

**ANNUAL RAILROAD SAFETY REPORT
TO THE
CALIFORNIA STATE LEGISLATURE**



**Pursuant to Public Utilities Code
Sections 309.7, 765.6, and 7711**

November 30, 2014

For
Fiscal Year 2013-14

**CALIFORNIA PUBLIC UTILITIES COMMISSION
SAFETY AND ENFORCEMENT DIVISION
OFFICE OF RAIL SAFETY
Railroad Operations and Safety Branch**

CALIFORNIA PUBLIC UTILITIES COMMISSION

Michael Peevey, President
Mike Florio, Commissioner
Carla Peterman, Commissioner
Michael Picker, Commissioner
Catherine Sandoval, Commissioner
Paul Clanon, Executive Director

SAFETY AND ENFORCEMENT DIVISION

Denise Tyrell, Director

OFFICE OF RAIL SAFETY

Paul King, Deputy Director

RAILROAD OPERATIONS AND SAFETY BRANCH

Roger Clugston, Program Manager

NOTE TO READERS

In an effort to be more efficient, the California Public Utilities Commission (CPUC or Commission) is combining the Local Safety Hazard Site Report and the Annual Railroad Safety Activity Report into this one comprehensive report.

This report complies with California Public Utilities Code sections 309.7, 765.6, and 7711.

- Public Utilities Code section 309.7 requires the Commission to report on activities of the division of the CPUC responsible for consumer protection and safety (currently, the Safety and Enforcement Division) and document expenditures of the funds derived by fees paid by the railroad corporations.
- Public Utilities Code section 765.6 requires the CPUC to report on the actions the CPUC has taken to ensure the safe operations of railroads in this state. In addition, Section 765.6 requires the CPUC to report annually on the impact on competition, if any, of the regulatory fees assessed railroad corporations for the support of the CPUC's activities.
- Public Utilities Code section 7711 requires the CPUC to report to the Legislature on sites on railroad lines in the state it finds to be hazardous. It also requires the CPUC to include a list of all railroad derailment accident sites in the state on which accidents have occurred within at least the previous five years, describe the nature and probable causes of the accidents, and indicate whether the accidents occurred at or near sites that the Commission has determined to be hazardous.

The Annual Railroad Safety Activity Report is mandated by Public Utilities Code section 765.6, which requires the CPUC to report on all railroad-funded actions taken to ensure the safe operations of the railroads. The report is due to the Legislature annually on or before November 30 of each year. The Annual Railroad Safety Activity Report requires the CPUC to report on the expenditure of railroad user fees and chronicle the operations of the CPUC Railroad Operations and Safety Branch during the previous fiscal year.

The Local Safety Hazard Site Report is mandated by Public Utilities Code section 7711, which requires the CPUC to report to the Legislature on sites on railroad lines in the state it finds to be hazardous. The report is due on or before July 1 of each year. The report also requires the CPUC to include a list of all railroad derailment accident sites in the state on which accidents have occurred within at least the previous five years. The derailment information is documented per calendar year.

Due to the timing of the reports, this report will duplicate the derailment information provided in the 2013 Local Safety Hazard Site Report. If in subsequent years this combined report turns out to be an efficient use of staff, and is seen to better satisfy legislative intent, this combined report format will be continued.

Table of Contents

Executive Summary	1
Introduction	4
Safety Culture and Risk Management	5
CPUC Safety Culture—Risk Management Status Reporting.....	6
Risk Assessment/Bridge Inspections	10
Near-Miss Reporting and Analysis	12
Other Proactive Safety Issues	14
Positive Train Control.....	14
Operation Lifesaver.....	16
The Foundation of the Rail Safety Program	19
Regular Inspections	19
Inspection mandates	22
Focused Inspections	22
Accident Investigations	22
Security Inspections	23
Complaint Investigations	24
Challenges for Rail Safety	25
Reporting of Accidents and Incidents	25
Recruitment and Retention Problems.....	26
Penalties and Citations	27
Regulatory Fee Impact on Competition	27
Local Safety Hazard Sites	30
Appendix A – State Railroad Safety Laws and Regulations	34
Appendix B – Positive Train Control	37
Appendix C - Examples of Operation Lifesaver Presentations	45
Appendix D - Examples of Regular Inspections	49
Appendix E - Examples of Focused Inspections	54
Appendix F - Investigation Summaries	60
Appendix G – Local Safety Hazard Site Maps	62
Appendix H - Acronyms	66

Annual Railroad Safety Activity Report

Fiscal Year 2013-2014

Pursuant to California Public Utilities Code sections 309.7, 765.6, and 7711

Executive Summary

The CPUC works to ensure the safety of freight, passenger, and commuter railroads in California. The CPUC performs these railroad safety responsibilities through its Safety and Enforcement Division, Office of Rail Safety, Railroad Operations and Safety Branch. The Railroad Operations and Safety Branch (ROSB) mission is to ensure that California communities and railroad employees are protected from unsafe practices on freight and passenger railroads by promoting and enforcing rail safety rules, regulations and inspection efforts; and by carrying out proactive assessments of potential risks before they create dangerous conditions.

Safety culture and risk management are paramount to the CPUC culture and mission. As a result of the San Bruno natural gas explosion on September 9, 2010, an Independent Review Panel recommended that the CPUC develop its risk management capabilities for its gas safety oversight program.¹

In response to the Independent Review Panel's report, all CPUC divisions are developing proactive risk management practices. Risk management practices expand regulatory oversight by looking beyond the regulations toward more comprehensive overall safety oversight. The ROSB has devised a new risk management reporting structure to assist its inspectors in pursuit of the goal of identifying and addressing all risks, in addition to regulatory enforcement required by the Federal Railroad Administration (FRA), California laws, and CPUC General Orders (GOs) and Public Utility Codes. (See Appendix A for a list of state railroad safety laws and regulations.)

The Risk-Management Status Reporting protocol that the ROSB established mid-2012 and described later in this report, has already proven successful. ROSB management developed the program in response to an identified need to document and remedy risks for which there was no specific regulation.

Towards the end of 2013, ROSB staff began observing a significant amount of construction of new crude-oil related railroad transfer facilities in the Bakersfield area. Upon further investigation and acting proactively, the branch manager formed an interdisciplinary team of federally certified ROSB railroad safety inspectors, naming it the Crude Oil Reconnaissance Team in anticipation of the crude oil rail shipments. The Crude Oil Reconnaissance Team's

¹ *Report of the Independent Review Panel San Bruno Explosion, Revised Copy*, June 24, 2011. See pp. 15, 20, 99-101.

individual specialties include: track, signal, hazardous materials / security, and operating practices and railroad equipment (railroad cars and locomotives).

The Crude Oil Reconnaissance Team actively monitors and inspects increased rail line rehabilitations, new facility and/or track construction and transportation activities. The focus is to ensure that all crude oil facilities comply with federal and state safety laws, in addition to mitigating risks that are not defined in regulations.

Another risk identified includes the safety of the state's railroad bridges. During 2013-14, the ROSB railroad safety analytical staff started compiling a list of California's railroad bridges and researched other states' approaches to assessing risks associated with railroad bridges. The CPUC's railroad safety analytical staff has created a rail map of California and is gradually plotting the railroad bridges as the bridge inventory becomes more comprehensive.

Additional proactive safety activities, described in detail later in this report, include:

- Collecting and analyzing near-miss incidents;
- Monitoring installation and evaluating the effectiveness of positive train control;
- Developing regulations for the safe planning and construction of high-speed rail;
- Conducting Operation Lifesaver presentations to prevent injuries and fatalities on railroad tracks; and,
- Participating in the Interagency Rail Safety Working Group.

The ROSB has 48 rail safety employees (not including seven vacancies). Thirty seven employees are inspectors with expertise in the subject matters of hazardous materials, motive power and equipment, operations, signal and train control, track and structure, and bridges, and are supported by analysts and administrative staff. The inspectors also identify and address additional public safety risks.

During the 2013-14 fiscal year, ROSB railroad safety inspectors conducted the following activities:²

- Performed 3,692 inspections and follow-up inspections to monitor the railroads' compliance and remedial actions;
- Identified 11,445 federal regulation non-compliance defects;

² Federal *defects* are a notice to the railroad that a non-compliant issue exists. Railroads are directed to replace, repair or remove defects from service. Federal *violations* are defects previously noted that were not remediated, or conditions so egregious they warrant a civil penalty recommendation and immediate remedial action once discovered.

-
- Completed 349 CPUC GO reports that identified 938 defects;
 - Recommended 259 violations of FRA regulations;
 - Cited 11 violations of state regulations;
 - Responded to and resolved 28 informal safety complaints and;
 - Performed 49 Operation Lifesaver presentations that reached approximately 2,158 people.

The Office of Rail Safety foresees challenges ahead. The most significant challenge, consistent with the 2013 Annual Report, is the absence of consistent reporting of accidents or incidents by the railroads. Additional challenges continue to be the pay disparity between the state railroad safety inspectors and their federal counterparts. The much higher pay scales for federal inspectors with the same jobs as state inspectors have caused difficult recruitment and low retention rates, and the resultant vacancies and time spent on training affect productivity. The ROSB has identified this issue annually over the past ten years.

The Office of Rail Safety can assess penalties depending on the violation. For violations of federal railroad safety regulations, ROSB railroad safety inspectors make recommendations to the FRA for the assessment of penalties. Any penalties collected go to the US Treasury. For violations of State laws and Commission General Orders, CPUC Resolution ROSB-002 provides the Director or Deputy Director of the Safety and Enforcement Division the authority to issue citations to railroad carriers for violation of certain GOs and a Public Utilities Code section. The GOs contain requirements for trackside walkways and workspace clearances and for several operational safety issues. The Public Utility Code section provides requirements for safety signage and as well as other operational safety issues. A railroad issued such a citation under ROSB-002 may accept the fine imposed or contest it through a process of appeal.

Last year, the state Legislature appropriated \$7.16 million for the operations of the ROSB from a dedicated account within the CPUC Public Transportation Reimbursement Account (referred to as *The Railroad User Fee*). Public Utilities Code section 309.7 requires the activities of the CPUC that relate to safe operation of common carriers by railroad, other than those relating to grade crossing protection, to be supported by the fees paid by railroad corporations. The fees paid by the railroad corporations are deposited into a separate subaccount within the CPUC Public Transportation Reimbursement Account and are the sole funding source for the CPUC railroad safety program. The fees do not fund any other CPUC programs. The railroad user fees assessed in 2013 on Union Pacific Railroad (UPRR) and BNSF represented just over one fourth of one percent of revenues (0.0026), and were unlikely to have had any effect on competition.

Introduction

The CPUC railroad safety program is one of the most comprehensive railroad safety assurance programs in the nation. The State Constitution declares that the Public Utilities Code is the highest law in the state, and unless federally preempted, the Legislature has unlimited authority to regulate public utilities under the Public Utilities Code, and that the Constitution's provisions override any conflicting provision of state law addressing the regulation of public utilities.

In 1970, the Federal Railroad Safety Act promulgated the Code of Federal Regulations Title 49 (49 CFR), Part 212, which established the State Safety Participation Program with the FRA. The purpose of the state-federal partnership is to provide an enhanced investigative and surveillance capability by having the state agencies assume responsibility for compliance investigations and other surveillance activities as a federal partner. State partners are required to identify violations of federal railroad safety laws, as well as state railroad safety laws.

Public Utilities Code section 765.5 requires the CPUC to dedicate sufficient resources necessary to adequately carry out the State Safety Participation Program for the regulation of rail transportation of hazardous materials. In order to be a state partner under 49 CFR, Part 212, the ROSB railroad safety inspectors must be qualified and certified by the federal government.

The CPUC requires job applicants to have a minimum of five years of direct railroad experience within a specific discipline: hazardous materials, motive power and equipment, operating practices, signal and train control, or track. Most ROSB railroad safety inspectors have accumulated over 20 years, and some more than 40 years, of railroad experience. This experience is critical to understanding what constitutes safe railroad practices. The CPUC also requires each applicant to pass a written and oral exam.

The CPUC and FRA require all new hires to undergo about one year of on-the-job training, depending on their depth of experience. To gain the FRA certification, all ROSB railroad safety inspectors actively participate in at least two week-long classroom training sessions with the FRA to start, followed by at least one week of training every year thereafter. Newly hired ROSB railroad safety inspectors are each assigned an FRA on-the-job training manual. As they complete specific required tasks, the CPUC or FRA railroad safety trainer signs off on the task. When the tasks are completed and the ROSB railroad safety inspector's supervisor believes that the inspector is ready to be an independent inspector, he or she must pass a certification field test. An FRA safety specialist (discipline specific) takes the ROSB railroad safety inspector out for a day or more in the field to test the person's knowledge and ability to perform as an independent railroad safety inspector.

CPUC federally-certified inspectors protect California communities and railroad employees from unsafe practices on freight and passenger railroads. The CPUC-certified inspectors promote and enforce rail safety rules and regulations by performing inspections and accident investigations.

The CPUC's rail safety responsibilities include:

- Inspecting railroads for compliance with state and federal railroad safety laws (Pub. Util.

Code §309.7).

- Investigating railroad accidents and safety-related complaints (Pub. Util. Code §315).
- Recommending railroad safety improvements to the CPUC and federal government (Pub. Util. Code §309.7).
- Ensuring enforcement of railroad safety requirements (Pub. Util. Code §§765.5, 768).

Where ROSB railroad safety inspectors identify a federal law violation, they report it to the FRA and recommend a civil penalty enforcement action.

For any regulatory non-compliance that has not been remedied, the railroad safety inspector may recommend to the Program Manager that the Commission open an Order Instituting an Investigation.³ For non-compliance with certain CPUC General Orders and specific Public Utilities Code provisions, the Director or Deputy Director of the Safety and Enforcement Division may approve a fine.⁴ All fines levied for state violations are deposited into the state's General Fund.



ROSB inspectors during a safety briefing before conducting a field audit

Safety Culture and Risk Management

The CPUC works to continuously enhance the safety culture of the railroad industry as well as its own safety culture. The ROSB railroad safety inspectors also work to identify, mitigate, and eliminate unregulated hazards. At the end of Fiscal Year 2013-2014, the Commission was formally adopting a Safety Management System approach to safety culture and risk management

³ CPUC Rules of Practice and Procedure, <http://docs.cpuc.ca.gov/SearchRes.aspx?docformat=ALL&DocID=89380172>

⁴ Resolution ROSB-002 permits the Safety and Enforcement Division Director and Deputy Director to issue citations and approve penalties in specified amounts for violations of General Orders specific Public Utilities Code sections, most notably for walkway and clearance regulations, and for certain railroad operating rules agreed to in a settlement between the CPUC, the Union Pacific Railroad Company (UPRR) and Burlington Northern Santa Fe Railway Company (BNSF) in UPRR Co. v. CPUC, Case No. 07-cv-001 (E.D. Cal. June 1, 2007).

in a formal safety policy statement. Shortly after the fiscal year ended, the policy was adopted, on July 10, 2014.⁵ A Safety Management System integrates policy, risk management, safety assurance such as compliance, and safety promotion, and will be used as a comprehensive structure for continuous improvement of the regulated utilities safety as well as the CPUC's safety oversight role.

CPUC Safety Culture—Risk Management Status Reporting

The Risk-Management Status Reporting protocol that the ROSB established mid-2012 has already proven successful. ROSB management developed the program in response to an identified need to document and remedy risks for which there was no regulation. In addition to serving as an important tool for risk management, Risk Management Status Reports are a means for ROSB inspectors to work across disciplines. Any ROSB railroad safety inspector has the ability, and the responsibility, for addressing railroad-related safety risks regardless of their discipline or federal certification.

In the course of field work, an inspector may identify an item of concern that is either: (1) out of his/her area of expertise; (2) outside of the formal/official reporting and action protocol; or, (3) an item, or related item, which despite prior formal or informal regulatory action, is still a safety risk.

Once a Risk-Management Status Report is documented, the assigned inspector works with his or her supervisor to mitigate the identified risk. The inspector and supervisor meet with the responsible railroad and identify the issue. The railroad representative will either remedy the risk, or choose to ignore the identified risk. The inspector performs a follow-up inspection to determine whether the risk was mitigated. If the railroad fails to eliminate or sufficiently mitigate the risk, the Program Manager will pursue resolution with the responsible railroad officials, and may bring the issue up to the Deputy Director to take further steps if necessary.

Over the past fiscal year, a number of Risk-Management Status Reports have been created by field staff. While some were associated with existing regulations, some were more complex without any clearly related regulation. Since regulations do not necessarily cover all specific details that can create risks, it is imperative for inspectors to look beyond the regulations, even where regulations may first appear to be comprehensive. Such work requires a substantial amount of staff time, including follow-up. During 2013-14, some of the areas where risks have been addressed through the risk-management status report protocol include:

- Positive Train Control installation and implementation.
- Railroad train dispatching.
- Lack of railroad response to General Order defect notifications.
- Root causes for leaking crude-oil container cars.

⁵ See the Special Interest section of the CPUC's webpage at <http://www.cpuc.ca.gov/puc/> and select "Safety Policy Statement of the CPUC."

-
- Inadequate and ineffective training of railroad employees.
 - Placement of advance warning devices at crossings.
 - Unsafe rail car switching by a non-utility.
 - Unsafe derail installation (a track device for derailing uncontrolled rail car movements).

CPUC Safety Culture—Crude Oil Reconnaissance Team

Current and projected increases in railroad shipments of domestic and Canadian crude oil to California refineries have recently become a national concern. Additionally, these shipments may traverse highly hazardous areas in tank cars. These shipments have been a new concern for the ROSB.



Members of Crude Oil Reconnaissance Team inspecting track near I-5 on the Sunset subdivision, February 2014

Last year, ROSB staff witnessed a significant amount of construction of new crude-oil related railroad transfer facilities in the Bakersfield area. These facilities are being constructed to handle the increasing volumes of crude oil being transported by railroad from the Midwest and Canadian shale-oil formations. Upon further investigation, the branch Program Manager formed an interdisciplinary team of federally-certified ROSB railroad safety inspectors, naming it the Crude Oil Reconnaissance Team. The individual specialties include: track and structures, signal and train control, hazardous materials shipping and security, operating practices, and railroad equipment (railroad cars and locomotives).

The Crude Oil Reconnaissance Team actively monitors and inspects the new building and transportation activities to ensure all crude oil facilities comply with federal and state safety laws, in addition to mitigating risks that are not defined in regulations.

The team's purpose is to:

- Assess and mitigate risks and potential risks to public safety associated with crude oil railroad transportation in California;
- Identify and to resolve relevant areas of general safety and regulatory compliance by the railroads; and,

-
- Provide guidance to the UPRR, BNSF, their contractors and sub-contractors, and all associated maintenance staff to improve the safety of crude oil transportation.

The Crude Oil Reconnaissance Team’s initial focus has been on the pending opening of the Plains American / Bakersfield Crude Oil Unloading Facility, located 30 miles southwest of Bakersfield, and the related necessary upgrades planned for the railroads’ routes to this area. During field observations beginning in November 2013, the team identified a number of potential risks regarding the condition of 29 miles of track and 30 grade crossings. In the subsequent months, the team has conducted numerous surveillance activities, inspections and investigations, culminating in mitigation efforts with railroads and their associated contractors to improve and maintain competencies and to address potential risks prior to operations beginning.



Rehabilitation along the Sunset Subdivision, southwest of Bakersfield, in preparation for crude oil train traffic.

The Crude Oil Reconnaissance Team monitors the effectiveness of inspections, investigations, communications, regulation, rules, and enforcement for areas found to be most vulnerable to the consequences of any crude oil releases. The crude oil destined for refineries in Bakersfield or any other existing refinery in California will traverse local safety hazard sites, whether it is brought in through points of railroad route entries into California from the north, south, or east.



Plains All American crude oil unloading terminal in Bakersfield. The January, 14, 2014 photo, left, shows preliminary site stakes in the ground just to the right of the overgrown bush. Within just a few months, the photo, right, shows train tracks placed – quickly constructed to make the facility ready for receiving crude oil transported

by rail. Plains All American personnel worked cooperatively with the Crude Oil Reconnaissance Team to ensure compliance before going into service.

Two companies, Plains All American Pipeline LP and Alon USA Energy Inc., are planning and developing separate crude oil rail terminal sites to offload as much as a total of 215,000 barrels per day.⁶ There are also similar developments and efforts already completed, underway, or being planned by other companies in preparing in anticipation for the influx of significant volumes of crude oil to be imported into California by railroad.

The Plains All American Pipeline is forecasted to transfer up to 65,000 barrels per day from railroads,⁷ although the facility is designed for 140,000 barrels per day. The Dallas-based Alon proposes to build a 150,000-barrel-a-day,⁸ double-track loop rail terminal at its Rosedale Highway plant that would handle an average of two "unit trains" per day, each more than a mile long and so named because they travel as a unit that is not switched en route and not mixed with other kinds of freight. Unit trains can be loaded and offloaded with the train intact at a single location. Similar crude oil by rail facilities are being developed in areas such as Santa Maria by Phillips 66, as well as in Richmond by Kinder Morgan.

Increases in crude oil shipped by railroad into California increase risks generally, and additionally increase risks where these shipments pass through local safety hazard sites. With each DOT-111 rail tank car used to carry the crude oil, holding up to just over 30,000 gallons, and a unit train consisting of anywhere from 35 to 100 or more DOT-111 rail tank cars, a significant volume of crude oil can pass through these sites with risks of derailment and release of crude oil.

During calendar year 2013, over 6 million barrels of crude oil were delivered by rail to California.⁹ If the Bakersfield terminals realize their potential volumes of crude-by-rail, they alone will be responsible for over 6 million barrels by rail per *month*, an increase of 12 times the 2013 volume.

An example of the Crude Oil Reconnaissance Team in action took place on May 5-8, 2014, where the team carried out a focused inspection in locations throughout Northern California where crude oil shipments are currently being transported. The multi-discipline audit checked for compliance with state and federal regulations, and gathered information on railroad operations pertaining to crude oil transportation. CPUC inspectors in the hazardous materials, track, operating practices, and signal and train control disciplines made up the team, as well as a hazardous materials trainee and track inspector from the FRA.

During the fiscal year, the Crude Oil Reconnaissance Team inspected facilities on BNSF, UPRR, Sacramento Valley Railroad (part of Patriot Rail), and the Stockton Terminal & Eastern

⁶ Schremp, Gordon. *Trends in Sources of Crude Oil: California Petroleum Overview & Background*. Presentation at the 2014 IEPR Workshop, June 25, 2014, Berkeley, CA.

⁷ *Ibid.*, p. 41.

⁸ *Ibid.*, p. 41.

⁹ *Ibid.*, p. 34.

(Omnitrax). Shippers with loading or unloading facilities on railroad property include Kinder Morgan at the BNSF Yard in Richmond, and Interstate Oil at the Sacramento Valley Railroad's yard at the McClellan Air Force Base property in Sacramento. Also taking place in May was an informational meeting held by UPRR, a daylong meeting and field event covering crude oil shipment between San Ardo (Wunpost facility) and Dolores in Los Angeles. Multi-discipline teams helped identify and document a variety of concerns that could affect the safe transportation of hazardous materials. This report will provide an overview of crude oil by rail operations in Northern California, as well as provide inspection findings and identified concerns.



Inspecting typical DOT-111A tank cars on San Ardo to Dolores oil train. Some cars have a built date of 1977. Cars have a life expectancy of 50 years.

Risk Assessment/Bridge Inspections

The Budget Act of 2013 (AB 110, Chapter 20, Statutes of 2013) included three Senior Utilities Engineers to implement risk management oversight for California's railroads. One engineer is dedicated toward risk assessment within the ROSB.¹⁰

Potentially significant safety risks are the age and unknown conditions of California's railroad bridges.¹¹ Many of these bridges are old steel and timber structures, some over a hundred years old. In addition, many of California's railroad bridges span large bodies of water, major highways, and/or areas of high population density. According to the Pennsylvania Department of Transportation, "The magnitude of the consequence [of bridge failure] is directly related to the significance of the featured bridge."¹² It is therefore important to make an assessment of the

¹⁰ The other two engineers include one dedicated toward risk assessment within the Railroad Transit Safety Branch, and one toward the Railroad Crossings Engineering Branch.

¹¹ In the safety professions, risk (r) is defined as the product of the likelihood (p) of an accident and its consequences (c); $r = p \times c$. (See, for example, *ISO Guide 73, Risk Management Vocabulary*, note 4, p. 2.) In the case of bridges, the likelihood of failure is low, but the consequences could be very high, thus posing significant potential risks. For a more complete discussion of risks associated with railroad bridges, see the CPUC Railroad Operations and Safety Branch 2013 Annual Report to the Legislature.

¹² Commonwealth of Pennsylvania Department of Transportation, *Condition Assessment of Short-line Bridges in Pennsylvania*, February 1, 2010, p. 120.

structural integrity of California's railroad bridges.

49 CFR, Part 237 requires track owners to create a bridge management program, perform annual bridge inspections, and calculate load capacities. It also requires railroads to make their bridge management program documents and records available for inspection and reproduction by the FRA.

The CPUC railroad track inspectors that specialize in bridges will work in close cooperation with FRA bridge inspectors to focus inspection efforts on bridges that have been given a prioritization rating based on the consequence of an accident happening on them. In addition, the CPUC and the FRA have agreed to cooperate to ensure that railroads complete their bridge management programs and make the documents available for inspection by the FRA and the CPUC.



Railroad Bridge Evaluation Project – inspecting a wooden trestle in October 2013

During FY 2013-14, the ROSB railroad safety analytical staff started compiling a list of California's railroad bridges and researched other states' approaches to assessing risks associated with railroad bridges. The CPUC's rail safety analytical staff has created a rail map of California and is gradually plotting the railroad bridges as the bridge inventory becomes more comprehensive.

The Budget Act of 2014 (SB 852, Chapter 25, Statutes of 2014) included two railroad track inspectors who specialize in bridge inspection. These inspectors are directed to create a Railroad Bridge Oversight Plan that would complement the risk assessment engineer with the expertise of experienced railroad bridge inspectors. These inspectors will evaluate the railroad's bridge inspections, as well as the bridges themselves, to confirm the implementation and assess the quality of the railroad's bridge inspection program, especially taking into consideration the ages of bridges and the increased volume of traffic expected from the increase in crude oil transportation by rail.

The CPUC rail safety analytical staff will use the results of the initial inspections to extrapolate inspection plans for the balance of California's railroad bridge population. The inspectors will identify deficiencies in the bridges, and make recommendations to the railroads to either repair

or replace bridges located in the most vulnerable high-consequence areas. Criteria that may affect a ranking of the risk of a bridge include whether the bridge exists in proximity to high-population areas, major waterways, or sensitive habitats. Additional considerations include the frequency of passenger traffic over railroad bridges and the risks posed by bridges that support trains carrying hazardous materials.

UPRR provided ROSB railroad safety inspectors an overview of the methodology UPRR uses to identify the bridges that are most economically valuable and those that are most at-risk. At this writing, the CPUC rail safety staff is in the process of reviewing other railroads' methods, but has yet to determine whether other track owners, such as short-line operators, have a schedule of bridge maintenance or replacement in place.

Near-Miss Reporting and Analysis

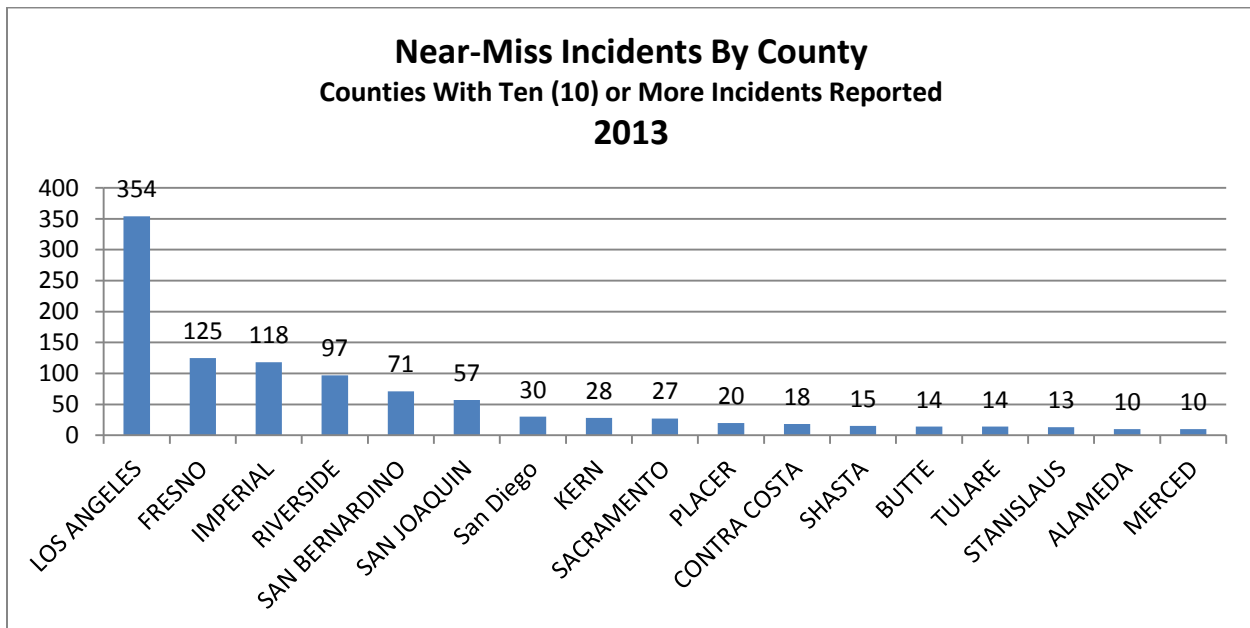
Public Utilities Code section 7711.1 requires the CPUC to collect and analyze near-miss data for incidents in California occurring at railroad crossings and along the railroad right-of-way. "Near-miss" is defined as including a runaway train or any other uncontrolled train movement that threatens public health and safety. In support of this requirement, the CPUC has developed a process for managing the risks discovered through the collection and analyzing of such near-miss data. Using near-miss data to identify locations where there are conditions which may pose a greater likelihood of accidents, and/or have greater consequences in the event of an accident, enables the railroad risk assessment team to improve railroad safety.

To proactively mitigate risks, the CPUC has more broadly interpreted the term "near-miss" to include an incident that does not result in the occurrence of an accident but presents an unintended condition or exposure to a hazard that may have caused an accident. Accidents may be preceded by one or more near-miss incidents, making near-miss incident data useful information for identifying potential threats to public health and safety.

The CPUC rail safety analytical staff has collected near-miss data reported in the calendar year 2013 and analyzed it for Class 1 railroads for counties in which they operate. The team graphed those counties in California with ten or more occurrences of near-miss incidents reported. Through this effort, areas being observed with a high frequency of occurrences of near-miss incidents can be further explored to determine if there are safety issues or existing hazards that can be addressed by taking additional action.

Unfortunately, the data are not systematic or comprehensive. Reporting of most near-miss incidents is voluntary and railroad corporations operating trains in California do not equally report near-miss information in a standardized format and do not use a uniform threshold for determining what conditions qualify as near-miss incidents. As such, the reported near-miss data may not be useful for comparisons. Nevertheless, because the data may describe conditions that may be leading indicators¹³ of accidents and thus describe characteristics that can be addressed, the near-miss data still has considerable accident prevention usefulness.

¹³ A leading indicator is information where there was no accident, but the information may show the potential for an accident, such as a near miss. A lagging indicator is after the fact, i.e., an accident. Both are risk indicators.



Source: UPRR and BNSF Railway

The county-wide data from near-miss incidents can be further broken down to a city level, and further still to a particular crossing. For example, a railroad crossing in El Centro, Imperial County, was identified through the risk assessment team’s analysis to have a significant number of near-miss incidents. Analysis revealed that the sharp angle of the railroad crossing configuration, located in El Centro at Clark Rd. and North 8th St., presents a blind spot hindering motorists from clearly seeing trains approaching the crossing from behind (see photos below). Train operators have a similar hindrance for seeing oncoming motorists. The issue was referred to the CPUC’s Railroad Crossings and Engineering staff, as well as the railroad and local jurisdiction. As of this writing, plans and funding are being discussed for improving the crossing protection.



North 8th St. /Clark Rd. railroad crossing, view from North 8th St. side of crossing. The railroad crossing blind spot is located on the right.



North 8th St. / Clark Rd. railroad crossing. Photo view is from Clark Rd. side of crossing. A train emerging out of the motorist blind spot created by trees and building structures, can be seen to the left.

Other Proactive Safety Issues

Positive Train Control

The Rail Safety Improvement Act of 2008 (P.L.110-432) requires all railroads to install positive train control devices in specified areas by December 31, 2015. Positive train control (PTC) is a Global Positioning System-based technology to provide real-time location and speeds of trains and avoid collisions, such as in the event of an operating rule violation, such as missing a signal. ROSB staff has been actively engaged in design review, observations, and inspections during the development and construction of PTC systems in California.

Positive train control systems are designed to provide the following safety enhancements:

- Train separation or collision avoidance.
- Line speed enforcement.
- Temporary speed restrictions.
- Rail worker wayside safety.

Positive Train Control in California

While the railroads in California required to install PTC have achieved some levels of success in the installation of these systems, it is doubtful that any will be 100-percent ready by the December 31, 2015 deadline. As of this writing, BNSF, North County Transit District and Metrolink may be able to meet the December 31, 2015 deadline, whereas other railroads do not appear to be in a position to do so. For a technical discussion, and more detail on the progress of individual railroads, see Appendix B.

High-Speed Rail Safety: Planning and Operations

The CPUC is one of the entities responsible for safety oversight in the planning, development, construction, and operation of the California High-Speed Rail project. California's high speed rail proposal uses new technologies that are unique to high-speed rail and to the California rail

safety program. During the preliminary planning phases, federal and state oversight agencies are conducting proceedings to develop a regulatory and policy framework tailored to the high speed rail project.

ROSB railroad safety inspectors will work to ensure that the California High Speed Rail Authority adheres to all applicable requirements. Specifically, the ROSB railroad safety inspectors perform the following:

- During planning and construction phases, ensure compliance with CPUC rules, decisions, general orders, and statutes regarding clearances, standards for construction and maintenance of walkways, etc. in addition to FRA regulations regarding track and other infrastructure specifications;
- Prior to and during operations, ensure the accuracy of high speed rail train consist records, observe crews performing safety operations, review the accuracy and completeness of safety manuals and security procedures, etc.;
- After construction, perform ongoing rail safety inspections in the five safety disciplines;
- Perform safety audits of the High Speed Rail System Safety Program Plan, which must be a comprehensive document covering all safety issues. ROSB audits will include focused inspections and involves all aspects of construction and testing phases of rail equipment and control systems.

CPUC high speed railroad safety inspectors plan to monitor high speed rail much the way that Crude Oil Reconnaissance Team is monitoring crude oil. ROSB railroad safety inspectors monitor construction progress, in design and in the field.

CPUC monitoring also includes oversight of electrification to power the trains, as well as any interface with conventional railroad infrastructure such as track design and construction processes. In March 2013, the California High Speed Rail Authority petitioned the CPUC to create regulations governing safety standards for the use of 25 kilovolt (kV) electric lines to power high-speed trains. The CPUC opened a proceeding (R13-03-009) to establish uniform safety requirements governing the design, construction, operation, and maintenance of overhead 25 kV railroad electrification systems and the specific safety challenges the system presents. Evidentiary hearings are scheduled to commence in December 2014.

Certain rules for high speed rail are already in place. 49 CFR, Part 213,¹⁴ specifies track requirements for train operations at track classes 6 and higher. Track Classes 6 and higher include all tracks used for the operation of trains at a speed greater than 90 miles per hour (mph) for passenger equipment and greater than 80 mph for freight equipment.

¹⁴ 49 CFR, Part 213, Subpart G, section 213.301.

New state and federal regulations will likely be promulgated as high speed rail moves forward. Through the testing phase of HSR, such issues in California will be addressed, as well as lessons learned from other high speed rail programs in the US that may advance faster than in California.

Operation Lifesaver

In America, about every three hours a person or vehicle is struck by a train. Operation Lifesaver, a volunteer organization founded in 1972, believes that the majority of these incidents are preventable. Through the “Three ‘E’s” of Operation Lifesaver—education, enforcement and engineering—volunteers aim to end collisions and the resulting fatalities and injuries at highway-rail grade crossings and on railroad rights of way.

ROSB railroad safety inspectors and support staff volunteer throughout the state, providing presentations to schools, community organizations, driver’s education classes, bus driving workshops and trucking organizations, as well as educating the public at weekend events such as festivals and safety fairs. CPUC rail safety staff take part in Officer on the Train and other enforcement events with local law enforcement to promote compliance with state motor vehicle laws and penal codes on railroad at-grade crossings and rights of way.

During the 2013-14 fiscal year, CPUC rail safety staff made 49 Operation Lifesaver presentations, reaching a total of 2,158 people. Presentations have been targeted toward areas where new train traffic will be introduced in the near future to raise awareness that tracks that were unused for years will become active with train traffic again. See Appendix C for examples of staff presentations.

Interagency Rail Safety Working Group

The CPUC Office of Rail Safety participated in the State of California Interagency Rail Safety Working Group and contributed to the group’s June 10, 2014 report, *Oil by Rail Safety in California – Preliminary Findings and Recommendations*.¹⁵

The Working Group’s report made recommendations for action by the California Legislature, CPUC, and state agencies other than CPUC, including:

- The Legislature should approve the proposal in the Governor’s Budget to add seven rail inspectors to the CPUC and request that the federal Department of Transportation move expeditiously to finalize new and retrofitted tank car regulations.
- The Legislature should expand the Oil Spill Prevention and Response Program to cover inland oil spills.
- The Legislature should provide additional funding for local emergency responders.

¹⁵ <http://www.caloes.ca.gov/HazardousMaterials/Pages/Oil-By-Rail.aspx>

-
-
- The Office of Emergency Services (OES) should partner with the California Environmental Protection Agency and the Department of Fish and Wildlife Office of Oil Spill Prevention and Response, with the U.S. Environmental Protection Agency Region 9, and the FRA to undertake a review of local, state and federal emergency response plans.
 - OES should request that railroads provide a complete inventory of their firefighting and spill-recovery resources (as outlined in a voluntary agreement between the Department of Transportation, the Association of American Railroads, and participating railroads¹⁶ to the state.
 - OES, in coordination with the Office of Oil Spill Prevention and Response should request that railroads provide “worst-case scenario” plans for responding to a multi-car incident in any part of California.
 - OES, in coordination with the CPUC should recommend that the federal Department of Transportation require external visual identification on tank cars of Bakken and similar crude to aid first responders.
 - OES, in coordination with the CPUC, should request that Class I railroads operating in California¹⁷ establish a system where emergency responders can securely log-in and access the daily location and status of rail cars and train consists.
 - OES, in coordination with the CPUC, should request that railroads provide better outreach programs and more information to communities.
 - CPUC should request the U.S. Department of Transportation to move expeditiously to finalize new and retrofitted tank car regulations that will result in a more rapid phase-out of DOT 111 tank cars.
 - The Office of the State Fire Marshal should request that the United States Fire Administration promptly issue guidance on the resources required to respond to oil by rail accidents.
 - The Office of the State Fire Marshal, in coordination with OES, should seek partnerships with railroads and oil companies to help fund the establishment of a West Coast Regional Training Center.
 - The U.S. Department of Transportation should codify the voluntary agreement into regulation. In addition, the agreement should be strengthened in several areas. These

¹⁶ The U.S. Department of Transportation, the Association of American Railroads, and participating railroads engaged in a voluntary agreement, dated February 21, 2014 that identified increased safety measures the railroads would implement.

¹⁷ UPRR and BNSF are the only Class I freight railroads operating in California. The Surface Transportation Board defines a Class I railroad as "having annual carrier operating revenues of \$250 million or more" after adjusting for inflation using the Railroad Freight Price Index developed by the Bureau of Labor Statistics. (49 CFR, Part 1201).

include increased track inspections and more stringent braking requirements. Also, the Report recommended that CPUC, among other activities, complete a survey of speed limits on California railroads and determine if there are areas where lower speed limits might be appropriate, monitor and publicly report the extent of railroad compliance with inspection requirements on crude oil routes, and conduct at least one additional inspection of the crude oil routes each year.

- CPUC should request that FRA identify routes that crude oil trains are expected to use, and if not equipped with positive train control, consider requiring the implementation of positive train control on these routes; and request that FRA require railroads and tank owners to install electronically-controlled pneumatic brake technology on crude oil trains.
- CPUC should clarify incident reporting requirements for the release of hazardous substances by rail.
- CPUC should request that FRA provide state-specific normalizing data to enable state accident analysis, including trend analysis and risk assessment, to evaluate the risks presented by the transportation of oil by rail.
- State agencies should work with federal agencies and the railroad industry to address gaps in relevant data.
- The state should develop and post on a public website an interactive map depicting areas along rail lines with potential high vulnerability.

The rail map produced by the Working Group is available online and includes:¹⁸

- Class I mainline track and Local Safety Hazard Sites
- Population density
- Locations of first response units Type 1, 2, 3 and non-certified
- Adjacent-to-track water bodies
- Adjacent-to-track seismic faults
- Sensitive habitats
- Adjacent-to-track population density
- Office of Emergency Services regions
- Counties and major highways

¹⁸ www.caloes.ca.gov

The Foundation of the Rail Safety Program

Regular Inspections

Over the past year, ROSB railroad safety inspectors have engaged in both proactive safety efforts and retroactive accident investigations to mitigate public safety risks. ROSB railroad safety inspectors perform regular inspections, focused inspections, accident investigations, security inspections and complaint investigations. Some examples of inspections and investigations, as well as a comprehensive list of rail safety inspections and investigations, are presented in the Appendices D, E, and F of this report.

ROSB railroad safety inspectors must participate in a thorough training process to become federally-certified in one of five rail-related disciplines:

1. Hazardous Materials
2. Motive Power and Equipment
3. Operating Practices
4. Signal and Train Control
5. Track

A Memorandum of Understanding with the FRA requires ROSB railroad safety inspectors to make civil penalty recommendations to the FRA when the ROSB railroad safety inspectors discover non-compliant conditions with federal railroad safety regulations. ROSB railroad safety inspectors also evaluate whether the inspected properties comply with California laws and CPUC GOs.

Total inspection data for each discipline for the 2013-14 fiscal year include:

- 1) CPUC Hazardous Materials inspectors:
 - Submitted 681 inspection reports for 21,047 units;
 - Identified 901 defects; and,
 - Cited 47 defect violations.

Hazardous Materials units can include each tank car, each record to ensure accurate representation of substance, each evaluation of a release plan, each inspection of the shipper's paperwork, and other similar items.

CPUC hazardous materials inspectors conduct a variety of activities, including the investigation of accidents involving the actual or threatened release of hazardous materials as reported by the OES 24-hour Warning Center. Inspectors also conduct unannounced inspections at the facilities of shippers, consignees, freight forwarders, intermodal transportation companies, and railroads.

CPUC hazardous materials inspectors also inspect facilities to ensure compliance with GO 161— Rules and Regulations Governing the Transportation of Hazardous Materials by Rail. For example, inspectors look for the appropriate grounding of cars to prevent dangerous static electricity buildup during unloading. GO 161 also has requirements for reporting the release or threatened release of hazardous materials where there is a reasonable belief that the release poses a significant present or potential harm to persons, property, or the environment.

2) CPUC Motive Power and Equipment inspectors:

- Submitted 859 inspection reports for 76,728 units;
- Identified 3,526 defects; and,
- Cited 39 defect violations.

Motive power and equipment units can include each locomotive, each rail car, inspection records or specific components thereof. PU Code 765.5(d) requires the CPUC to establish, by regulation, a minimum inspection standard to ensure that at the time of inspection, that railroad locomotives, equipment, and facilities located in the Class I railroad yards will be inspected not less frequently than every 120 days.

3) CPUC Operating Practices inspectors:

- Submitted 1,013 inspection reports for 6,663 units;
- Identified 509 defects; and,
- Cited 86 defect violations.

Operating practices units can include ensuring the accuracy of train consist records, observing crews performing switching operations, reviewing the accuracy and completeness of accident records, ensuring compliance with certifications and licenses, and other similar items.

4) CPUC Signal and Train Control inspectors:

- Submitted 199 inspection reports for 1,161 units;
- Identified 237 defects; and,
- Cited 4 defect violations.

Signal and train control units can include each signal system appurtenance, maintenance and testing records, warning devices at crossings, and other electronic or mechanical signaling systems.

5) CPUC Track inspectors:

-
- Submitted 940 inspection reports for 17,592 units;
 - Identified 6,272 defects; and,
 - Cited 34 defect violations.

PU Code 765.5(d) requires the CPUC to establish, by regulation, a minimum inspection standard to ensure that all branch and main line track is inspected not less frequently than every 12 months. Track units are equal to each mile of track, each switch inspected, each Roadway and Maintenance Machine inspected, each record inspected, and other similar items involving the track structure.

Inspectors use several methods to inspect track. The most thorough way is by physically walking the track. By walking the track, the inspector can not only see the track structure better by being at ground level, but can also be on the look out and see more clearly defective rails and other non-compliant and unsafe conditions. To cover his or her territory, the track inspector will always use this method in combination with a hi-rail inspection (see below), since typically an inspector can only inspect up to 5 miles per day by walking, depending on the condition of the track and the number of trains operating during that time.

Another inspection method involves a hi-rail vehicle (motor vehicle outfitted with steel rail guide wheels). An inspection using a hi-rail vehicle can cover more track miles per day; however, the inspector may miss some critical track anomalies that can be more easily seen from the ground level. Hi-rail inspections are combined with walking inspections, especially at switches, track crossings and bridges.

The ROSB railroad safety inspectors often join the FRA on federal “geometry cars,” which are special rail cars equipped to identify, collect, and disseminate track defects and other potential accident-causing conditions. One drawback to this type of inspection is that the geometry cars often operate at passenger train speeds and may not identify some critical switch component defects, such as those that might cause switch points to open slightly and thus cause a derailment..

When a defective condition is identified by a geometry car, railroads are typically allowed 30 days before a CPUC or FRA railroad safety inspector will perform a follow-up inspection. During this time, the railroads may perform corrective actions by repairing the track, restricting the track (speed reductions) or removing the track from service.

In the 2013-14 fiscal year, ROSB railroad safety inspectors surveyed 580 miles of track in California aboard the track geometry vehicles. The track geometry vehicles identified 112 defective conditions. ROSB railroad safety inspectors conducted follow-up inspections to monitor the railroads’ compliance and verify that the defects had been corrected.

Inspection mandates

Public Utilities Code sections 309.7 and 765.5(d) require the CPUC to employ a sufficient number of federally-certified inspectors to ensure that railroad locomotives and equipment and facilities located in Class I railroad yards in California are inspected not less frequently than once every 120 days, and that all main and branch line tracks are inspected not less frequently than once every 12 months. In the 2013-14 fiscal year, ROSB railroad safety inspectors satisfied the mandate that all locomotive and equipment repair facilities be inspected every 120 days. CPUC also satisfied the track-inspection statutory mandate. Inspectors also conduct unannounced inspections at the facilities of shippers, consignees, freight forwarders, intermodal transportation companies, and railroads.

Focused Inspections

Public Utilities Code section 765.5(e) requires the CPUC to conduct focused inspections of railroad yards and track, and to target the railroad yards and track that pose the greatest safety risk, based on inspection data, accident history, and rail traffic density. Focused inspections involve inspectors from a variety of disciplines or multiple inspectors from a single discipline, working together at a specific location or rail facility.

ROSB railroad safety inspectors conducted focused inspections of railroad yards and track; operating practices; signal and train control; hazardous materials and railroad equipment. Typically, focused inspections are joint efforts between the FRA and CPUC, though Public Utilities Code section 767.5 permits the CPUC to conduct the inspections as the Commission determines to be necessary.

Focused inspections allow ROSB railroad safety inspectors to evaluate all aspects of a railroad or facility's operational and maintenance practices and procedures. They also allow for close evaluation of railroad management and labor abilities, technical expertise and experience, and safety culture.

If corrective actions are recommended by ROSB railroad safety inspectors, a follow-up inspection is performed to determine progress by the railroad entity in carrying out the recommended actions.

In the 2013-14 fiscal year, ROSB railroad safety inspectors performed 49 focused inspections. Of that total, 8 were in the track discipline, 13 were hazardous materials inspections, 10 were for operating practices, 4 for motive power and equipment, 1 for signal and train control, 4 for grade crossing enforcement, and 9 were General Order-related inspections.

Accident Investigations

ROSB railroad safety inspectors investigate accidents including derailments; collisions between trains and other trains, motor vehicles, bicyclists, pedestrians, and obstructions; and hazardous materials releases from trains, pursuant to Public Utilities Code section 315. ROSB railroad

safety inspectors evaluate each accident when reported to CPUC (usually, by OES) and determine the appropriate investigative response based on accident severity criteria, including:

- Impact to the public (evacuations, injuries, fatalities);
- Injuries or fatalities to railroad employees or passengers;
- Environmental impact;
- Impact on commercial transportation (highway closures, commuter interruptions); and,
- Violations of state or federal railroad safety regulations or operating rules.

In the 2013-14 fiscal year, there were 670 reported rail incidents and, while the CPUC rail safety supervisors review all reported incidents, 65 required investigation.

Security Inspections

Public Utilities Codes sections 7665 through 7667 require every owner, operator, or controller of each rail facility to provide a risk assessment to the CPUC for each rail facility, and prescribe the information that must be included. ROSB railroad safety inspectors perform annual security reviews to ensure the railroads comply with these requirements.

In the 2013-14 fiscal year, ROSB railroad safety inspectors performed 34 security reviews of the railroads' risk assessment plans. Of the 34 railroads reviewed, 28 performed the risk assessment in compliance with the statute. Five railroads were found to have minor compliance exceptions: San Francisco Bay Railroad, Napa Valley Railroad, North County Transit District, Pacific Sun Railroad, and Pacific Southwest Railway Museum. ROSB railroad safety inspectors who specialize in security inspections are working with all five railroads to bring them into compliance.

In a more serious violation, the Santa Cruz & Monterey Bay Railroad failed to provide a security plan on three inspection attempts. Santa Cruz & Monterey Bay Railroad is owned and operated by Iowa Pacific Railroad. The Vice President of Operations for Iowa Pacific Railroad was notified of the requirements of Public Utilities Codes 7665 through 7667. He assured the ROSB railroad safety inspector that Iowa Pacific Railroad would develop a risk assessment plan and submit it to the CPUC.

Mare Island Railway ceased operations on April 30, 2014 and was removed from the inspection list.

All railroads were provided a copy of the new Security Plan Guidance, developed in February 2014. This guidance was developed to provide all railroads with the statutory requirements as well as necessary information required to fulfill these requirements.

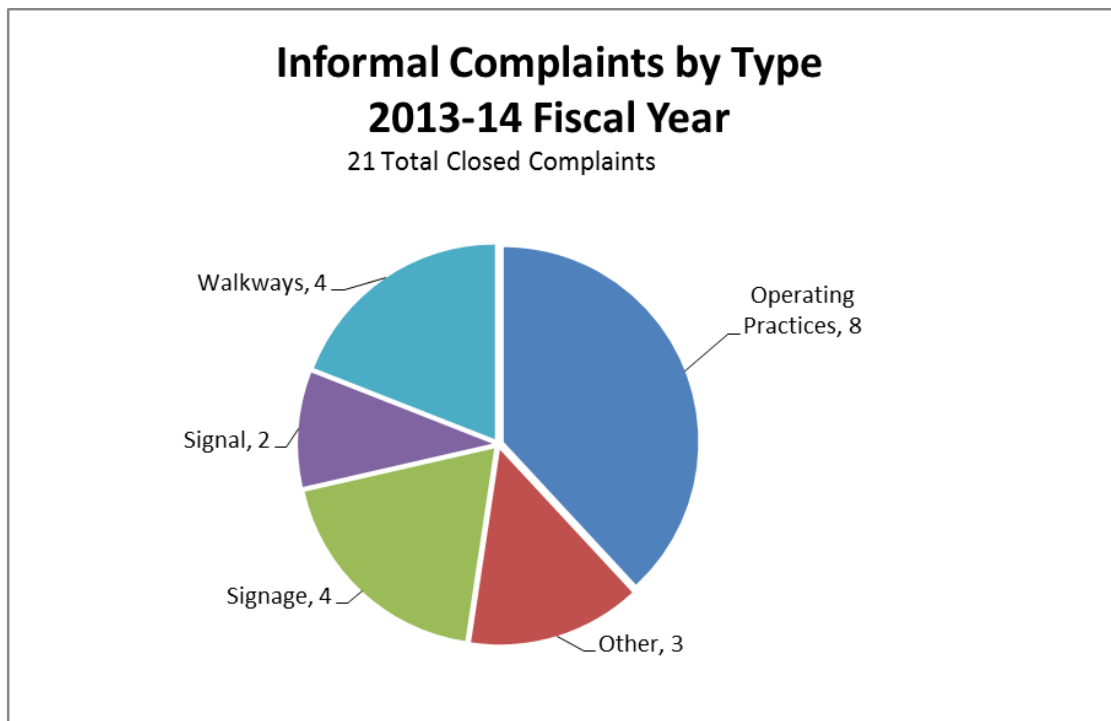
Annual security reviews for the 2014-15 fiscal year began in October 2014. ROSB railroad safety inspectors review individual railroad security plans and work with each railroad to iron out any issues.

Complaint Investigations

The CPUC receives complaints from various sources, including railroad employees, railroad unions (United Transportation Union and the Brotherhood of Locomotive Engineers), the general public, and government personnel. ROSB railroad safety inspectors initially contact the FRA to determine whether the complainant notified both agencies. The CPUC and FRA determine which agency will perform the investigation to eliminate duplication.

For complaints investigated by the CPUC, an inspector discusses the issue with the complainant or a contact person. The inspector investigates the issue and relevant location and gathers data, including photographs and other pertinent information. The inspector discusses the issue with railroad managers in an effort to gain compliance by pointing out unsafe conditions, practices or risks pertinent to the complaint. A formal or informal action plan is discussed with railroad management, including a timeframe for remediation. The inspector then prepares a written response, with proposals for resolving the complaint, for review by his or her supervisor. A response letter is prepared by one of the ROSB supervisors and mailed to the complaining party or his/her representative. A follow-up inspection is performed to ensure compliance and/or remedial action.

In the 2013-14 fiscal year, the CPUC investigated and resolved 21 complaint investigations.



Challenges for Rail Safety

Reporting of Accidents and Incidents

In the CPUC's 2013 Annual Railroad Safety Activity Report,¹⁹ the ROSB reported that the most significant challenge facing railroad safety in California is the noncompliance of many railroads with these requirements for reporting incidents and accidents to the OES and/or CPUC. The CPUC can be hampered in complying with Public Utilities Code section 315 (accident investigations) if the railroads do not report accidents. Similarly, such noncompliance limits the CPUC's ability to comply with Public Utilities Code section 309.7, which requires ROSB railroad safety inspectors to advise the Commission on rail safety issues, and propose regulatory remedies to address unsafe conditions. As a result, ROSB railroad safety inspectors may be unaware of unsafe conditions, and thus may be unable to address those conditions.

Railroads have been inconsistent in their compliance with federal law, California law, and CPUC General Orders with regard to reporting accident / incidents and hazardous materials releases to the CPUC.

- Public Utilities Code section 315 requires the CPUC to investigate the cause of all accidents that have occurred on the property of any public utility resulting in loss of life or injury to person or property and permits the CPUC to make an order or recommendation.
- Public Utilities Code section 7661 requires the Safety and Enforcement Division to investigate any incident that results in a notification, and report its findings concerning the cause or causes to the commission.
- Public Utilities Code section 7662 requires railroads to provide immediate notification to OES²⁰ of accidents and incidents;²¹
- Public Utilities Code section 7672.5 requires railroads to immediately report incidents resulting in a release or threatened release of a hazardous material to relevant agencies, including OES.²²

¹⁹ <http://www.cpuc.ca.gov/NR/rdonlyres/7945B5AC-B200-431B-A8C4-648AB1BEAB2D/0/2013AnnualReporttotheLegRNCV.pdf>

²⁰ The California Office of Emergency Services was formerly called the California Emergency Management Agency (CEMA).

²¹ OES immediately notifies the CPUC.

²² OES immediately notifies the CPUC.

-
- General Order 161 requires railroads to immediately notify the appropriate emergency-response agency in the event of a hazardous materials incident.

Immediate reporting provides an opportunity to enhance safety. Information regarding an accident's circumstances and cause is often lost quickly as time passes. This information is necessary for the CPUC to deploy inspectors to determine whether the railroad violated regulations or otherwise had unsafe operating or maintenance practices.

On December 3, 2013, the CPUC sent a letter to the General Manager of the California Division of BNSF as well as California Short Line Railroad Association (CSLRA), reminding them of their statutory responsibility to report accidents and incidents. The ROSB continues to monitor this reporting issue, and will take the appropriate enforcement action when necessary.

Recruitment and Retention Problems

This issue was also identified in the 2013 CPUC Annual Railroad Safety Activity Report and continues to be a challenge.²³ That Report identifies the issue more thoroughly, including the programmatic need, the justification, and the statewide significance.

Over the past ten years, the CPUC has been challenged to recruit and retain experienced railroad safety inspectors in all five inspection disciplines. The primary cause of this problem is the compensation disparity between state inspector salaries and the higher federal compensation for nearly identical jobs, and even higher industry wages similar jobs. After the CPUC hires, trains and certifies the inspectors, they often leave to work for the FRA. The FRA pays about \$20,000 to \$35,000, about 35 percent, more per year for enforcing only federal regulations, whereas ROSB inspectors must enforce both state and federal rail safety regulations.

The difficulty in recruiting and retaining experienced and certified inspectors inhibits the CPUC's ability to comply with Public Utilities Code section 309.7, which requires the CPUC to employ sufficient federally certified inspectors to inspect and investigate the rights-of-way, facilities, equipment, and operations of railroads and public mass transit guideways, and to enforce state and federal laws.

While each discipline has experienced these issues, severely at times, currently the greatest problem is the CPUC's inability to recruit qualified applicants for Signal and Train Control (S&TC) inspectors for both railroad and rail transit vacancies. Of the seven authorized S&TC inspector positions, in 2013 four of the positions were vacant, and when they were advertised for hiring they could not be filled. Over the past fiscal year, the CPUC received 10 applications for the examination. Only two applicants were qualified for hiring. One did not accept an interview when he was informed of the pay, and the other was interviewed and offered a job, but declined when offered a private industry job.

²³ <http://www.cpuc.ca.gov/NR/rdonlyres/7945B5AC-B200-431B-A8C4-648AB1BEAB2D/0/2013AnnualReporttotheLegRNCV.pdf>

Without qualified S&TC inspectors, besides being short-handed to monitor and inspect PTC installations, the CPUC is challenged to effectively and frequently monitor railroad signal system installations, maintenance, and follow-up inspections. Retaining well-trained and experienced signal inspectors is critical to public safety because a signal defect can lead to many types of collisions. For example, in 1988, in Pico Rivera, a freight train collided at 46 miles per hour with a stopped train because of erroneous wiring in the signal system. The accident resulted in one fatality, two injuries, and \$2 million in damages.

The ROSB supports compensation parity and stands ready to assist in any appropriate venue to achieve this parity.

Penalties and Citations

The CPUC Office of Rail Safety can assess penalties depending on the violation. For violations of federal railroad safety regulations, ROSB railroad safety inspectors make recommendations to the FRA for the assessment of penalties. For violations of certain GOs²⁴ and a Public Utilities Code section, CPUC Resolution ROSB-002 delegates Commission authority to the Director or Deputy Director of the Safety and Enforcement Division to issue citations to railroad carriers. The GOs contain requirements for trackside walkways and clearances, and the Public Utilities Code section provides requirements for wayside signage and certain railroad operating rules. A railroad issued such a citation may accept the fine imposed or contest it through a process of appeal.

During the 2013-14 fiscal year, CPUC rail safety inspectors noted 221 violations of federal regulations. Possible fines under these regulations range from about \$1,000 to \$5,000 each, per day. The final penalty amount depends on what is decided after the FRA holds a claims conference with the railroad.

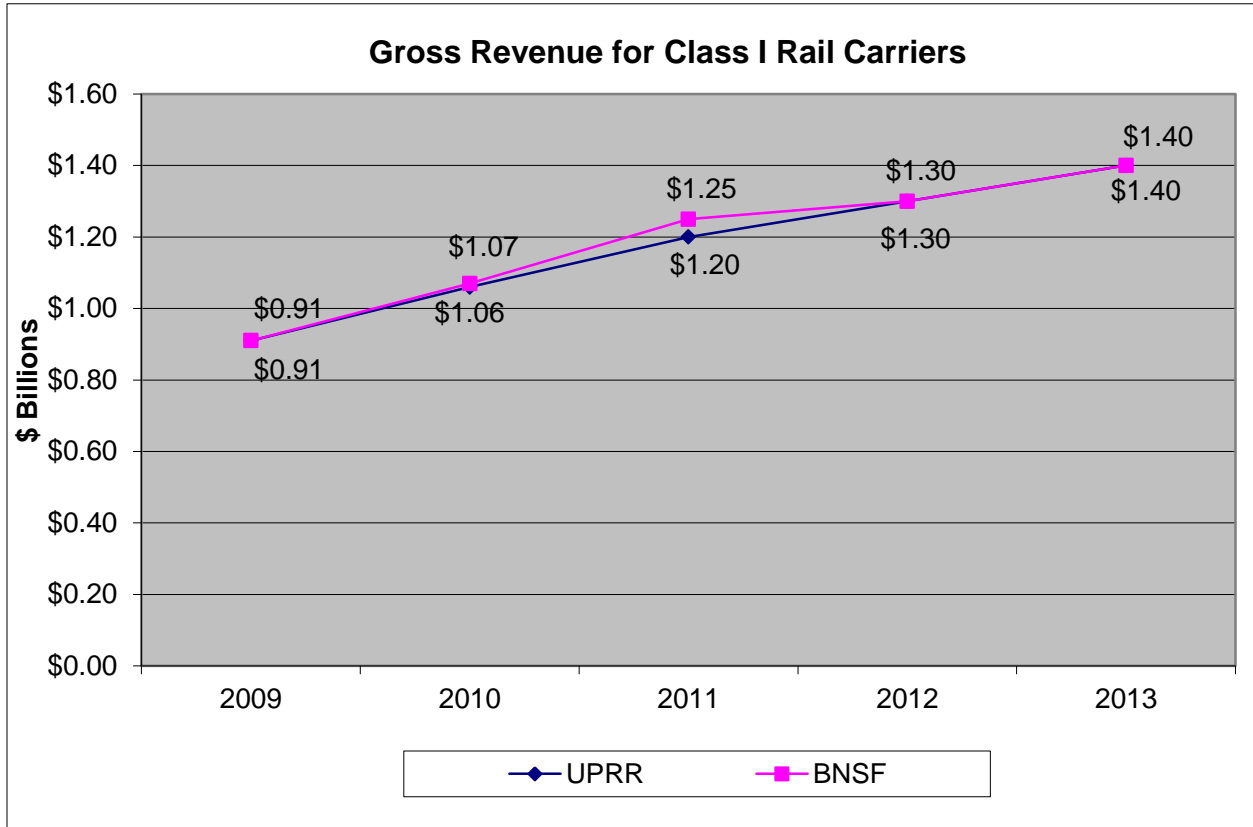
The Safety and Enforcement Division issued 11 citations for non-compliance for state regulations under the provisions of ROSB-002. Penalties totaled \$25,500. All penalty amounts are deposited into the General Fund.

Regulatory Fee Impact on Competition

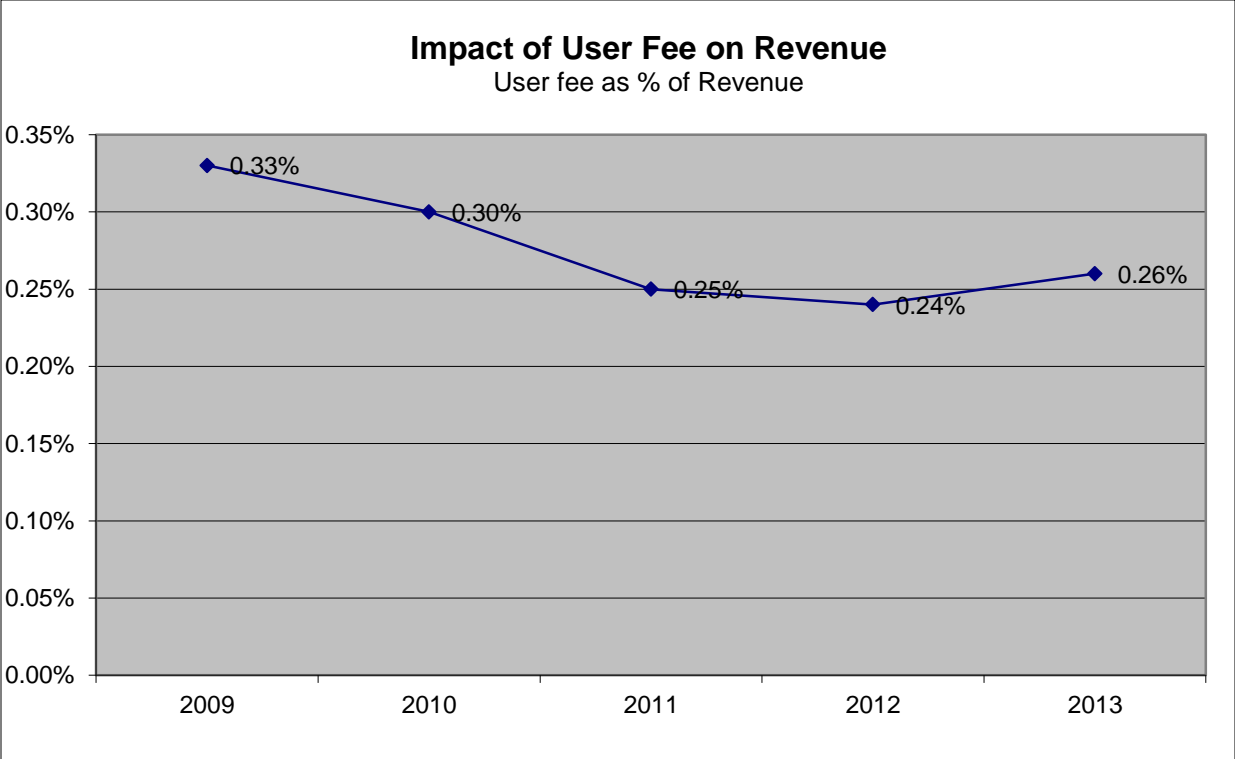
The activities of the ROSB are supported through fees collected from California railroads based on a percentage assessed against annual gross revenues, pursuant to Public Utilities Code sections 421 and 422. Monies collected are used to fund the labor and expenses of staff involved exclusively in railroad safety activities as described in the Public Utilities Code, such as sections 309.7, 315, 765.5, 765.6, and 7665-7667. Specifically, Public Utilities Code section 309.7 requires the activities of the CPUC that relate to safe operation of common carriers by rail, other than those relating to grade crossing protection, to be supported by the fees paid by railroad corporations.

²⁴ GO 26-D, GO 118-A.

In 2013 the state Legislature appropriated \$7.16 million from the CPUC Transportation Reimbursement Account. The fees paid by the railroad corporations are deposited into a dedicated subaccount within the CPUC Transportation Reimbursement Account and are the sole funding source for the CPUC Railroad Operations Safety Program. The fees do not fund any other CPUC programs.



From 2012 to 2013, Union Pacific Railroad and BNSF combined gross revenues increased by 7 percent and 5 percent, respectively. The railroad user fees assessed in 2013 on Union Pacific Railroad and BNSF represented just over one fourth of one percent of revenues (0.0026), and were unlikely to have had any effect on competition.



Local Safety Hazard Sites

Public Utilities Code section 7711 requires the CPUC to report to the Legislature on sites on railroad lines in the state it finds to be hazardous. The sites on railroad lines the CPUC identified as hazardous were identified in 1997 in a formal Commission Decision, D.97-09-045, and were termed Local Safety Hazard Sites (LSHS).²⁵ Two methods to determine sites were used: 1) sites determined by a statistically significant higher derailment rate than elsewhere on the line, and 2) sites determined by the operating railroad to require stricter operating practices than elsewhere on the line. For example, railroads place a limit on how much tractive effort (locomotive power) can be concentrated at any one point in a train in relation to the tonnage the locomotives are pulling on steep grade and tight curves. Too much tractive effort concentrated at any one point, such as the front or rear of a train, can cause cars to derail in tight curves.

Section 7711 also requires the CPUC to include a list of all railroad derailment accident sites in the state on which accidents have occurred within at least the previous five years, describe the nature and probable causes of the accidents, and indicate whether the accidents occurred at or near sites that the Commission has determined to be hazardous. This report, in addition to the electronically available list of all railroad derailment accidents over the past five years and the causes, fulfills those requirements.²⁶

Table 1 lists the accidents that have occurred “at or near” an identified local safety hazard site within the previous five years pursuant to Public Utilities Code subsection 7711(a). While the original analysis identifying these sites was based on the higher risk main line and siding accidents, the requirement for “at or near” includes yard and industry track derailments, and causes some incomparability in the Table’s list. Specifically, the UPRR Yuma subdivision Site #3 main line runs through Union Pacific’s Colton yard, one of the busiest railroad yards on the west coast. None of the other sites are “at or near” a major yard. Consequently, while the main line accident tally that would be comparable to the other sites is only two, when the yard and industry lower risk derailments are added, the number increases to 32.

²⁵ The ROSB currently is using the term “high hazard areas” to distinguish from the legal term “local safety hazard” sites, as used in the preemption exemption language of the Federal Railroad Administration (49 U.S.C. § 20106).

²⁶ A list of all derailments is located at <http://www.cpuc.ca.gov/PUC/safety/Rail/Railroad/>

Table 1—List of Local Safety Hazard Sites

*LSHS #	Current LSHS Track Line	Previous LSHS Track line at time of D.97-09-045 ²⁷	RR Milepost	Number of Derailments 2009-13	Overlap with Site #**
16	UPRR Mojave Subdivision	SP Bakersfield Line	335.0 to 359.9	10	
9	UPRR Black Butte Subdivision	SP Shasta Line	322.1 to 332.6	4	#10
10	UPRR Black Butte Subdivision	SP Shasta Line	322.1 to 338.5	4	#9
19	UPRR Mojave Subdivision	SP Bakersfield Line	463.0 to 486	4	
12	UPRR Roseville Subdivision	SP Roseville District	150.0 to 160.0	3	
6	UPRR Yuma Subdivision	SP Yuma Line	542.6 to 589.0	2	#3, #4
22	UPRR Canyon Subdivision	UP Feather River Division	234.0 to 240.0	2	#25
25	UPRR Canyon Subdivision	UP Feather River Division	232.1 to 319.2	2	#22, #23
3	UPRR Yuma Subdivision	SP Yuma Line	535.0 to 545.0	2 (32)***	#6
23	UPRR Canyon Subdivision	UP Feather River Division	253.0 to 282.0	1	#25
4	UPRR Yuma Subdivision	SP Yuma Line	586.0 to 592.0	1	#6
26	BNSF Gateway Subdivision	UP Bieber Line,	15.0 to 25.0	1	
31	BNSF San Diego Subdivision	ATSF San Diego	249.0 to 253.0	1	
1	UPRR Coast Subdivision	SP Coast Line	235.0 to 249.0	0	
7	Central Oregon and Pacific Railroad Siskiyou Subdivision	SP Siskiyou Line	393.1 to 403.2	0	
27	UPRR L.A. Subdivision, Cima Grade		236.5 to 254.6	0	
28	BNSF Cajon Subdivision	ATSF Cajon	53.0 to 68.0	0	

²⁷ In 1996, UPRR purchased Southern Pacific Railroad.

29	BNSF Cajon Subdivision	ATSF Cajon	81.0 to 81.5	0	
30	BNSF Cajon Subdivision	ATSF Cajon	55.9 to 81.5	0	

*The LSHS number (LSHS #) is for identification purposes only, and does not indicate any ranking.

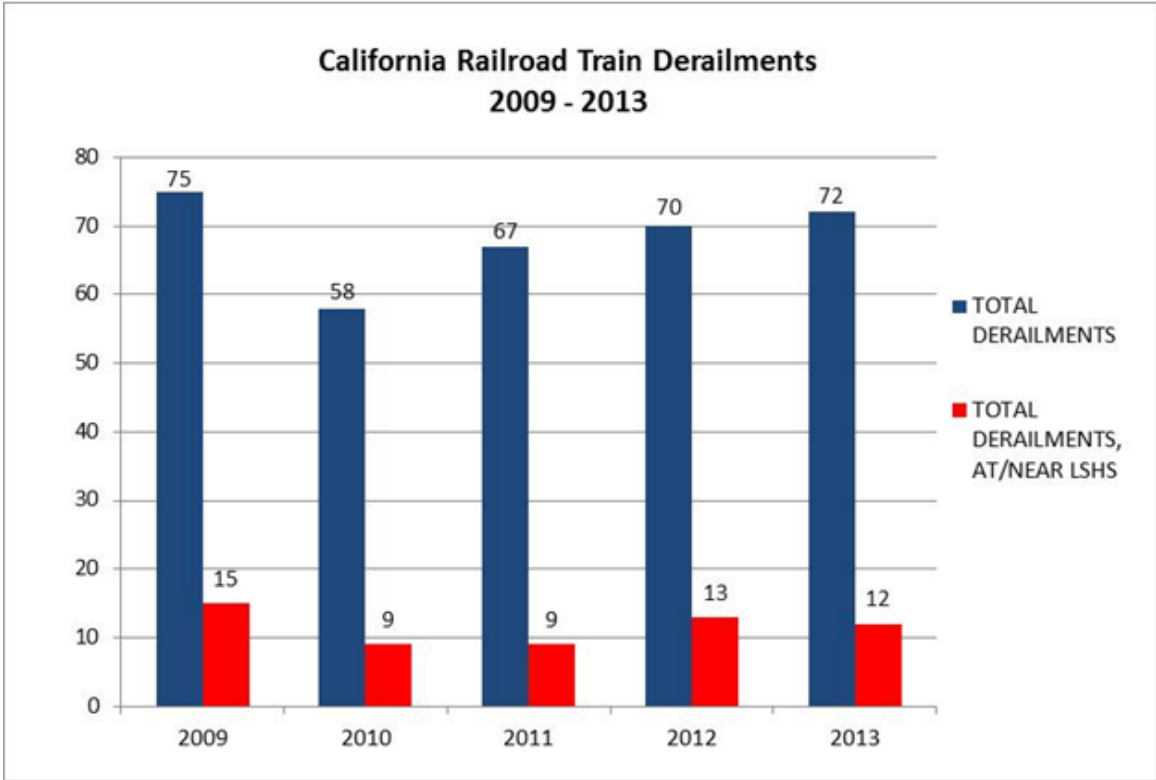
** Where a site's boundaries overlap with another site identified by the different method, the other site is listed in this column.

*** See the explanation in the text above for Table 1, which describes this site as unique among the sites as being adjacent to a major yard, i.e., Colton Yard. The entry "2" indicates the number of main line accidents, and thus is comparable to the other sites' numbers. The number "32" in parentheses is a total that includes the yard and industry track derailments, and thus is not comparable to the other sites' numbers.

Within the previous five calendar years, California experienced 342 derailments. Of that total, 58 derailments, or 17 percent, occurred at or near local safety hazard sites. For this report, "at or near" includes any location of railroad track along the railroad right-of-way that is contained in the segment of railroad designated to be a local safety hazard site, including the distance of track one mile on each side of the local safety hazard site. Maps of local safety hazard sites are included in Appendix G.



Westbound freight train exiting Tunnel #3 in Tehachapi Pass (Local Safety Hazard Site No.16)



Data source: Federal Railroad Administration, Office of Safety Analysis

Appendix A – State Railroad Safety Laws and Regulations

State Constitution, Article XII, Sec. 4	The commission may fix rates and establish rules for the transportation of passengers and property by transportation companies
PU Code Sec. 309.7 (a)	(a) The division of the commission responsible for consumer protection and safety shall be responsible for inspection, surveillance, and investigation of the rights-of-way, facilities, equipment, and operations of railroads and public mass transit guideways, and for enforcing state and federal laws, regulations, orders, and directives relating to transportation of persons or commodities, or both, of any nature or description by rail. The Safety and Enforcement Division shall advise the commission on all matters relating to rail safety, and shall propose to the commission rules, regulations, orders, and other measures necessary to reduce the dangers caused by unsafe conditions on the railroads of the state.
PU Code Sec. 309.7 (b)	(b) In performing its duties, the Safety and Enforcement Division shall exercise all powers of investigation granted to the commission, including rights to enter upon land or facilities, inspect books and records, and compel testimony. The commission shall employ sufficient federally certified inspectors to ensure at the time of inspection that railroad locomotives and equipment and facilities located in class I railroad yards in California are inspected not less frequently than every 180 days, and all main and branch line tracks are inspected not less frequently than every 12 months.
PU Code Sec. 309.7 (c)	(c) The general counsel shall assign to the Safety and Enforcement Division the personnel and attorneys necessary ...to enforce safety laws, rules, regulations, and orders, and to collect fines and penalties resulting from the violation of any safety rule or regulation.
PU Code Sec. 309.7 (d)	(d) The activities of the Safety and Enforcement Division that relate to safe operation of common carriers by rail, other than those relating to grade crossing protection, shall also be supported by the fees paid by railroad corporations.
PU Code Sec. 315	315. The commission shall investigate the cause of all accidents occurring within this State upon the property of any public utility or directly or indirectly arising from or connected with its maintenance or operation, resulting in loss of life or injury to person or property and requiring, in the judgment of the commission, investigation by it, and may make such order or recommendation with respect thereto as in its judgment seems just and reasonable.
PU Code Sec. 765.5	(a) The purpose of this section is to provide that the commission takes all appropriate action necessary to ensure the safe operation of railroads in this state. (b) The commission shall dedicate sufficient resources necessary to adequately carry out the State Participation Program for the regulation of rail transportation of hazardous materials as authorized by the Hazardous Material Transportation Uniform Safety Act of 1990 (P.L. 101-615). (c) On or before July 1, 1992, the commission shall hire a minimum of six additional rail inspectors who are or shall become federally certified, consisting of three additional motive power and equipment inspectors, two signal inspectors, and one operating practices inspector, for the purpose of enforcing compliance by railroads operating in this state with state and federal safety regulations. (d) On or before July 1, 1992, the commission shall establish, by regulation, a minimum inspection standard to ensure, at the time of inspection, that railroad locomotives, equipment, and facilities located in class I railroad yards in California will be inspected not less frequently than every 120 days, and

	<p>inspection of all branch and main line track not less frequently than every 12 months.</p> <p>(e) Commencing July 1, 2008, in addition to the minimum inspections undertaken pursuant to subdivision (d), the commission shall conduct focused inspections of railroad yards and track, either in coordination with the Federal Railroad Administration, or as the commission determines to be necessary. The focused inspection program shall target railroad yards and track that pose the greatest safety risk, based on inspection data, accident history, and rail traffic density.</p>
PU Code Sec. 768	768. The commission may, after a hearing, require every public utility to construct, maintain, and operate its line, plant, system, equipment, apparatus, tracks, and premises in a manner so as to promote and safeguard the health and safety of its employees, passengers, customers, and the public. The commission may prescribe, among other things, the installation, use, maintenance, and operation of appropriate safety or other devices or appliances, including interlocking and other protective devices at grade crossings or junctions and block or other systems of signaling. The commission may establish uniform or other standards of construction and equipment, and require the performance of any other act which the health or safety of its employees, passengers, customers, or the public may demand.
PU Code Sec. 7661	The Safety and Enforcement Division shall investigate any incident that results in a notification...and shall report its findings concerning the cause or causes to the commission.
PU Code Sec. 7662	Requires a railroad to place appropriate signage to notify an engineer of an approaching grade crossing and establishes standards for the posting of signage and flags, milepost markers, and permanent speed signs.
PU Code Sec. 7665.2	By July 1, 2007, requires every operator of rail facilities to provide a risk assessment to the commission and the agency for each rail facility in the state that is under its ownership, operation, or control, and prescribes the elements of the risk assessment.
PU Code Sec 7665.4	<p>(f) Requires the rail operators to develop an infrastructure protection program, and requires the CPUC to review the infrastructure protection program submitted by a rail operator. Permits the CPUC to conduct inspections to facilitate the review, and permits the CPUC to order a rail operator to improve, modify, or change its program to comply with the requirements of this article.</p> <p>(g) Permits the CPUC to fine a rail operator for failure to comply with the requirements of this section or an order of the commission pursuant to this section.</p>
PU Code Sec. 7667	
General Order 22-B	Requires accident investigations on all incidents occurring on railroad property.
General Order 26-D	Establishes minimum clearances between railroad tracks, parallel tracks, side clearances, overhead clearances, freight car clearances, and clearances for obstructions, motor vehicles, and warning devices to prevent injuries and fatalities to rail employees by providing a minimum standards for overhead and side clearance on the railroad tracks. (Pursuant to PU Code Sec. 768.)
General Order 72-B	Formulates uniform standards for grade crossing construction to increase public safety. (Pursuant to PU Code Sec. 768.)
General Order 75-D	Establishes uniform standards for warning devices for at-grade crossings to reduce hazards associated with persons traversing at-grade crossings. (Pursuant to PU Code Sec. 768.)
General Order 118-A	Provides standards for the construction, reconstruction, and maintenance of walkways adjacent to railroad tracks to provide a safe area for train crews to work. (Pursuant to PU Code Sec. 768.)
General Order 126	Establishes requirements for the contents of First-Aid kits provided by

	common carrier railroads. (Pursuant to PU Code Sec. 768.)
General Order 161	Establishes safety standards for the rail transportation of hazardous materials. (Pursuant to PU Code Sec. 768.)
General Order 135	Establishes regulations governing the occupancy of public grade crossings by railroads. (Pursuant to PU Code Sec. 768.)

Appendix B – Positive Train Control

The Rail Safety Improvement Act of 2008 (P.L.110-432) (Act) requires all railroads to install positive train control devices in specified areas by December 31, 2015. Positive train control is a Global Positioning System based technology to provide real-time location and speeds of trains and avoid collisions, such as in the event of an operating rule violation like missing a yellow (slow) or red (stop) signal.²⁸

Positive train control systems are designed to provide the following safety enhancements:

- Train separation or collision avoidance.
- Line speed limit enforcement.
- Temporary speed restrictions.
- Rail worker wayside safety.

49 CFR, Part 236 Subpart I, places considerable importance on the reliability of the communications networks needed for PTC. This provision of law greatly expanded the underlying need for a robust reliable communication network. Positive train control is an overlay onto the existing centralized traffic control system, which must be reliable. Both positive train control and the centralized traffic control system are critically dependent on the performance of the communications network. During deployment and testing, system performance deficiencies or gaps in the existing communication system and network were assessed and corrected as necessary to ensure positive train control system reliability.

Positive Train Control in California

While the railroads in California subject to PTC requirements have achieved some levels of success in the installation of positive train control systems, it is doubtful that any will be 100-percent ready by the December 31, 2015 deadline.

BNSF is using an interoperable electronic train management system and has made tremendous progress; however, the Federal Communication Commission delayed the construction of new communication towers to complete their communication system. Metrolink was the first commuter line in California to run in “revenue service demonstration.”²⁹ However, BNSF is the

²⁸ This section contains PTC-specific terms and may be difficult to understand. ROSB staff invites legislators to contact the CPUC’s Office of Government Affairs if they have questions or wish more explanation.

²⁹ One of the final steps before the new positive train control system can be certified as a safe working system by the FRA, is to perform a “revenue service demonstration.” The railroad may begin revenue service demonstration upon completion of the preconditions outlined in their respective conditional approval letters, review and approval of the reported results, review and approval of the submitted documentation, determination that the system is functioning as intended, successful mitigation of all identified problems and critical anomalies, and the concurrence of the FRA test monitor. The results of all field testing must be submitted to the FRA prior to commencement of the revenue service demonstration phases.

only railroad in California that is close to meeting the December 31, 2015, deadline for all its lines in California.

UPRR is using an interoperable electronic train management system as their positive train control operating system, but has not made the progress that BNSF has made. UPRR is not expected to meet the deadline.

Metrolink is using an interoperable electronic train management system as their positive train control operating system. Metrolink trains had to electronically communicate with the BNSF back-office server; however, it has not been able to get its back-office server working and it has negatively impacted its implementation schedule to be fully in service on all its lines. It is too unpredictable to determine whether Metrolink will meet the deadline.

North County Transit District is using an interoperable electronic train management system as its positive train control operating system. North County Transit District may be able to complete positive train control installation and operation by the end of 2015.

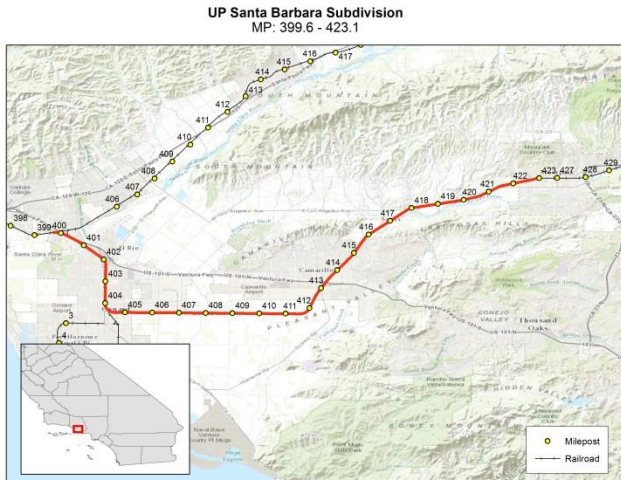
Caltrain is attempting to install a much more sophisticated system, a communications-based overlay signal system, which includes grade crossings. Caltrain has submitted a “test waiver” to the FRA, which is needed when installing an untested and unproven system. The basic test procedures, used on an established system, are waived and more rigorous testing is performed. Caltrain must explain each and every test procedure, and each test must be submitted to and approved by the FRA. Caltrain has encountered many obstacles and is not expected to meet the deadline.

In order to certify the positive train control system as “ready to implement” as part of the signal system, the positive train control system must be able to control the train runs at a high level of reliability.

Progress Report

BNSF started operating PTC demonstration trains on the following subdivisions in California: San Bernardino, Bakersfield, Mojave, Needles, and Stockton. BNSF continues to revise its positive train control track database files for the following subdivisions in California: San Bernardino, Bakersfield, Mojave, and Stockton. The track database is a key component of positive train control safety. The positive train control track profile database is combined with the composition of the train and calculates the effective stopping distances to prevent collisions or other incidents. Track profiles entered into the database are built from geo-mapping of track geometry (e.g. curves and grades) and other components such as mileposts, grade crossings, switches, signals, and other appurtenances along the right-of-way.

UPRR has started positive train control field testing on the Santa Barbara Subdivision, between North Montalvo and Las Posas. The present method of operation for the Santa Barbara Division is by signal indications of a traffic control system.



Metrolink Positive Train Control Project



Metrolink has completed positive train control brake tests on the Antelope Valley Line (Valley Subdivision) and started positive train control brake tests on the Orange County Line (Orange

Subdivision) on June 7, 2014, and on the Inland Empire-Orange County Line (San Gabriel Subdivision).

Metrolink has begun operating PTC demonstration trains on the Inland Empire-Orange County Line. Metrolink became the first commuter railroad in the nation to run such interoperable positive train control equipped trains. This was achieved with the support of BNSF. Metrolink is working aggressively to put positive train control in service on their dispatched lines later this year and begin demonstrations across its entire Southern California Regional Rail Authority territory by January 2015.

Major communication network improvements that are substantially complete and have been commissioned to service are:

- Los Angeles Union Station to Pomona fiber backbone on the Inland Empire-Orange County Line.
- Central Maintenance Facility to Redondo Junction fiber backbone on the Riverside Line.
- Fullerton to San Clemente fiber backbone on the Orange County Line and the San Bernardino Line, with microwave hops to the Pomona Metrolink Operations Center.
- Packet-digital microwave and Ethernet radio networks on the Inland Empire-Orange County Line.
- Antelope Valley Line fiber-optic network.
- Office Gateway Server and other communication-related central back office improvements at the Pomona Metrolink Operations Center.
- Migration to upgraded commercial (AT&T) multiprotocol label switching at about 80 Metrolink Stations and communication service points.

Caltrain Positive Train Control Project



Caltrain conducts operations along its peninsula corridor including regular and special-event passenger services at speeds up to 79 mph at present service levels of 90 trains per day. The Caltrain peninsula rail corridor includes 52 route miles and 115 total miles of track extending from the San Francisco northern terminus located at 4th and King Streets to the southern terminus at the Tamien Station in San Jose.

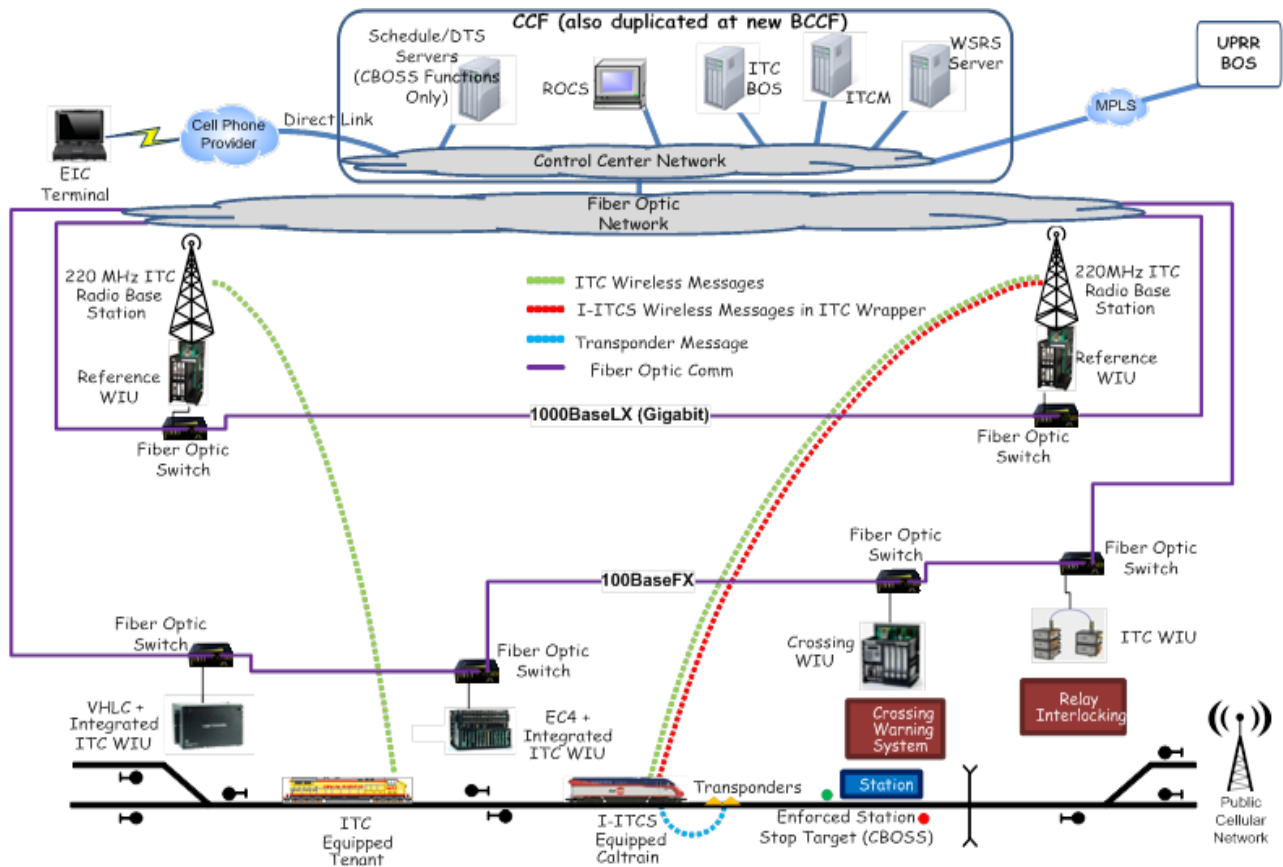
UPRR typically operates six local freight trains per day on the peninsula and 12 local and through-freights per day. Additional passenger services involving Caltrain's tenant railroads (Amtrak, Caltrans/Capital Corridor and the Altamont Corridor Express Rail), are operated over the southern end of the corridor.³⁰ The tenant passenger railroads presently operate a maximum of 24 trains per day on Caltrain's rail corridor. All train operations within the area described above are controlled by Caltrain dispatchers.

Freight train services are operated on Caltrain's peninsula rail corridor by UPRR at a maximum operating speed of 50 mph, and a maximum of 60 mph south of Tamien Station in San Jose.

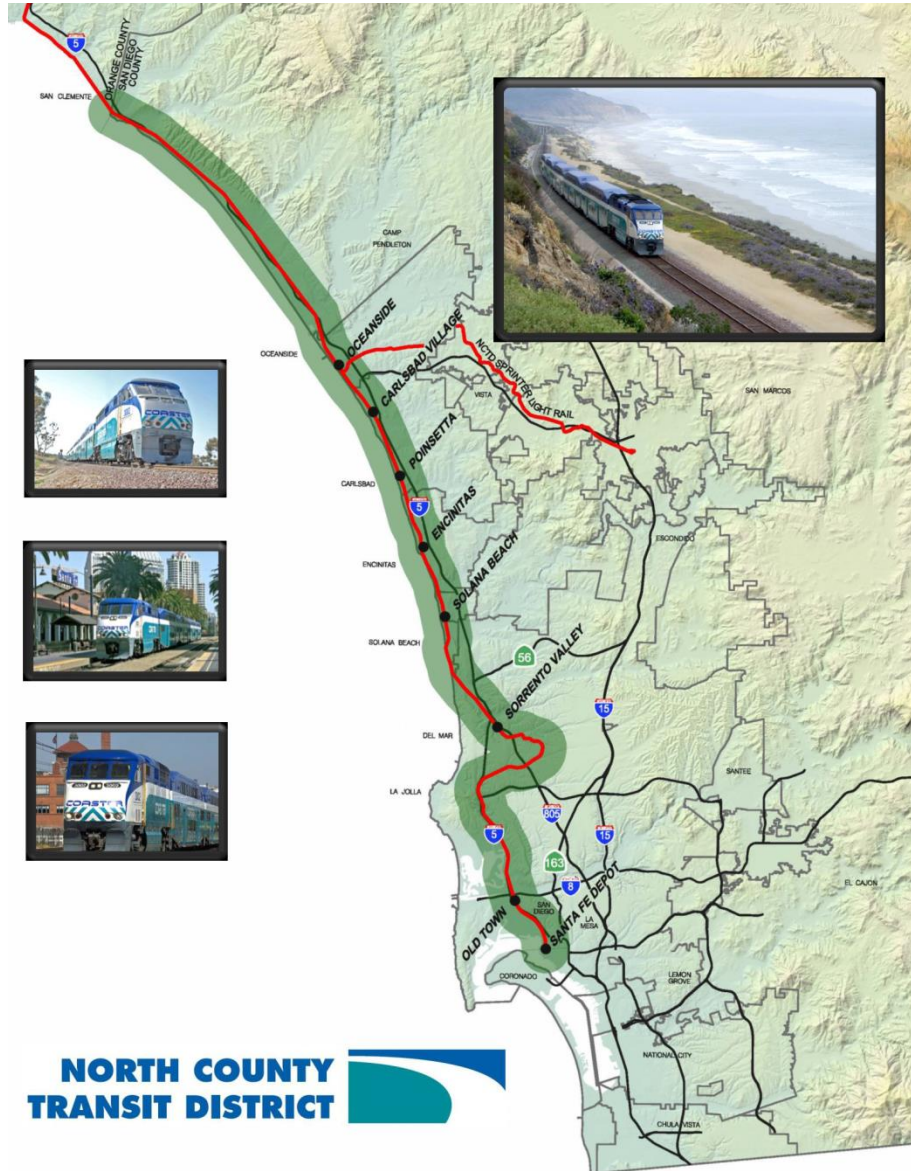
- Controlling cab equipment installed in 67 vehicles:
 - All Locomotives and Cab Cars.
- Field equipment installed along the right of way:
 - Conventional signal enclosures.
 - Highway-grade crossing enclosures.
 - Station pedestrian crossings.
 - Transponders in the track area.
- Communications-based data network:
 - Positive train control 220 MHz radios.
 - Fiber optic backhaul along the right of way, and between Computing and Communication Foundations (CCF) and the Business Collaboration Context Framework (BCCF), which provides enterprises with the context required for business collaboration.
- Office equipment co-located and integrated in the CCF and BCCF.
- Employee in charge (EIC) uses portable devices to authorize train movement authority within the defined limits of the work zone.

³⁰ Tenant railroads are railroads that use the track owner's tracks.

Layout of the Basic Components of the Communications-based Overlay Signal System



North County Transit District Positive Train Control Project



North County Transit District is implementing an interoperable positive train control system on its coastal line from the Orange County line down to the Santa Fe Depot in San Diego, where passenger and freight operations are simultaneously conducted. This rail corridor is 60.3 miles in length and is signaled centralized traffic control territory with 50 percent of the territory having segments of multiple main tracks and passing sidings. Passenger train operations on the corridor are COASTER (22 trains/weekday), Amtrak Pacific *Surfliner* intercity service (22-24

trains/day), and Metrolink commuter rail services (up to 14 trains/day). Freight train service includes BNSF (4-6 trains/day) and Pacific Sun Railroad (5-10 trains/week).

In addition to the North County Transit District's COASTER, tenant railroads use the corridor as follows:

- Amtrak's Pacific *Surfliner* Service - Entire subdivision.
- BNSF Railway - Entire subdivision.
- Metrolink Orange County Line - From Oceanside to the Orange County Line.
- BNSF Railway's contracted operator Pacific Sun Railroad, a Watco Company - Local freight service operating between Stuart Mesa Maintenance Facility and Miramar freight spur, and Escondido Subdivision with occasional trips to San Onofre near the Orange County Line.

The fiber backbone was anticipated to be completed by North County Transit District in 2013; completion is now anticipated in the beginning of the third quarter of 2014. The Program Management Team is working to mitigate impacts to the positive train control project.

The CPUC will continue to monitor all phases of installation and testing to ensure that all these system have the oversight necessary to ensure a safer signal system.

Appendix C - Examples of Operation Lifesaver Presentations

June 3, 2014: Railroad Safety staff including a CPUC Senior, Program Technician and railroad crossings engineer assisted with an Operation Lifesaver-sanctioned event at Livermore to celebrate International Level Crossing Awareness Day. UPRR and Altamont Corridor Express (ACE) provided equipment and crews for an awareness and enforcement train which operated between Livermore and Pleasanton on UPRR track. While the train operated through town, police officers from Livermore and Pleasanton as well as UPRR police officers cited or warned trespassers and unsafe motorists who were crossing the tracks illegally.



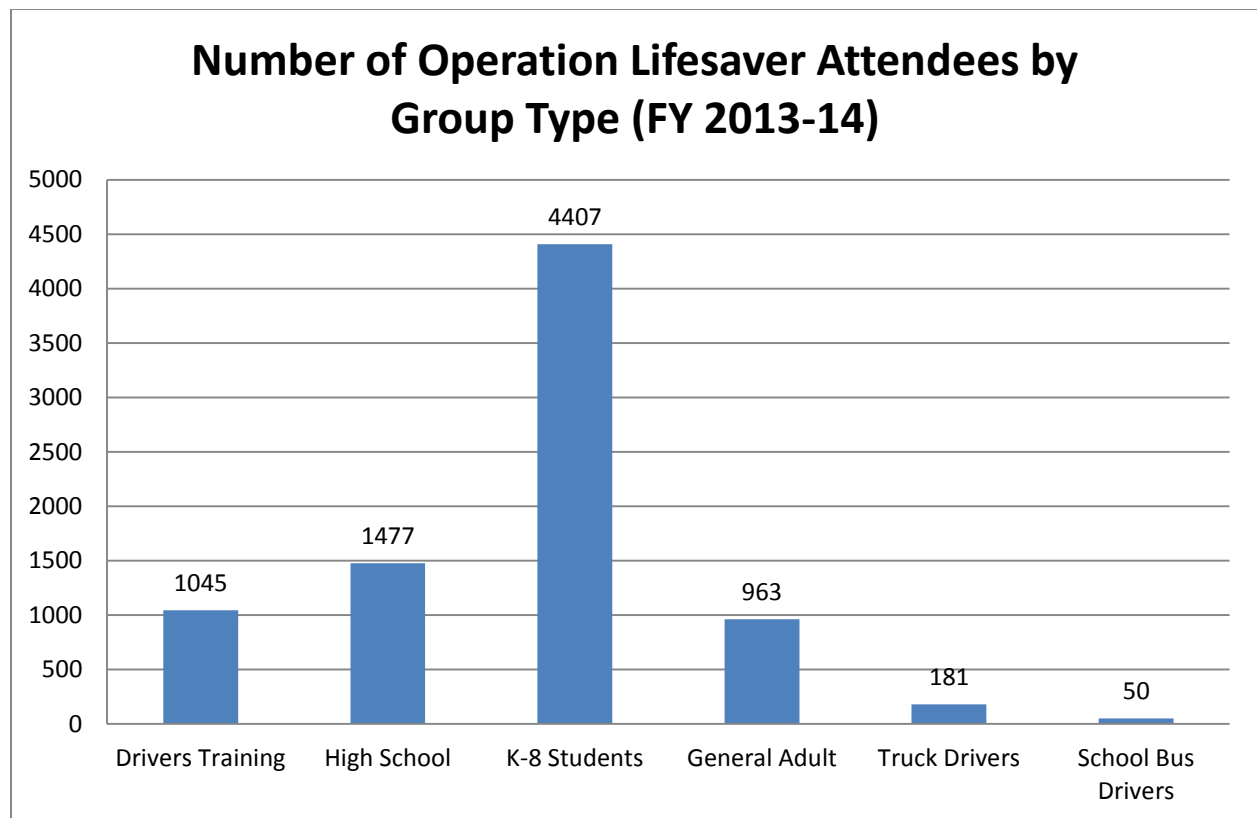
Officials from the cities of Livermore and Pleasanton join with Operation Lifesaver, UPRR, and Altamont Commuter Express for the Awareness Day.

CPUC staff manning the booth at the Livermore station spoke with residents and city and county officials while providing information on public safety in the vicinity of railroad tracks. The city of Pleasanton issued a resolution declaring June 3rd Railroad Safety Day, while Livermore has designated the month of June as Railroad Safety Month. Operation Lifesaver's Northern California Coordinator Nancy Sheehan introduced the "See Tracks? Think Train" motto, which stresses the importance of being aware of possible train movement when near the tracks.

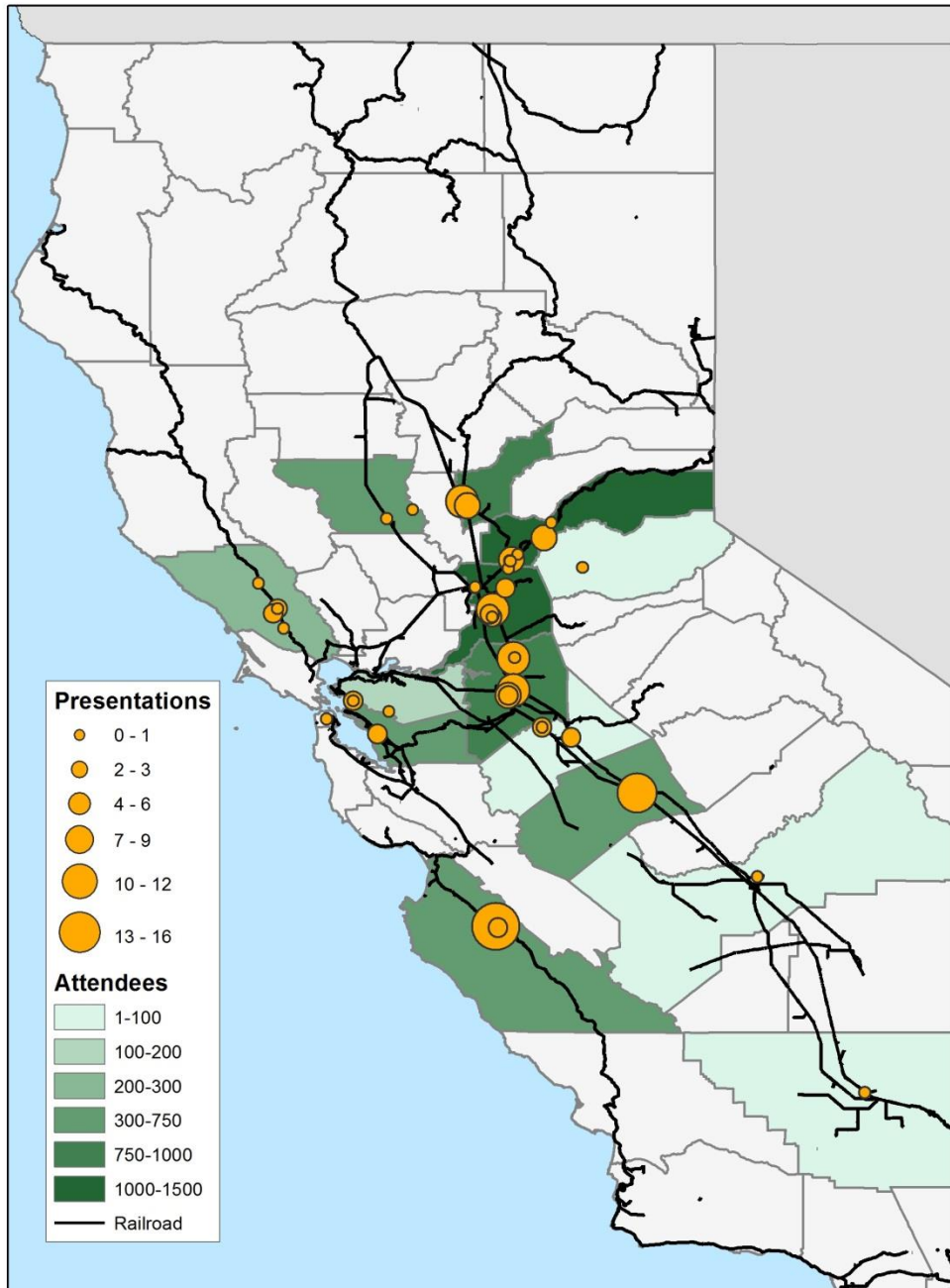


Police officers from Pleasanton and Livermore look on as the Vice Mayor of Pleasanton announces his city's commitment to Rail Safety on International Level Crossing Awareness Day

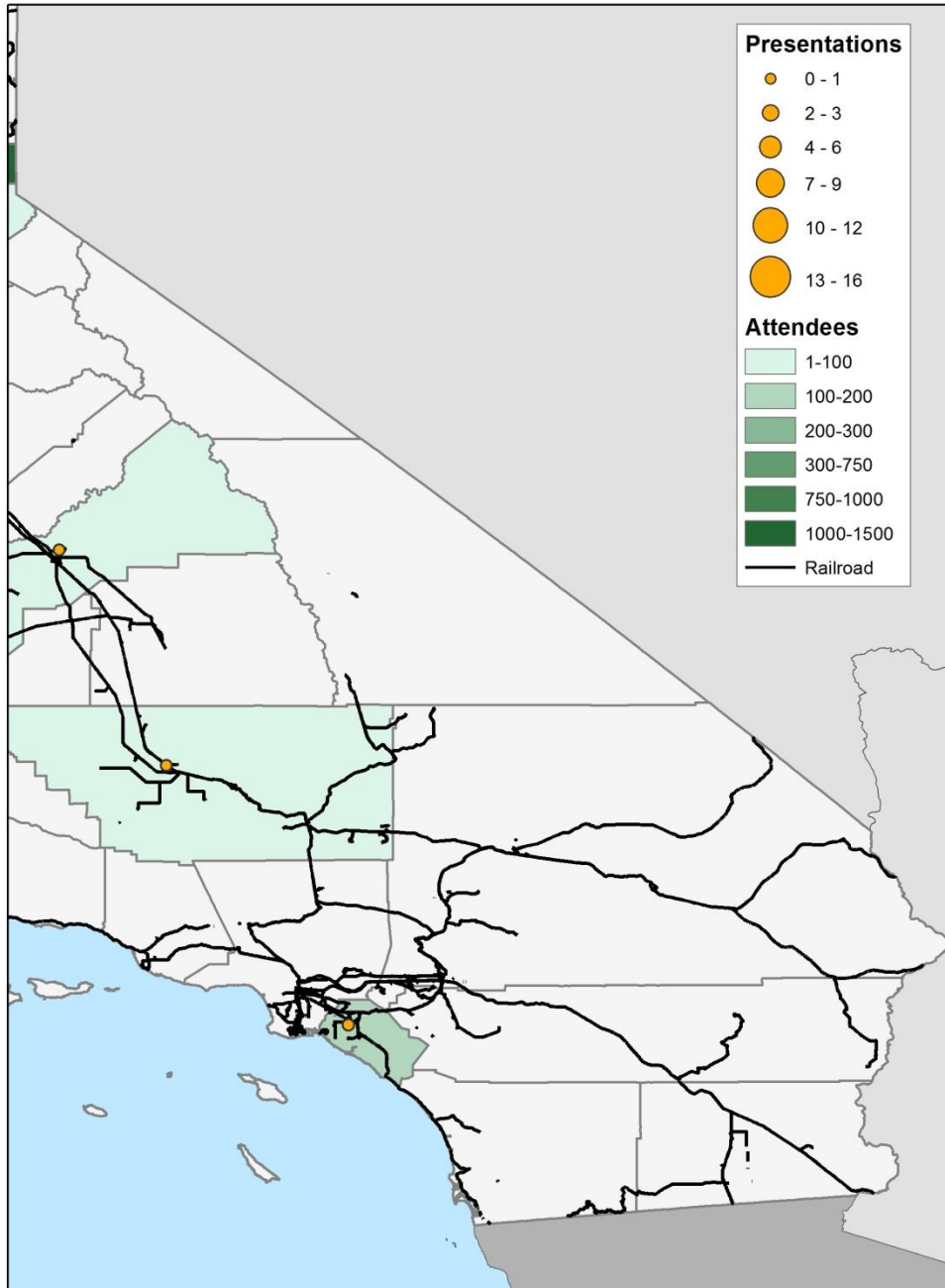
June 14, 2014: An CPUC Motive Power and Equipment railroad safety inspector delivered an Operation Lifesaver presentation to personnel of the PTM Engineering Company in Riverside as they prepared to commence work on streets near railroad tracks in the city of Colton, San Bernardino County. This work is being done to modify and improve vehicle and pedestrian traffic. The presentation covered safety tips about trains and railroad tracks. The ROSB railroad safety inspector shared safety tips in both English and Spanish to better reach all members of the audience. Some tips shared with the audience included the fact that tracks are for trains; that trains cannot stop quickly and cannot swerve; that railroad tracks are on private property; and that trespassing on tracks and railroad right of way is against the law and a misdemeanor under the Penal Code, and the trespasser could be cited. Tips also included what emergency steps to take in case a vehicle stalls on the tracks, such as having everyone exit the vehicle immediately and having someone call 911. The presenter also informed the audience about the emergency telephone number required to be posted at highway-rail crossings. Advanced warning signs which inform motorists of tracks ahead and how to respond to these signs was also covered in the presentation. The group appreciated the rail safety tips and invited the CPUC to return for future presentations.



Operation Lifesaver Presentations by Northern CA Counties (FY2013-2014)



Operation Lifesaver Presentations by Southern CA Counties (FY2013-2014)



Appendix D - Examples of Regular Inspections

Below are examples of regular inspections carried An ROSBout during the 2013-14 fiscal year:

August 8, 2013: An ROSB Motive Power & Equipment railroad safety inspector was performing a routine locomotive inspection at the BNSF yard in Fresno and observed an unsafe practice regarding the fueling of locomotives on a nearby track. BNSF uses an outside contractor to fuel locomotives with a tanker truck at this location. It was noted that the truck driver had parked his fuel truck in the foul of two live tracks in order to fuel locomotives that were two tracks over. The Inspector immediately investigated and discovered that the driver had put up a portable flag at each end of the rail, but that the switches themselves were not protected against movement with locks and or derails, and the locomotives on these tracks were not flagged as would be required of railroad workers when fouling a live track.

The ROSB railroad safety inspector approached the truck driver and advised him of the danger he was in because he was not protected against train movements. The ROSB railroad safety inspector brought this safety concern to the attention of the BNSF Yardmaster and a Trainmaster who immediately locked and protected the switches providing access to the track. The ROSB railroad safety inspector explained to the managers that although federal regulations are unenforceable in this situation because the contractor is not a railroad worker, the railroad still has an obligation to protect and instruct outside contractors they bring onto the property. BNSF management revised policies and procedures to eliminate future occurrences of this type.



The fuel truck could be struck and fuel hoses severed if rail equipment were to pass by on the live track between the truck and the locomotive being fueled

August 27, 2013: An ROSB Hazardous Materials & Security railroad safety inspector conducted a General Order inspection at UPRR's West Colton Yard in the city of Bloomington, San Bernardino County. The inspection focused on General Orders 118-A (walkway conditions) and 26-D (side and overhead clearance). The ROSB railroad safety inspector noted a number of

defective walkway conditions, including rough and uneven surfaces and substantial debris within the walkways. The railroad was informed of the defects. Follow-up inspections efforts ensured that the conditions were rectified.



*Rough and Uneven Walkway with Substantial Debris – GO 118 Defect
UP West Colton Yard*

August 28, 2013: An ROSB Motive Power & Equipment railroad safety inspector performed a routine inspection of an outbound train with 37 cars at the BNSF yard in Stockton. This train was declared “Ready for Service” by the BNSF Mechanical Department prior to the inspection. During the course of the inspection, a tank car was discovered to have a broken and bent brake beam at the No.2 wheel which rendered the brakes ineffective. The damage appeared to be old and probably due to running over an unknown object between the rails or possibly a previous derailment. Due to the open construction of a tank car, these components are easily inspected and should have been discovered if a proper inspection was performed. This was the originating terminal for this train. Federal regulations require the train to have 100 percent operative brakes and no mechanical defects before departure from the originating terminal. A more serious concern with this type of defect is the fact that these components are under the car and when they fail the car can drop large pieces of metal under the car wheels, causing derailment. In addition to the subject car, there were six other cars in this train with defects. The car was removed from the train and the carrier was notified of ROSB’s intent to recommend civil penalty in this matter. BNSF made corrections to its procedures to help prevent these occurrences.



Broken beam

October 26, 2013: An ROSB Operating Practices railroad safety inspector attended an emergency preparedness event hosted by the Altamont Corridor Express in Tracy. The event simulated a terrorist-caused passenger train derailment. Emergency responders from various agencies, including local fire departments, police departments, ACE employees and managers, and observers from Transportation Security Administration and CPUC attended the event. Passengers and crew members were evacuated and triaged by emergency responders the same as if it were a real emergency. The purpose of the drill was to provide training to emergency responders and railroad employees and to fulfill the requirements of 49 CFR, Part 239.103 that requires that such an event is held at least once per year. A final evaluation revealed that while most procedures were carried out efficiently, there was room for improvement. This “learning by doing” simulation is a valuable educational tool for emergency responders and railroad personnel to determine how to effectively work together in case of a serious incident.



Firefighters assist the “injured” during the ACE train simulation exercise

March 18, 2014: An ROSB Operating Practices railroad safety inspector identified an unsafe condition in UPRR’s Spence Street Yard on the Alhambra Subdivision. The condition was in violation of 49 CFR Part 218.109(b)(1), which requires derails to be in the derailing position when not in use. The derail in question is meant to protect the main track from having unauthorized equipment enter the main track. The main track in this area is a passenger route used by Amtrak trains. After notification to the railroad, the ROSB railroad safety inspector recommended that a civil penalty of \$7,500 be assessed. UPRR officials made procedural changes to ensure compliance.



Derail not in derailing position, UP Alfalfa Lead, Alhambra Subdivision

April 7, 2014: An ROSB Operating Practices railroad safety inspector conducted an inspection of the San Ysidro Yard and border crossing. At that location, the inspector observed the Baja California Railroad performing switching operations and inspected the railroad's operational locomotives. The federally-required 92-day mechanical inspections were found to be out of date. Upon notification to the railroad that this defect had been written by the ROSB inspector, the locomotives were taken out of service and secured until the required inspections could be made. The railroad began the required inspections on April 5, 2014. The inspector scheduled a follow-up inspection for three months later and verified that the required corrections had been completed.



Baja California railroad cars at San Ysidro Yard/Border crossing

June 10 – 11, 2014: ROSB railroad safety inspectors and rail crossings staff participated in a two day meeting and field event at the site of the Sonoma Marin Area Rail Transit's (SMART) future passenger train operation. Participants included SMART supervisors and consultants, the CPUC, and the FRA. Updates were provided to the FRA and CPUC regarding the status of equipment and track construction as well as discussion of plans for operating, dispatching and use of positive train control. Phase 1 of the construction will allow for passenger trains to operate between Santa Rosa and downtown San Rafael. Some areas of SMART's track have been back in use for three years by the Northwestern Pacific Railroad (NWP) which provides freight service in the area. Participants toured various locations during the field event, including the

future site of the maintenance facility and a number of stations.



The group traveled by hi-rail over the Haystack Bridge which was then turned to allow passage of boat traffic on the Petaluma River. This bridge will be replaced.

Appendix E - Examples of Focused Inspections

Below are examples of CPUC focused inspections as well as joint CPUC-FRA focused inspections during FY 2013-14:

July 23, 2013: In 2013, CPUC launched the General Order Team Audit program. These audits fall under the umbrella of focused inspections. They are designed to enhance ROSB inspectors' knowledge of Commission General Orders and Public Utilities Codes which relate to railroad safety. The end objective is to improve enforcement of these regulations. One such audit took place in July at BNSF's Watson Yard in the city of Wilmington. The Team was made up of five ROSB railroad safety inspectors representing the Hazardous Materials & Security, Operating Practices and Motive Power & Equipment disciplines. The audit identified a number of defects. The categories of defects included walkway debris and other tripping hazards, clearance problems, and lacking or inadequate signage. The railroad was notified of all defects and follow-up investigation efforts were conducted to assure that the defects were corrected.

January 15, 2014: An ROSB Operating Practices railroad safety inspector and an FRA Chief Inspector performed a joint inspection of UPRR's Truckee Yard, located in the Roseville Subdivision. Items observed included two sets of unattended locomotives, hand-operated switches, derails, and walkway surfaces. A follow-up discussion was conducted with the local leadership team for immediate correction of two items found to be out of compliance with federal regulations and/or the railroad's own operating rules. Locomotives were left where they did not clear the workspace on the next track, creating a dangerous fouling condition. . If a trainman riding the side of moving equipment were to be struck by the non-clearing equipment, the resulting injury could be serious and possibly fatal. The ROSB inspectors pointed out the infractions to the UPRR Manager of Track Maintenance and called the Manager of Train Operations for correction. Violations were issued to UPRR for the non-compliance



UPRR Truckee Yard, Track #115 looking East --Jordan Spreader fouling adjacent track. The equipment should have been left behind the yellow marker, visible under the locomotive.

January 27-29, 2014: CPUC Track inspectors performed a General Order 118-A walkway inspection behind a BNSF Railway System Tie Gang that worked the mainline on the Bakersfield Subdivision. This inspection resulted in a fourteen page General Order report documenting non-compliance with GO walkway requirements. The types of defective conditions found ranged from walkways not meeting minimum requirements, to signal wires and other objects being left in the walkways, creating tripping hazards for trainmen. Several walkway slopes at road crossings did not meet slope requirements, and employee training was inadequate. As a result of this inspection, BNSF management provided written notification to trainmen to make them aware of the unsafe walkway conditions. BNSF management has since remedied the majority of the identified concerns. Additional follow up inspections by ROSB are planned to monitor compliance.



Photo to the left is a junction box that is in the walkway creating a tripping hazard for trainmen. The top of the box should be level with the walkway. Photo to the right shows a steep slope to the left of the switch. There is no safe place for a trainman to stand while lining the switch. A three foot level walkway is required behind the switch stand.

February 3, 2014: A team of ROSB Motive Power & Equipment inspectors conducted inspections at railroad properties from San Diego to Oceanside. Inspected railroad sites and equipment included the following:

- AMTRAK trains at the Santa Fe Depot located in San Diego;
- Pacific Sun Railroad locomotives;
- Metrolink passenger trains that the railroad had inspected and prepared for service at the Stuart Mesa facility located inside Camp Pendleton in Oceanside;
- National City where BNSF trains undergo testing and inspection prior to departure;

-
- BNSF locomotives at the BNSF San Diego Railroad Yard; and
 - San Diego & Imperial Valley Railroad at both San Ysidro and San Diego facilities.

The team identified a number of conditions that were out of compliance with state and federal regulations. However, they noted that the defects were far less severe than had been documented during prior inspections. In addition, many of the identified defects were corrected while the team was still on site. Those that were not corrected will be addressed during follow-up inspections.

March 19, 2014: Three ROSB railroad safety inspectors (one Hazardous Materials and two Operating Practices) plus one FRA Operating Practices inspector conducted a focused inspection of the Richmond Pacific Railroad's Parr Yard located in Richmond. In the following picture, a Hazardous Materials railroad safety inspector inspects for securement of the manway cover on top of a regulated shipment recently pulled from a shipper, while a CPUC Operating Practices railroad safety inspector maintains a look out for hazardous conditions. Six non-complying conditions were found during this inspection. These conditions were discussed with the Richmond Pacific Railroad management and the hazardous materials shipper who offered the tank cars for transportation. Emphasis was placed on the importance of correctly preparing hazardous materials tank cars for rail shipment.



Hazmat tank car inspection, with CPUC Operating Practices personnel acting as lookouts

April 15 – 18, 2014: An ROSB team of four Motive Power & Equipment inspectors, and two FRA Motive Power and Equipment inspectors, conducted a focused inspection at UPRR's West Colton Yard in Bloomington. The team divided its efforts in order to conduct 24 hour observations for the multi-day period. The team inspected 16 trains that the railroad had declared ready for departure. Inspections of those trains yielded 190 defects for 981 cars inspected. Nine civil penalties were recommended for the most severe defects. Among the defects identified

were safety appliances out of compliance with regulations, power brake defects and defects with the potential to result in derailments. The inspection was triggered by previous inspections at that location that had found non-compliance with safety regulations. The railroad was informed of the inspection findings. UPRR has begun to take corrective action and the situation will be monitored by CPUC staff in subsequent inspections to assure that full compliance is achieved.



*Petroleum tank car with insufficient side bearings clearance
UPRR West Colton Yard*

May 5 – 8, 2014: ROSB railroad safety inspectors, led by the CPUC’s Crude Oil Reconnaissance Team, performed a cross-discipline focused inspection of crude oil by rail operations, focusing on railroads and facilities where crude oil cars are handled while en route to refineries. ROSB inspectors from the Operating Practices, Track, and Hazardous Materials disciplines teamed up to check for compliance with state and federal regulations, and to gather information on railroad operations pertaining to crude oil transportation. The focused inspection included participation by nine CPUC inspectors, who were joined by two FRA inspectors. A total of 20 inspections were performed as part of the audit. Railroads inspected include UPRR, BNSF Railway, and two short line railroads. Facilities inspected included Kinder Morgan in Richmond, the Exxon Mobil facility serviced by the UPRR in Central California, and Interstate Oil in Sacramento.



DOT 111-A Car built in 1977 travels between Central and Southern California as part of a unit train

Safety concerns identified during the focused inspection include multiple rails with bolt hole cracks in the classification yard at UPRR Roseville. Broken rails have been identified as a leading cause of derailments involving crude oil cars. CPUC inspectors found a number of hazmat-related defects connected with unloading cars by Interstate Oil, which were addressed. During a BNSF inspection, CPUC staff observed a crew's failure to properly secure handbrakes on crude oil cars that were left unattended.

The focused inspection found 94 federally non-complying conditions, as well as 19 General Order defects. CPUC rail safety staff provided railroad management with inspection reports and follow up was made to ensure a plan was in place to remedy the defects. Follow-up inspections were performed to monitor the condition of the tank cars in use, finding only minor defects with the equipment. BNSF Railway has also clarified their rules regarding securement of handbrakes, and provided instructions to crews about proper securement.

June 16 – 18, 2014: CPUC Operating Practices inspectors conducted a focused inspection of the Pacific Harbor Line (PHL) railroad. PHL is a short line railroad that serves the ports of Long Beach and Los Angeles, along with other entities in the San Pedro Bay area. The CPUC inspectors were joined by FRA Operating Practices inspectors. The objective of the inspection was to attempt to ascertain the reasons behind an increase in human factor derailments on PHL property between 2012 and 2013. The investigation team focused on railroad management operations compliance testing. The team undertook the following investigative activities: observation of crews performing switching operations and shoving movements; observation of managers performing operations testing; and inspection of locomotives and cars for proper securement. The team completed a total of ten inspection reports and identified five defects. The defects including improper position of derail, crossover switches out of correspondence, switch hooks not in hasp, failure of crew member to inspect a switch after lining, and failure of an engineer to use proper horn cadence at a crossing. These reports were provided to the railroad and follow-up inspections were held to ensure that the identified problems had been corrected.

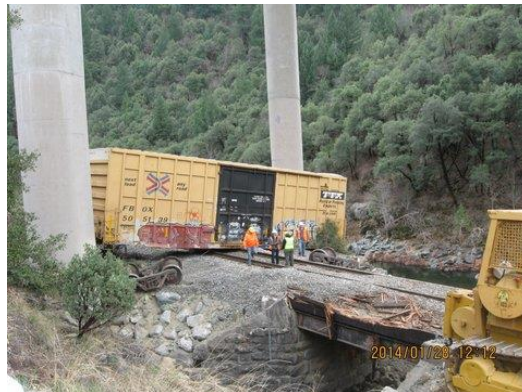


CPUC Inspector at PHL Railroad

Appendix F – Investigation Summaries

CPUC rail safety supervisors reviewed all reported rail incidents. Of that amount, 65 required investigations. The following reports provide an example of CPUC rail safety investigations.

January 27- 28, 2014: Three ROSB railroad safety inspectors investigated a derailment of a northbound freight train south of Dunsmuir on UPRR's main track in the vicinity of Gibson Siding on the UPRR's Valley Subdivision. The incident occurred adjacent to the Sacramento River. Although there was over \$500,000 damage to track and equipment, there were no injuries and no hazardous material spilled. The investigation attributed this derailment to track geometry variation in the cross-level of the track and an unevenly distributed load of scrap paper in a box car.



North end of Gibson derailment site, UPRR Milepost 304.23, just under I-5 Freeway Overpass at the confluence of Boulder creek/Sacramento River where one loaded and three empty boxcars left the rail.



Point of derailment south of Gibson Siding at MP 301.8, at the entry to a railroad suspension bridge which spans the Sacramento River



UPRR work train locomotives, Maintenance of Way workers and CPUC Track railroad safety inspectors testing track geometry including gage, cross level and elevation under load near POD at Gibson derailment site.

April 23, 2014: CPUC inspectors investigated a Union Pacific derailment. At approximately 10:32 a.m., a northbound UPRR freight train derailed seven rail cars near milepost 342.75 on Union Pacific’s Mojave Subdivision. This location is approximately 30 miles southeast of Bakersfield. There were no fatalities, injuries or hazardous materials releases. Track damage was considered minimal. The locomotive event recorder downloads were reviewed in order to identify possible causal factors. The train crew was also interviewed. The derailment was what is referred to as a “string lining” event. “String lining” is a condition wherein a train tends to seek a straight line when the locomotives pull the train through a curve. The pulling of the locomotives and the drag of heavy loads can cause lighter and/or longer cars to be pulled to the inside of a curve, as depicted in the photograph below. Communication loss between operating locomotives and distributed power unmanned locomotives was the cause .



Derailed Cars – “String line” incident, near MP 342.75 at Cliff Union Pacific – Mojave Subdivision

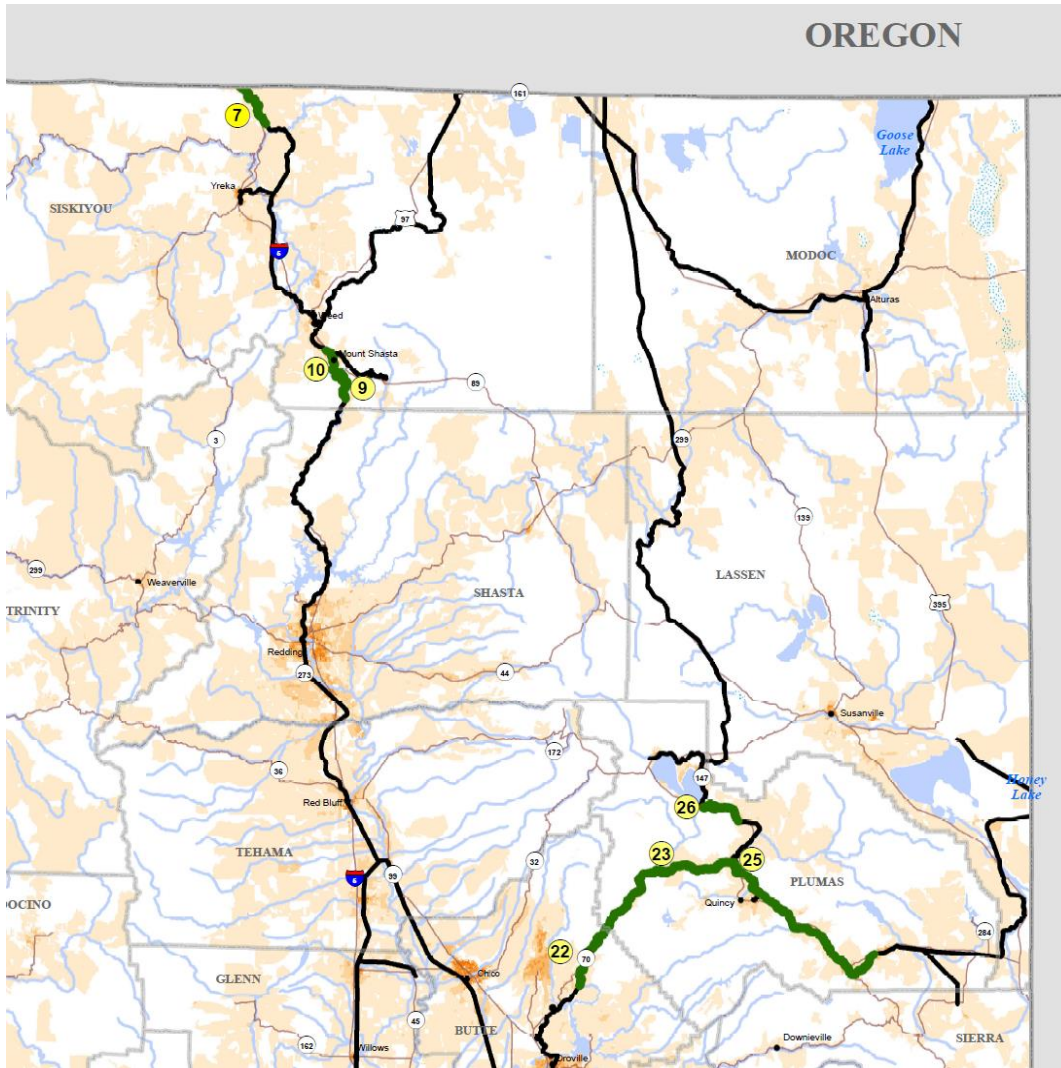
Appendix G – Local Safety Hazard Site Maps



Notes:

Maps are broken down into three areas: 1) Northern California, 2) California Central Coast/Desert Valley, and 3) Southern California.

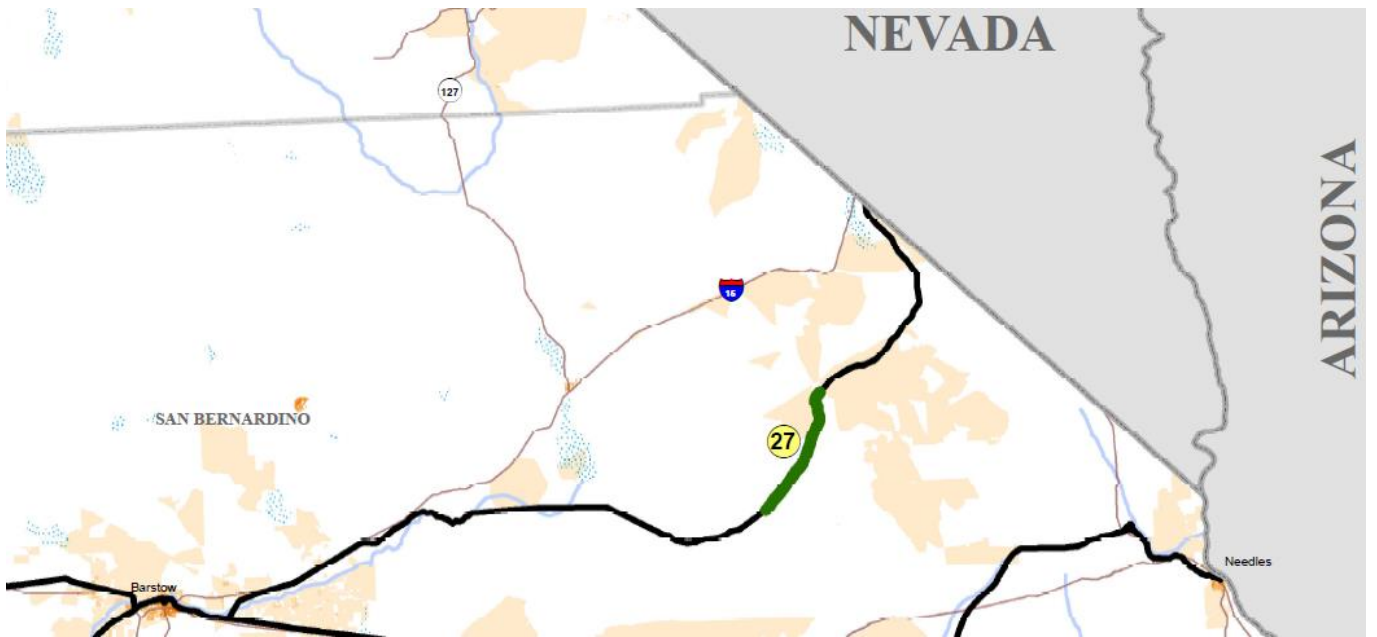
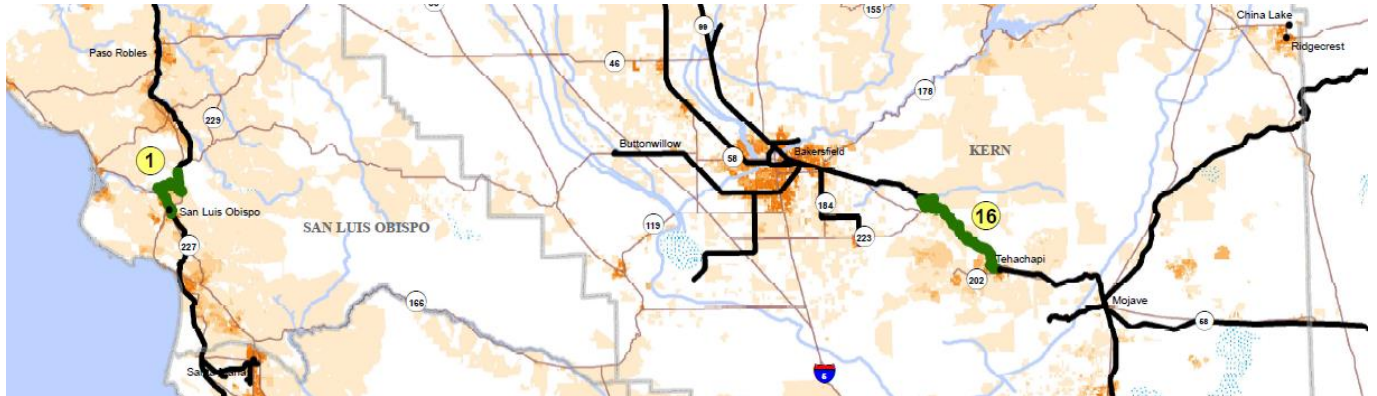
These maps are being updated, and soon should be available as interactive maps on the CalOES website. For information on accessing those maps, legislators should contact the CPUC's Office of Government Affairs.

- Northern California -



LEGEND	LSHS Track Distance (mi.)	LSHS County Location
 Local Safety Hazard Sites  Rail LSHS Site #		
7	9.7	Siskiyou
9	10.5	Siskiyou
10	16.4	Siskiyou
12	10	Placer
22	6	Butte
23	29	Plumas
25	87.1	Butte and Plumas
26	10	Plumas

- California Central Coast/Desert Valley -

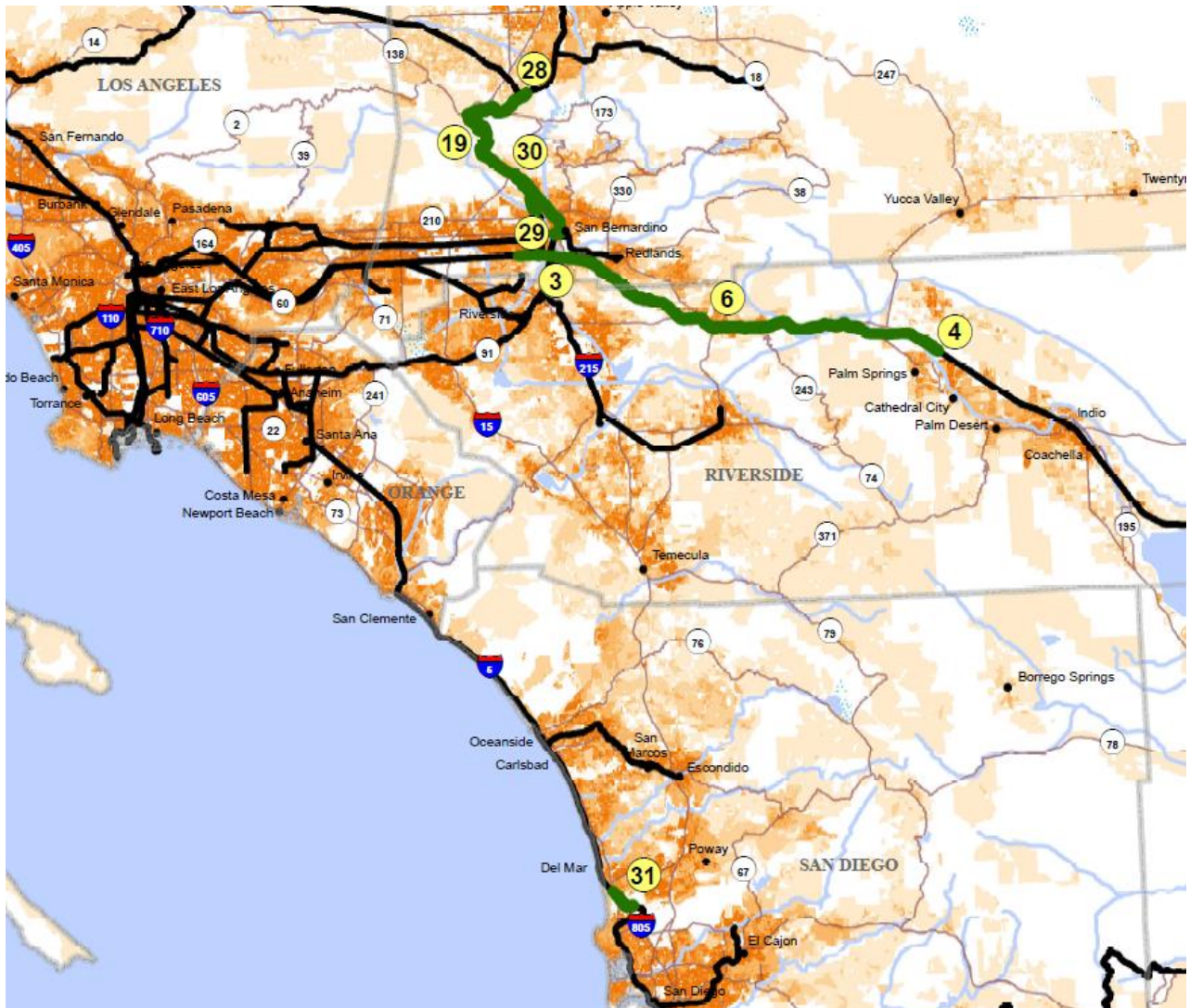


LEGEND

- Local Safety Hazard Sites
- Rail

LSHS Site #	LSHS Track Distance (mi.)	LSHS County Location
1	14	San Luis Obispo
16	24.9	Kern
27	18.1	San Bernardino

- Southern California -



LEGEND

— Local Safety Hazard Sites

— Rail

LSHS Site #	LSHS Track Distance (mi.)	LSHS County Location
3	10	San Bernardino/ Riverside
4	6	Riverside
6	46.4	San Bernardino/ Riverside
19	23	San Bernardino
28	15	San Bernardino
29	0.5	San Bernardino
30	25.6	San Bernardino
31	4	San Diego

Appendix H - Acronyms

ACE	Altamont Commuter Express
BNSF	BNSF Railway
CEMA	California Emergency Management Agency
CFR	Code of Federal Regulations
CPUC	California Public Utilities Commission
FRA	Federal Railroad Administration
GO	General Order
HSR	High Speed Rail
METROLINK	Southern California Regional Rail Authority
MP&E	Motive Power & Equipment
OES	Office of Emergency Services
OL	Operation Lifesaver
PHL	Pacific Harbor Line
PTC	Positive Train Control
RAS	Risk Assessment Section
RMSR	Risk Management Status Report
ROSB	Railroad Operations and Safety Branch
RSAC	Rail Safety Advisory Committee
RSAP	Rail Safety Action Plan
SED	Safety and Enforcement Division
SMART	Sonoma-Marín Area Rail Transit
STC	Signal and Train Control
TSA	Transportation Security Administration
UPRR	Union Pacific Railroad
WIU	Wayside Interface Units