiative**

PacifiCorp's ethos of continuous improvement guides the company to always seek and incorporate lessons learned, and as new opportunities arise, PacifiCorp will evaluate them for incorporation into this initiative.

7.3.10.3 Cooperation with suppression agencies

PacifiCorp's emergency management team maintains relationships with federal and state emergency responders and mutual assistance groups. The company's emergency manager has contact information for state, county and tribal emergency managers, the state's Emergency Operations Center Emergency Support Functions (ESF) personnel, and the Geographic Area Coordination Centers for fire-related emergency response. District operations managers also maintain relationships with local first responders. If an incident like a wildland fire occurs and emergency operations are established, a district manager or an identified company representative will deploy when needed or requested to the jurisdictional agency's Incident Command Post (ICP) to provide necessary electric utility support and coordination.

Throughout the year, PacifiCorp also participates in regulatory proceedings, town hall meetings, and open-house events to engage other industry leaders, community leaders and members, and local emergency response management organizations. These events focus on a range of aspects of PacifiCorp's wildfire emergency planning and preparedness programs, including communication protocols, notification protocols, and resource coordination efforts.

1. **Risk to be mitigated / problem to be addressed**

   Suppression agencies may require the support of electric utility personnel to support wildfire suppression efforts.

2. **Initiative selection**

   This initiative has the potential to reduce the spread of wildfire. For the OEIS definition of this patrol inspection initiative, see Section 9.1 starting on page 278~~244~~.

3. **Region prioritization**

   There is no region prioritization for this initiative.

4. **Progress on initiative since the last WMP submissionand plans, targets, and/or goals for the current year**

   PacifiCorp plans to maintain the relationship with suppression agencies in 2022.

5. **Future improvements to initiative**

   The company will continue to maintain the current initiative and update plans based on lessons learned, learnings from other utility plans and regulation changes.

7.3.10.4 Forest service and fuel reduction cooperation and joint road map

1. ~~Refer~~Risk to ~~Section 7.3.5.2, page 186 Detailed Inspections and~~ be mitigated

   Vegetation management ~~practices for~~ activities may result in impacts on communities or the environment where work is conducted. Impacts may be expressed in both the planning and implementation phases of the work. Implementation of vegetation ~~clearances around distribution electrical~~management activities may require obtaining approvals from authorizing agencies at the local, state and federal levels, and from stakeholders including concerned customers or the communities affected that may result in inefficiencies or delays.

2. **Initiative selection**

   Coordination with authorizing agencies and customers is a critical component to successful delivery of a compliant vegetation management program. PacifiCorp strives to conduct vegetation management actions while maintaining environmental compliance and customer relations. PacifiCorp wants customers and authorizing agencies to be informed of its vegetation management program. For the OEIS definition of this community and environmental impact initiative, see Section 9.1 starting on page 278~~244~~.

3. Region prioritization

Implementation of initiatives described above, including the process to notify communities of vegetation management activity, takes place where work is planned and is focused in areas where significant vegetation management work is needed (e.g., efforts to remove fire-impacted trees/hazard trees). Notification and coordination are focused with customers and organizations that have previously requested advanced notice and increased coordination.

To manage environmental compliance PacifiCorp prioritizes environmental reviews and agency coordination based on project schedule considering time required for agency review and permitting. Projects are reviewed and packaged where feasible to streamline review and coordination with authorizing agencies.

4. Progress on initiative

PacifiCorp collaborates with CalFire, local logging companies and forest service agencies on fire breaks/fuels reduction and safety projects as opportunities arise. In the past, this collaboration included:

- Cal Fire – In the Lake Shastina community, PacifiCorp participated in a joint fuel reduction project with Cal Fire. While CalFire was clearing 100' from roads to allow for emergency vehicle access, PacifiCorp collaborated to concurrently clear vegetation along transmission lines.

- Shasta Trinity USFS – In 2021 while the US Forest Service was completing a large scale fuel reduction project along Hwy 89, PacifiCorp joined the efforts and removed many large trees along Line 2. Additionally, this project also involved Cal Trans; who provided the flagging for the operations.

- Dunsmuir Fire Safe Council – During a city of Dunsmuir fuel reduction project along the I-5 corridor, PacifiCorp had facilities in the area and provided crew support to remove vegetation within the project area.

- Logging Companies – As logging companies work near PacifiCorp facilities, the Company provides fuel reduction support. For example, for a logging project adjacent to line ~~and equipment~~2 and line 14, PacifiCorp provided mowing services along the right of way to connect their project on either side of the transmission lines.

These types of collaborative efforts are often at the request of community groups or as concurrent work is identified within the year. PacifiCorp does not have a specific plan or overarching joint roadmap to drive cooperative work with other groups but, instead relies on existing partnerships and working relations to identify opportunities as they arise through coordinating with these groups while implementing the

vegetation management program.

5. Future improvements to initiative

Cooperation with agencies for fuel reduction projects has been successful and PacifiCorp will continue to engage with other land managing agencies within its service territory in the future.

In 2022, PacifiCorp plans to continue cooperation with the aforementioned organizations and any other organizations that may have aligned objectives.

8

PUBLIC SAFETY POWER SHUTOFFS (PSPS)

8 PUBLIC SAFETY POWER SHUTOFFS (PSPS)

8.1 DIRECTIONAL VISION FOR NECESSITY OF PSPS

Describe any lessons learned from PSPS since the last WMP submission and describe expectations for how the utility's PSPS program will evolve over the coming 1, 3, and 10 years. Be specific by including a description of the utility's protocols and thresholds for PSPS implementation. Include a quantitative description of the projected evolution over time of the circuits and numbers of customers that the utility expects will be impacted by any necessary PSPS events. The description of protocols must be sufficiently detailed and clear to enable a skilled operator to follow the same protocols.

When calculating anticipated PSPS, consider recent weather extremes, including peak weather conditions over the past 10 years as well as recent weather years, and how the utility's current PSPS protocols would have been applied to those years.

Instructions for Table 8-.1-1:

Rank order, from highest (1 – greatest anticipated change in reliability or impact on ignition probability or estimated wildfire consequence. over the next 10 years) to lowest (9 - minimal change or impact, next 10 years), the characteristics of PSPS events (e.g., numbers of customers affected, frequency, scope, and duration), regardless of if the change is an increase or a decrease. To the right of the ranked magnitude of impact, indicate whether the impact would be a significant increase in reliability, a moderate increase in reliability, limited or no impact, a moderate decrease in reliability, or a significant decrease in reliability. For each characteristic, include comments describing the expected change and expected impact, using quantitative estimates wherever possible.

Lessons Learned

PacifiCorp's experience with implementing PSPS remains relatively low, with two PSPS events and one PSPS Watch implemented since 2019. Despite limited experience, PacifiCorp is committed to learning from ~~the~~these events and incorporating any changes or improvements needed. Lessons learned from the 2021 PSPS experience, which can be found in PacifiCorp's PSPS Post Event Report[30] filed on March 1, 2022~~, include the need to have~~ included three lessons learned.

The first lesson focused on a more streamlined process to produce GIS mapping data ~~for others,~~. Real time production of GIS mapping data was more challenging to produce and distribute than anticipated. The Public Safety Partner Portal is the identified resolution to

[30] PacifiCorp's 2021 Post-Season Public Safety Power Shut-Off Report was submitted consistent with Decisions (D.) 21-06-034 and 20-03-004. Decision Adopting Phase 3 Updated and Additional guidelines and Rules for Public Safety Power Shutoffs (Proactive De-energizations) of Electric Facilities to mitigation Wildfire Risk Caused by Utility Infrastructure.

address GIS mapping data streamlining. The second lesson learned focused on the need for better CRC communication ~~and~~to customers. CRC information is being included in messaging to customers and external media sources. The third lesson learned was the need for better notification records. Confirmation of notifications was delayed and inconsistent. There are three actions related to this lesson, including standing up external notification system technical support, increased education for call center personnel and quicker verification of notifications.

From these lessons learned, PacifiCorp has developed next steps and plans to implement a Public Safety Partner portal, have additional messaging to customers during events about CRCs and implement several new notification improvement steps in 2022.

Evolution over 1, 3, and 10 years

It is the intention of the WMP initiatives to reduce the probability of using a PSPS over the coming years.

The culmination of initiatives should result in more granular situational awareness within a hardened system, which would provide better insights as to when (if at all) a PSPS might be used and how to minimize customer impacts. PacifiCorp continues to believe that the implementation of grid hardening initiatives such as the Line Rebuild program (covered conductor) should reduce the ignition risk associated with risk drivers, such as contact by object, and thus raise the thresholds for initiating a PSPS event. The exact impact to preliminary thresholds for a PSPS watch is still being evaluated; PacifiCorp has not adjusted thresholds at this time. Improvements to weather forecasting, in conjunction with implemented initiatives, such as increased asset inspections, more timely corrections and increased vegetation management, may also make the system more resilient against extreme weather events, such as those associated with climate change.

The PacifiCorp meteorology department generates situational awareness reports on a daily basis, to aid in decision-making during periods of elevated risk, including in support of PSPS assessment and activation. These reports identify where fuels (dead and live vegetation) are critically dry, where and when critical fire weather conditions are expected (gusty winds and low humidity), and where and when the weather is forecast to negatively impact system performance and reliability. It is the intersection of these three triggers that result in the potential for a PSPS event.

PacifiCorp continues to develop a fully mature aggregate index to assess risk, similar to the FPI used by other utilities. It is PacifiCorp's intent to procure modeling tools and begin using an index by 2023, through the Situational Awareness initiative described in Section 7.3.2.4 on page 166~~156~~ to assess risk and PSPS decision-making. PacifiCorp expects that this will be an iterative process as new information, methods and industry best practices are incorporated. Additionally, Pacific Power expects to potentially refine this methodology as the company finds a balance between adequately warning the public of a potential PSPS

event versus raising a false alarm too frequently or over-use of PSPS as a tool.

Over the next three to 10 years, PacifiCorp will evolve its index, in collaboration with other utilities to reduce the scale, scope and impact of PSPS events.

Table 8.1 Anticipated characteristics of PSPS use over next 10 years (WMP Table 8.1-1)

Rank order 1-9	PSPS characteristic	Significantly increase; increase;no change; decrease. significantly decrease	Comments
5	Number of customers affected by PSPS events (total)	Decrease	Completing mitigation efforts removes exposed segments of circuits and helps protect customers served by those segments from PSPS risk.
6	Number of customers affected by PSPS events (normalized by fire weather, e.g., RFW line mile days)	Decrease	Completing efforts removes exposed circuit segments and helps protect customers served by those segments from PSPS risk.
3	Frequency of PSPS events in number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability (total)	Decrease	Grid configurations and communication technologies are being introduced, which give the company more ability to remotely reconfigure the network's system protection; this removes risk and reduces the need for PSPS operations.
4	Frequency of PSPS events in number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability (normalized by fire weather,e.g., Red Flag Warning line mile days)	Decrease	Grid configurations and communication technologies are being introduced, which give the company more ability to remotely reconfigure the network's system protection; this removes risk and reduces the need for PSPS operations.
1	Scope of PSPS events in circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization (total)	Significantly decrease	As the company builds out its weather network, enhances its LRAM modeling and completes asset hardening projects the scope of events will reduce.
2	Scope of PSPS events in circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization (normalized by fire weather, e.g., Red Flag Warning line mile days)	Significantly decrease	As the company builds out its weather network, enhances its LRAM modeling and completes asset hardening projects the scope of events will reduce.
7	Duration of PSPS events in customer hours (total)	Decrease	The addition of more network modularization, including advancement of grid technologies, will reduce the duration of PSPS events.
8	Duration of PSPS events in customer hours (normalized by fire weather, e.g., Red Flag Warning line mile days)	Decrease	The addition of more network modularization, including advancement of grid technologies, will reduce the duration of PSPS events.
	Other (Describe) – Rank as 9 and leave other columns blank if no other characteristics associated with PSPS		

8.2 PROTOCOLS ON PUBLIC SAFETY POWER SHUTOFF

Describe protocols on Public Safety Power Shutoff (PSPS or de-energization), highlighting changes since the previous WMP submission:

1. *Method used to evaluate the potential consequences of PSPS and wildfires. Specifically, the utility is required to discuss how the relative consequences of PSPS and wildfires are compared and evaluated. Inaddition, the utility must report the wildfire risk thresholds and decision-making process that determine the need for a PSPS.*
2. *Strategy to minimize public safety risk during high wildfire risk conditions and details ofthe considerations, including but not limited to a list and description of community assistance locations and services provided during a de-energization event.*
3. *Outline of tactical and strategic decision-making protocol for initiating a PSPS/de-energization (e.g., decision tree).*
4. *Strategy to provide for safe and effective re-energization of any area that is de-energized due to PSPS protocol.*
5. *Company standards relative to customer communications, including consideration for the need to notify priority essential services – critical first responders, public safety partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water utilities/agencies. This section, or an appendix to this section, must include a complete listing of which entities the electrical corporation considers to be priority essential services. This section must also include a description of strategy and protocols to ensure timely notifications to customers, including access and functional needs populations, in the languages prevalent within the utility's service territory.*
6. *Protocols for mitigating the public safety impacts of these protocols, including impactson first responders, health care facilities, operators of telecommunications infrastructure, and water utilities/agencies.*

1. Method Used to Evaluate PSPS Consequences

PacifiCorp evaluates the weather-related outage risk and wildfire risk across its service territory every day using a combination of recently deployed weather and wildfire models, LRAM/HRRR, publicly available information from the National Weather Service and Geographic Area Coordination Center, and in-house subject matter experts. It is the intersection of these two risks that can result in a PSPS.

To assess the risk for wind-related outages, PacifiCorp correlated five years of historical High Resolution Rapid Refresh (HRRR) model forecasts to outage occurrence over that same period to generate circuit-level fragility curves. These results are used by PacifiCorp to convert the daily wind forecasts from NOAA's HRRR model to wind gust percentiles and expected outage rates. This allows PacifiCorp to

identify circuits at higher risk of wind-related outages up to 48 hours in advance. PacifiCorp is currently working to implement a more robust version of this tool using its 96-hour WRF model (operational) and the 30-year WRF reanalysis (in progress).

PacifiCorp currently relies on its internal meteorologists as well as publicly available observations and forecasts from the GACC to assess local and regional wildfire risk. This assessment considers fire weather conditions, National Fire Danger Rating System (NFDRS) outputs, and fire weather indices such as the Hot-Dry-Windy Index as forecast by PacifiCorp's WRF. PacifiCorp also considers fire weather and fire potential forecasts from the GACC and NWS. Going forward, PacifiCorp is on track to deploy Technosylva's Wildfire Analyst Enterprise by August of 2022. This tool will become an important component of the company's wildfire risk assessment by providing detailed circuit level ignition and wildfire consequence forecasts.

2. Strategy to Minimize Public Safety Risk

PacifiCorp has a working relationship with state, county and local agencies which are available to support any response. Through these well-established partnerships, accurate situational awareness, and response capabilities, PacifiCorp is able to safely execute PSPS actions. Using an approach which provides regular and ongoing updates while maintaining a common operating picture across all response agencies.

PacifiCorp works with local emergency managers, public safety partners, and tribal leadership to identify appropriate deployment locations for Community Resource Centers (CRCs). In general, PacifiCorp has identified at least 3 CRC locations per county and at least one CRC per PSPS zone, where most CRC locations are within 10-20 miles of PSPS zones. Additionally, PacifiCorp contracts with private vendors to support the deployment of temporary CRCs in the event that fixed facilities are not a feasible option. The current list of identified CRC locations is below.

General Area	PSPS Zone Name	CRC Identified
Siskiyou County	Mt Shasta PSPS Zone	Mt Shasta Community Center
	Weed / Snowbrush PSPS Zone	Weed Community Center
	Dunsmuir PSPS Zone	Dunsmuir Community Center
	Happy Camp PSPS Zone	Karuk Senior Nutrition Program Happy Camp Wellness Center Kahtishraam Wellness Center
Del Norte County	Cave Junction PSPS Zone	Selma Community Center Cave Junction Senior Center Cave Junction High School

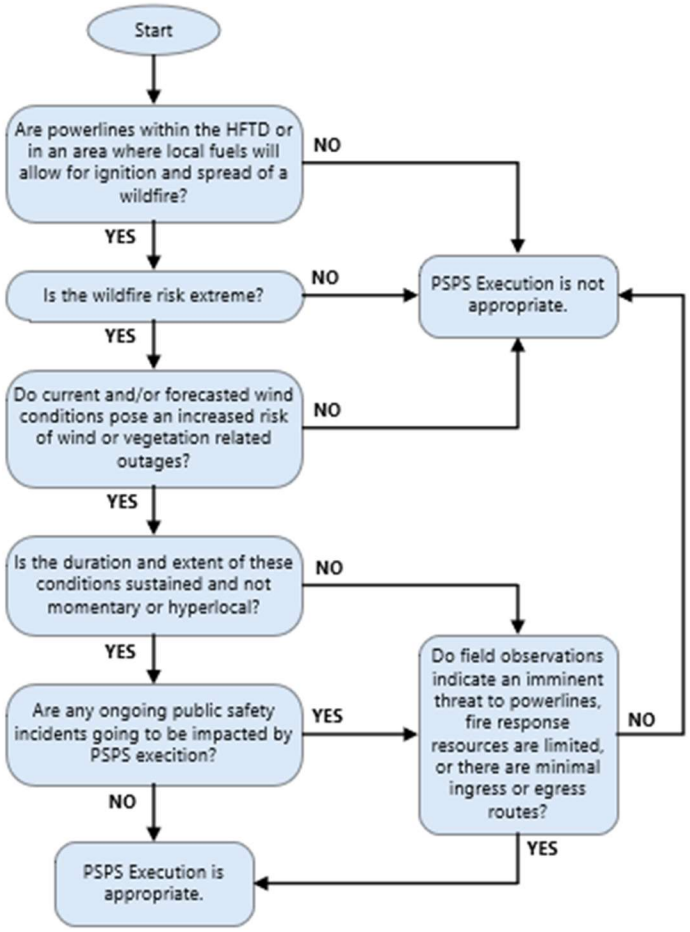
Additionally, PacifiCorp provides (CRCs) to affected areas as needed to support

community needs. CRC capabilities typically include:

- Shelter from environment
- Air conditioning
- Air Purifiers & Air Quality Monitors
- Potable water & Non-perishable snacks
- Seating and tables
- Restroom facilities
- Refrigeration & Heating for medicine and/or baby needs
- Interior and area lighting
- On-site security
- Televisions
- Ice
- Communications capability such as Wi-fi access, SatPhone, Radio, Cellular phone etc.
- On-site medical support
- Charging stations for Cell Phones, AM/FM/Weather radios, computers, etc.
- Small Crates for Pets
- AFN/LEP Population support
- Portable ADA Ramp
- Personal Protective Equipment

3. Outline of Tactical and Strategic Decision-Making Protocols for Initiating PSPS

The decision tree below outlines the tactical and strategic decision-making protocols for initiating PSPS. PacifiCorp considers multiple factors when assessing the conditions that influence the PSPS decision making such as fuels, forecast wind conditions, field observations, and ingress or egress routes. The duration and extension of forecasted weather conditions is also evaluated in this protocol.



4. Strategy to Provide Safe and Effective Re-Energization

PacifiCorp has a working relationship with state, county and local agencies which are available to support any response. Through these well-established partnerships, accurate situational awareness and response capabilities, the Company is able to safely restore power within areas affected by PSPS actions. PacifiCorp uses a liaison officer approach which provides regular and ongoing updates to emergency management agency partners. This approach maintains a common operating picture across all response agencies and provides the greatest opportunity for safe power restoration while also considering any variables to be mitigated or just in time adjustments to plans to be completed directly from the Emergency Coordination Center. PacifiCorp maintains the ability to deploy emergency management staff to local Emergency Operation Centers at the request of the local or state entity.

5. Company Communication Standards

PacifiCorp uses a common language that integrates the notification and

communication protocols developed for California Statewide Alert and Warning Guidelines.

To meet this requirement, the messages address: (1) Who is the source of the warning? (2) What is the threat? (3) Does this affect my location? (4) What should I do? and (5) How long is this event expected to last?

Communications direct customers to education and outreach materials shared by the company before each wildfire season.

PacifiCorp notifies customers and delivers clear and understandable information; communications are available in different languages (English, Spanish, Chinese traditional, Chinese simplified, German, Hmong, Mixteco, Vietnamese and Tagalog) and use multiple modes/channels to reach different AFN populations.

PacifiCorp communicates the possibility of a de-energization event, the estimated start date and time, the estimated duration of the event, and the estimated time to restore power in warning notifications. These notifications coincide with the timelines outlined in ~~Table 8.2~~ and identify when customers can expect additional information as the event progresses..

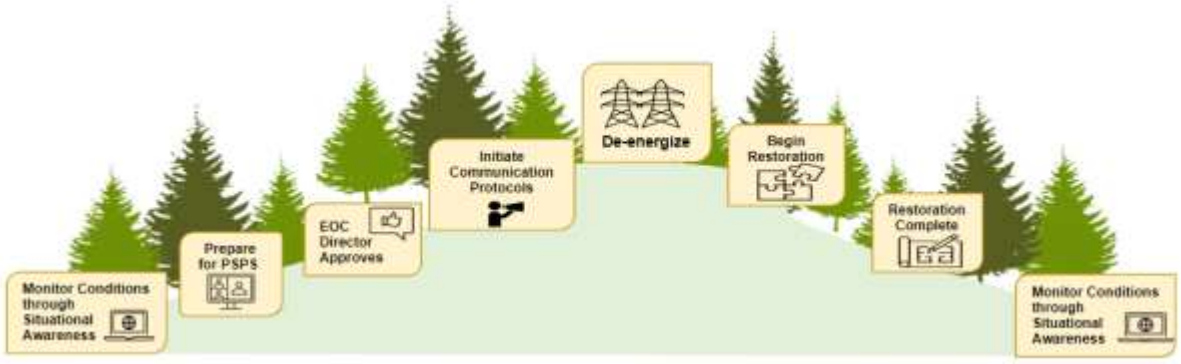
Keeping in mind that weather related events are extremely dynamic and weather forecasting can be challenging, the timelines in ~~Table 8.2~~ may be reduced if changing conditions do not allow for such advance notification. This dynamic nature and potential deviation from the timeline is recognized in D.19-05-042. In these instances, the company will promptly notify customers and will include a summary of the circumstances warranting deviation from these timelines in the final report.

Throughout the notification process, PacifiCorp performs positive or affirmative communication with Medical Baseline Customers through special procedures and methods, such as personal phone notification instead of automatic calls, in-person notification at the service location in the event contact cannot be confirmed and tracked verification of contact with these customers.

Table 8.2 Notification timeline

72 Hours	De-Energization Watch with Initial Public Safety Partner Notification
48 Hours	De-energization Watch or Warning with Initial Public Notification
24 Hours	De-energization Warning
2 Hours	De-energization Imminent
1 Hour	De-energization Imminent
Event Begins	De-energization Begins
Re-energization Begins	Re-energization Begins
Re-energization Completed	Re-energization Completed
Cancellation of Event	De-energization Event Canceled

5. Protocols for Mitigating Public Safety Impacts of these Protocols



PacifiCorp's general process for a PSPS is described in Figure 8.1~~Figure 8.1~~:

PacifiCorp PSPS protocols

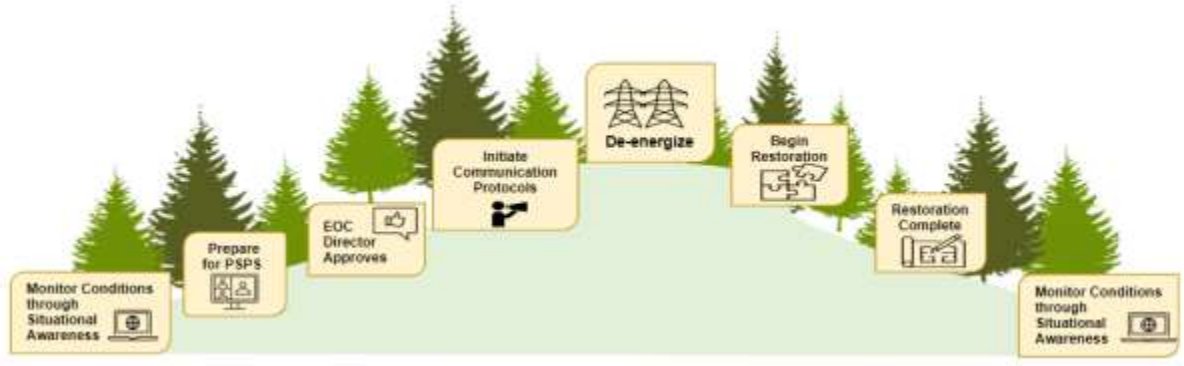


Figure 8.1 PSPS process

PacifiCorp uses an internal escalation process to ensure that it addresses fire risk mitigation at the same time it works to limit community impacts from potential de-energization. To ensure the best possible service for customers, PacifiCorp is establishing "internal watches" during which the company performs the following tasks:

- Activates the Emergency Coordination Center (ECC)
- Conducts pre-~~risk period~~event patrols
- ~~Interrogates relays to identify any recent events~~
- Alters system protection ~~control~~ settings, if applicable
- Develops granular forecasts for periods of concurrent elevated risk

- Prepositions line and vegetation personnel to monitor key locations
- Notifies public safety partners of elevated concern and the company's mitigation efforts
- Actively monitors the network during the watch period
- Notify and coordinate with all appropriate critical infrastructure and public safety partners for plan development, response actions and mitigation strategies.
- Upon an all-clear notice ~~restores system settings and shut down,~~ the ECC shuts down.

~~PacifiCorp PSPS protocols~~

Currently, situational awareness reports are used throughout the elevated risk process to inform decision making. Reports include fuel information and where weather conditions have the potential of ignition. When PacifiCorp ~~procures~~ completes procurement and implementation of the Technosylva ~~as~~suite of tools described in section 7.3.2.4, ~~it~~these tools will be used to support the evaluation of potential consequences of PSPS and wildfires. It is anticipated that this will be an iterative process, where PacifiCorp seeks to balance wildfire safety and customer reliability.

When a PSPS is imminent, PacifiCorp utilizes a contracted vendor to support the rapid deployment of Community Resource Centers in the community. PacifiCorp is prepared to set up CRCs as per section ~~7.3.9.3~~7.3.9.3 page 242~~219~~, where the CRC locations and services are provided.

In Section 7.3.9.4 page 244~~222~~, PacifiCorp has described the PSPS/de-energization protocols.

In Section 7.3.9.5 page 246~~224~~, PacifiCorp has described the re-energization protocols.

~~PacifiCorp uses a common language that integrates the notification and communication protocols developed for California Statewide Alert and Warning Guidelines.~~

~~To meet this requirement, the messages address: (1) Who is the source of the warning? (2) What is the threat? (3) Does this affect my location? (4) What should I do? and (5) How long is this event expected to last?~~

~~Communications point customers toward education and outreach materials shared by the company before each wildfire season.~~

~~PacifiCorp notifies customers and delivers clear and understandable information, communicates to customers in different languages (English, Spanish, Chinese, and Tagalog) and uses multiple modes/channels of communication in a way that addresses different AFN populations.~~

~~PacifiCorp communicates the possibility of a de-energization event, the estimated start date and time, the estimated duration of the event, and the estimated time to restore power in warning notifications. These warnings also let customers know when they can expect additional notification and they coincide with the timelines outlined in Table 8.2.~~

~~Timelines~~

~~The timelines in Table 8.2 may be reduced if changing conditions do not allow for advance notification. If that happens, the company will notify customers as soon as possible and will include a summary of the circumstances prohibiting compliance to the regulatory requirements in the final report.~~

~~**Table 8.2 Notification timeline**~~

~~48 Hours~~	~~De-energization Warning~~
~~24 Hours~~	~~De-energization Warning~~
~~2 Hours~~	~~De-energization Imminent~~
~~1 Hour~~	~~De-energization Imminent~~
~~Event Begins~~	~~De-energization Begins~~
~~Re-energization Begins~~	~~Re-energization Begins~~
~~Re-energization Completed~~	~~Re-energization Completed~~
~~Cancellation of Event~~	~~De-energization Event Canceled~~

8.3 PROJECTED CHANGES TO PSPS IMPACT

Describe utility-wide plan to reduce scale, scope and frequency of PSPS for each of the following time periods, highlighting changes since the prior WMP report and including key program targets used to track progress over time,

1. *By June 1 of current year*
2. *By September 1 of current year*
3. *By next WMP submission*

Reducing the impact of PSPS is a significant goal of PacifiCorp's WMP and PacifiCorp perceives the best way to reduce PSPS impacts is to reduce the number, geographic scope, and duration of PSPS events. While recognizing the general application of all mitigation initiatives to help reduce the impact of PSPS, PacifiCorp also acknowledges that certain initiatives are more directly tied to the PSPS Program.

Above all, improved situational awareness reflects a category of initiatives closely related to the

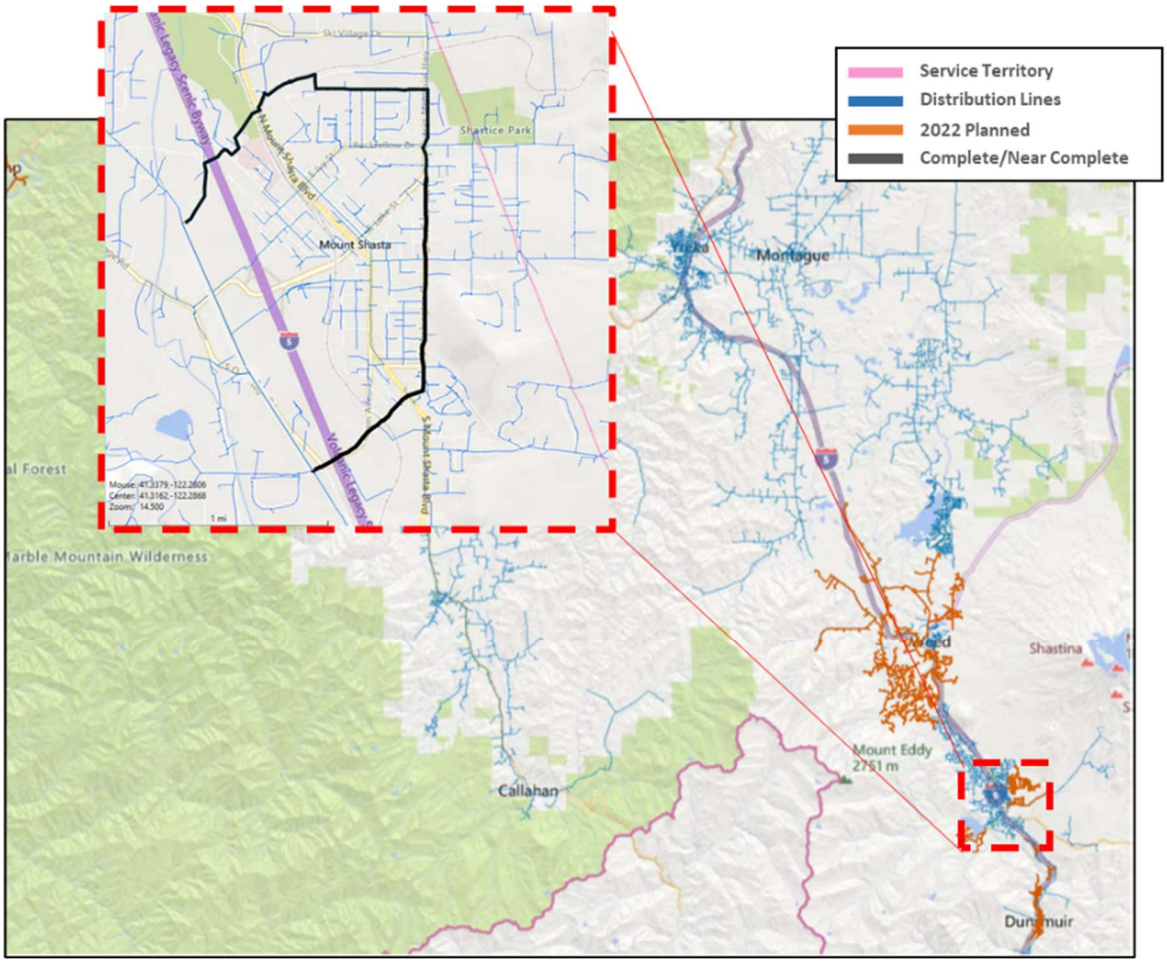
PSPS decision-making process. Like other utilities, PacifiCorp's situational awareness plans include the installation of additional weather stations to access localized weather risk data and inform decision making. Additionally, to better leverage this weather data and other key information, PacifiCorp is investing in range of new data processing and modeling capabilities.

This includes key investment and the development of an operational weather forecast model that leverages fully redundant HPCC capabilities to process and deliver a twice daily 96-hour forecast as described in Section 7.3.2.4 on page 166~~156~~. Furthermore, PacifiCorp is procuring Technosylva's WFE-A modeling suite as described in Section 4.5.1.1 on page 66, including FireCast, to model fire spread risk daily across PacifiCorp's service territory, FireSim to model on demand fires spread potential, and WRRM to quantify asset risk and inform planning.

This additional data and more sophisticated situational awareness model will continue to better inform decision making, which reduces PSPS impacts by (i) reducing the likelihood that a PSPS will be implemented unnecessarily and (ii) facilitating a more surgical application of PSPS, thereby reducing its scope. This effort is further described in Section 7.3.2.4 on page 166~~156~~.

Other initiatives have less direct involvement in the PSPS decision-making process. But those initiatives can still have a dramatic influence on reducing PSPS impacts by reducing the likelihood of PSPS. Many of PacifiCorp's initiatives are specifically geared to reduce wildfire ignition risk with the most notable being covered conductor. PacifiCorp's covered conductor will materially reduce PSPS impacts by (a) making PSPS substantially less likely and (b) helping PacifiCorp surgically reduce the size and areas of impact. Above all, the mechanical properties of a covered conductor design physically prevent the initiation of a flash-over due to vegetation on the line. Notably, while data continues to be gathered to better understand specific relationships, the general correlation between wind, vegetation contacts, and wildfire spread is well-understood. Installing covered conductor will increase the grid's resiliency against wind-driven vegetation contacts, which can lead to devasting wildfire ignitions. High winds are, of course, a critical factor in the assessment of risk and considered in any PSPS decision-making process. The mitigation benefits of covered conductor, especially when combined with other grid hardening efforts implemented as part of a rebuild effort, will significantly decrease PSPS impacts by significantly decreasing the likelihood of a PSPS. If the powerlines can withstand higher wind speeds, it will decrease the occurrence of PSPS events. Covered conductor projects also give PacifiCorp flexibility to take a more surgical approach to PSPS.

As a specific example, PacifiCorp recently completed approximately 3 miles of covered conductor in Mt Shasta as depicted in Figure 8.2~~Figure 8.2~~.


Service Territory
Distribution Lines
2022 Planned
Complete/Near Complete
Mount Shasta
Shastina
Mount Eddy
2751 m
Callahan
Dunsmuir

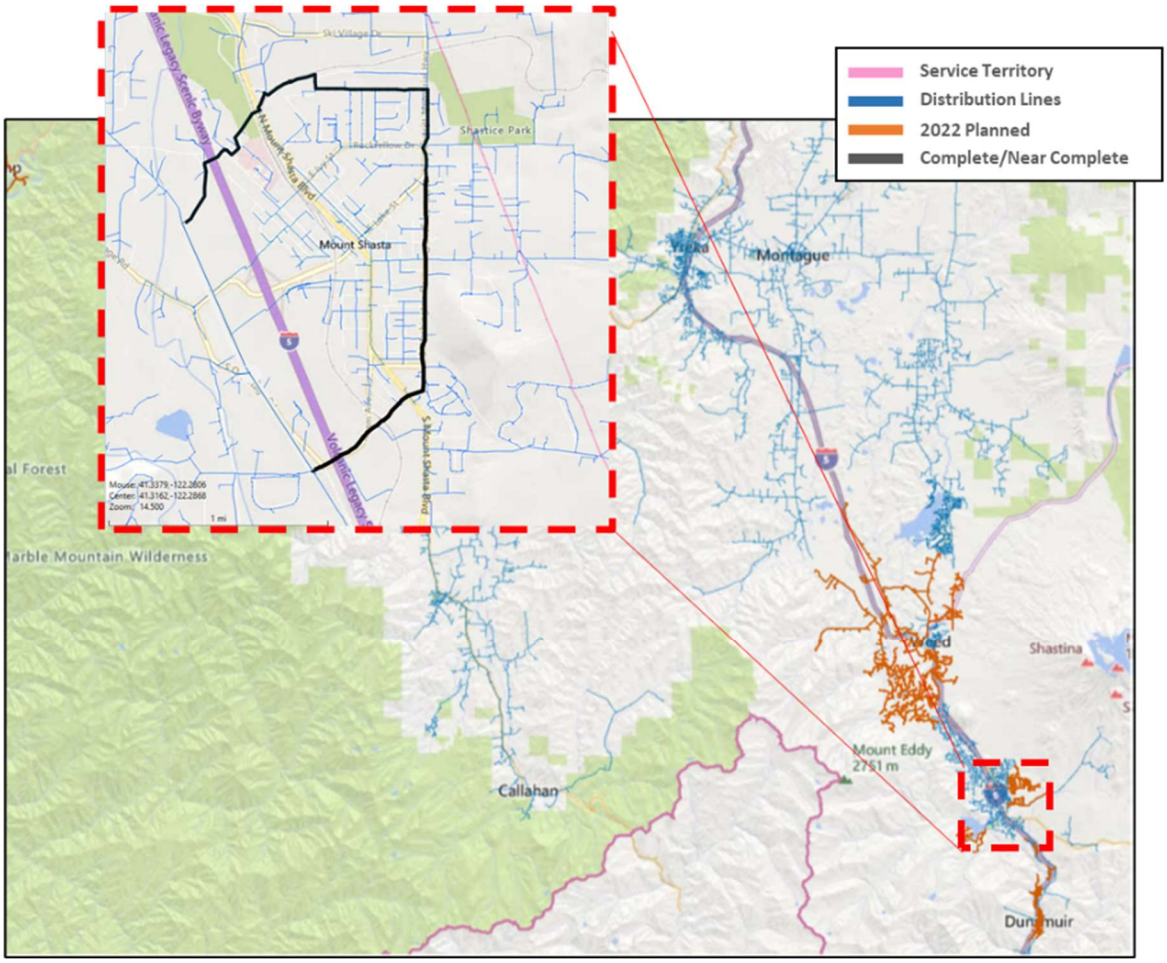


Figure 8.2 Example Grid Hardening Project in Mt Shasta

While the entire Mt Shasta grid hardening plan includes the implementation of approximately 82 miles of covered conductor over three years, this initial step will begin to provide flexibility and resilience. Prior to the completion of this project, any extreme or localized risk experienced by the inner 3 miles that may have required implementation of a PSPS event, would have directly impacted any taps or other circuits or circuit segments fed from this loop. Prior to grid hardening, PacifiCorp was not able to isolate the risk posed to the main loop from the taps or distant portions of the circuit. The covered conductor removes that direct linkage and provides flexibility in decision making. Conditions experienced by the main loop will no longer necessitate a PSPS event on the entire circuit. While this example is small in scope and not likely to have immediate material impacts on decision making, it demonstrates the general concept of mitigating PSPS impacts through implementation of covered conductor. As more and more miles are hardened, more and more direct linkages will be broken, further mitigating the impact of PSPS.

Other initiatives specifically address reducing the impact of a PSPS that has actually been implemented. Examples include the new portable battery program and generator rebate program

discussed in Section 7.3.3.11 on page 179~~168~~. Additionally, PacifiCorp continues improving its readiness to open Community Resource Centers in any community impacted by a PSPS as described in Section 7.3.9.3 on page 242~~219~~.

Specific program targets associated with these initiatives can be found in Section 5.3 on page 116~~114~~ and Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx. The following describes planned program deliverables with direct linkages to PSPS impacts by June of the current year, September 1 of the current year, and before the next WMP Update.

By June 1 of the current year

Installed weather stations will have their annual calibration completed and be prepared to provide accurate weather data to situational awareness forecast processes which can potentially reduce the scope and scale of a PSPS.

By September 1 of the current year

Several initiatives will be significantly progressed, as per 2022-05-02_PC_2022_Q1-QDR_R1.xlsx quarterly targets. Much of these initiatives, such as those related to the grid hardening category, are projected to impact the scale, scope and frequency of PSPS over time.

By next Annual WMP Update

PacifiCorp will have met the goals described in Table 5.1, which directly impact the scale, scope, frequency or impact of PSPS over time. As an example, PacifiCorp initiated the installation of covered conductor in 2021. Based on targets in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx for covered conductor, PacifiCorp anticipates that a significant portion of covered conductor will be completed, providing significant ignition risk reduction, thus potentially reducing the frequency of PSPS.

A key change since the 2021 WMP Update is that PacifiCorp plans to implement Technosylva modelling tools to enhance situational awareness. As described above, this addition to PacifiCorp initiatives is projected to provide more granular data, with increased accuracy such that PacifiCorp can potentially reduce the scope of a PSPS by the next annual update.

8.4 ENGAGING VULNERABLE COMMUNITIES

Report on the following:

1. *Describe protocols for PSPS that are intended to mitigate the public safety impacts of PSPS on vulnerable, marginalized and/or at-risk communities. Describe how the utility is identifying these communities.*
2. *List all languages which are "prevalent" in utility's territory. A language is prevalent if it is spoken by 1,000 or more persons in the utility's territory or if it is spoken by 5% or more of the population within a "public safety answering point" in the utility territory[31] (D.20-03-004).*
3. *List all languages for which public outreach material is available, in written or oral form.*
4. *Detail the community outreach efforts for PSPS and wildfire-related outreach. Include efforts to reach all languages prevalent in utility territory.*

PacifiCorp describes its outreach plan in greater detail, responsive to each of these points outlined in its PSPS Phase 2 Progress Report and in sections 7.3.9 and 7.3.10 starting on pages 239~~217~~ and 248~~225~~ respectively.

~~Engaging~~Information regarding PacifiCorp's engagement with vulnerable communities information has been provided in the ~~2022 Annual Access and Functional Needs Plan of PacifiCorp filed on January 31, 2022.~~ 2022 Annual Access and Functional Needs Plan of PacifiCorp filed on January 31, 2022 and is summarized below:

1. **PSPS Protocols Intended to Mitigate the Public Safety Impacts of PSPS on Vulnerable, Marginalized, and/or At-Risk Communities**

   Vulnerable customers, such as those customers identified to need electricity for medical equipment or AFN customers, receive additional outreach prior to a PSPS, which is intended to mitigate the impact of a PSPS for these customers. Prior to a PSPS, PacifiCorp endeavors to accomplish "confirmed communication" with these customers, either through a phone conversation (not voicemail) or, in some circumstances, through a personal visit from a PacifiCorp employee. Medical baseline customers who could not be reached through these means are then forwarded to emergency services for follow-up.

   PacifiCorp currently identifies AFN customers through collaboration with state and Community Based Organizations (CBOs). Additionally, PacifiCorp includes on its PSPS website FAQs information on how customers can sign up for the medical baseline program.

[31] See Cal. Government Code § 53112

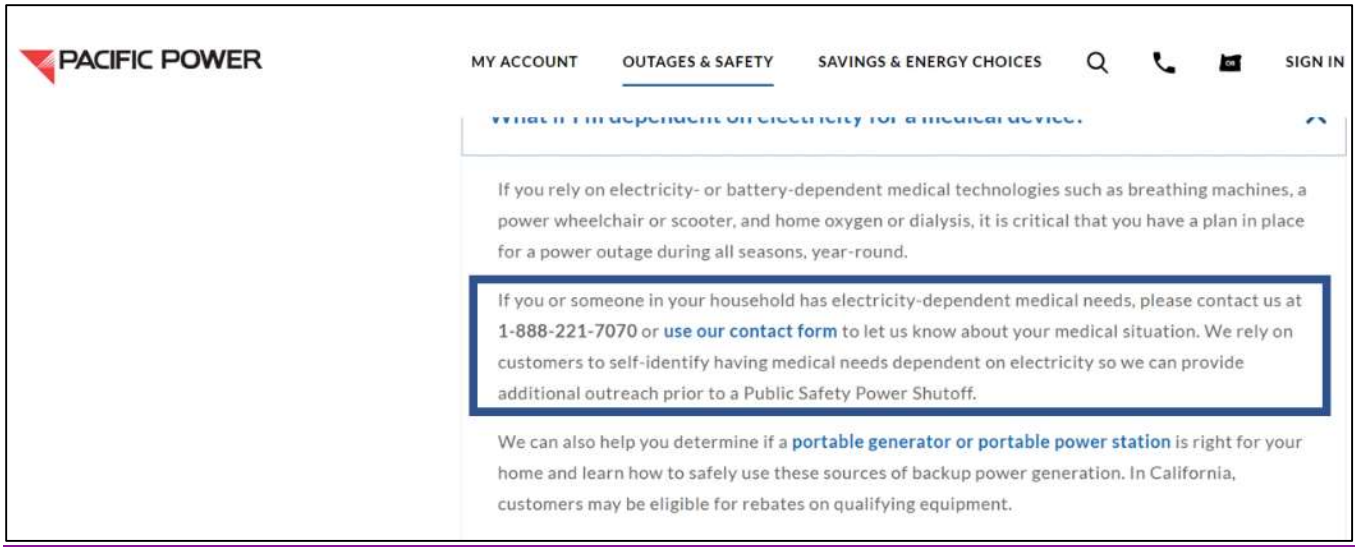


Figure 339 : Medical Baseline Signup Online

2. Prevalent Languages

English is the prevalent language in the PacifiCorp California service territory.

3. Public Outreach Material Languages

To ensure that outreach is provided in identified languages, Pacific Power delivers wildfire safety-specific communications including brochures, handouts, and bill messages translated into Spanish; a message in nine languages – which includes Chinese traditional, Chinese simplified, Tagalog, Vietnamese, Mixteco, Zapoteco, Hmong, German and Spanish – is included in PSPS event communications including press releases, social media posts and website updates. The company is working to expand those messages onto other, non-event PSPS and wildfire safety collateral.

4. Community Outreach Efforts of PSSP and Wildfire-Related Outreach

The Pacific Power PSPS webpage provides timely and detailed information for potential and actual PSPS events relevant to a specific location. Pacific Power's website has the bandwidth to manage site traffic under extreme demand; and has implemented bandwidth capacity to a level that will allow for increased customer access while maintaining site integrity. The webpage (available at www.pacificpower.net/psps) allows customers to determine the likelihood of a PSPS event based on address information. An additional online tool allows the customer to see the "Public safety power shutoff forecasting" for that area over the following seven days. The status indicates whether the area is operating as "Normal," whether there is a PSPS "Watch," or whether there is an actual PSPS "Event." The website is

easily accessible by mobile device - additionally - the Pacific Power 'app' is available for mobile devices which allows customer access to real-time outage updates and information. Material languages are described in Section 3 above.

8.5 PSPS-SPECIFIC METRICS

PSPS data is reported quarterly. Placeholder tables below to be filled in based on quarterly data

Instructions for PSPS table: of Attachment 3:

In the attached spreadsheet document, report performance on the following PSPS metrics within the utility's service territory over the past seven years as needed to correct previously reported data. Where the utility does not collect its own data on a given metric, the utility is required to work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in the "Comments" column.

Please see WMP Table 11 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx submitted on May 2, 2022.

8.6 IDENTIFICATION OF FREQUENTLY DE-ENERGIZED CIRCUITS

Senate Bill 533 (2021) added an additional requirement to the WMPs. Pub. Util. Code Section 8386(c)(8) requires the "Identification of circuits that have frequently been de-energized pursuant[32] to a de-energization event to mitigate the risk of wildfire and the measures taken, orplanned to be taken, by the electrical corporation to reduce the need for, and impact of, future de-energization of those circuits, including, but not limited to, the estimated annual decline in circuit de-energization and de-energization impact on customers, and replacing, hardening, or undergrounding any portion of the circuit or of upstream transmission or distribution lines." To comply with this statutory addition, utilities are required to populate Table 8.3~~Table 8.3~~ and provide a map showing the listed frequently de-energized circuits.

Table 8.3 Frequently de-energized circuits

ID of Circuit	County	Dates of Outages	# of Customers Affected	Measures taken, or plannedto be taken, to reduce the need for, and impact of, future PSPS of circuit
N/A	N/A	N/A	N/A	N/A

[32] "Frequently de-energized circuit" has been defined in the glossary as "A circuit which has been de-energized pursuant to a de-energization event to mitigate the risk of wildfire three or more times in a calendar year."

9

APPENDIX

9 APPENDIX

9.1 DEFINITIONS OF INITIATIVE ACTIVITIES BY CATEGORY

Table 9.1 Definitions of initiative activities by category

Category	Initiative activity	Definition
A. Risk mapping and simulation	A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment	Development and use of tools and processes to develop and update risk map and simulations and to estimate risk reduction potential of initiatives for a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.
	Climate-driven risk map and modeling based on various relevant weather scenarios	Development and use of tools and processes demonstrating medium and long-term climate trends based on the best available climate models demonstrating the most wildfire-relevant impacts (e.g., warming trends, fuel moisture trends, soil moisture trends, vegetation distribution trends). Describe how these trends are being incorporated into risk modeling or other risk-informed analyses.
	Ignition probability mapping showing the probability of ignition along the electric lines and equipment	Development and use of tools and processes to assess the risk of ignition across regions of the grid (or more granularly, e.g., circuits, spans, or assets).
	Initiative mapping and estimation of wildfire and PSPS risk-reduction impact	Development of a tool to estimate the risk reduction efficacy (for both wildfire and PSPS risk) and RSE of various initiatives.
	Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment	Development and use of tools and processes to assess the impact of potential ignition and risk to communities (e.g., in terms of potential fatalities, structures burned, monetary damages, area burned, impact on air quality and greenhouse gas, or GHG, reduction goals, etc.).
B. Situational awareness and forecasting	Advanced weather monitoring and weather stations	Purchase, installation, maintenance, and operation of weather stations. Collection, recording, and analysis of weather data from weather stations and from external sources.
	Continuous monitoring sensors	Installation, maintenance, and monitoring of sensors and sensorized equipment used to monitor the condition of electric lines and equipment.
	Fault indicators for detecting faults on electric lines and equipment	Installation and maintenance of fault indicators.
	Forecast of a fire risk index, fire potential index, or similar	Index that uses a combination of weather parameters (such as wind speed, humidity, and temperature), vegetation and/or fuel conditions, and other factors to judge current fire risk and to create a forecast indicative of fire risk. A sufficiently granular index is required to inform operational decision-making.

Category	Initiative activity	Definition
	Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	Personnel position within utility service territory to monitor system conditions and weather on site. Field observations is required to inform operational decisions.
	Weather forecasting and estimating impacts on electric lines and equipment	Development methodology for forecast of weather conditions relevant to utility operations, forecasting weather conditions and conducting analysis to incorporate into utility decision-making, learning and updates to reduce false positives and false negatives of forecast PSPS conditions.
C. Grid design and system hardening	Capacitor maintenance and replacement program	Remediation, adjustments, or installations of new equipment to improve or replace existing capacitor equipment.
	Circuit breaker maintenance and installation to de-energize lines upon detecting a fault	Remediation, adjustments, or installations of new equipment to improve or replace existing fast switching circuit breaker equipment to improve the ability to protect electrical circuits from damage caused by overload of electricity or short circuit.
	Covered conductor installation	Installation of covered or insulated conductors to replace standard bare or unprotected conductors (defined in accordance with GO 95 as supply conductors, including but not limited to lead wires, not enclosed in a grounded metal pole or not covered by: a "suitable protective covering" (in accordance with Rule 22.8), grounded metal conduit, or grounded metal sheath or shield). In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D
	Covered conductor maintenance	Remediation and adjustments to installed covered or insulated conductors. In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non- conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.

Category	Initiative activity	Definition
	Crossarm maintenance, repair, and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing crossarms, defined as horizontal support attached to poles or structures generally at right angles to the conductor supported in accordance with GO 95.
	Distribution pole replacement and reinforcement, including with composite poles	Remediation, adjustments, or installations of new equipment to improve or replace existing distribution poles (i.e., those supporting lines under 65kV), including with equipment such as composite poles manufactured with materials reduce ignition probability by increasing pole lifespan and resilience against failure from object contact and other events.
	Expulsion fuse replacement	Installations of new and CAL FIRE-approved power fuses to replace existing expulsion fuse equipment.
	Grid topology improvements to mitigate or reduce PSPS events	Plan to support and actions taken to mitigate or reduce PSPS events in terms of geographic scope and number of customers affected, such as installation and operation of electrical equipment to sectionalize or island portions of the grid, microgrids, or local generation.
	Installation of system automation equipment	Installation of electric equipment that increases the ability of the utility to automate system operation and monitoring, including equipment that can be adjusted remotely such as automatic reclosers (switching devices designed to detect and interrupt momentary faults that can reclose automatically and detect if a fault remains, remaining open if so).
	Maintenance, repair, and replacement of connectors, including hotline clamps	Remediation, adjustments, or installations of new equipment to improve or replace existing connector equipment, such as hotline clamps.
	Mitigation of impact on customers and other residents affected during PSPS event	Actions taken to improve access to electricity for customers and other residents during PSPS events, such as installation and operation of local generation equipment (at the community, household, or other level).
	Other corrective action	Other maintenance, repair, or replacement of utility equipment and structures so that they function properly and safely, including remediation activities (such as insulator washing) of other electric equipment deficiencies that may increase ignition probability due to potential equipment failure or other drivers.
	Pole loading infrastructure hardening and replacement program based on pole loading assessment program	Actions taken to remediate, adjust, or install replacement equipment for poles that the utility has identified as failing to meet safety factor requirements in accordance with GO 95 or additional utility standards in the utility's pole loading assessment program.
	Transformers maintenance and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing transformer equipment.
	Transmission tower maintenance and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing transmission towers (e.g., structures such as lattice steel towers or tubular steel poles that support lines at or above 65kV).

Category	Initiative activity	Definition
	Undergrounding of electric lines and/or equipment	Actions taken to convert overhead electric lines and/or equipment to underground electric lines and/or equipment (i.e., located underground and in accordance with GO 128).
	Updates to grid topology to minimize risk of ignition in the HFTDs	Changes in the plan, installation, construction, removal, and/or undergrounding to minimize the risk of ignition due to the design, location, or configuration of utility electric equipment in the HFTDs.
D. Asset management and inspections	Detailed inspections of distribution electric lines and equipment	In accordance with GO 165, careful visual inspections of overhead electric distribution lines and equipment where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.
	Detailed inspections of transmission electric lines and equipment	Careful visual inspections of overhead electric transmission lines and equipment where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.
	Improvement of inspections	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
	IR inspections of distribution electric lines and equipment	Inspections of overhead electric distribution lines, equipment, and right-of-way using IR (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.
	IR inspections of transmission electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using IR (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.
	Intrusive pole inspections	In accordance with GO 165, intrusive inspections involve movement of soil, taking samples for analysis, and/or using more sophisticated diagnostic tools beyond visual inspections or instrument reading.
	LiDAR inspections of distribution electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	LiDAR inspections of transmission electric lines and equipment	Inspections of overhead electric distribution lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).

Category	Initiative activity	Definition
	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric transmission lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric distribution lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Patrol inspections of distribution electric lines and equipment	In accordance with GO 165, simple visual inspections of overhead electric distribution lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out during other company business.
	Patrol inspections of transmission electric lines and equipment	Simple visual inspections of overhead electric transmission lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out during other company business.
	Pole loading assessment program to determine safety factor	Calculations to determine whether a pole meets pole loading safety factor requirements of GO 95, including planning and information collection needed to support said calculations. Calculations must consider many factors including the size, location, and type of pole; types of attachments; length of conductors attached; and number and design of supporting guys, per D.15-11-021.
	Quality assurance / quality control of inspections	Establishment and function of audit process to manage and confirm work completed by employees or contractors, including packaging QA/QC information for input to decision-making and related integrated workforce management processes.
	Substation inspections	In accordance with GO 175, inspection of substations performed by qualified persons and according to the frequency established by the utility, including record-keeping.
E. Vegetation management and inspection	Additional efforts to manage community and environmental impacts	Plan and execution of strategy to mitigate negative impacts from utility vegetation management to local communities and the environment, such as coordination with communities, local governments, and agencies to plan and execute vegetation management work.
	Detailed inspections and management practices for vegetation clearances around distribution electrical lines and equipment	Careful visual inspections and maintenance of vegetation around the distribution right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded. Describe the frequency of inspection and maintenance programs.

Category	Initiative activity	Definition
	Detailed inspections and management practices for vegetation clearances around transmission electrical lines and equipment	Careful visual inspections and maintenance of vegetation around the transmission right-of- way, where individual trees are carefully examined, visually, and the condition of each rated and recorded. Describe the frequency of inspection and maintenance programs.
	Emergency response vegetation management due to red flag warning or other urgent weather conditions	Plan and execution of vegetation management activities, such as trimming or removal, executed based upon and in advance of forecast weather conditions that indicate high fire threat in terms of ignition probability and wildfire consequence.
	Fuel management and, management of all wood and “slash” from vegetation management activities	Plan and execution of fuel management activities in proximity to potential sources of ignition. This includes pole clearing per PRC 4292 and reduction or adjustment of live fuel (based on species or otherwise)
	Improvement of inspections	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
	Remote sensing inspections of vegetation around distribution electric lines and equipment	Inspections of right-of-way using remote sensing methods such as LiDAR, satellite imagery, and UAV.
	Remote sensing inspections of vegetation around transmission electric lines and equipment	Inspections of right-of-way using remote sensing methods such as LiDAR, satellite imagery, and UAV.
	Other discretionary inspections of vegetation around distribution electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Other discretionary inspections of vegetation around transmission electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Patrol inspections of vegetation around distribution electric lines and equipment	Visual inspections of vegetation along rights-of- way that is designed to identify obvious hazards. Patrol inspections may be carried out during other company business.
	Patrol inspections of vegetation around transmission electric lines and equipment	Visual inspections of vegetation along rights-of- way that is designed to identify obvious hazards. Patrol inspections may be carried out during other company business.
	Quality assurance / quality control of vegetation management	Establishment and function of audit process to manage and oversee the work completed by employees or contractors, including packaging QA/QC information for input to decision-making and workforce management processes. This includes identification of the percentage of vegetation inspections that are audited annually, as a program target in Table 5.3-1.

Category	Initiative activity	Definition
	Recruiting and training of vegetation management personnel	Programs to ensure that the utility can identify and hire qualified vegetation management personnel and to ensure that both employees and contractors tasked with vegetation management responsibilities are adequately trained to perform vegetation management work, according to the utility's wildfire mitigation plan, in addition to rules and regulations for safety. Include discussion of continuous improvement of training programs and personnel qualifications.
	Identification and remediation of "at-risk species"	Specific actions, not otherwise described in other WMP initiatives, taken to reduce the ignition probability and wildfire consequence attributable to "at-risk species,", such as trimming, removal, and replacement.
	Removal and remediation of trees with strike potential to electric lines and equipment	Actions taken to identify, remove, or otherwise remediate trees that pose a high risk of failure or fracture that could potentially strike electrical equipment.
	Substation inspection	Inspection of vegetation surrounding substations, performed by qualified persons and according to the frequency established by the utility, including record-keeping.
	Substation vegetation management	Based on location and risk to substation equipment only, actions taken to reduce the ignition probability and wildfire consequence attributable to contact from vegetation to substation equipment.
	Vegetation management enterprise system	Inputs, operation, and support for a centralized vegetation management enterprise system updated based upon inspection results including (1) inventory of and management activities such as trimming and removal of vegetation.
	Vegetation management to achieve clearances around electric lines and equipment Additional vegetation management practices beyond regulatory requirements and recommendations	Actions taken to ensure that vegetation does not encroach upon the minimum clearances set forth in Table 1 of GO 95, measured between line conductors and vegetation, such as trimming adjacent or overhanging tree limbs. Identifying and discussing additional vegetation management actions (e.g., trimming and removal of vegetation) taken beyond the minimum regulatory requirements and recommendations, for example, enhanced vegetation management.
	Vegetation management activities post-fire	Vegetation management (VM) activities during post-fire service restoration including, but not limited to activities or protocols that differentiate post-fire VM from programs described in other WMP initiatives; supporting documentation for the tool and/or standard the utility uses to assesses the risk presented by vegetation post-fire; and how the utility includes fire-specific damage attributes into its assessment tool/standard.
F. Grid operations and protocols	Automatic recloser operations	Designing and executing protocols to deactivate automatic reclosers based on local conditions for ignition probability and wildfire consequence.

Category	Initiative activity	Definition
	Protective equipment and device settings	The utility's procedures for adjusting the sensitivity of grid elements to reduce wildfire risk, other than automatic reclosers (such as circuit breakers, switches, etc.). For example, PG&E's Fast Trip Settings.
	Crew-accompanying ignition prevention and suppression resources and services	Those firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, and water) that are deployed with construction crews and other electric workers to provide site-specific fire prevention and ignition mitigation during on-site work
	Personnel work procedures and training in conditions of elevated fire risk	Work activity guidelines that designate what type of work can be performed during operating conditions of different levels of wildfire risk. Training for personnel on these guidelines and the procedures they prescribe, from normal operating procedures to increased mitigation measures to constraints on work performed.
	Protocols for PSPS re- energization	Designing and executing procedures that accelerate the restoration of electric service in areas that are de-energized, while maintaining safety and reliability standards.
	PSPS events and mitigation of PSPS impacts	Designing, executing, and improving upon protocols to conduct PSPS events, including development of advanced methodologies to determine when to use PSPS, and to mitigate the impact of PSPS events on affected customers and residents.
	Stationed and on-call ignition prevention and suppression resources and services	Firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, firefighting foam, chemical extinguishing agent, and water) stationed at utility facilities and/or standing by to respond to calls for fire suppression assistance.
G. Data governance	Centralized repository for data	Designing, maintaining, hosting, and upgrading a platform that supports storage, processing, and utilization of all utility proprietary data and data compiled by the utility from other sources.
	Collaborative research on utility ignition and/or wildfire	Developing and executing research work on utility ignition and/or wildfire topics in collaboration with other non-utility partners, such as academic institutions and research groups, to include data-sharing and funding as applicable.
	Documentation and disclosure of wildfire-related data and algorithms	Design and execution of processes to document and disclose wildfire-related data and algorithms to accord with rules and regulations, including use of scenarios for forecasting and stress testing.
	Tracking and analysis of near-miss data	Tools and procedures to monitor, record, and conduct analysis of data on near miss events.
H. Resource allocation methodology	Allocation methodology development and application	Development of prioritization methodology for human and financial resources, including application of said methodology to utility decision-making.
	Risk reduction scenario development and analysis	Development of modeling capabilities for different risk reduction scenarios based on wildfire mitigation initiative implementation; analysis and application to utility decision- making.

Category	Initiative activity	Definition
	RSE analysis	Tools, procedures, and expertise to support analysis of wildfire mitigation initiative risk- spend efficiency, in terms of MAVF and/ or MARS methodologies.
I. Emergency planning and preparedness	Adequate and trained workforce for service restoration	Actions taken to identify, hire, retain, and train qualified workforce to conduct service restoration in response to emergencies, including short-term contracting strategy and implementation.
	Community outreach, public awareness, and communications efforts	Actions to identify and contact key community stakeholders; increase public awareness of emergency planning and preparedness information; and design, translate, distribute, and evaluate effectiveness of communications taken before, during, and after a wildfire, including AFN populations and Limited English Proficiency populations in particular.
	Customer support in emergencies	Resources dedicated to customer support during emergencies, such as website pages and other digital resources, dedicated phone lines, etc.
	Disaster and emergency preparedness plan	Development of plan to deploy resources according to prioritization methodology for disaster and emergency preparedness of utility and within utility service territory (such as considerations for critical facilities and infrastructure), including strategy for collaboration with Public Safety Partners and communities
	Preparedness and planning for service restoration	Development of plans to prepare the utility to restore service after emergencies, such as developing employee and staff trainings, and to conduct inspections and remediation necessary to re-energize lines and restore service to customers.
	Protocols in place to learn from wildfire events	Tools and procedures to monitor effectiveness of strategy and actions taken to prepare for emergencies and of strategy and actions taken during and after emergencies, including based on an accounting of the outcomes of wildfire events.
J. Stakeholder cooperation and community engagement	Community engagement	Strategy and actions taken to identify and contact key community stakeholders; increase public awareness and support of utility wildfire mitigation activity; and design, translate, distribute, and evaluate effectiveness of related communications. Includes specific strategies and actions taken to address concerns and serve needs of AFN populations and Limited English Proficiency populations in particular.
	Cooperation and best practice sharing with agencies outside CA	Strategy and actions taken to engage with agencies outside of California to exchange best practices both for utility wildfire mitigation and for stakeholder cooperation to mitigate and respond to wildfires.
	Cooperation with suppression agencies	Coordination with CAL FIRE, federal fire authorities, county fire authorities, and local fire authorities to support planning and operations, including support of aerial and ground firefighting in real-time, including information-sharing, dispatch of resources, and dedicated staff.

Category	Initiative activity	Definition
	Forest service and fuel reduction cooperation and joint roadmap	Strategy and actions taken to engage with local, state, and federal entities responsible for or participating in forest management and fuel reduction activities; and design utility cooperation strategy and joint stakeholder roadmap (plan for coordinating stakeholder efforts for forest management and fuel reduction activities).

9.2 CITATIONS FOR RELEVANT STATUTES, COMMISSION DIRECTIVES, PROCEEDINGS, AND ORDERS

Throughout the WMP, cite relevant state and federal statutes, Commission directives, orders, and proceedings. Place the title or tracking number of the statute in parentheses next to comment, or in the appropriate column if noted in a table. Provide in this section a brief description or summary of the relevant portion of the statute. Track citations as end-notes and order (1, 2, 3…) across sections (e.g., if section 1 has 4 citations, section 2 begins numbering at 5).

Citation	Description/Summary	WMP Sections
Public Utilities Code § 8386	Law that, among other things, requires electric corporations to submit wildfire mitigation plans	Executive Summary~~Executive Summary~~, pg. ixviii
Public Resources Code § 4292	Minimum clearance around the base of the pole cleared of all flammable vegetation down to bare soil and the removal of all dead tree branches within this cylinder up to the cross-arm .	Section 7.3.5. pg. 196~~182~~; Section 7.3.5.5.1 pg. 203~~189~~
Public Resources Code § 4293	CAL FIRE requires 10 feet of minimum clearance around the base of the pole cleared of all flammable vegetation down to bare soil and the removal of all dead tree branches within this cylinder up to the cross-arm (within the State Responsibility Area)	Section 7.3.5.19, pg. 218~~204~~
Resolution WSD-002	Guidance Resolution on 2020 Wildfire Mitigation Plans Pursuant to Public Utilities Code Section 8386.	Executive Summary~~Executive Summary~~, pg. ixviii
Resolution WSD-005	Resolution Ratifying Action of the Wildfire Safety Division on San Diego Gas & Electric Company's 2020 Wildfire Mitigation Plan Pursuant to Public Utilities Code Section 8386.	Executive Summary~~Executive Summary~~, pg. ixviii
Resolution WSD-011	Resolution implementing the requirements of Public Utilities Code Sections 8389(d)(1), (2) and (4), related to catastrophic wildfire caused by electrical corporations subject to the Commission's regulatory authority	Executive Summary~~Executive Summary~~, pg. ixviii
R.18-10-007	Order Instituting Rulemaking to Implement Electric Utility Wildfire Mitigation Plans Pursuant to Senate Bill 901 (2018)	Section 7.3.1.1, pg. 153~~150~~; Section 4.5.1.4, pg. 83~~81~~

Citation	Description/Summary	WMP Sections
R.20-07-013	Order Instituting Rulemaking to Further Develop a Risk-based Decision-making Framework for Electric and Gas Utilities	Executive Summary~~Executive Summary~~, pg. ix~~viii~~; Section 4.2, pg. 35
D.18-03-011	CPUC Phase 2 Decision Adopting Safety Model Assessment Proceeding Settlement Agreement with Modifications	Section 7.3.9.3, pg. 242~~219~~
D.20-03-004	CPUC Decision on Community Awareness and Public Outreach Before, During, and After a Wildfire, and Explaining Next Steps for Other Phase 2 Issues	Section 8.1, pg. 256~~232~~
D.21-06-034	Decision Adopting Phase 3 Updated	Section 8.1, pg. 256~~232~~
General Order 95	Overhead electric line design, construction, and maintenance requirements in order to ensure adequacy of service and safety; covers topics such as proper grounding, clearances, strength requirements, and tree trimming	Executive Summary~~Executive Summary~~, pg. ix~~viii~~; Section 4.4.1.2, pg. 49; Section 5.4.3, pg. 125~~123~~; Section 7.1, pg. 136~~134~~; Section 7.3.4.1, pg. 185~~171~~; Section 7.3.4.11, pg. 191~~177~~; Section 7.3.4.14, pg. 192~~178~~; Section 7.3.5.19, pg. 218~~204~~; Section 9.3, pg. 290~~255~~
General Order 96.b	[Provisions adopted by Decision (D.) 01-07-026 (July 12, 2001), D.02-01-038 (January 9, 2002), D.05-01-032 (January 13, 2005), D.07-01-024 (January 25, 2007), D.07-09-019 (September 6, 2007), D.08-05-019 (May 15, 2008), Resolution ALJ-221 (August 21, 2008), Resolution W-4749 (March 26, 2009), and D.09-04-005 (April 16, 2009) Resolution T-17327 (January 12, 2012) Resolution ALJ-346 (May 10, 2018)	Section 7.2, pg. 146~~144~~
General Order 165	Inspection requirements for transmission and distribution facilities in order to ensure safety and high-quality electrical service; sets maximum allowable inspection cycle lengths, scheduling and performance of corrective action, record-keeping, and reporting	Executive Summary~~Executive Summary~~, pg. ix~~viii~~ Section 4.5.2, pg. 103~~101~~; Section 7.3.4.1, pg. 185~~171~~; Section 7.3.4.6, pg. 188~~174~~; Section 7.3.4.11, pg. 191~~177~~;
General Order 166	Standards for Operation, Reliability, and Safety During Emergencies and Disasters	Executive Summary~~Executive Summary~~, pg. ix~~viii~~
General Order 174	Inspection requirements for substations to promote the safety of workers, the public, and enable adequacy of service	Section 7.3.5.15, pg. 213~~199~~
SB 901	Wildfire Preparedness and Response	Executive Summary~~Executive Summary~~, pg. ix~~viii~~

Citation	Description/Summary	WMP Sections
WSD GIS Data Standards	Wildfire Safety Division Draft Geographic Information System Data Reporting Requirements and Schema for California Electrical Corporations (August 21, 2020); Sets forth requirements for WMP spatial data submissions	Section 6.5, pg. 132~~130~~
WSD-017 OEIS Action Statement	Office of Energy Infrastructure Safety Final Revised Action Statement issued June 2021.	Section 7.3.2.2.2, pg. 165~~154~~; Section 7.3.3.3, pg. 172~~161~~; Section 7.3.3.4, pg. 174~~163~~; Section 7.3.3.7, pg. 176~~164~~

9.3 COVERED CONDUCTOR INSTALLATION REPORTING

In Section 7.3.3.3, page 172~~161~~ covered conductor installation, report on the following key information for covered conductor installation:

- Methodology for installation and implementation

Covered conductor is installed as a component of the PacifiCorp Line Rebuild Program. The line rebuild program includes installing covered conductor, replacing poles with more fire resistant materials, and replacing small diameter copper conductor. When a circuit is identified for the Line Rebuild Program based on risk, engineering looks at the full system along that line for upgrades to align with Wildfire Mitigation objectives. Lines identified during the Line Rebuild evaluation for covered conductor installation are installed per internal standards and policies.[33] These policies and standards align with the manufacturer recommendations and provide the overall instruction for field installations.

- Design and design considerations (such as selection of type of covered conductor, additional hardware needed for installation, pole strengthening or replacements, etc.)

Once the line is identified for rebuild, generally as a result of risk analysis intended to reduce the potential for PSPS events, area engineering evaluates the scoped line for additional hardware needed for installations, similar to how other distribution projects are defined such as new connections or load growth accommodations. Additional hardware can include items such as cross arm replacement, pole replacement and small copper diameter conductor replacement. After the general scope is finalized, a detailed engineering analysis for each pole and segment is performed by a licensed engineering contractor. This pole loading calculations to determine whether pole replacements are needed to accommodate the additional weight of covered conductor. As a final step prior to construction, this detailed analysis is quality checked internally by engineering to ensure the final design meet internal standards.

- Implementation (including timeframes, prioritization, contractor and labor needs, etc.)

General implementation progress and timelines for covered conductor are included in Table 12 of 2022-05-02_PC_2022_Q1-QDR_R1.xlsx. Since initiation in 2019, the company has delivered fewer miles of covered conductor in California than planned and is currently faced with the continued challenge of ramping up to achieve 2022 targets. Line rebuild projects using covered conductor were initially viewed similar to other distribution projects with short lead times and moderate construction needs. However, these projects generally require a 12-24 project pipeline, depending on permitting and right of way requirements. Additionally, construction resources within the region tend to compete, resulting in construction bottle necks. PacifiCorp acknowledges that these challenges are likely to continue and impact the delivery of covered conductor. To address these challenges, PacifiCorp is planning to engage

[33] Example internal standards include Policy ED 061 and ED-061 supplied via data request to OEIS on March 8, 2022.

a construction management partner through a competitive bidding process in 2022. This new contracted partner is expected to facilitate delivery of the various aspects of covered conductor projects, such as project management, project controls, project reporting, engineering, estimating, permitting, surveying, material procurement, material management, construction, and post construction inspections. PacifiCorp anticipates that the new contracted partner will begin supporting the delivery of covered conductor in late 2022 or early 2023.

- Long-term operations and considerations (including maintenance, long-term effectiveness and feasibility, effectiveness monitoring, etc.)

Maintenance for covered conductor as per GO 95 and 165 will be integrated into the 2023 visual inspection processes for damage. PacifiCorp plans to monitor and measure effectiveness as per the initiative evaluation processes described in Attachment 6.

- Key assumptions

Key assumptions in the cost effectiveness of covered conductor have been explained in Attachment 6.

- Cost-effectiveness evaluations (including cost breakdown per circuit mile, comparison with alternatives, etc.)

PacifiCorp cost effectiveness evaluation of covered conductor has been provided in the Attachment 6: Joint Utility Response to Covered Conductor, provided to OEIS.

- Any other activities relevant to the covered conductor installation

PacifiCorp installs covered conductor and undergrounds conductor as part of the Line Rebuild Program described in Section 7.3.3.3 starting on page 172~~161~~.

9.4 UNDERGROUNDING IMPLEMENTATION REPORTING

In Section 7.3.3.16, on page 183~~171~~, undergrounding of electric lines and/or equipment, report on thefollowing key information for undergrounding implementation:

- Methodology for installation and implementation

As described in Section 7.3.3.3 starting on page 172~~161~~, PacifiCorp evaluates the potential to convert overhead lines to underground lines for rebuild projects on a project-by-project basis. Through the design process, each individual project is assessed to determine whether sections of the rebuild should be completed with underground construction. Once selected, PacifiCorp installs underground lines consistent with engineering standards, local permitting requirements, and general construction practices.

- Design and design considerations (such as permitting requirements, additional hardware needed for installation, etc.)

When compared to overhead installations, undergrounding requires different conductor, vaults, and pad mounted equipment. Additionally, when converting to underground, customer equipment, such as meter bases, generally need to be changed or reconfigured. Generally, PacifiCorp does not have easements larger than what is needed for overhead lines and, therefore, conversion to underground often requires additional easements as the effective footprint of underground can be larger than overhead.

Despite these challenges undergrounding can be an appropriate solution in many instances. For example, the preferences of certain land-owners may favor undergrounding, and/or codes and zoning restrictions may dictate the use of underground. Furthermore, in highly remote or rugged terrain locations with few customer connections, underground may be the preferred alternative to improve reliability and reduce wildfire risk. Most customer overhead meter bases cannot accept underground conductor or are located in an area that may not support underground installation, therefore there can be a significant cost associated with converting an overhead line to underground where there are a lot of customers on the line.

- Implementation (including timeframes, prioritization, contractor and labor needs, etc.)

A typical timeline for undergrounding conductor can be two to five years, depending on land use permitting, easement requirements, number of customer connections, road or railroad crossings, and general topography. Underground projects also generally take longer to construct and can require additional contractors for civil construction work, and equipment operators.

Undergrounding conductor, when used, is a component of the line rebuild program, thus it is prioritized the same way as covered conductor. The general implementation process for underground is described below.

- Long-term operations and considerations (including maintenance, long-term effectiveness and feasibility, effectiveness monitoring, etc.)

As described in Section 7.3.3.3 starting on page 172~~161~~, underground if generally the most effective at reducing the risk of any utility-related ignition. Other benefits include aesthetics, reliability, and PSPS avoidance. Additionally, underground installations do not require the

same vegetation management or asset inspection activities as overhead installations. This can be a long term operational and cost consideration. However, operations and maintenance of underground is not without challenges. Routine assessment of asset condition, typical accomplished through visual inspections for overhead equipment, can require the use of very expensive, highly specialized equipment. Additionally, should a fault occur on underground equipment resulting in an outage, fault location and restoration can be more challenging and more costly as compared to overhead installations. Additionally, the general cost of underground construction often makes it difficult to apply on a widespread basis. As described in Section 7.3.3.3 starting on page 172~~161~~, PacifiCorp, at this time, is considering limited and strategic use of undergrounding on a project-by-project basis and plans to continue learning from other utilities that may be using underground more broadly as a wildfire mitigation tactic.

- Key assumptions

PacifiCorp generally assumes that underground is the most effective tactic to reduce ignition risk by eliminating or nearly eliminating the potential for contact with object, vegetation management, or other weather-related impact such as wind, which are get ignition risk drivers. Additionally, based on experience, PacifiCorp assumes that underground is more costly to construct that overhead.

- Cost-effectiveness evaluations (including cost breakdown per circuit mile, comparison with alternatives, etc.)

Generally, undergrounding conductor is more expensive than covered conductor due to the increase in equipment needed, additional procurement of land and additional labor. PacifiCorp estimates, based on experience and general observation of the California Service Territory that undergrounding could cost between $1 million - $6 million per line mile. The large range of costs reflects variation in permitting, construction, and number of meters on the line.

- Any other activities relevant to the undergrounding implementation

PacifiCorp installs covered conductor and undergrounds conductor as part of the Line Rebuild Program described in Section 7.3.3.3 starting on page 172~~161~~.

Exhibit D

PacifiCorp

Public Safety Power Shutoff (PSPS) Execution

PUBLIC VERSION

PACIFICORP | Pacific Power | Rocky Mountain Power

2023 Public Safety Power Shutoff Execution Plan

Document Owner: The emergency management team is responsible for maintaining this document. This includes scheduling annual reviews and exercises, updating content based on annual reviews and exercises, and redistributing new version to document stakeholders.

The plan will be reviewed and exercised annually. The scale of the exercise will be determined by the President and CEO in coordination with emergency management personnel and key leadership.

Author: PacifiCorp Emergency Management Version: 3.0 Origination Date: May 10, 2019 Last Revision: January 12, 2023 Last Review: April 6, 2023 Next Revision: Winter 2023	Exercise Last Exercise Date: March 28, 2023 Last Exercise Type: Tabletop Next Exercise Date: May 15-18, 2023 Next Exercise Type: Functional

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Record of Revisions

Date of Revision	Activity	Summary of Changes	Reviewers/ Approvers
Dec 2022	Plan revised	Significant revisions	Jeff Bolton

2 PACIFICORP ACRONYMS

AAR – After Action Report

AFN – Access and Functional Needs

CRC – Community Resource Center

DOC – Department Operations Center

DOT – Department of Transportation

ECC – Emergency Coordination Center

EM – Emergency Management

EOC – Emergency Operations Center

EPG – Executive Policy Group

ESF -Emergency Support Function

ETR – Estimated Time of Restoration

FEMA – Federal Emergency Management Agency

GIS – Geographic Information System

ICS – Incident Command System

IP – Improvement Plan

IT – Information Technology

JIC – Joint Information Center

JIS – Joint Information System

MBL – Medical Baseline

OEM – Office of Emergency Management

OLB – Operational Leadership Branch

PCC – Portland Control Center

PIO – Public Information Officer

PP – Pacific Power

PSPS – Public Safety Power Shutoff

PUC – Public Utilities Commission

RBM – Regional Business Manager

RMP – Rocky Mountain Power

SCC – Salt Lake Control Center

T&D – Transmission and Distribution

WRMAA – Western Region Mutual Assistance Agreement

3 PLAN OVERVIEW

3.1 PURPOSE

This is intended to provide the **minimum** guidelines for a planned de-energization (Public Safety Power Shutoff) of energized facilities when extreme weather or other conditions pose an imminent safety threat to persons and/or property. **Additional guidelines may be required as part of a specific state event mitigation plan (i.e., wildfire)**. Public Safety Power Shutoff (PSPS) events are dynamic in nature and may require additional, or a variance in steps, as dictated by the event.

A planned de-energization is a last resort measure to reduce public safety risk.

Nothing in this plan supersedes the general authority of the company to de-energize a power line during an emergency, and a decision (i.e., to protect fire response personnel or to protect company assets from fire damage) might be made without complying with the notification and outreach sections of this plan. This plan primarily allows for a proactive decision to be made, to implement a planned Public Safety Power Shutoff event. While unavoidably disrupting electrical service, a planned Public Safety Power Shutoff event may be warranted to reduce any risk of energized facilities being involved in a public safety incident under extreme conditions (i.e., weather, flooding, etc.).

3.2 ACTIVATION CRITERIA

This plan may be activated for any public safety incident which could be mitigated by de-energization of specific energized infrastructure.

4 SITUATION OVERVIEW

The company utilizes weather forecasts and other situational awareness information to identify when a potential public safety power shutoff event may be warranted. Based on the best available weather forecast and other relevant situational awareness information, senior management can initiate a public safety power shutoff event.

Upon agreement by executive management to initiate Public Safety Power Shutoff actions, the Emergency Coordination Center (ECC) will be activated (if it has not already been activated). The ECC Staff will then prepare a Public Safety Power Shutoff Plan, which at a **minimum** shall include:

- Forecasted date and time that the de-energization event will start.
- Estimated duration of the event.
- Date and time that affected customers will be notified under a proposed customer notification plan.

- Critical customers and facilities on the circuit such as hospitals, emergency centers, and water/water treatment plants that will be impacted.
- With respect to each circuit or portion of a circuit planned for de-energization, a description of the circumstances that give rise to the need to de-energize with specific focus on how it creates an "imminent and significant risk to persons and/or property;"
- A description of measures considered as an alternative to de-energization and why such measures alone are insufficient.
- A description of the public safety benefits the company hopes to achieve by de-energizing the applicable electrical facilities.
- A description of proposed efforts to mitigate the adverse impacts on customers and communities impacted by de-energization; and
- The proposed date and time for notifying the appropriate commission staff.
- Additional information may be required as part of a specific state event mitigation plan.

Once the Public Safety Power Shutoff Plan is ready for distribution, the Emergency Coordination Center (ECC) will activate a MSTeams meeting, or conference bridge (503-251-5293[1]) if MSTeams is unavailable and invite the following company participants or their designated representative:

- Senior Vice President, Power Delivery
- Vice President of System Operations
- Vice President of Operations
- Vice President of Customer Service
- Vice President of Corporate Communications
- Managing Director, Transmission and Distribution Operations (PP or RMP)
- Director of Renewable Generation (when applicable)
- Managing Director of Operations (PP or RMP)
- Director of Emergency Management
- Manager of Region System Operations (PCC or SCC)
- Emergency Manager (PP or RMP)
- Manager of Meteorology
- Director of Commercial Accounts and Community Relations (for impacted area)
- Regional Business Manager (for impacted area)
- State Regulatory Affairs Manager.

The Public Safety Power Shutoff Plan may be modified based on the discussion during the call.

[1] Conference bridge can support up to 15 callers at one time.

4.1 Public Safety Power Shutoff Weather Monitoring and Review

During fire season, as needed, a situational monitoring call may be conducted when the forecast indicates the potential for PSPS actions. A decision to activate the Emergency Coordination Center may be made within the situational monitoring call or may be initiated separately.

The following considerations are part of the decision process to initiate PSPS actions:

- **Location:** Are powerlines within an area where local fuels will allow for ignition and spread of a wildfire? Is the wildfire risk extreme?
- **Weather:** Do current and/or forecasted wind conditions pose an increased risk of wind or vegetation related outages?
- **Duration:** Is the duration and extent of these conditions sustained and not momentary or hyperlocal?
- **Public Safety:** Are any ongoing public safety incidents going to be impacted by PSPS execution?
- **Field Observations:** Do field observations indicate an imminent threat to powerlines, fire response resources are limited, or there are minimal ingress or egress routes?

4.2 Circuit situational Monitoring

Prior to the activation of the Public Safety Power Shutoff, the Area/District Manager or designee may dispatch circuit crews to the impacted areas to complete a weather and/or situational assessment and a patrol of the targeted circuits using the 069 Procedure – Condition Codes (link below). Feedback will be provided to the Emergency Coordination Center via approved process.

http://idoc.pacificorp.us/policies_and_procedures/eamp/transmission/fpp.html

4.3 External Coordination

Strong partnerships between the utility and local public safety, health, other utilities, and emergency management agencies are essential for effective coordination in any event that impacts the community. PacifiCorp will serve as the initiating agency in the event of a Public Safety Power Shutoff and will coordinate with all local agencies as appropriate. The utility will take advantage of the expertise and recommendations offered by state and local emergency management agencies. Any non-outage related issues or incidents that arise during a Public Safety Power Shutoff will be handled by local emergency management and public safety.

PacifiCorp emergency management staff will maintain regular outreach with local jurisdictions to include voice and email notifications and communication at least daily during the event. Additionally, if requested, a PacifiCorp employee may be dispatched to the affected State or County Emergency Operations Centers in the role of Agency Representative and will be to provide a constant and direct conduit for information.

To help PacifiCorp understand local sensitivities and concerns during a Public Safety Power Shutoff, PacifiCorp will typically discuss the Critical Infrastructure affected with the Local Emergency Management Agencies. This information adds to the situational awareness of PacifiCorp's incident command personnel before the event's initiation. Identified specific information for states and counties can be found in Appendix E.

PacifiCorp will conduct outreach to adjacent utilities as appropriate based on the event's circumstances. Other utility contact information can be found within mutual assistance directories or the use of the "In Case of Crisis" application which is an electronic directory of all WRMAA member utility points of contact, internal directory as created for smaller neighboring utilities, and through ESF-12 (Energy) requests for coordination.

Effective communication is essential in any incident that impacts the public. PacifiCorp will coordinate local communication from the Emergency Coordination Center unless a physical Joint Information Center is activated. Event update meetings will be held as needed with an option to join remotely. In addition, should a Community Resource Center (CRC), as outlined in the Community Resource Center Plan, be established, company representatives will be present to communicate with and assist community members. The communication plan can be found in Appendix D.

When feasible, the decision to activate a Community Resource Center should be made at the 48-hour point. If 48-hour notice is not feasible, a CRC decision should be made at least within the 24-hour point, because a minimum of a 24-hour notice is typically needed to successfully mobilize a Community Resource Center (see the CRC Plan for specifics).

4.4 Pre-Event Notification to Affected Customers and Other Stakeholders

Forecasting from the PacifiCorp Meteorology Team and local input are utilized by the company to monitor situations that could warrant de-energization of electrical infrastructure in an identified area. Additional data inputs may be required as outlined in a state specific event mitigation plan.

When the Emergency Coordination Center is activated, the Emergency Manager will assume the position of the Emergency Coordination Center Manager. The Emergency Manager will schedule a coordination call and notify the appropriate personnel through established distribution lists of the activation and that a PSPS watch is in place.

The ECC Manager will facilitate all coordination calls with the goal to identify and prioritize actionable items and to build and modify as needed the Public Safety Power Shutoff Plan for the specific event. Once the plan has been adopted, it will receive approval from ECC and DOC managers.

Level	Description
PSPS Watch	Public safety circumstances are such that enhanced situational monitoring is required and a de-energization event is possible to occur
PSPS Warning	Public safety weather forecasts are such that a de-energization event will likely occur
PSPS Cancellation	Public safety circumstances are such that PSPS actions are no longer necessary, make notifications the same as event end. This may occur prior to execution during watch or warning phases.
PSPS Execution	Public safety circumstances are such that de-energization actions are in progress
PSPS Restoration	Public safety circumstances are such that restoration actions have begun
PSPS Event End	All restoration is complete

After adoption of a Public Safety Power Shutoff Plan, before the de-energization event is initiated, the company will make reasonable attempts to notify affected customers and other stakeholders of the planned event. As situations can be dynamic, the timeframes outlined are

subject to change and may be adjusted for each specific event. If an individual(s) responsible for notifications did not participate in the initial call, the ECC will ensure the plan is immediately delivered to every individual (or designee). Additional notification obligations may be required as outlined in a state specific event mitigation plan.

Access and Functional Needs (AFN) and Medical Baseline (MBL) customers will receive a direct and verified call from a customer service representative instead of or in addition to the normal automatic notification tools. If verification is not successful, the ECC Manager will coordinate with the local public safety jurisdiction to attempt an in-person notification.

4.5 DE-ENERGIZATION

Region System Operations will develop the switching plan(s) for the Public Safety Power Shutoff execution after adoption of the PSPS plan. A final review of the switching plans by the Transmission/Distribution planning coordinator will be completed before execution by the Emergency Coordination Center. The final approval to initiate a Public Safety Power Shutoff will be given by the Operational Leadership Group. After the final approval is received, the designated T&D Department Operations Center Chief receives instruction from the Emergency Coordination Center to execute de-energization; the appropriate operator(s) will begin switching activities with field personnel. Data regarding circuits of concern, de-energization and restoration times will be captured in the data collection table (Attachment F).

4.6 RESTORATION

The Emergency Coordination Center will notify the T&D Department Operations Chief that the conditions necessitating the planned Public Safety Power Shutoff have subsided and prepare to initiate restoration of the affected facilities once directed to restore.

Before re-energizing any facilities (line, substation, etc.), the Department Operation Center will direct field personnel to begin assessing the deenergized circuits generally through ground or air patrols. As part of the patrol and inspection, field personnel must document all damage to PacifiCorp's facilities in the de-energized areas.

After receiving confirmation that a line is ready for restoration based on existing guidelines, the responsible region operator shall restore the applicable lines(s) or portion(s) of a line (distribution and/or transmission), facilities (i.e., substations), and log the date and time each facility (line, portion of line, substation, etc.) was re-energized.

4.7 EVENT END

Upon cancellation without de-energization, or upon restoration of customers affected by the PSPS event the ECC will gather all data and begin the After-Action Report (AAR) process. These actions include deactivating the ECC, gathering all notes and materials for inclusion in the AAR, notification of partners of response termination, and creating, and tracking to completion of the AAR and Improvement Plan (IP).

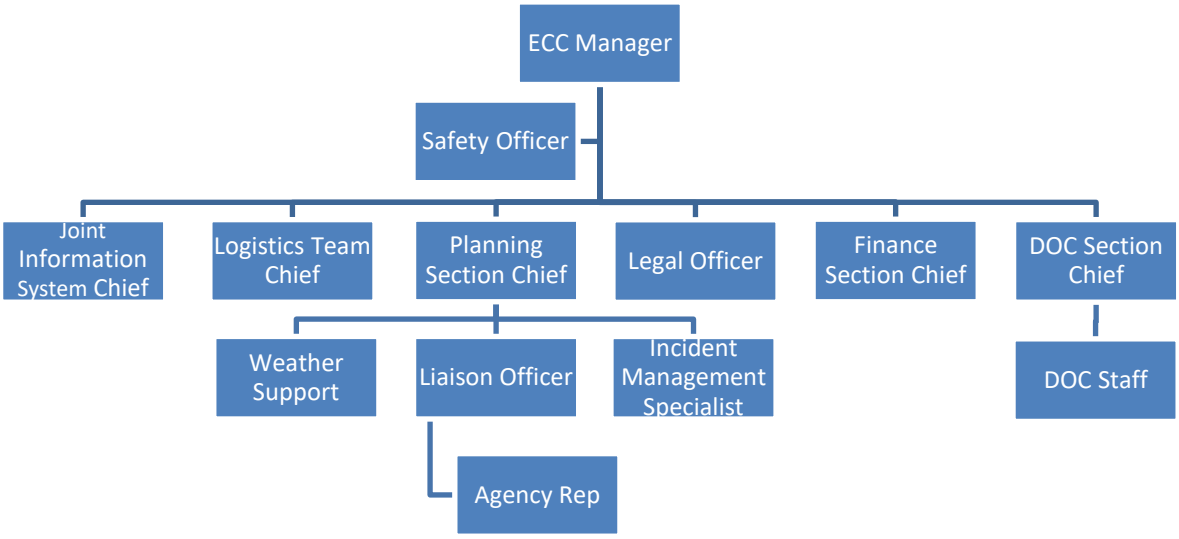
5 ROLES AND RESPONSIBILITIES

Roles, responsibilities, and protocols are defined in the PacifiCorp Emergency Response Plan which follows FEMA's guidelines for managing any event or incident. The information and responsibilities included in this document are meant as a supplement to the all-hazards structure.

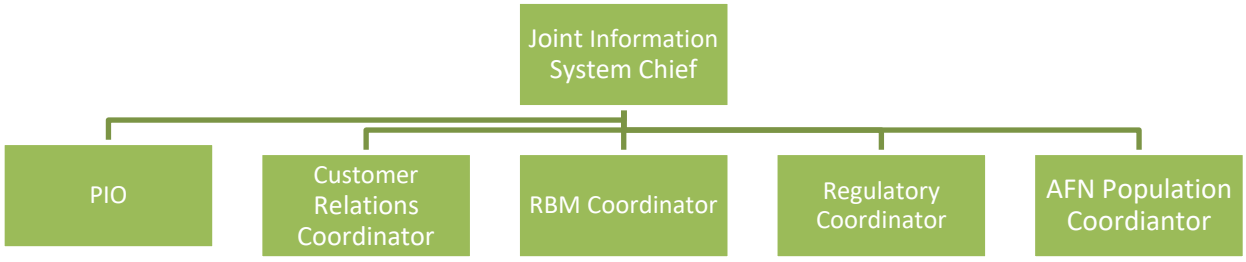
5.1 OVERVIEW

The ECC provides coordination and support to the T&D Department Operations Center and tactical response resources and reports current situational information to the Executive Policy Group and/or Operational Leadership Group. The ECC organizational structure is designed to be scalable based on situational needs and follows the established structure as outlined in the Emergency Response Plan and related functional annexes. Below are a few key examples:

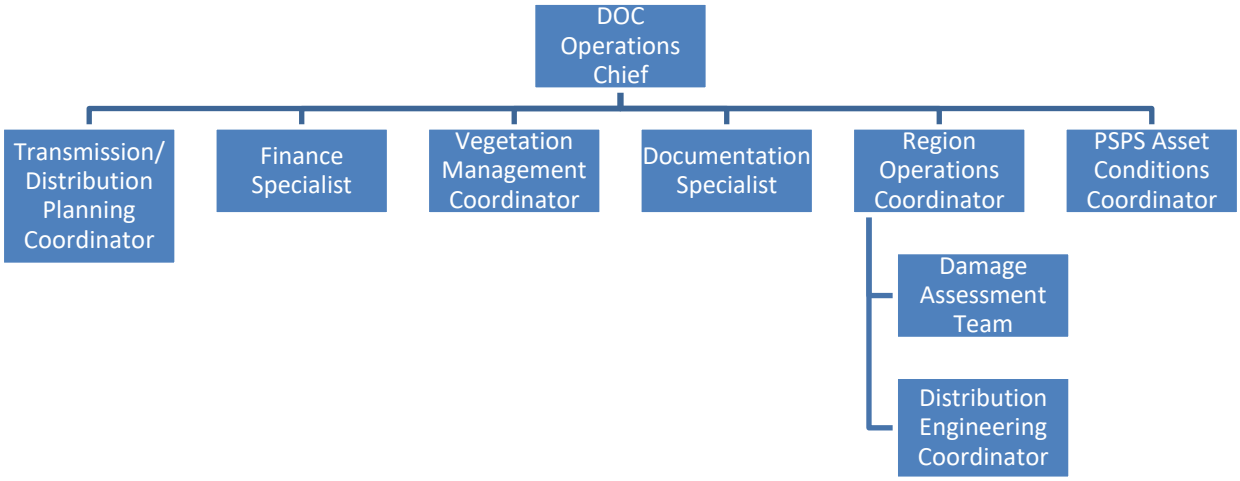
5.1.1 Example Emergency Coordination Center Structure



5.1.2 Example Joint Information System Structure (JIS)



5.1.3 Example Department Operations Center Structure



6 PSPS CHECKLISTS

The checklist tables below are broken out by timeframes for PSPS Warning, Watch, Execution and Restoration. The tables below identify required activities specific to a Public Safety Power Shutoff event (which should be completed in addition to tasks already outlined in the Emergency Coordination Center portion of the PacifiCorp Emergency Response Plan). Documentation should be completed within the designated timeframe as identified for the incident based on the PSPS Data Reporting Template.xlsx in addition to normal Situation Reports and Operational updates.

When conducting a PSPS, all responsible parties will capture the date and time of action in the 'complete' column, or on an ICS 214 form. Any additional actions not listed, should be documented in the additional columns at the end of each timeframe. All documentation captured will be submitted to the Documentation Unit or ECC manager at the conclusion of the event.

6.1 PSPS Watch Checklist 7-4 Days Prior

Objectives
• Ensure life-safety • Ensure employee welfare • Continuous coordination and communication with affected customers

	Actions	Responsible	Complete
PSPS WATCH **7-4 DAYS PRIOR**	☐ Receive forecast notification and notify appropriate personnel ☐ Initiate and coordinate decision making conference call ☐ Notify appropriate county, state, and tribal emergency management agencies ☐ Gather local situational information from impacted emergency management agencies	Emergency Management Duty Officer	
	☐ Monitor weather forecasts ☐ Provide weather briefings ☐ Identify potential circuits of concern	Meteorology	
	☐	T & D DOC Chief	
	☐ Participate in initial decision-making call ☐ Assume Response Organization roles	All	
	☐ Approve activation of PSPS Execution Plan and associated actions	SVP, Power Delivery (or delegate)	
	Listed Responsible Positions For Checklist Transition From Normal Business Titles to EPG/OLB/ECC/DOC Roles At This Point		
	☐ Assume role of Executive Policy Group (EPG) Director (if activated)	CEO	
	☐ Obtain the following data: • Identify district • Identify impacted distribution lines-facilities • Identify impacted sub-transmission lines-facilities • Create impacted critical customer list • Create impacted customer list	Region System Operations	

PSPS WATCH **7-4 DAYS PRIOR**	☐ Communicate with appropriate state regulatory agencies as required ☐ Begin compiling data into PUC post event reports	Regulatory Coordinator	
	☐ Notify and coordinate with industrial accounts ☐ Coordinate with affected local and city government	RBM Coordinator	
	☐ Identify effects on generation capability ☐ Prepare affected plant personnel for de-energization (if applicable) ☐ Develop restoration plan (if needed)	Generation or Renewables DOC Chief	

6.2 PSPS Watch Checklist 72-48 Hours Prior

	Actions	Responsible	Complete
PSPS WATCH **72-48 HOURS PRIOR**	☐ Activate Emergency Coordination Center (ECC) for support operations. ☐ Assume operational leadership role of situation until termination *Note: Consider additional staff for weather monitoring, switching plan development, and engineering support*	OLB Chief	
	☐ Continue to monitor situation and provide guidance as needed (if activated)	EPG Director	
	☐ Activate Department Operations Center and assume command of situation until termination ☐ Manage assets within and outside affected area	T&D DOC Chief	
	☐ Update appropriate county, state appropriate tribal emergency management agency's ☐ Request partners continue outreach to include: ○ Variable messaging signs through DOT ○ 211 messaging ○ County Emergency Management Agency messaging support ○ State Emergency Management Agency messaging support ☐ Notify CRC vendor of potential response ○ *See CRC Plan for specific information* ☐ For events affecting multiple utilities, request ESF-12 establish regular coordination calls among all affected utilities and the appropriate PUC/OEM	ECC Liaison Officer	
	☐ Populate PSPS Template and provides to T&D DOC and ECC Manager ☐ Provide operational support to field resources through normal ECC procedures, staffing, roles, and responsibilities within the scope of the established PacifiCorp Incident Management Structure. ☐ Contact emergency logistical support (i.e., Community support centers) vendor for deployment details and timing	ECC Manager	
	☐ PSPS website goes live	IT Representative	
	☐ Request a Work Order Number from T&D Operations Support and publish for use during event	Finance Chief or ECC Manager	
	☐ Monitor weather forecasts ☐ Provide weather briefings	Meteorology	

PSPS WATCH **72-48 HOURS PRIOR**	☐ Refine circuits of concern		
	☐ Pull customer data & provide to ECC & Customer Communications ☐ Create switching plans for field engineering to review ☐ Secure necessary field resources to support effort ☐ Manage assets within and outside affected area	Region System Operations, Affected Wires Director	
	☐ Provide resources to support effort as requested ☐ Secure necessary field resources to support efforts and day-to-day operations	Supporting Wires Director	
	☐ Coordinate with industrial accounts ☐ Coordinate with affected local and city government	RBM Coordinator	
	☐ Communicate with appropriate state regulatory agencies as required ☐ Begin compiling data into PUC post event reports	Regulatory Coordinator	
	☐ Provide 48-hour notice to customers (including critical priority customers) ☐ Provide direct and verified notification to AFN/MBL customers	Customer Relations Coordinator	
	☐ Identify potential effects and mitigation strategies on generation assets ☐ Prepare affected plant personnel for de-energization (if applicable) ☐ Develop restoration plan (if needed)	Generation or Renewables DOC Chief	

6.3 PSPS Watch Checklist 48-24 Hours Prior

	Actions	Responsible	Complete
PSPS WATCH **48-24 HOURS PRIOR**	☐ Continue to monitor situation and provide guidance as needed (if activated)	EPG Director	
	☐ Manage assets within and outside affected area	Affected Wires Director	
	☐ Review and finalize switching orders based on known circumstances	Region System Operations	
	☐ Initiate appropriate Emergency Management Agency outreach ☐ Request partners continue outreach to include ○ variable messaging signs through DOT ○ 211 messaging ☐ State and County Emergency Management Agency messaging support	ECC Liaison Officer	
	☐ Initiate appropriate customer, community-based organization, media, and business outreach ☐ Coordination communication cadence and content	JIS (All)	
	☐ Notification posted on website, social media, and emergency response site ☐ Issue a press statement/release ☐ Ensure all communications channels such as website, app, and press release messages match	PIO	
	☐ Provide notice to customers (including critical priority customers) ☐ Provide direct and verified notification to AFN/MBL customers ☐ Post notification on website, social media and PSPS website	Customer Relations Coordinator	
	☐ Activate CRC (if activating) ☐ Notify and coordinate with industrial accounts ☐ Coordinate with affected local and city government	RBM Coordinator	
	☐ Communicate with appropriate state regulatory agencies as required ☐ Begin compiling data into PUC post event reports	Regulatory Coordinator	
	☐ PSPS Website updates	IT Representative	

6.4 PSPS Warning 24 Hours Prior

Objectives
• Ensure life-safety • Ensure employee welfare • Continuous coordination and communication with affected customers

	Actions	Responsible	Complete
PSPS WARNING **24 HOURS PRIOR**	☐ Continue to monitor situation and provide guidance as needed (if activated)	EPG Director	
	☐ Initiate resource gathering for de-energization and restoration tasks ☐ Secure necessary field resources to support effort. ☐ Provide resources as requested. ☐ Manage assets within and outside the affected area.	T&D DOC Chief	
	☐ Field engineering review to support switching plan	Field Engineering Manager	
	☐ Pre-position resources to appropriate circuits for de-energization and restoration	T&D Operations Manager	
	☐ Continue appropriate county, state appropriate tribal emergency management agency's request to include • Variable messaging signs through DOT • 211 messaging • State and County Emergency Management Agency messaging support	ECC Liaison	
	☐ Provide Agency Representative to Local EOC as available/requested ☐ Finalize CRC activation dispatch *See CRC Plan for specific information*	ECC Manager	
	☐ Continue customer, community-based organization, media, and business outreach ☐ Coordination communication cadence and content	JIS (All)	
	☐ Notification posted on website, social media, and emergency response site ☐ Issue a press statement/release	PIO	

PSPS WARNING **24 HOURS PRIOR**	☐ Ensure all communications channels such as website, app, and press release messages match		
	☐ Identify AFN/MBL Customers and directly notify via Customer Service Representative ☐ Post notification on website, social media, and emergency response site	Customer Relations Coordinator	
	☐ Notify and coordinate with industrial accounts ☐ Coordinate with affected local and city government	RBM Coordinator	
	☐ Communicate with appropriate state regulatory agencies as required ☐ Begin compiling data into PUC post event reports	Regulatory Coordinator	
	☐ Continuously monitor weather forecast ☐ Provide weather briefings	Meteorology	
	☐ Pre-position resources to appropriate circuits for de-energization and restoration	T&D Operations Manager	
	☐ Identify effects on generation capability ☐ Prepare affected plant personnel for de-energization (if applicable) ☐ Develop restoration plan (if needed)	Generation or Renewables DOC Chief	

6.5 PSPS WARNING 12 HOURS PRIOR

	Actions	Responsible	Complete
PSPS WARNING **12 HOURS PRIOR**	☐ Continue to monitor situation and provide guidance as needed (if activated)	EPG Director	
	☐ Ensure staffing levels are appropriate for actions	T&D DOC Chief	
	☐ Assign resources to appropriate circuits for de-energization and restoration	T&D Operations Manager	
	☐ Any medical customers that could not be reached are turned over to emergency services.	ECC Manager	
	☐ Continuously update Emergency Management Agencies	ECC Liaison Officer	
	☐ Continue outreach via media, social media, and direct customer contact ☐ Coordination communication cadence and content	JIS (All)	
	☐ Coordination communication cadence and content ☐ Notification posted on website, social media, and emergency response site ☐ Issue a press statement/release ☐ Ensure all communications channels such as website, app, and press release messages match	PIO	
	☐ Provide notice to customers (including critical priority customers) ☐ Direct and verified notification to AFN/MBL customers ☐ Identify AFN/MBL Customers and directly notify via Customer Service Representative. ☐ Notify ECC Manager of any AFN/MBL customers who have not been reached with verified notification	Customer Relations Coordinator	
	☐ Notify and coordinate with industrial accounts ☐ Coordinate with affected local and city government	RBM Coordinator	
	☐ Communicate with appropriate state regulatory agencies as required ☐ Begin compiling data into PUC post event reports	Regulatory Coordinator	
	☐ Create generation mitigation plan (if needed)	Generation or Renewables DOC Chief	

6.6 PSPS Warning 4-1 Hours Prior

	Actions	Responsible	Complete
PSPS WARNING **4-1 HOURS PRIOR**	☐ Continue to monitor situation and provide guidance as needed (if activated)	EPG Director	
	☐ Final De-energization decision	OLB Chief	
	☐ Employee all call for affected area ☐ Manage deployment of resources	T&D DOC Chief	
	☐ Receive verification that all medical customers were contacted. If not contacted initiate welfare check through local public safety partner.	ECC Liaison Officer	
	☐ Notify customers of de-energization via all communications methods ☐ Coordination communication cadence and content	JIS (ALL)	
	☐ Coordination communication cadence and content ☐ Notification posted on website, social media, and emergency response site ☐ Issue a press statement/release ☐ Ensure all communications channels such as website, app, and press release messages match	PIO	
	☐ Notify customers of de-energization via all communications methods ☐ Directly notify AFN/MBL Customers via Customer Service Representative. ☐ Notify ECC Manager of any AFN/MBL customers who have not been reached regarding restoration with verified notification ☐ Initiate real-time social media updates	Customer Relations Coordinator	
	☐ Notify and coordinate with industrial accounts ☐ Coordinate with affected local and city government	RBM Coordinator	
	☐ Communicate with appropriate state regulatory agencies as required ☐ Begin compiling data into PUC post event reports	Regulatory Coordinator	

PSPS Execution/De-Energization checklist

Objectives
• Ensure life-safety • Ensure employee welfare • Complete appropriate de-energization procedures • Continuous coordination and communication with affected customers

	Actions	Responsible	Complete
PSPS EXECUTION **DE-ENERGIZATION**	☐ Provide strategic guidance for any situation not covered within this plan	EPG Director	
	☐ Execute switching orders ☐ Monitor local assets during event ☐ Provide guidance for any situation not directly covered in this plan	Region System Operations, Field Crews	
	☐ Monitor system stability	VP, Sys Operations	
	☐ Monitor partner emergency management agencies needs	ECC Liaison Officer	
	☐ Coordinate response actions	ECC Manager	
	☐ Monitor situation forecasts and begin restoration planning	Meteorology	
	☐ Coordination communication cadence and content	JIS (All)	
	☐ Notification posted on website, social media, and PSPS webpage ☐ Issue a press statement/release ☐ Ensure all communications channels such as website, app, and press release messages match	PIO	
	☐ Customer situational update ☐ Direct and verified notification to AFN/MBL	Customer Relations Coordinator	
	☐ Notify and coordinate with industrial accounts ☐ Coordinate with affected local and city government	RBM Coordinator	
	☐ Communicate with appropriate state regulatory agencies as required ☐ Begin compiling data into PUC post event reports	Regulatory Coordinator	
	☐ Mitigate generation as directed (if needed)	Generation or Renewables DOC Chief	

6.7 Restoration Checklist

Objectives
• Ensure life-safety • Ensure employee welfare • Restore power • Ensure compliance and documentation requirements

	Actions	Responsible	Complete
PSPS RESTORATION	☐ Confirm reason for de-energization has passed	Meteorology	
	☐ Terminate/demobilize de-energization response	OLB Chief	
	☐ Identify order and priority of restoration	T&D DOC Chief and ECC Manager	
	☐ Coordinate district patrol and restoration with field crews	T&D Operations Manager	
	☐ Notify Emergency Management Agencies of restoration initiation and ETR	ECC Liaison Officer	
	☐ Notify customers of beginning of restoration via all communications methods	JIS (All)	
	☐ Directly notify AFN/MBL Customers via Customer Service Representative. ☐ Notify ECC Manager of any AFN/MBL customers who have not been reached regarding restoration with verified notification	Customer Relations Coordinator	
	☐ Patrol and restore in accordance with identified plan ☐ Complete restoration switching ☐ Record and photograph conditions found	Region System Operations, Operations Manager Field Crews	
	☐ Communicate with appropriate state regulatory agencies as required ☐ Begin compiling data into PUC post event reports	Regulatory Affairs	
	☐ Coordination communication cadence and content	JIS (All)	

PSPS RESTORATION	☐ Notification posted on website, social media, and emergency response site ☐ Issue a press statement/release ☐ Ensure all communications channels such as website, app, and press release messages match	PIO	
	☐ Update customers on ETR ☐ Direct and verified notification to AFN/MBL	Customer Relations Coordinator	
	☐ Notify and coordinate with industrial accounts ☐ Coordinate with affected local and city government	Regional Business Manager	
	☐ Return generation to normal status (if needed)	Generation or Renewables DOC Chief	

6.8 PSPS Event End Checklist

	Actions	Responsible	Complete
PSPS EVENT END **DE-ACTIVATION**	☐ Verify all restoration actions are complete and terminate response	ECC Manager	
	☐ Communicate with appropriate state regulatory agencies as required ☐ Begin compiling data into PUC post event reports	Regulatory Affairs	
	☐ Notify customers of restoration via all communications methods	JIS (All)	
	☐ Directly notify AFN/MBL Customers via Customer Service Representative. ☐ Notify ECC Manager of any AFN/MBL customers who have not been reached regarding restoration with verified notification	Customer Relations Coordinator	
	☐ Notify all appropriate partners of ECC deactivation and termination of response ☐ Follow up on any AFN/MBL customers who have not been reached regarding restoration	ECC Liaison Officer	
	☐ Deactivate ECC ☐ Gather all notes and data for inclusion in AAR/IP ☐ Coordinate final documentation such as AAR, Regulatory reports, data collection, etc. ☐ Send participants after action survey and schedule After Action Review	ECC Manager	
	☐ Write AAR/IP and update action tracker	Emergency Management	

APPENDIX A: REFERENCES

- Annex 02 – Executive Policy Group
- Annex 03 – Operational Leadership Branch
- Annex 04 – Emergency Coordination Center
- Annex 05 – Department Operations Center
- Annex 06 – On-Scene Incident Response
- Annex 07 – Resourcing and Mutual Assistance
- PacifiCorp Community Resource Center Plan
    - CRC Locations by County.xlsx
- PacifiCorp Policy PAC-1000
- Agreements
    - California Utility Emergency Association Mutual Assistance Agreement
    - Western Region Mutual Assistance Agreement
    - In Case of Crisis Application for directory of other utility representatives
- Contact Lists
    - EM Partner POC Info.xlsx
- Reporting Templates (CA specific)
    - PSPS Data Reporting Template.xlsx
    - PacifiCorp PSPS Post Event Reporting TEMPLATE .docx
- Data collection during event
    - PSPS De & Re Energization Timing .xlsx
- Executive Briefing Template
    - PSPS_State_Executive_PacifiCorp.pptx
    - 2023 EM Work Plan and MYTEP.xlsx

APPENDIX B: PSPS EVENT INITIAL INFORMATION TEMPLATE

	Notes/Comments:
System Operator provides to EM on initial call	
District(s)	
Substation(s)	
Circuit ID(s), including, if applicable, a specific description of any portion of a circuit which will be de-energized while other portions of the circuit remain energized	
Number of customers that will be impacted on each circuit	
ECC Decision Notes	
Date and time de-energization event will start	
Estimated duration of the event	
Date and time that affected customers will be notified under proposed notification plan	
Critical customers and facilities on the circuit such as hospitals, emergency centers, and water/water treatment plants that will be impacted	
With respect to each circuit or portion of a circuit planned for de-energization, a description of the applicable extreme fire weather conditions	
With respect to each circuit of portion of a circuit planned for de-energization, a description of the circumstances that give rise to the need to de-energize, such as “imminent and significant risk that strong winds will topple PacifiCorp power lines onto tinder-dry vegetation or will cause major vegetation related impacts on PacifiCorp facilities”	
A description of measures considered as an alternative to de-energization and why such measures alone are insufficient	
A description of the public safety benefit**s** the company hopes to achieve by de-energizing the applicable circuit(s)	
A description of proposed efforts to mitigate the adverse impacts on customers and communities impacted by de-energization	
The proposed date and time for notifying the appropriate PUC	

APPENDIX C: NOTIFICATION MATRIX

PRE-EVENT

Event Description: _____

Date of proposed event: _____

	Planned De-Energization		Estimated Restoration		Completed Restoration		Responsible Person / Position
	Date	Time	Date	Time	Date	Time	
a. Customer Notification							Customer Contact Center
b. Emergency Responders							Emergency Manager or Local RBM
c. Local Government							Local RBM or Emergency Manager
d. Communications Providers							Emergency Manager or Local RBM
e. Critical Facilities							Emergency Manager or Local RBM
f. Regulatory Notifications							Regulation

POST EVENT

All notifications from pre-event will be accomplished advising customers of event conclusion. In addition, state specific notifications will take place in accordance with that state's specific requirements, see Appendix E.

APPENDIX D: PUBLIC COMMUNICATIONS PLAN

1. OVERVIEW

Weather conditions can change quickly. The Public Safety Power Shutoff communications plan is based on ideal conditions that permit advance notification. However, the public communications plan can adapt to changing conditions and shortened timelines.
PacifiCorp communications personnel will receive notification of a potential Public Safety Power Shutoff from Systems Operations up to seven days before an event is activated. Information provided will include the current or forecasted weather conditions and additional key variables triggering an event, the affected area, customer count, and the expected date and time of the event. This places the communications team at an awareness level.
The goal is for PacifiCorp customer care to begin notifying customers 48 hours in advance of a potential de-energization event. If this is not possible due to changing conditions, the notification process will begin as soon as possible. Issuing a public warning or watch prior to 48 hours is discourages, because premature notification of an event that does not occur can lead to public fatigue.

2. PUBLIC SAFETY AUTHORITIES, LOCAL MUNICIPALITIES, EMERGENCY RESPONDERS

As outlined in Appendix C, the utility's Emergency Manager will notify the appropriate local agencies in the affected area, communicating the boudaries of impacted areas and expected duration. PacifiCorp will work with agencies to minimize the impact of de-energization. Notifications will be documented for regulatory reporting purposes and submitted to the PUC after the event has ended.

3. PACIFICORP PUBLIC INFORMATION OFFICER RESPONSIBILITIES

If a PSPS is planned, a company public information officer (PIO) would manage public-facing communications for the event's duration.

Responsibilities:

- Determine, according to direction from the company Emergency Manager, any limits on information release.
- Develop accurate, accessible, and timely information for use in press/media briefings.
- Conduct media briefings in coordination with local PIOs.
    - A pre-determined location with conference rooms, abundant parking and space for news trucks and additional amenities should be identified for JIC. This location should ideally be separate from Emergency Operations Centers.
- Develop a schedule of media briefings based on the level of media interest and estimated duration of the event.
- Arrange for tours and other interviews or briefings that may be required.
- Monitor and forward media information that may be useful to incident planning.
- Maintain current information, summaries and/or displays on the incident.
- Participate in planning meetings.

4. **PACIFICORP CUSTOMER CARE CENTER**

Prior to, during and after an event, customers will be invited across a variety of communication channels to call the PacifiCorp customer care center for questions and concerns. Instructing customers to contact PacifiCorp for non-emergency, outage-related questions and concerns will be repeated across all applicable PacifiCorp public-facing communication channels, including in media advisories and interviews. Local 911 dispatch and emergency services will be encouraged to redirect customers to the PacifiCorp customer care center for non-emergency, outage-related questions, and concerns. Additional customer care staff will be activated as needed in a Public Safety Power Shutoff. The customer care number is 1-866-221-7070. Messages will be relayed in both English and Spanish.

5. **METHOD OF NOTIFICATION**

Affected customers will be contacted by text, email, or phone call based on their account preference. If no preference is selected, a phone call will be made to the primary phone number on the account. Event messages will be posted on social media, PacifiCorp website, and media advisories sent via FlashAlert.

6. **COMMUNICATION TIMELINE**

The following timelines may be modified if changing conditions do not allow for advance notification. In such cases, the company will notify customers as reasonably practicable. Additional communication methods can be added or removed based on the circumstances of the event and regulatory requirements. In general, the company attempts to provide notices as follows:

72-48 Hours	De-energization Warning to Emergency Management Agencies
48-24 Hours	Initial Public De-Energization Warning
24 Hours	De-energization Warning
4-1 Hours	De-energization Imminent
Cancellation of Event (if appropriate)	PSPS Event Cancelled prior to de-energization notification
Event Begins	De-energization Begins
Re-energization Begins	Re-energization beginning notification to all within affected area
Re-energization Completed	Re-energization notification/confirmation to all within affected area
Event End	PSPS execution is complete and affected customers restored

72 Hours: PacifiCorp Emergency Coordination Center is activated.

- Critical customer list is provided to Incident Commander.
- PacifiCorp PIO begins drafting talking points for Regional Business Managers, the contact center agents, the customer advocacy team, and any other internal/external stakeholders per recommendation of Incident Commander.

48 Hour Watch: Customer notification begins 48 hours prior to a forecasted event.

- PacifiCorp website updated to reflect potentially affected public safety power shutoff area.
- The 48-hour alert script is launched, and customers are contacted by telephone, text, or email based on the customer's identified preference.
- All PacifiCorp social media platforms are updated with the alert.
- A media advisory is issued via FlashAlert.

24 Hour Warning: The 24-hour alert script is used by the call center to launch outbound calls to all customers.

- Additional notification by text or email may also be sent to customers.
- All PacifiCorp social media platforms are updated with the 24-hour alert.
- A media advisory is issued via FlashAlert.
- PacifiCorp identified medical needs or life support customers identified are personally contacted by call center agents.
    - All outbound calls will be tracked in order to provide the ECC Manager a list of uncontacted customers.
    - List of medical needs or life support customers not contacted is provided to the Incident Commander.
        - The number and location of uncontacted medical needs customers in the de-energization area will be provided to emergency management personnel.

Additional (as determined by regulatory requirement or event circumstance): The alert script is used by the call center to launch outbound calls to all customers.

- Additional notification by text or email may also be sent to customers.
- All PacifiCorp social media platforms are updated with the one-hour imminent alert script.
- A media advisory is issued via FlashAlert.
- **Event Begins**: The event begins script is used by the call center to launch outbound calls to all customers.
- Additional notification by text or email may also be sent to customers.
- All PacifiCorp social media platforms are updated with the event begins script.
- A media advisory is issued via FlashAlert.

Customer Contact during Re-energization

Re-energization Initiated: The re-energization-initiated script is used by the call center to launch outbound calls to all customers.

- Additional notification by text or email may also be sent to customers.
- All PacifiCorp social media platforms are updated with the re-energization-initiated script
- A media advisory is issued via FlashAlert.

Re-energization Completed: The re-energization completed script is used by the call center to launch outbound calls to all customers.

- Additional notification by text or email may also be sent to customers.

- All PacifiCorp social media platforms are updated with the re-energization completed script.
- A media advisory is issued via FlashAlert.

7. **Vulnerable Customer Outreach**

- Known vulnerable customers (reliance on electricity for medical needs) will receive additional outreach from the company requesting they evaluate the safety of their situation and consider a backup plan in case of a public safety power shutoff or any outage.
    - Additional year-round communications will encourage customers dependent on electricity for medical needs to self-identify with PacifiCorp.
    - PacifiCorp will work with local public safety and public health to identify additional opportunities to communicate with vulnerable populations.

Outreach during a public safety power shutoff
24 hours prior to an event, additional phone calls will be made to known vulnerable population and successful/unsuccessful contacts will be tracked.

- Additional outreach coordination with local emergency management and health services for customers not successfully contacted will take place prior to a public safety power shutoff.
- Frequency of calls will be determined by estimated duration of the event. All calls will be tracked, and a spreadsheet of successful and unsuccessful calls will be shared with local partners.

8. **Phone and Email Script**

"Hello this is PacifiCorp with an important safety message. We are actively monitoring hazardous weather conditions in [LOCATION] to mitigate wildfire risk. This [EVENT DAY] forecasted high winds, combined with current low humidity and dry conditions can result in flying debris coming in contact with power lines and escalating wildfire risk. We may issue a Public Safety Power Shutoff to prevent a potential fast-spreading wildfire from occurring.
Our crews continue to patrol power lines in the area and ahead of the [FORECASTED CONDITIONS] beginning [DAY AND TIME]. Currently, PacifiCorp is strategically positioning teams for on-the-ground real-time observation to monitor power lines and quickly respond to any issues.
Weather forecasts indicate a potential Public Safety Power Shutoff could be initiated [EVENT TIMEFRAME], should sustained winds and other measures exceed thresholds.
We will continue to monitor conditions and will provide updates should we need to issue a Public Safety Power Shutoff in your area.
For more information, please visit pacificpower.net or call our customer care team at 1-888-221-7070.
We appreciate your attention. Thank you.
Si necesita hablar con un representante que habla español, llame al 1-888-225-2611. "

9. **Text Message Script**

“We are monitoring for wildfire risk in your area. Updates to continue if a Public Safety Power Shutoff is issued [Day/Date].”

APPENDIX E: STATE SPECIFIC INFORMATION

California

Notify the CalOES Strategic Warning Center via online survey at each milepost (72, 48, 24, 1 hour prior, de-energization, restoration begin, restoration complete and for any major scope change of greater than 2,000 customers): https://psps-calema.hub.arcgis.com/and follow up with a call 916-845-8911

PacifiCorp will also provide initial and updated as needed GIS map layers to CalOES via the PSPS Portal.

PacifiCorp will establish daily executive briefing calls with CalOES at 1400 through the PSPS site. Additionally, operational calls will be conducted daily at appropriate times. Use the slide deck PSPS_State_Executive_PacifiCorp.pptx for the executive and operational briefing.

For California reports the following templates should be used

- PSPS Data Reporting Template.xlsx
- PacifiCorp PSPS Post Event Reporting TEMPLATE .docx

APPENDIX F: DATA COLLECTION

The following table should be completed, as appropriate, for any PSPS event to ensure appropriate data collection. This document can be found electronically at PSPS De & Re Energization Timing .xlsx

Circuit	Area	County	General Description of area	Weather Station	Status	Customers	# Of Customer under PSPS	Forecast De-energization	Actual De-Energization	Forecast Time to Initiate Patrol	Actual time to Initiate Patrol	Forecast Time of Restoration	Actual Restoration Time	Customers Restored	PSPS Duration	Weighted Duration

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Appendix 1: Community Resource Center Plan

Document Owner: The Pacific Power emergency management team is responsible for maintaining this document. This includes scheduling annual reviews and exercises, updating content based on annual reviews and exercises, and redistributing new version to document stakeholders.

Document Disclaimer: This plan is specific to Public Safety Power Shutoff scenarios. The measures and planning detailed in this plan does not alter the utility's approach and communication around non-Public Safety Power Shutoff outages.

This document should be considered iterative. The area-specific Public Safety Power Shutoff plan will be modified as necessary.

Author: Horace Ward
Version: 1.0
Origination Date: September 2021
Last Revision: June 22, 2022
Next Revision: 2023

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Plan Fundamentals

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1.1.1 Purpose

This plan provides guidelines on how Pacific Power will activate, staff, and provide resources for Community Resource Centers in the Proactive De-Energization Zones identified across our service territory with the understanding that Community Resource Centers are not just a requirement but an integral part in ensuring community members affected by PSPS events have access to basic resources and up-to-date information.

1.1.2 Scope

A) This plan is activated in tandem with the PSPS Execution Plan.
B) This guidance document does not directly address providing support for individuals with disabilities or functional needs, but rather addresses issues relevant to general sheltering operations.
C) It may become necessary to turn to local resources to fill the gaps of any facility that is selected.

1.1.3 Objectives

1. Provision of basic needs for shelter, water, and food.
2. Provide strong leadership and effective management.
3. Ensure a quick response to a PSPS event that requires CRC activation.
4. Develop standard operating procedures (SOPs) and checklists to respond to the incident.
5. Partner with local, state, and federal agencies and appropriate private sector organizations.
6. Develop and maintain mutual aid agreements with local & tribal agencies, non-governmental organizations, and others, as needed.
7. Develop and implement an effective communications process for internal and external stakeholders.
8. Periodically, exercise the plan to ensure its effectiveness and change as needed.

1.1.4 Situation Overview

A) With wildfires becoming more frequent and intense throughout our region, protecting the communities that Pacific Power serves while providing safe, reliable power, is the utility's highest priority. Utilizing Public Safety Power Shutoffs is a last resort measure to reduce public safety risk and using historical weather data accompanied by fuels data Pacific Power has identified several Fire High Consequence Areas within its service territory that have an elevated risk of rapid wildfire growth within or near populated areas. Smaller areas known as Proactive De-energization Zones (PDZ) have been identified within the high-risk areas where energized facilities will be shut off when extreme weather conditions pose an imminent safety threat to persons and property.
B) A comprehensive overview of Public Safety Power Shutoffs is available in the Pacific Power Public Safety Power Shutoff Plan.
C) Community Resource Centers are activated when a PSPS is occurring to serve the community in the de-energization area.
D) PacifiCorp works with local emergency managers, public safety partners, and tribal leadership to identify appropriate deployment locations for CRCs. In general, PacifiCorp has identified at least 3 CRC locations per county and at least one CRC per PSPS zone, where most CRC locations are within 10-20 miles of PSPS zones. During an event, this equates to approximately 250 potential customers per CRC on the high end, assuming approximately 5% of potentially impacted customers seek services at the CRC. Given the high density of CRC locations near Mt Shasta, this number could easily be reduced to less than 100 customers if needed by opening adjacent CRCs during an event. Additionally, PacifiCorp contracts with private vendors to support the deployment temporary CRCs in the event that fixed facilities are not a feasible option.

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COMMUNITY RESOURCE CENTERS

Pacific Power utilizes a contracted vendor for logistical support in deploying Community Resource Centers should the need arise during a Public Safety Power Shutoff event. Community Resource Centers will be activated once a PSPS de-energization is Imminent. The center(s) will be open from the beginning of a PSPS event to 10pm with the potential to stay open longer based on community needs. Pacific Power will utilize brick and mortar facilities for CRC locations unless a facility is not available or feasible in which case logistics support can deploy a Community Resource Center tent which is 33ft x 18ft and able to sustain winds of 55mph gusting to 65mph. Pacific Power personnel will staff the center(s) to assist and provide information to community members.

1.1.5 CRC Resources

At least one Community Resource Center location is established within each PDZ and will provide the ability for the community to have specific needs met during a PSPS. Services/resources provided include:

• Shelter from environment • Air conditioning • Air Purifiers & Air Quality Monitors • Potable water & Non-perishable snacks • Seating and tables • Restroom facilities • Refrigeration & Heating for medicine and/or baby needs • Interior and area lighting • On-site security • Televisions • Ice	• Communications capability such as Wi-fi access, SatPhone, Radio, Cellular phone etc. • On-site medical support (EMT-A at a minimum, Paramedic preferred) • Charging stations for Cell Phones, AM/FM/Weather radios, computers, etc. • Small Crates for Pets • AFN/LEP Population support • Personal Protective Equipment • Portable ADA Ramp

1.1.6 Establishing a CRC

All CRC locations were chosen by location through collaboration with local emergency managers. CRC locations are then vetted using a checklist that was developed with guidance from Public Utilities Commissions and the current Americans with Disabilities Act Checklist for Emergency Shelters to ensure CRC services are equitable and accessible for medical baseline and access and functional needs populations.

Pacific Power Emergency Management meets regularly with local and regional Access and Functional Needs groups, Local Emergency Managers, and other support groups to ensure CRC, AFN, & medical baseline needs are identified, and resources are both equitable and accessible.

1.1.7 Activating a CRC

*See: ATTACHMENT 1 - CRC ACTIVATION CHECKLIST

1.1.8 Public Health

Air Quality Monitors will be utilized at any CRC site that is impacted by wildfire smoke. The logistics contractor will provide Air Purifiers at CRC sites to keep air quality levels at acceptable levels as identified by the local public health officials.

- Any additional resources or procedures needed to comply with local health guidance will be sourced and provided at CRC sites such as masks, gloves, hand sanitizer, and social distancing practices.

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1.1.9 After Hours Resources

- For Electric Vehicle (EV) charging, Pacific Power has built three mobile EV charging stations with each having the ability to charge two vehicles at once. Impacted customers will be directed to the Electric Vehicle Charging Station Locations Map & locations https://afdc.energy.gov/fuels/electricity_locations.html#/find/nearest?fuel=ELEC
- For all other power needs, customers will be directed to the outage map

1.1.10 Logistics Vendors

PacifiCorp has signed master service agreements with two logistics vendors (primary & alternate) that will deploy, setup, and maintain CRC locations upon our request.

Primary: Fire DAWG

Alternate: Abel Fire Service

1.1.11 Cost estimate of a CRC

ACTIVITY	RATE	QUANTITY	AMOUNT
20'x40' Tent	$500/day	1	$500
5-ton A/C	$385/day	1	$385
6' Non-porous Table	$4/day	20	$80
Folding Chair – Plastic	$1.50/day	30	$45
Light Tower	$300/day	2	$600
Portable Toilet	$68/day	4	$272
Portable Handwashing Station	$50/day	2	$100
5k Forklift	$350/day	1	$350
Solar Variable Traffic Msg Board	$275/day	1	$275
Water Truck w/ Driver	$1750/day	1	$1750
Generator	$400/day	1	$400
Generator/ Power Distribution Equipment	$300/day	1	$300
45 Gal. Garbage Cans	-	4	NO CHARGE
4'x8' Whiteboard for Tents	-	2	NO CHARGE
Large Screen TV	$45/day	1	$45
Command Trailer	$1650/day	1	$1650
Charging Station	$20/day	1	$20
Refrigerator	-	1	NO CHARGE
Bottled Water	$5/Per Case	10	$50
Labor	$1650/day	1	$1650
Incidentals	$1528/day	1	$1528
		Totals	$10,000

*Estimate based off of 2021 Fire DAWG Daily Rate.

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1.1.12 Generic Site Footprint & Needs

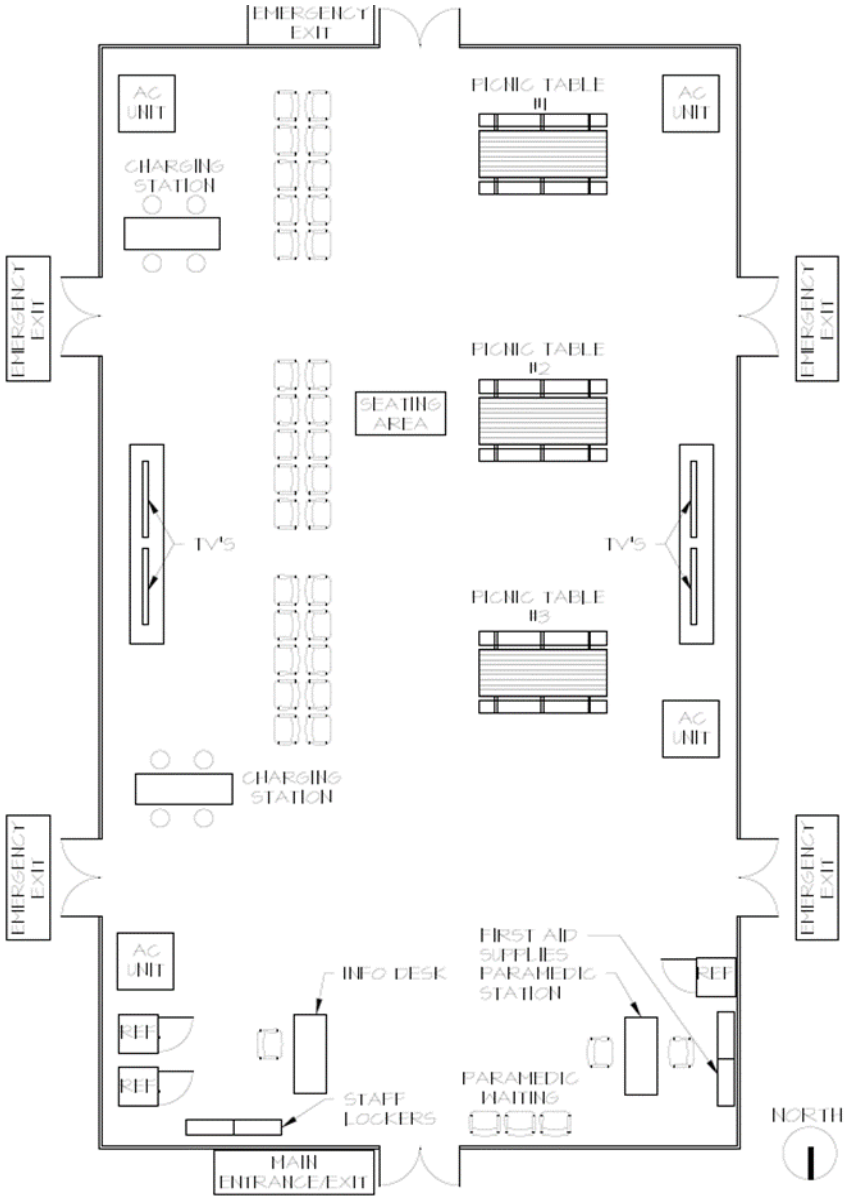
The basic needs of a Community Resource Center location include:

- Adequate parking
  - Handicap Parking
  - Space for public parking
  - Space for vendor equipment
- A minimum of 600 sq. ft. and the capacity to host a minimum of 40 people.
- ADA compliant entryways
- Ground level access
- A separate room for nursing
- A large room for seating/gathering
  - Area or separate room for eating
- Indoor restrooms or room outdoors for portable toilets

Optimal site features

- Backup Power Generator or direct generator connections to building power
- Additional office space for Pacific Power Staff
- HVAC system with recommended filtration and circulation capabilties to handle wildfire smoke.
- A kitchen
  - At minimum a microwave or stove
- Electric Vehicle Charging Stations

Generic Site Layout (CRC Tent)



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1.1.13 Douglas County, OR PDZs

There are three distinct sub-areas in Douglas County that Pacific Power serves that are designated potential proactive de-energization zones for public safety consideration. Generally, the company expects only one of those zones to be exercised in a public safety power shutoff event.

Potential Pro-active De-Energization Zones	Total Customers*
Glendale	**2,503**
Winchester	**2,473**
Riddle / Myrtle Creek	**6,630**

* = count of meters

Area Contact list

Agency/Position	Name	Mobile Number	Office Number	Email
Douglas County Emergency Manager	Wayne Stinson	[redacted]		
Douglas County Emergency Communications	-			
Douglas Public Health Network	-			
Umpqua Valley disAbilities Network	Matt Droscher			
Pacific Power Regional Business Manager	Sam Carter			
Pacific Power Area Distribution Manager	Darin Davis			
Pacific Power Regional Emergency Manager	Tyler Averyt			

CRC Location Information

Location Name	PDZ Area	Address	County	Contact Info	Capacity	On-site Amenities	Under Contract
Glendale Elementary School	Glendale	100 Pacific Avenue, Glendale, OR	Douglas	[redacted]	-	-	-
Tri-City Fire Department	Riddle Myrtle Creek	140 S Old Pacific Hwy, Myrtle Creek, OR	Douglas		-	-	-

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1.1.14 Hood River & Wasco County OR PDZs

There are four distinct sub-areas in Hood River & Wasco counties that Pacific Power serves that are designated potential proactive de-energization zones for public safety consideration. Generally, the company expects only one of those zones to be exercised in a public safety power shutoff event.

Potential Pro-active De-Energization Zones	Total Customers*		Total Line	SIC Locations
HR Urban West	RES Non-RES	270 42	9.7mi (OH) 10.9mi (UG)	66
HR Urban South	RES Non-RES	191 47	11.8mi (OH) 3.4mi (UG)	58
HR (Wasco) Rural Hood River County	RES Non-RES	136 29	11mi (OH) 6.1mi (UG)	37
(HR) Wasco Rural Wasco County	RES Non-RES	564 115	44.5mi (OH) 11.9mi (UG)	161

* = count of meters (updated 3/1/22)

Area Contact list

Agency	Name	Mobile Number	Office Number	Email
Hood River Emergency Manager	OPEN	[redacted]		
Hood River County 9-1-1 Dispatch Center	-			
Hood River County Health Department	-			
Eastern Oregon CIL, The Dalles	W. Kirt Toombs			
Pacific Power Community Relations Manager	Kari Greer			
Pacific Power Area Distribution Manager	Jonah Shelton			
Pacific Power Regional Emergency Manager	Horace Ward			

CRC Location Information

Location Name	PDZ Area	Address	County	Contact Info	Capacity	On-site Amenities	Under Contract
Columbia Gorge Community College	Hood River	1730 College Way, Hood River, OR 97301	Hood River	[redacted]	-	-	-

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1.1.15 Jackson County, OR PDZ

There are six distinct sub-areas (four of which overlap with Josephine County) in Jackson County that Pacific Power serves that are designated potential proactive de-energization zones for public safety consideration.

Potential Pro-active De-Energization Zones	Total Customers*
Glendale	2,503
Merlin	6,388
Fielder Creek	2,686
Shady Cove	3,997
South Rogue River	6,974
Lost Creek Lake	725

* = count of meters

Area Contact list

Agency	Name	Mobile Number	Office Number	Email
Jackson County Emergency Manager	Holly Powers	[redacted]		
Oregon Department of Human Services	Terra Ralph			
Emergency Communications of Southern Oregon	-			
Jackson County Health & Human Services	Chad Petersen			
HASL (Independent Abilities Center)	Randy Samuelson			
Pacific Power Regional Business Manager	Christina Medina			
Pacific Power Area Distribution Manager	Mike Curry			
Pacific Power Regional Emergency Manager	Tyler Averyt			

CRC Location Information

Location Name	PDZ Area	Address	County	Contact Info	Capacity	On-site Amenities	Under Contract
Greenspring's Fire Station	Cascades-Siskiyou	11471 OR-66, Ashland, OR 97520	Jackson	[redacted]	-	-	-
Shady Cove Library	Shady Cove	22477 OR-62, Shady Cove, OR 97539	Jackson		-	-	-

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Location Name	PDZ Area	Address	County	Contact Info	Capacity	On-site Amenities	Under Contract
Shady Cove City Hall	Shady Cove	22451 OR-62, Shady Cove, OR 97539	Jackson	[redacted]	-	-	-
Patrick Elementary School	Fielder Creek and South Rogue River	1500 2nd Ave, Gold Hill, OR 97525	Jackson		-	-	-

1.1.16 Josephine County, OR PDZ

There are six distinct sub-areas (four of which overlap with Jackson County and one that overlaps with Del Norte County) in Josephine County that Pacific Power serves that are designated potential proactive de-energization zones for public safety consideration.

Potential Pro-active De-Energization Zones	Total Customers*
Glendale	2,503
Merlin	6,388
Fielder Creek	2,686
Jerome Prairie	3,198
South Rogue River	6,974
Cave Junction	5,473

* = count of meters

Area Contact list

Agency	Name	Mobile Number	Office Number	Email
Josephine County Emergency Manager	Emily Ring	[redacted]		
Josephine County 911 Dispatch	-			
Josephine County Division of Health	-			
HASL (Independent Abilities Center)	Randy Samuelson			
Director, Commercial Accts & Community Relations	Alan Meyer			
Pacific Power Area Distribution Manager	Thomas Eide			
Pacific Power Regional Emergency Manager	Tyler Averyt			

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CRC Location Information

Location Name	PDZ Area	Address	County	Contact Information	Capacity	On-site Amenities	Under Contract
Boys & Girls Club	Cave Junction	24353 Redwood Hwy, Kerby, OR 97531	Josephine	[redacted]	150	-	Yes
Illinois Valley High School	Cave Junction	625 E River St, Cave Junction, OR 97523	Josephine		-	-	-
Bear Hotel	South Rogue River	2101 NE Spalding Ave. Grants Pass, OR 97526	Josephine		-	-	-
Sportsman Park	South Rogue River	7407 Highland Ave. Grants Pass, OR 97526	Josephine		-	-	-
Redwood Christian Center	South Rogue River	4995 Redwood Ave, Grants Pass, OR 97527	Josephine		-	-	-
Jerome Prairie Transition Center	Jerome Prairie	2555 Walnut Ave, Grants Pass, OR 97527	Josephine		-	-	-
Jerome Prairie Community Hall	Jerome Prairie	5368 Redwood Ave. Grants Pass, OR 97527	Josephine		-	-	-
Jerome Prairie Bible Center	Jerome Prairie	2564 Walnut Ave. Grants Pass, OR 97527	Josephine		-	-	-
Merlin Community Park	Merlin	100 Acorn St, Merlin, OR 97532	Josephine		-	-	-
Fleming Middle School	Merlin	6001 Monument Dr, Grants Pass, OR 97526	Josephine		-	-	-

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Location Name	PDZ Area	Address	County	Contact Information	Capacity	On-site Amenities	Under Contract
Manzanita Elementary School	Merlin	310 San Francisco St, Grants Pass, OR 97526	Josephine	[redacted]	-	-	-
Sunny Wolf Charter School	Glendale	100 Ruth Ave, Wolf Creek, OR 97497	Josephine		-	-	-
Wolf Creek Inn	Glendale	100 Front St, Wolf Creek, OR 97497	Josephine		-	-	-
Glendale Elementary	Glendale	100 Pacific Avenue, Glendale, OR 97422	Douglas		-	-	-

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1.1.17 Siskiyou County, CA PDZ

There are six distinct sub-areas (four of which overlap with Josephine County) in Siskiyou County that Pacific Power serves that are designated potential proactive de-energization zones for public safety consideration.

Potential Pro-active De-Energization Zones	Total Customers*
Happy Camp	865
Weed	2,589
Mt. Shasta	5,074
Dunsmuir	1,806
Snowbrush	17

* = count of meters

Area Contact list

Agency	Name	Mobile Number	Office Number	Email
Siskiyou County Emergency Manager	Bryan Schenone	[redacted]		
Siskiyou County Sheriff's Dispatch	-			
Siskiyou County Public Health	-			
Disability Action Center	-			
Karuk Tribe Emergency Management	Jacqueline Nushi			
Karuk Tribe Indian Health Services	-			
Pacific Power Regional Business Manager	Todd Andres			
Pacific Power Area Distribution Manager	Richard Harris			
Pacific Power Regional Emergency Manager	Tyler Averyt			

CRC Location Information

Location Name	PDZ Area	Address	County	Contact Information	Capacity	On-site Amenities	Under Contract
Karuk Senior Nutrition Program (Headway)	Happy Camp	64101 2nd Ave, Happy Camp, CA 96039	Siskiyou	[redacted]	-	-	-
Happy Camp Wellness Center	Happy Camp	537 Jacobs Way, Happy Camp, CA 96039	Siskiyou		-	-	-
Kahtishraam Wellness Center	Happy Camp	1403 Kahtishraam, Yreka, CA 96097	Siskiyou		-	-	-

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Location Name	PDZ Area	Address	County	Contact Information	Capacity	On-site Amenities	Under Contract
Mt. Shasta Community Resource Center	Shasta	109 East Lake Street, Mt. Shasta, CA 96067	Siskiyou	[redacted]	-	-	-
Family & Community Resource Center of Weed	Weed & Snowbrush	260 Main Street, Weed, CA 96094	Siskiyou		-	-	-
Dunsmuir Community Resource Center	Dunsmuir	5840 Dunsmuir Avenue, Dunsmuir, CA 96025	Siskiyou		-	-	-

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1.1.18 Yakima County, WA PDZ

There is one distinct area that Pacific Power serves designated as potential proactive de-energization zones for public safety consideration.

Potential Pro-active De-Energization Zones	Total Customers*		Total Line	SIC Locations
Nile Valley	Res Non-Res	641 80	30.7mi (OH) 17.3mi (UG)	107

* = count of meters

Area Contact list

Agency	Name	Mobile Number	Office Number	Email
Yakima County Emergency Manager	Tony Miller	[redacted]		
Suncomm 911 & Dispatch	-			
Yakima County Sheriff's Office Dispatch	-			
Yakima Health District	-			
Central Washington Disability Resources	-			
Pacific Power Regional Business Manager	Toni Petty			
Pacific Power Area Distribution Manager	Chad Ooten			
Pacific Power Regional Emergency Manager	Horace Ward			

CRC Location Information

Location Name	PDZ Area	Address	County	Contact Information	Capacity	On-site Amenities	Under Contract
Nile Community Church	Nile Valley	60 Bedrock Ln, Naches, WA 98937	Yakima	[redacted]	-	-	-

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CRC Activation Timeline

Timing	Action	Responsible Person(s)-Department(s)
-72 Hours	Emergency Coordination Center activation	Emergency Management
-48 Hours	Decide likelihood of CRC need Possible thresholds: • Outage Overnight • Outage > 8 hours • Customer impacts requiring extra support • Other incidents • Ongoing public safety incidents	Incident Commander/Emergency Management
-44 hours	Contact Fire DAWG of the potential for a CRC activation to allow them to begin acquiring resources	Emergency Management

-44 hours	Coordinate with the county for status of identified CRC location & public health guidelines
	• Identify if the location will also be used for an emergency shelter if an incident were to occur
	  ○ Establish joint operations plan where Pacific Power operates location during designated hours & county operates location after hours.
	• Identify current public health guidance
	  ○ Pandemic/Outbreak information
	  ○ Air quality thresholds
	• Submit specifics to vendor and ask them to create site plan
		Emergency Management
		CRC Logistics Vendor

-30 Hours	Contact & Survey CRC location to confirm viability • Generation connection • Ensure enough generation capacity is requested for the site • Not in use for other purposes • Any other concerns • Purchase potable water & nonperishable snacks	Regional Business Manager
-26 Hours	Initiate movement of CRC contract resources Initiate movement of EV Charging Trailers	Emergency Management
-4 Hours	Dispatch RBM to CRC for company representation and to receive resources	Emergency Management
-2 hours	• Ensure activation of CRC and completeness of resources on site • Add CRC location and info to webpage/social media	Regional Business Manager Corporate Communications
Event	CRC Operational • Announce that CRC is open on website/social media • Keep information on PSPS & CRC status updated	CRC Logistics Vendor Regional Business Manager Emergency Management Corporate Communications
Post Event	Decision to De-mobilize CRC	Incident Commander
Post Event	Coordinate administrative and financial obligations to CRC vendor	Emergency Management

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1.1.19 Overview

PacifiCorp has a strategic Public Communications Plan for Public Safety Power Shutoffs that includes messaging for Community Resource Centers, below you will find the CRC specific messaging and timeline that accompanies a PSPS event. A comprehensive overview of our Public Communications Plan for PSPS events can be found in our PSPS Execution Plan.

1.1.20 Communication Timeline

The following timelines may be reduced if changing conditions do not allow for advance notification. In these cases, the company will notify customers as soon as possible and communicate specific event information.

Additional communication methods can be added or removed based on the circumstances of the event but in general all communications on PSPS events will be sent via phone, text, email, and posted to our webpage & social media accounts.

Timeframe	Action	Basic Message
2 Hours	De-energization Imminent & Community Resource Center Location	*"A CRC will be opening at [enter location] in two hours"*
1 Hour	De-energization Imminent & Community Resource Center Stand Up	*"A CRC will be opening at [enter location] in around one hour"*
Event Begins	De-energization Begins & Community Resource Center Open	*"A CRC is open at [enter location], [insert available resources]"*
Re-energization Begins	Re-energization beginning notification to all within affected area	*"The CRC will remain open until Re-energization is completed or until 10pm whichever comes first. A list of after-hours resources is available on our website or at the CRC"*
Re-energization Completed	Re-energization notification/confirmation to all within affected area & Community Resource Center closure	*"The CRC is now closed. Please reach out to [Enter customer service center #] with additional questions or needs. Please let us know how your experience with the CRC went by visiting: [enter web link for survey]"*
Cancellation of Event	De-energization Event Cancelled notification	*"No action needed"*

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1.1.21 Plan Review Schedule

Complete By	Activities to be performed
April of current year (pre-fire season)	• Ensure contracts are in place • Update contacts • Complete plan updates
December of current year (post-fire season)	• Update feedback section • Identify areas of improvement • Identify additional changes as required by PUCs

1.1.22 Record of Changes

Change Number: (Year-Update #)	Date of Change:	Document/Section	Change Summary	Position/Name
2022-01	7/22/2022	1.1.16	New CRC location	Emergency Manager, Tyler Averyt

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1.1.23 Review and Improvement Process

Pacific Power Emergency Management will review all feedback from customers, logistics staff, Public Utilities Commissions, and Pacific Power employees then compile an after-action review/improvement plan. PPEM will use the following tools for collecting feedback:

- A survey (attachment 2) will be available to customers after a CRC activation on our website and through our customer service center.
- Pacific Power Emergency Response Checklists
- After Action Feedback forms (for EOC & CRC logistics staff)
- Attachment 3: CRC Usage, Results, Feedback, & Challenges will hold an ongoing list of metrics and feedback from our different sources.

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ATTACHMENT 1 - CRC ACTIVATION CHECKLIST

Complete	Timeline	Action	Responsible Department
☐	-72-48hrs	Receive approval from Executive and/or Incident Commander to establish a CRC	Emergency Management
☐	-48hrs	Contact CRC logistics vendor of the potential for a CRC activation to allow them to begin acquiring resources. Fire Dawg - Julie Quigley, [redacted] Fire Dawg Alan Stovall, [redacted] Abel Fire Services – Westin Abel, 530-[redacted]	Emergency Management

☐	-48hrs	Coordinate with the county for status of identified CRC location & public health guidelines
		• Identify if the location will also be used for an emergency shelter if an incident were to occur
		  ○ Establish joint operations plan where Pacific Power operates location during designated hours & county operates location after hours.
		• Identify current public health guidance
		  ○ Pandemic/Outbreak information
		  ○ Air quality thresholds
		• Pass information onto vendor for site safety plan
			Emergency Management

☐	-40hrs	Contact & Survey CRC location to confirm viability • Generation connection • Ensure enough generation capacity is requested for the site • Not in use for other purposes • Accessible for Access & Functional Needs population • Any other concerns	Regional Business Manager
☐	-24hrs	Initiate movement of CRC Logistics Vendor resources Add CRC location and info to webpage/social media	Emergency Management
☐	-4hrs	Dispatch RBM to CRC for company representation and to receive resources	Emergency Management
☐	-2hrs	• Ensure activation of CRC and completeness of resources on site • Add CRC location and info to webpage/social media • Update 2-1-1 on CRC location, hours, and resources	-Regional Business Manager -Corporate Communications
☐	8am-10pm Daily During PSPS	CRC Operational • Announce that CRC is open on website/social media • Keep information on PSPS & CRC status updated	-Logistics Contractor -Regional Business Manager -Emergency Management -Corporate Communications
☐	Post PSPS Event	Decision to De-mobilize CRC	Incident Commander
☐	1 Week after PSPS	Coordinate administrative and financial obligations to CRC vendor	Emergency Management

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Attachment 2 – Customer Feedback Form

1. **Optional** What is your home address?_____

2. How did you get notified of the Community Resource Center? ____Phone Call _____Text _____Email _____social media _____Television News _____Radio News

3. Was the CRC easily accessible? _____Yes _____No

If you answered no, please explain why:

4. Were you able to keep your essential/medical devices charged and functioning? ____Yes _____No

If you answered no, please explain why:

5. Did you have any needs the staff at the CRC could not meet? ____Yes ____No

If you answered no, please explain why:

Additional Comments:

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ATTACHMENT 3: CRC USAGE RESULTS, FEEDBACK, & CHALLENGES

There was no feedback or challenges discovered during CRC activations in the previous year. Future PSPS event/CRC activation information for usage results, feedback, and challenges will be shown here.

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