Safety Policy Division Review of Pacific Gas and Electric Corporation's 2021 Safety Performance Metrics Submittal Pursuant to Decision 19-04-020

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I. Purpose

Pursuant to Ordering Paragraph 2 in Decision (D.)19-04-020 of the Safety Model Assessment Phase (S-MAP) proceeding, Application (A.) 15-05-002 et al, PG&E submitted a Safety Performance Metrics Report to the California Public Utilities Commission (CPUC or Commission). PG&E also concurrently distributed the report to members on the service list in A.15-05-003.

D.19-04-020 also directed Safety and Enforcement Division staff to review the submitted safety performance metrics reports. Since the Risk Assessment and Safety Analytics Section staff that is responsible for the evaluation of these reports has since migrated from the Safety Enforcement Division to the Safety Policy Division (SPD), this report summarizes SPD staff's review of PG&E's Safety Performance Metrics Report.

II. Overview of PG&E Report

PG&E submitted data on 25 metrics as required by D.19-04-020. Their report is divided into five sections:

I. **Introduction**: Provides a narrative of PG&E's Safety Performance Metrics Report (SPMR) and its compliance with S-MAP Phase Two Decision Directives.
II. **Metrics Overview**: Provides a summary of how PG&E uses metrics to "provide valuable insight on our safety performance." This section provides narratives examples describing how the SPMs have been used by PG&E.
III. **Bias Controls Overview:** Provides an overview of the nature and scope of the Bias controls that PG&E uses.
IV. **2020 Imputed Adopted Values for Safety-Related Risk Mitigation Activities:** This section provides a table showing the Risk mitigations spending level for 2020.
V. **Safety Performance Metrics**: Provides a summary and narrative of the data for each of PG&E's 25 metrics, along with the required reporting information on executive compensation and bias controls.

Observations:

SPD has reviewed the PG&E SPMR. SPD finds that PG&E has complied with the S-MAP Decision as specified by ordering paragraphs 2, 3, and 6. Table 1 lists each of the metrics that were submitted for review.

Table 1: Safety Performance Metrics and Associated Units

Category	Safety Performance Metric		Unit
Electric	1	Transmission and Distribution (T&D) Overhead Wires Down	Number of wire down events
	2	T&D Overhead Wires Down – Major Event Days (MED)	Number of wire down events
	3	Electric Emergency Response (911)	Percentage of time response is within 60 mins
	4	Fire Ignitions	Number of ignitions
Gas	5	Gas Dig-in	The number of 3rd party gas dig-ins per 1,000 USA tags/tickets
	6	Gas In-Line Inspection	Miles inspected
	7	Gas In-Line Upgrades	Miles upgraded
	8	Shut in the Gas Average Time – Mains	Average (median) time in mins required to stop gas flow
	9	Shut in the Gas Average Time – Services	Average (median) response time in minutes required to stop the flow of gas during incidents involving services

Category	Safety Performance Metric		Unit
	10	Cross Bore Intrusions	# of cross bore intrusions per 1,000 inspections
	11	Gas Emergency Response	Average response time in minutes
	12	Gas Storage Baseline Inspections	# of inspections
Injuries	14	Employee Serious Injuries and Fatalities (SIF)	# of Serious Injuries/ Fatalities
	15	Employee Days Away, Restricted, or Transferred (DART) Rate	DART Cases multiplied by 200,000 divided by employee hours worked
	16	Employee Lost Work-Day (LWD) Case Rate	# of LWD cases incurred for employees per 200,000 hours worked associated with work for the reporting utility
	17	OSHA Recordables Rate	OSHA recordable incidents times 200,000 divided by employee hours worked
	18	Contractor OSHA Recordables Rate	OSHA recordable multiplied by 200,000 divided by contractor hours worked
	19	Contractor Days Away, Restricted, or Transferred (DART) Rate	DART Cases multiplied by 200,000 divided by contractor hours worked
	20	Contractor SIF	# of Work-related serious injuries or fatalities associated with work for the reporting utility
	21	Contractor Lost Work-Day (LWD) Case Rate	# of LWD cases incurred for contractors per 200,000 hours worked associated with work for the reporting utility
	22	Public SIF	# of Serious Injuries/ Fatalities
Vehicles	23	Helicopter/ Flight Accident or Incident	# of accidents or incidents (as defined in 49 CFR Section 830.5 "Immediate Notification")
Injuries	24	SIF Corrective Actions on time	% SIF Corrective Actions completed on time
Vehicles	25	Hard Brake Rate	# hard braking events per thousand miles driven
Vehicles	26	Driver Check Rate	# of Driver Check complaint calls received per 1 million miles driven

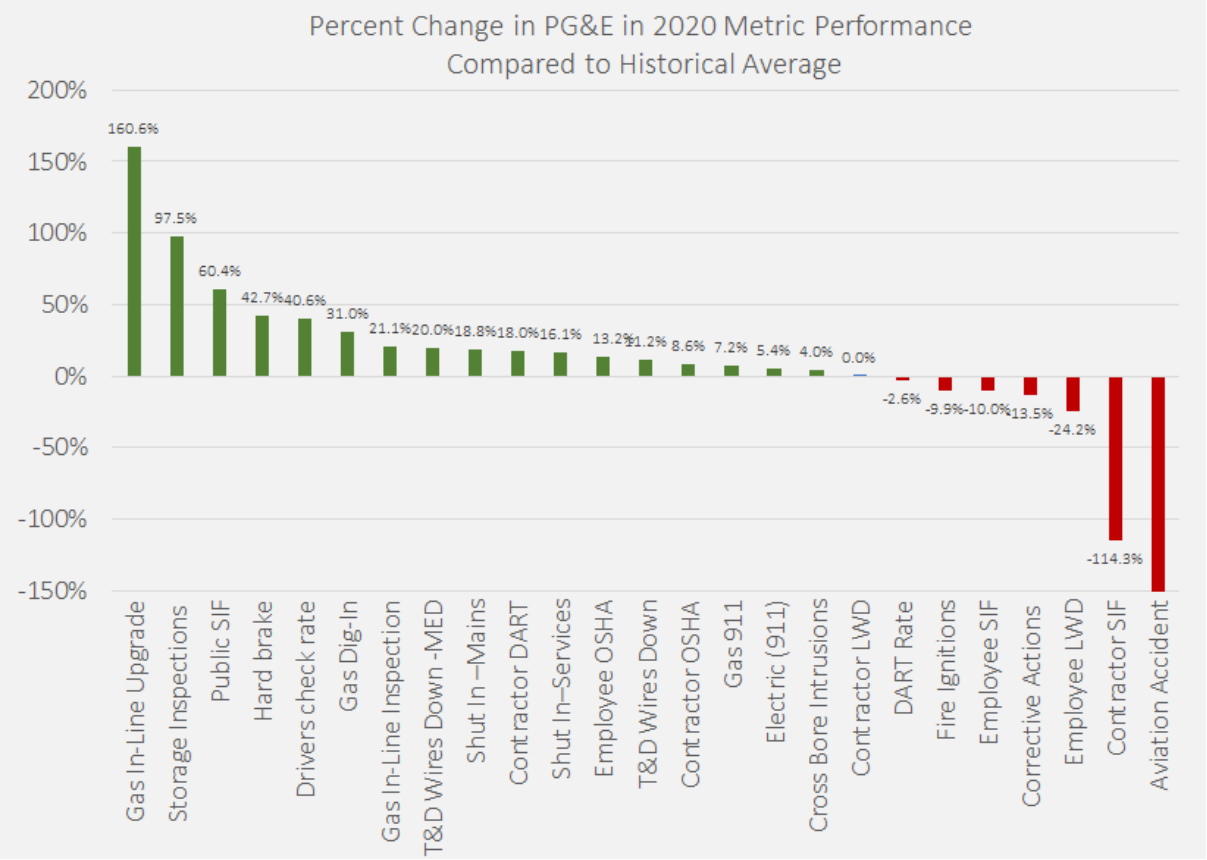
Metric performance: To make observations about performance on safety metrics SPD staff looked for discernible trends in the data. Staff also compared 2020 numbers to average prior performance for each metric that had at least 4 years of data. Charts showing performance on each metric for all of the years of data provided by PG&E can be seen in the Overview of PG&E's Safety Performance Metrics & Individual Metric Summary section of this report.

Overall, PG&E's Safety Performance Metrics data shows that on 18 out of 25 tracked metrics, PG&E performed better in 2020 than the average of preceding years, and on seven metrics, PG&E performed worse in 2020 than the average of preceding years.

PG&E's metric performance is summarized in Figure 1. This chart depicts PG&E's performance in 2020 relative to the average performance on each metric that had more than four years of data. Metrics reflecting improved safety performance are shown in green and metrics that reflect poorer safety outcomes compared to prior year averages are in red. If a metric that measures a negative safety event increases, that is displayed as a "negative" number to show that it is an undesirable to be above the average of prior years. For example, metric 1 (wires down) has a decrease in the 2020 number of events over the 10-year average by 11%. Because fewer wires down events indicates an increase in safety, we coded this metric as +11%. Conversely, Metric 4 (Fire ignitions) had an 9.9% increase over the 10-year average showing a decrease in safety and is shown as a negative number in red as -9.9%.

Positive values show an improvement in metric performance compared to the historic average and negative values show a decline in safety performance.

Figure 1. Summary of PG&E 2020 Metric Performance Compared to Available Historical Averages



While informative, this data should be viewed with the caveat that, for some metrics, such as Serious Injuries and Fatalities (metrics 14, 20, and 22), there is a very small number of reported occurrences relative to the risk exposure. This results in a higher level of uncertainty associated with the reported metric numbers. SIF numbers are so few relative to the total exposure in any given year that the reported variations cannot be presumed to indicate that operational and technical deficiencies are drivers of negative performance or that operational and technical improvements are the drivers of positive performance. For metrics with so few occurrences relative to risk exposure, observed trends over a much longer period are necessary to produce credible conclusions. For metrics with many data points, the trends are more credible and are less likely due to possibly random variations.

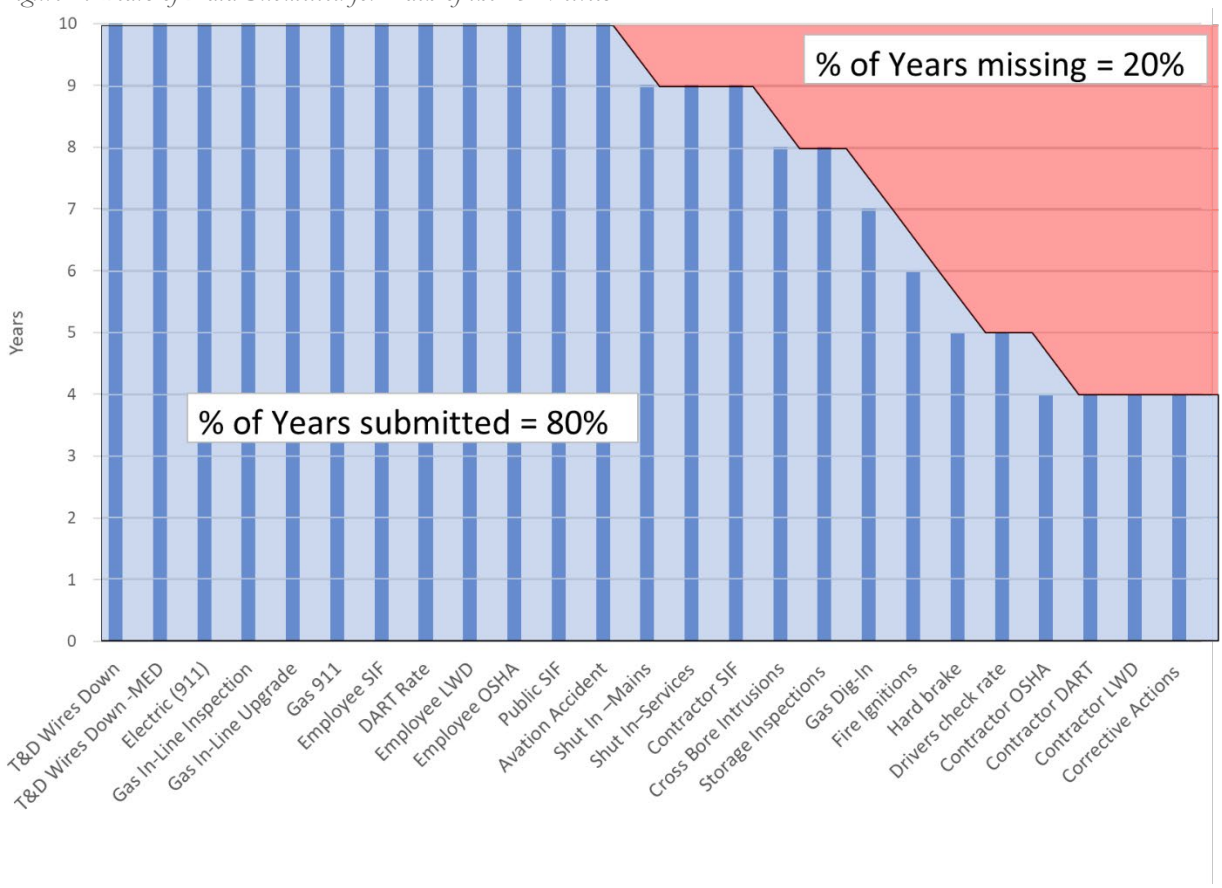
III. Compliance with Requirements in D.19-04-20

This section reviews whether the utility submitted the information required in D.19-04-20.

Ordering Paragraph 2 requires data for the last ten years for all safety performance metrics for which such data exist.

Of the 25 metrics, PG&E has the full ten years of data for twelve metrics. Thirteen metrics had less than ten years of data. Figure 2 shows the number of years of data that PG&E submitted for each metric. As PG&E continues to collect these data, the number of missing years will decrease over time should this reporting requirement be retained.

Figure 2. Years of Data Submitted for Each of the 25 Metrics



Ordering Paragraph 3 requires the utility to submit current year data on public serious injuries and fatalities (SIF).

PG&E provided Public Serious Injuries and Fatalities data sixty days prior to the due date for this report, fulfilling this requirement. See Metric 25 for more details on this metric.

Ordering Paragraph 6 (a) requires the utility to identify all metrics linked to or used in any way for the purpose of determining executive compensation levels and/or incentives, regardless of whether or not systems are in place to control bias, and including all metrics linked to individual and group performance goals, executive compensation.

PG&E reports information about the linkage of executive compensation to each of the 25 metrics. Seven of the 25 metrics are tied to compensation. PG&E has submitted their executive compensation plan for review to Wildfire Safety Division/Office of Energy Infrastructure Safety. Information about that can be found here: https://www.cpuc.ca.gov/wsd/executivecomp/.

Ordering Paragraph 6 (b) requires the utility to identify the Director-level or higher executive positions to which the metric(s) is linked.

For each metric, PG&E provided a list of the positions linked to that metric - 24 of 25 metrics have identified linkages to comply with this ordering paragraph.

Ordering Paragraph 6 (c) requires the utility to describe the bias controls that the utility has in place to ensure that reporting of the metric(s) has not been gamed or skewed to support a financial incentive goal.

PG&E began the report by providing a high-level overview of their bias control efforts. This included use of "multiple bias controls and systems" including "internal and external auditing, third party data collection and resources, and state mandated reporting and safety regulation such as OSHA." (p. 3-1). They then identified and described bias controls to varying extents for each metric in the report as required.

Ordering Paragraph 6 (d) requires the utility to Provide three to five examples of how the utility has used Safety Performance Metrics (metrics) data to improve staff and/or contractor training, and/or to take corrective actions to minimize top risks or risk drivers; and provide three to five examples of how the utility is using metrics data to support risk-based decision-making as required in the Safety Model Assessment Proceeding (SMAP) and Risk Assessment Mitigation Phase (RAMP) processes.

To determine compliance, SPD staff reviewed the examples provided by PG&E and attempted to ascertain whether or not they generally fit into one or more of the categories of examples required in the ordering paragraph.

To meet part (d) of ordering paragraph 6, PG&E divided examples into two categories of how metrics are used . "A) improve staff and/or contractor training or take corrective actions aimed at minimizing top risks or risk drivers, and (b) to support risk-based decision-making".

PG&E cites 6 examples for category A and 5 examples for category B. Below are three from each category

<u>Category A Examples: Training and corrective actions</u>

1. **911 Emergency Response metrics**: PG&E states that data is used to "better understand how weather events impact different parts of the service territory." The analysis is intended to elucidate which areas need resources the most during weather events. "Using the analysis, PG&E implemented a plan to more strategically distribute resources across the service territory during weather events."
2. **Employee Days Away, Restricted and Transfer (DART**): PG&E describes programs designed to mitigate safety risks to employees including:
    a. On-site Clinics
    b. FIT 4 U program
    c. Telephonic Case Management (TCM) program
    d. Industrial Athlete
    e. Office Ergonomics
    f. Industrial Ergonomics
3. **Contractor SIF:** Assuring vegetation management subcontracting compliance with safety practices

<u>Category B Examples: Risk-Based Decision-Making</u>

1. **Wires Down:** A wires down database is used to inform the overhead conductor replacement program.
2. **Gas Dig-In, Shut In the Gas Average Time – Services, Cross Bore:** PGE states that these metrics inform their "process safety indicator dashboard." PG&E states that "Metrics are evaluated

continuously and calibrated at the beginning of the year to ensure that Gas Operations drive the right continuous improvement conversations." We would like to know more about how these metrics are "calibrated."

3. Third Party Dig-Ins: Dig-In Data informed the development of the Global Positioning System (GPS) devices in development by the Gas Research and Development team.

Observations: Just as in last year's evaluation, SPD staff observed that this requirement poses challenges for compliance by the utility and determination of compliance by staff. Staff is revisiting this requirement and is discussing a clarification with the Administrative Law Judge and the Assigned Commissioner's Office to consider revising this requirement as part of R.20-07-013.

Ordering Paragraph 6 (e) requires the utility to explain how the safety metrics reflect progress against the utility's RAMP and General Rate Case safety goals.

PG&E complied with this requirement by describing how each metric reflects progress on General Rate Case safety goals in a subsection of every metric they reported.

Ordering Paragraph 6 (f) requires the utility to provide a high-level summary of its total estimated risk mitigation spending level as approved in their most recent GRC.

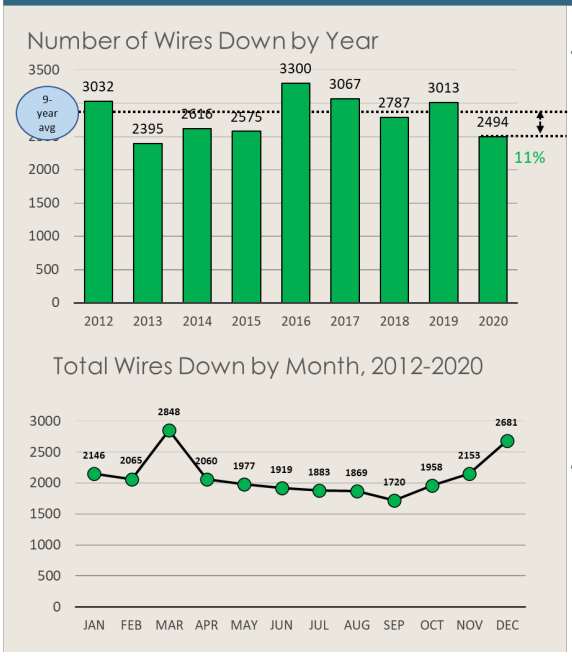
On pg. 4-1, PG&E provided the following table that included the total estimated risk mitigation spending level adopted in the 2020 General Rate Case for 2020 and the recorded expenditure amount to comply with this requirement.

Table 1: Safety Related Risk Mitigation Spending: Adopted and Actuals: Note This table is comprised of all Major Work Categories or Maintenance Activity Types that are related to safety-related risk mitigation activities.

	Expense	Capital
2020 Imputed Regulatory Values	$ 1,726,340.91	$ 2,359,457.17
Recorded 2020	$ 2,534,723.12	$ 2,957,623.01

Overview of PG&E's Safety Performance Metrics & Individual Metric Summary

PG&E Metric 1: T&D Wires Down – No MED – 9 year- avg ← Lagging | Electric



METRIC DEFINITION

# of instances where an electric transmission or primary distribution conductor is broken and falls to rest on the ground or a foreign object; excludes down secondary distribution wires and Major Event Days

Bias controls

- Wire down events are reported using uniform reporting guidelines as the events occur.
- Engineers conduct post wire down event reviews.
- QC team processes and initiate all valid change requests based on their reviews and findings.

Linkage to compensation and performance

- Executive compensation: ✓
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 10 years of monthly data (2011-2020) on Metric 1. In 2012, PG&E implemented a new "Wires Down Program" and changed the methodology for collecting wire down data. This resulted in a 70% increase in measured wires down events in 2012. PG&E attributes this increase to the new program's "more accurate measurement". Due to this shift in methodology, the percent change reflected in the chart compares only data collected after the "Wires Down Program" revisions were implemented.

Following the shift to the new data collection methods in 2012, the number of overhead wires down stayed relatively stable. PG&E asserts that as part of the Wires Down Program, they have made an "effort to identify and mitigate the root cause of wires down incidents, Electric Operations implemented a program to visit wires down locations to gather essential data, understand the cause, and develop work plans to mitigate future wires down incidents." They further state that "work has been performed to reduce wires down, including replacing overhead conductors, vegetation clearing, hardening of distribution circuits, infrared inspections of overhead lines to identify and repair hot spots, and investigating wire down incidents and implementing learnings/corrective actions." These efforts do not appear to have resulted in a corresponding change in their performance on this metric.

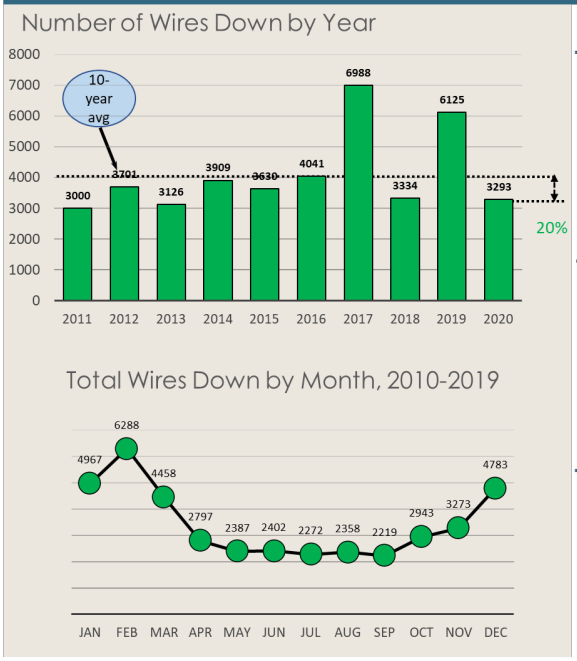
PG&E cites challenges in meeting performance targets on this metric due to "due to unfavorable weather and tree failures due in part to the impact of the extended drought."

Seasonality:

The monthly data indicates a seasonal trend with significantly more wire down events in the winter and early spring months (November to March) than the remainder of the year (April to October).

PG&E Metric 2: T&D Overhead Wires Down – w/ MED

Lagging | Electric



METRIC DEFINITION

of instances where an electric transmission or primary distribution conductor is broken and falls to rest on the ground or a foreign object; excludes down secondary distribution wires, includes Major Event Days

Bias controls

- PG&E does not focus on this metric; therefore, it does not have any bias controls in place for this specific metric.

Linkage to compensation and performance

- Executive compensation: ✓
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 10 years of monthly data (2011-2020) on Metric 2. Metric 2 was not linked to executive compensation or individual performance goals in 2019. PG&E now includes Metric 2 as a Short-Term Incentive Program (STIP) metric.

PG&E states that "The metric, inclusive of [Major Event Days (MEDs)] is not being used for internal reporting purposes. PG&E focuses on transmission and primary distribution conductor wire down events, excluding MEDs." PG&E states that Institute of Electrical and Electronics Engineers (IEEE) established the Major Event Day (MED) criteria to exclude severe weather days from industry benchmarked reliability data because of the large fluctuations in weather patterns. PG&E further states that "Given the fluctuations driven in this metric from weather patterns, [they] do not view it as an appropriate metric to properly assess system performance or improvement."

Seasonality:

The monthly data indicates a seasonal trend similar to Metric 1. i.e. significantly more wire down events in the winter and early spring months (Nov – Mar) than the remainder of the year (Apr- Oct).

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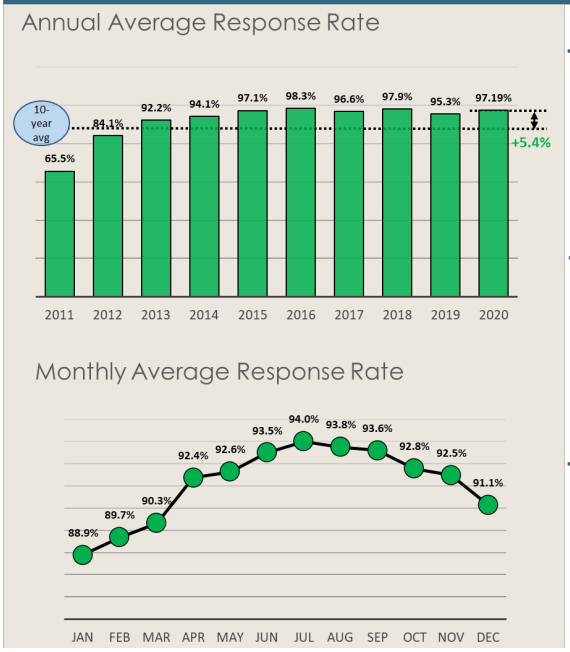
PG&E Metric 3: Electrical Emergency Response Rate

Lagging | Electric



METRIC DEFINITION

The percent of time utility personnel respond (are on-site) within one hour after receiving a 911 (electric related) call.

Bias controls

- PG&E has several controls in place for this metric that are "verified by internal audit."
- 911 data timestamps are entered into an OIS database.

Linkage to compensation and performance

- Executive compensation: ✓
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 10 years of monthly data (2011-2020) on Metric 3. PG&E "began benchmarking its response to 911 calls with other utilities in 2012." They now claim to be best in class (in a cohort of 8 to 10 utilities) on this metric. PG&E attributes its success to having identified several performance drivers, including accurately predicting when calls come in, ensuring that resources are on hand when they come in, and coordinating across departments. They also discuss actions taken to improve each driver. These include proactive scheduling of resources, training, coordination across lines of business and technology adoption.

They have identified performance drivers, mitigation activities that impact these drivers, and benchmarks that help calibrate their performance expectations. As with other metrics in this report, PG&E identified bias controls including a time stamping system and internal auditing.

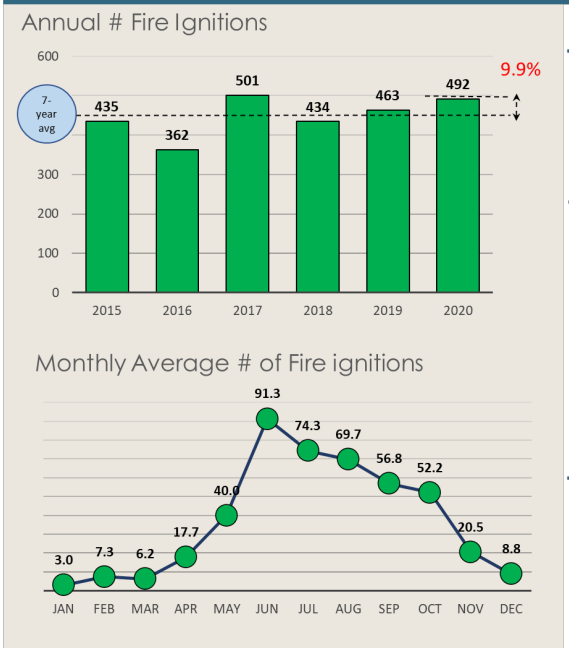
PG&E has maintained a consistently high response rate since 2013.

Seasonality:

The monthly data indicates a seasonal trend that peaks in the summer months.

PG&E Metric 4: Fire Ignitions

Lagging | Electric



METRIC DEFINITION

of powerline-involved fire incidents annually reportable to the California Public Utilities Commission (CPUC) per D.14-02-015

Bias controls

- PG&E has controls in place that are reviewed and confirmed by the Electrical Incident Investigation(EII) Team.
- Data is archived in Fire Ignitions Tracker.
- QC to verify fire Lat/Long, HFTD, Event Element and Suspected initiating Cause.

Linkage to compensation and performance

- Executive compensation: ✓
- Individual/group performance goals: ✓
- Executive positions identified: ✓

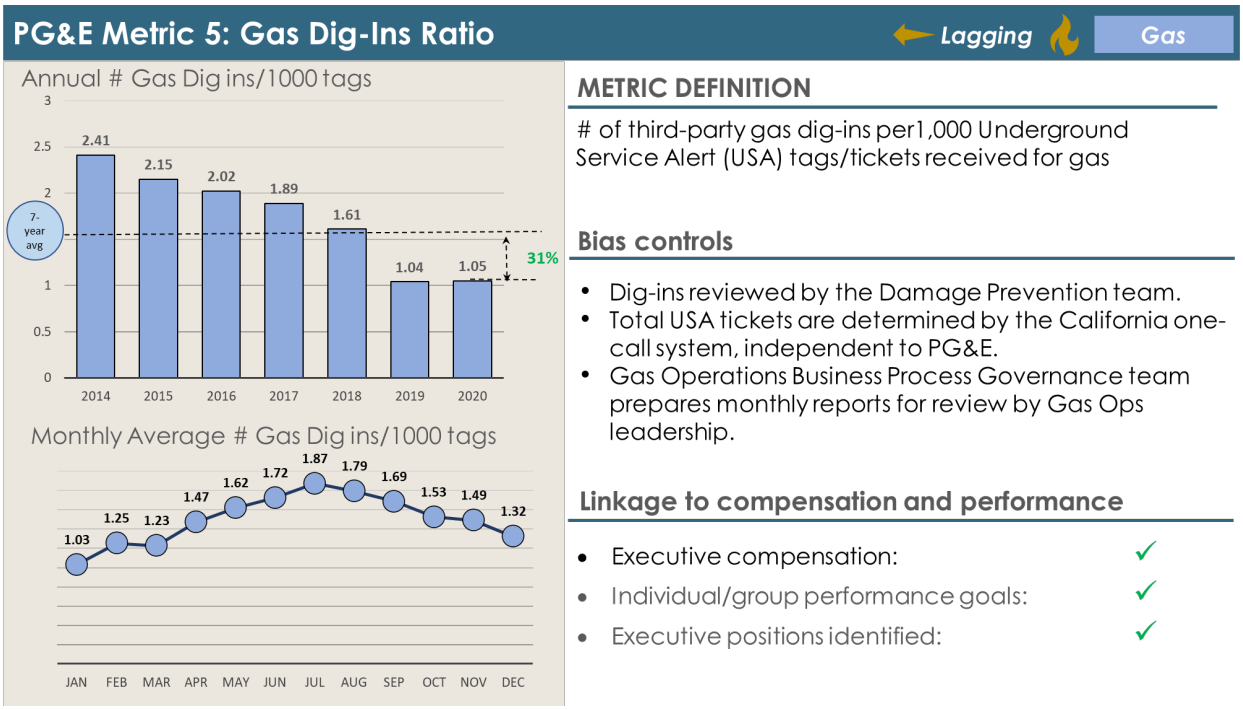
Observations:

PG&E submitted 6 years of monthly data (2015-2020) on Metric 4. PG&E views the Fire Ignition Metric as a "primary metric used to evaluate PG&E's commitment to public safety." 2020 was 9.9% above the average of the six-year reporting period. Fortunately, the majority of ignitions take place in non-high fire hazard threat districts. Ignitions have remained relatively flat over the period in which data is available.

The drivers of this metric are multi-faceted and are the subject of several other proceedings. Wildfire was the single largest risk identified in PG&E's 2020 Risk Assessment Mitigation Phase application, which included extensive mitigation efforts directly aimed at reducing ignition risks. Bias controls include data logging and tracking processes, incident investigation and other quality control processes.

Seasonality:

The monthly data indicates a peak of ignitions in June that tails off over the remainder of the calendar year. However, some of the highest impact events resulting from fire ignitions have occurred in August – November.



Observations:

PG&E submitted 7 years of data (2014-2020) on Metric 5. PG&E appears to have demonstrated a steady reduction in the Gas Dig-In rate until 2018 and then a significant improvement in the ratio starting in 2019.

Staff notes that according to a California State Senate Subcommittee report from October of 2020 entitled, "Gas Safety Retrospective: A Decade Since San Bruno", the relatively large drop from 2018 to 2019 could be attributable to a substantial increase in tickets called in by PG&E and one of its contractors, Osmose.[1]

According to the subcommittee report, "calls in Northern California – reported '524,721 more tickets in 2019 than …in 2018, an increase of 41.4%." This represented the largest annual increase in ticket volume and 27% of the 2019 tickets came directly from PG&E, while 21% came from Osmose, who was consulting with PG&E."

The # of gas tickets - as reported in the SPM – did increase from 1,069,710 in 2017 to 1,534,928 in 2020: a 43% increase. PG&E attributes this increase to a change in the Pole Test & Treat (PT&T) program[2]. They state that the "increase in tickets for the PT&T program was generated because of a change in practices from bundling poles into a single USA ticket to creating a USA ticket for each pole"

To estimate the impact that this program may have had on the overall Gas Dig-In ratio, we looked at each of the metric constituents:

$$Gas\ Dig-In\ Ratio = 1000 * \frac{\#\ 3rd\ Party\ Dig-Ins}{\#\ Gas\ Tickets}$$

[1] Gas Safety Retrospective: A Decade Since San Bruno, Senate Subcommittee on Gas, Electric, and Transportation Safety, October 13, 2020. https://seuc.senate.ca.gov/sites/seuc.senate.ca.gov/files/10-13-20_background.pdf

[2] See PG&E Data Request No. SPD_001SPMR2020-Q01: PG&E response to SPM data request made on July 14th 2021

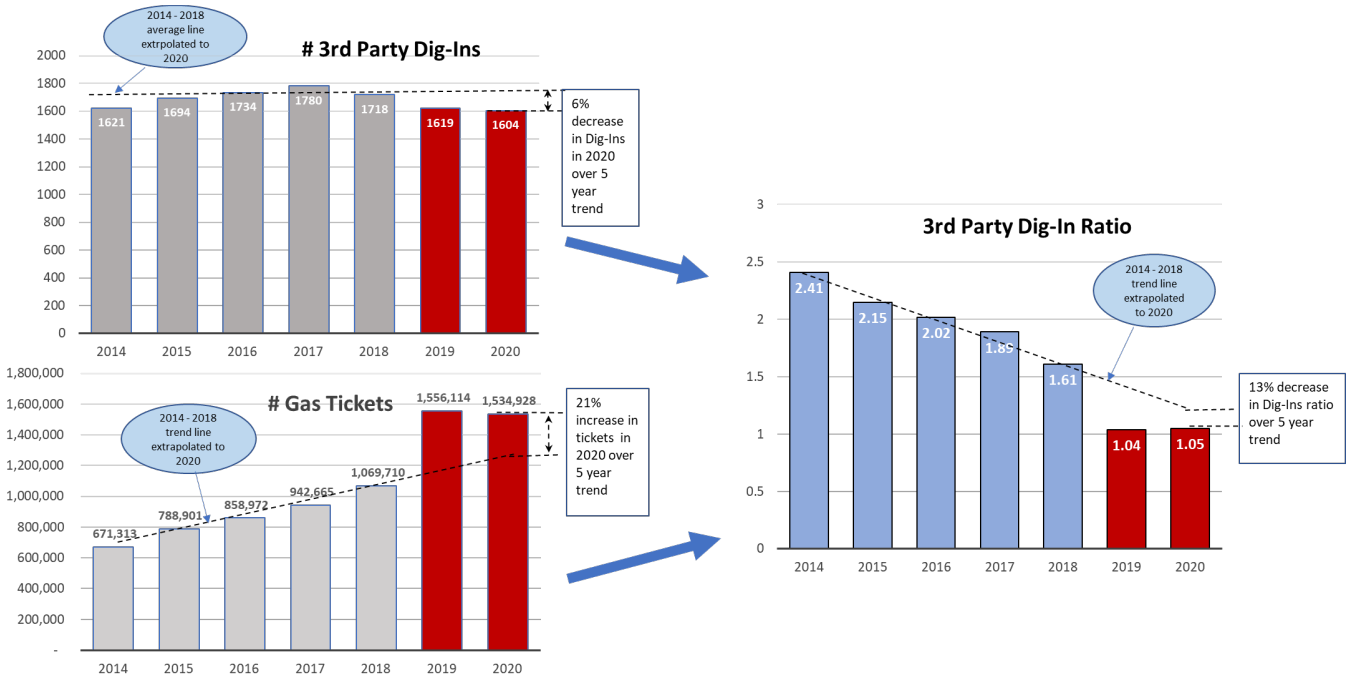
Staff evaluated the 5-year trend prior to the program change and extrapolated this trend out to 2020 for # of third-party Dig-Ins, # of gas tickets, and the gas Dig-In ratio. We compared these extrapolated 2020 values with the actual 2020 values reported by PG&E.

Figure 3 below shows the number of gas tickets increasing at a rate of about 100,000 per year from 2014 to 2018. We estimate that the 2020 ticket count would have been 1,268,000 without any program changes. This is a 21% difference between the staff estimate and the actual reported number of tickets (see lower left plot in the figure below). The gap between the estimated and actuals is 266,000 tickets. The PPT program accounts for 173,000 tickets (65%). It is not clear how much Gas Dig-In programmatic changes, random noise of the Dig-In statistics and simply uncertainty in the estimation method contribute to this difference in the expected vs actual values.

The number of third-party Dig-Ins is essentially flat between 2014 and 2018. We use the average to forecast out to 2020. The 2019 and 2020 Dig-Ins are about 6% below the five-year average. (See upper left plot in the figure below). PG&E did not provide any specific explanation for the decline in the number 3rd Party Dig-Ins. It seems plausible that the increase in the number of Gas Tickets, may have helped identify issues that avoided Gas Dig-Ins.

Finally we estimate the change in the Dig-In ratio using a five year trend. We estimate that the ratio decreased by 13% more than the expected five year trend. (See right plot in the figure below)

Figure 3 Gas Dig-In ratio inputs

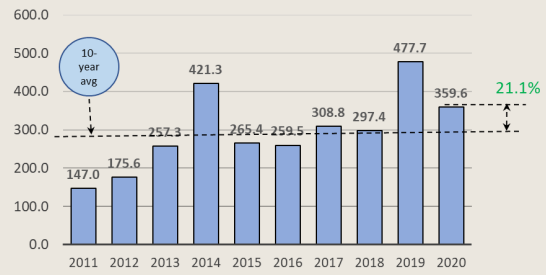


This simple estimate indicates the PT&T program may have had some impact on the gas Dig-In ratio. The staff estimate attributes approximately 13% change to the program. Based on this, we recommend reevaluating this metric to possibly exclude PG&E and Contractor tickets from the ratio calculation to ensure the emphasis is on third party dig-ins.

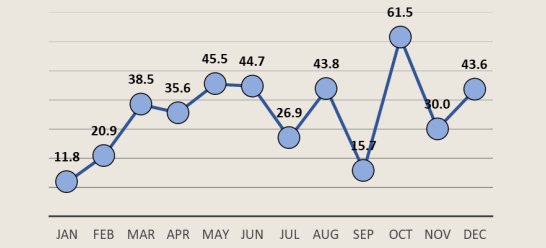
PG&E Metric 6: Gas In-line Inspections(ILI)

Leading | Gas

Annual # Gas ILI Miles



Monthly Average # Gas ILI Miles



METRIC DEFINITION

of miles of transmission pipe inspected by ILI. This metric measures PG&E's completed planned Traditional ILI, including activities that exceed current code requirements.

Bias controls

- Gas Operations Business Process Governance team prepares reports for review by Gas Ops leadership.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

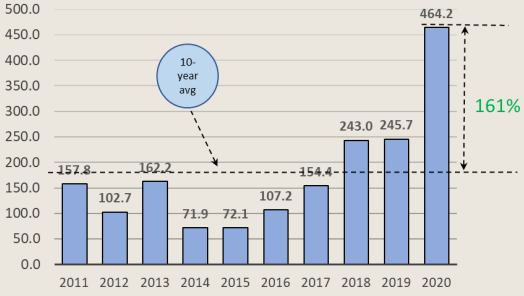
Observations:

PG&E submitted 10 years of monthly data on Gas In-line Inspections (ILI). ILI is a technique used to assess the integrity of natural gas transmission pipelines from the inside of the pipe. This requires that the pipes be "piggable" – e.g. that the pipe is free of obstructions and physical barriers. As of 2020, approximately 43 percent of the system is piggable. PG&E expects 3,109 of total first time ILI miles to be inspected by the end of 2021. This is 47% of the total system miles.

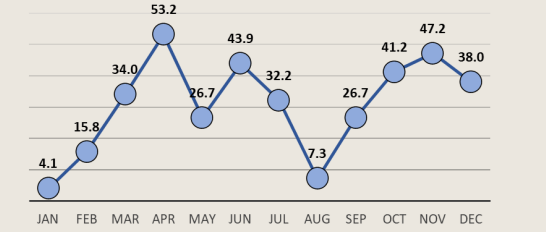
PG&E Metric 7: Miles of Gas In Line upgrades

Leading | Gas

Annual #Gas IL Miles upgraded



Monthly Average # Gas IL Miles upgraded



METRIC DEFINITION

of miles of complete planned Traditional ILI Upgrade projects, including activities that exceed current code requirements.

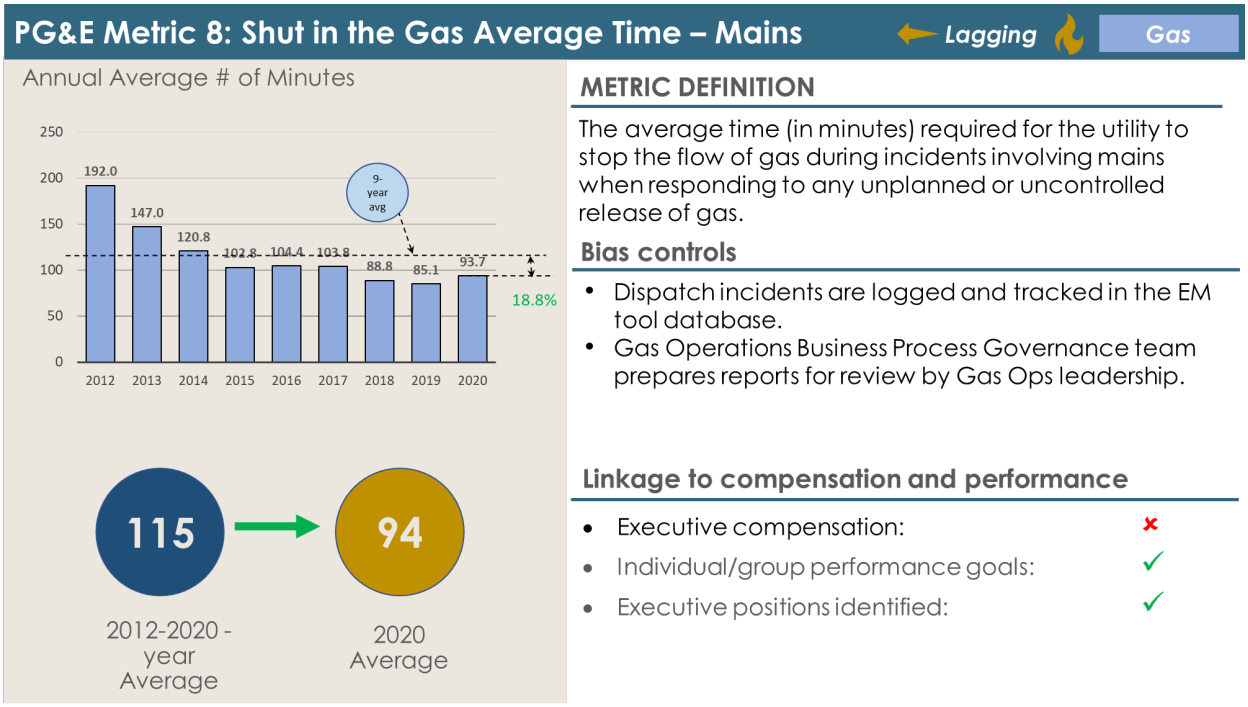
Bias controls

- Gas Operations Business Process Governance team prepares reports for review by Gas Ops leadership.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

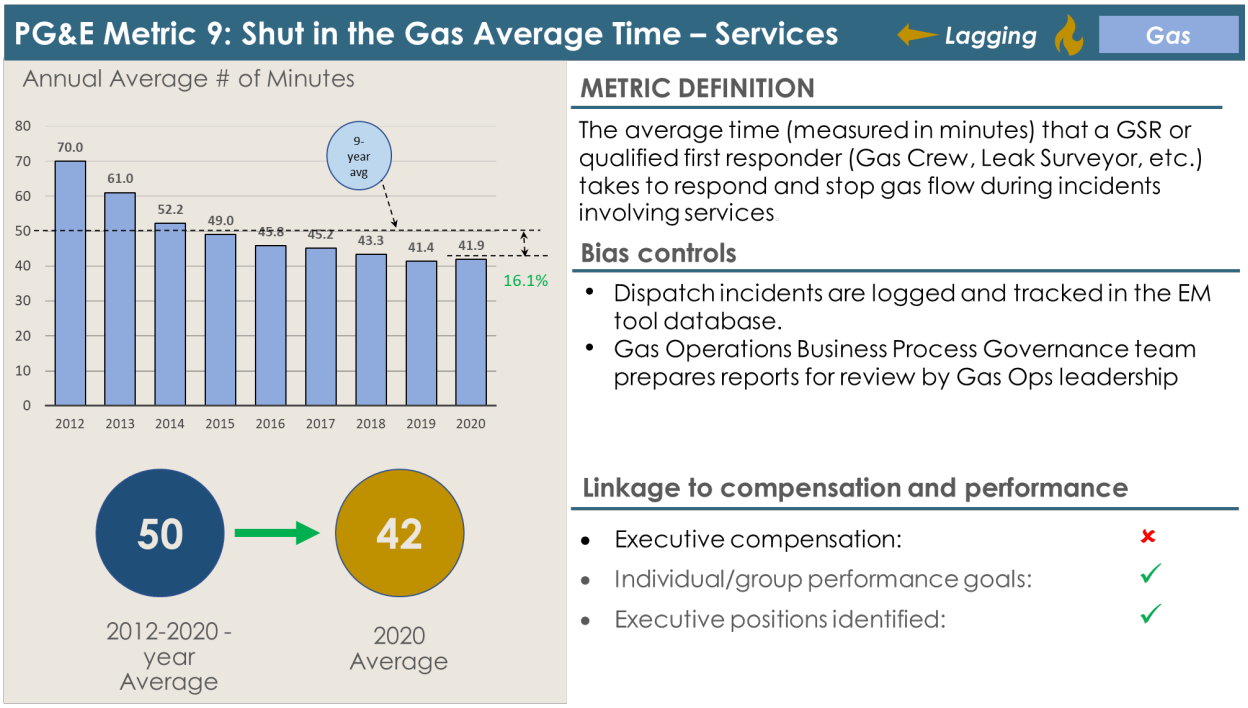
Observations:
PG&E submitted 10 years of monthly data on Metric 7. ILI is a technique used to assess the integrity of natural gas transmission pipelines from the inside of the pipe. This requires that the pipes be "piggable" – e.g. that the pipe is capable of being internally inspected and free of obstructions and physical barriers. This metric tracks progress on the upgrades to the existing pipeline systems. PG&E refers to this as "Traditional ILI Upgrades," which involve capital improvements to make the pipelines "piggable." PG&E notes that "D.11-06-017, as codified by Public Utilities Code (Pub. Util. Code) Section 958, requires natural gas transmission pipelines in California to be capable of [in-line inspections], where warranted."



Observations:
PG&E submitted 9 years of data (2012-2020) on Metric 8. Monthly data was not provided. PG&E has demonstrated a consistent and significant reduction in the Shut-in time for Mains until 2019. 2020 showed an uptick in this metric.

They attribute the reduction in average gas shut-in time to several activities including: enhanced plastic squeeze capability, training, access to emergency equipment, operational and process improvements, and incident review processes. PG&E has developed bias controls that include targets, target setting, and management reviews. PG&E reports quantitative measures that help inform their assessment of gas shut-in response times.

Seasonality:
No seasonal data was provided.



Observations:

PG&E submitted 9 years of data (2012-2020) on Metric 9. Monthly data was not provided. PG&E has demonstrated a consistent and significant reduction in the Shut in time for Services.

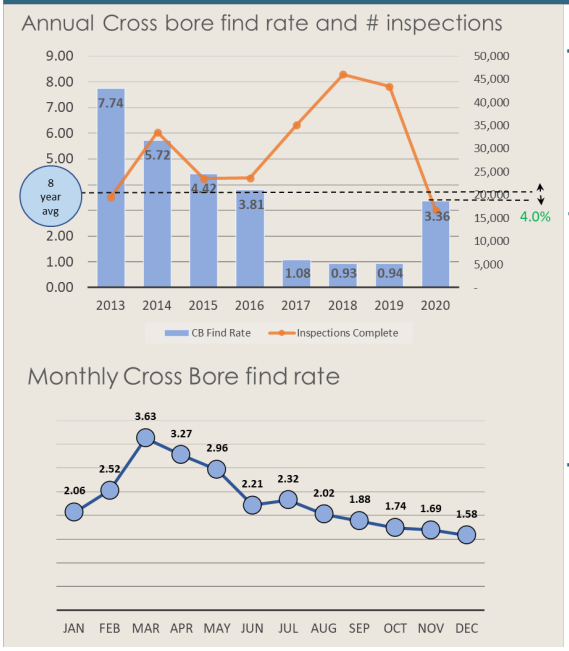
PG&E attributes the reduction to several activities including: enhanced plastic squeeze capability, training, access to emergency equipment, operational and process improvements, and incident review process. PG&E bias controls include targets, target setting, and management reviews. PG&E utilizes quantitative measures (e.g., targets) to help inform their assessment of the gas shut-ins response times.

Seasonality:

No seasonal data was provided.

PG&E Metric 10: Cross Bore Intrusions

Leading | Gas



METRIC DEFINITION

#Cross bores found per 1,000 inspections. A cross bore refers to a gas main or service that has been installed unintentionally, using trenchless technology , through a wastewater or storm drain system.

Bias controls

- Cross bore inspections tracked within SAP.
- Validation is conducted by the Distribution Operations team.
- Cross Bores are tracked by the Cross Bore Program management team.
- Cross bore intrusions triggers a response for a GSR and Locate and Mark operator.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✗
- Executive positions identified: ✗

Observations:

PG&E submitted 8 years of data (2013-2020) on Metric 10. PG&E demonstrated a consistent and significant reduction in the Cross Bore intrusion rate until 2019. In 2020 there was a significant increase in the find rate and a significant decrease in the # of inspections performed. PG&E attributes this change to "a focus on completing work in the City of San Francisco." The 2020 spike in the find rate, however, is still below the 10 year average.

PG&E also states that "This area has been identified as the highest risk of potential legacy Cross Bores, however, is also one of the most difficult geographic locations to perform inspections, which resulted in slower production."

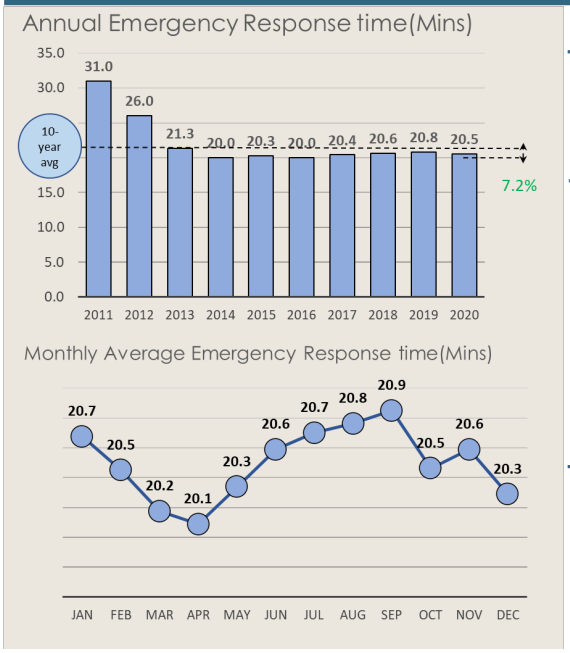
This metric is not linked to executive compensation or performance goals.

Seasonality:

No seasonal data was provided.

PG&E Metric 11: Gas Emergency Response

Lagging | Gas



METRIC DEFINITION

The average time (Mins) that a GSR or a qualified first responder takes to respond after receiving a call which results in an emergency order

Bias controls

- Emergency calls are reviewed by the IR team to determine appropriate exclusions, and the average response time is calculated
- Response times are captured electronically using PG&E's Field Automation System and are verified.
- Gas Operations Business Process Governance team prepares reports for review by Gas Ops leadership on a sample basis.

Linkage to compensation and performance

- Executive compensation: ✓
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

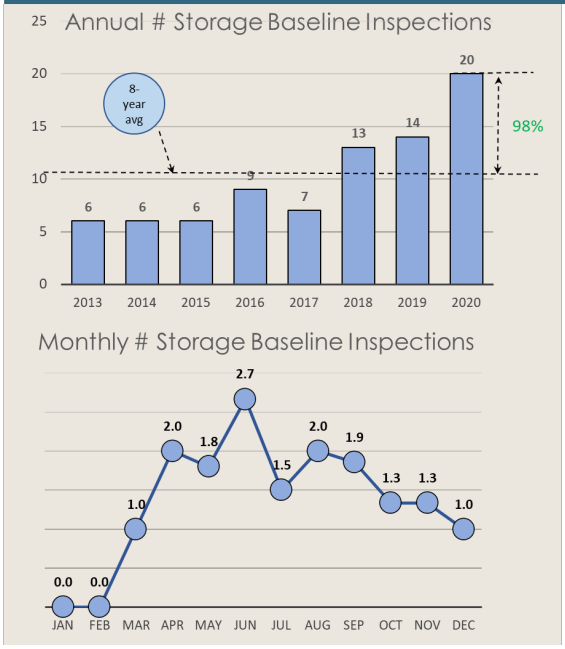
PG&E submitted 10 years of monthly data (2011-2020) on Metric 11. PG&E made significant improvement on this metric between 2011 and 2013. Since that time, they have consistently sustained an approximately 20-minute response time.

Seasonality:

The monthly data shows a slightly higher response time in summer month, but the variability is less than one minute throughout the year.

PG&E Metric 12: Natural Gas Storage Baseline Inspections

Lagging | Gas



METRIC DEFINITION

Natural Gas Storage Baseline Inspections Performed – Tracks the progress of completing baseline and reassessment inspections that were expected to be completed within a given year.

Bias controls

- Project completion tracked in the P6 scheduling database.
- Reservoir Engineering team responsible for validating the assessment.
- California Geologic Energy Management (CalGEM) is also responsible for validating work.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 8 years of monthly data on Metric 12. The data show a surge in inspections in 2020.

In PG&E's 2019SPM report , PG&E's goal was to "complete baseline well production casing assessments on 111 wells by 2025 and to have 40 percent of these assessments to be completed by 2023."

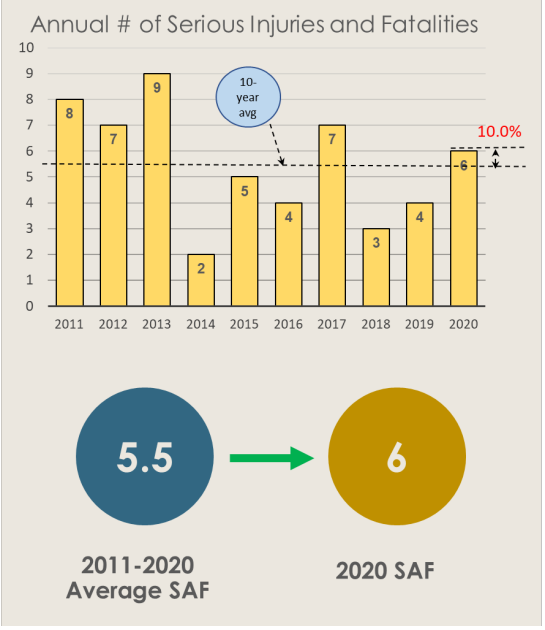
In PG&E's 2020 SPM report, PG&E states it has "adjusted to incorporate an accelerated pace required by regulation changes in the storage industry at both federal and state levels. From 2013-2020 PG&E has completed approximately 61 percent of the assessments." The surge in inspections in 2020 seems to be a result of changes in regulation.

PG&E's revised plan now "proposes completion of baseline casing inspections of the storage wells by 2023."

Seasonality:

The monthly data does not show a pattern for when inspections occur. It may vary based on availability of rigs and regulatory personnel available to witness and verify testing results.

PG&E Metric 14: Employee Serious Injuries & Fatalities (SIF) — Lagging — Injuries



METRIC DEFINITION

of employee work-related injuries or illnesses annually that result in a fatality, inpatient hospitalization for more than 24 hours (other than for observation purposes), a loss of any member of the body, or any serious degree of permanent disfigurement

Bias controls

- Data is compiled by the Law Department.
- Employee SIF events are reviewed monthly by the Enterprise Health and Safety team.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 10 years of monthly data on Metric 14. PG&E has seen a rise in employee SIF for 2 straight years, doubling from 3 in 2018 to 6 in 2020.

PG&E states that "Corrective actions are underway to address causes and precursors of incidents that could lead to a SIF."

Due to the small number of events relative to risk exposure, it is difficult to identify any long-term trends from the data. Nonetheless, any number of SIFs is highly troubling. PG&E has proposed multiple mitigations related to employee and contractor safety in Chapter 16 of their 2020 Risk Assessment and Mitigation Phase Report (A.20-06-012).

Like all employers, PG&E is required to report serious injuries and fatalities immediately to Cal OSHA, so all of their data is separately recorded.

PG&E states that the bias control for this metric is that "data is compiled by the Law Department and Employee SIF events are also reviewed monthly by the Enterprise Health and Safety team."

It should be noted that reporting SIFs to Cal OSHA serves as bias control because it contains specific legal requirements for types of events that are to be reported.

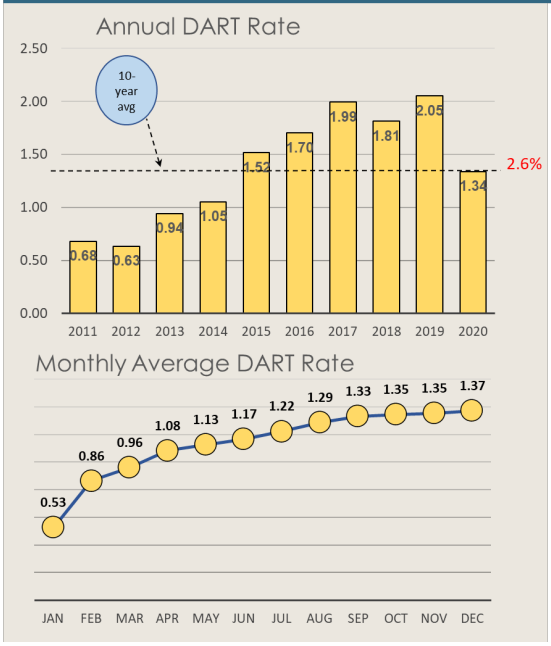
SPD staff has recommended as part of Rulemaking 20-07-013 that Employee SIF Rate be included as a Safety and Operational Metric to be used for Enhanced Oversight and Enforcement purposes pursuant to Decision 20-05-053 approving PG&E's Reorganization Plan.

Seasonality:

No monthly data provided.

PG&E Metric 15: Employee DART Rate

Lagging — Injuries



METRIC DEFINITION

Rate is calculated based on number of OSHA-recordable injuries resulting in Days Away from work and/or Days on Restricted Duty or Job Transfer, and hours worked

Bias controls

- OSHA regulates the definition of a DART case.
- Physician determine work relatedness and need for time off or restricted duty.
- Internal Audit of DART classifications in 2019 to verify that bias controls are in place and effective.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 10 years of monthly data (2011-2020) on Metric 15. PG&E states that the 2012-2017 rates are driven primarily by restricted duty cases related to sprains and strains.

Beginning in 2013, PG&E saw a relatively continuous upper trend with a plateau beginning in 2017.

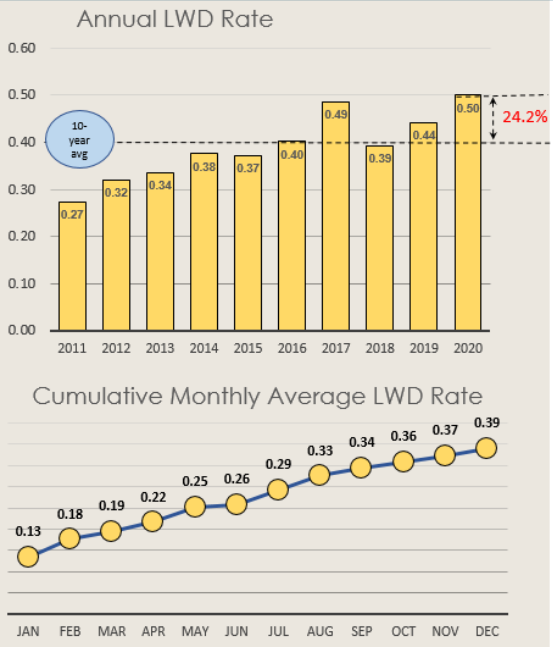
PG&E states that "In 2020, there was a 35 percent decrease in the DART rate. The decrease was driven by a decline in restricted duty cases but our lost time cases saw an increase over 2019 results."[3]

Mitigation actions include implementation additional onsite clinics and increasing Athlete Specialists hours.

[3] The association between DART rate and LWD rate should be clarified.

PG&E Metric 16: Employee Lost Workday (LWD) Case Rate

Lagging — Injuries



METRIC DEFINITION

This measures the number of LWD cases incurred for employees and staff augmentation (excluding contractors) per 200,000 hours worked, or for approximately every 100 employees.

Bias controls

- OSHA regulates the definition of a LWD case.
- Physician determine work relatedness and need for time off or restricted duty.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

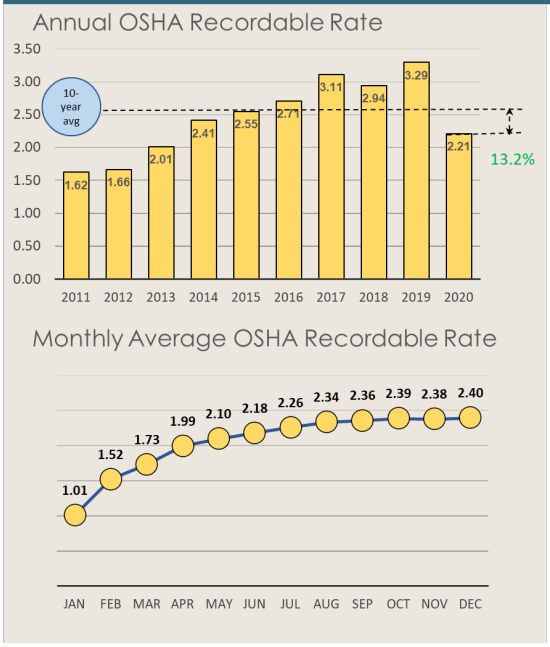
Observations:

PG&E submitted 10 years of monthly data on Metric 16. PG&E reported an increase from 2011 until 2017 driven primarily by injuries related to falls, lifting, repetitive motion and motor vehicle incidents.

Mitigation actions include implementing additional onsite clinics and increasing Athlete Specialists' hours. However, despite these efforts at addressing the issue, there has been a steady increase on this number since 2018.

PG&E Metric 17: OSHA Recordable Rate

Lagging — Injuries



METRIC DEFINITION

An occupational (job-related) injury or illness that requires medical treatment beyond first aid, or results in work restrictions, death or loss of consciousness. OSHA recordable rate is calculated as OSHA recordable times 200,000 divided by employee hours worked.

Bias controls

- OSHA regulates the definition of a case.
- Physicians determine work relatedness and treatment.

Linkage to compensation and performance

- Executive compensation: ✓
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 10 years of monthly data on Metric 17. PG&E states that the increase in 2011 - 2019 rates "is primarily attributable to an increase in injuries related to strains, falls and repetitive motion."

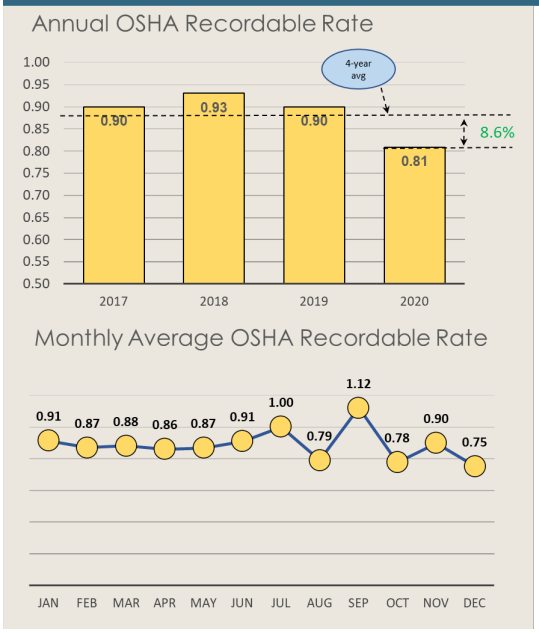
PG&E states, "Over the course of 2020, there was a decline in both Restricted Duty and Medical Only cases driven by reductions in both office and field injuries. Office workers moved to remote work during the year and were supported with virtual ergo evaluations. Field employees also had fewer cases due partially to Shelter in Place restrictions."

Mitigation actions include implementation additional onsite clinics, and increasing Athlete Specialists hours.

CalOSHA's prescriptive reporting requirements control for bias.

PG&E Metric 18: Contractor OSHA Recordable Rate

Lagging | Injuries



METRIC DEFINITION

An occupational (job-related) injury or illness that requires medical treatment beyond first aid, or results in work restrictions, death or loss of consciousness. OSHA recordable rate is calculated as OSHA recordable times 200,000 divided by employee hours worked.

Bias controls

- OSHA regulates the definition of a case
- The PG&E specific information is self-reported by the contractors.
- The contractor company OSHA logs are verified annually by an external third party.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 4 years of monthly data on Metric 18. Due to the small number of reported years, it is difficult to identify any long-term trends from the available data.

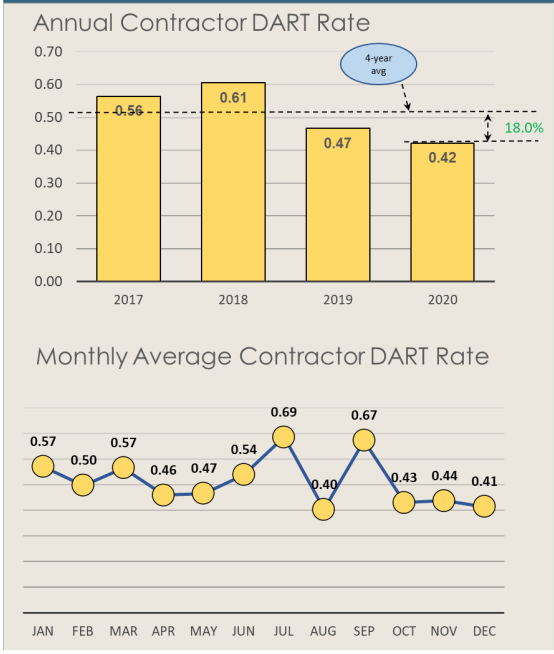
PG&E has not identified drivers of the recordable rate. Mitigations include a Contractor Safety Program being evaluated as part of the 2020 RAMP Report and a Contractor work management system.

Bias controls are primarily determined by OSHA regulations and are verified annually by an external third party.

Seasonality:
The monthly data does not indicate any significant seasonal trend.

PG&E Metric 19: Contractor DART Rate

Lagging | Injuries



METRIC DEFINITION

Rate is calculated based on number of OSHA-recordable injuries resulting in Days Away from work and/or Days on Restricted Duty or Job Transfer, and hours worked

Bias controls

- OSHA regulates the definition of a DART case
- The PG&E specific information is self-reported by the contractors.
- The contractor company OSHA logs are verified annually by an external third party.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 4 years of monthly data on Metric 19. Due to the small number of reported years, it is difficult to identify any long-term trends from the data.

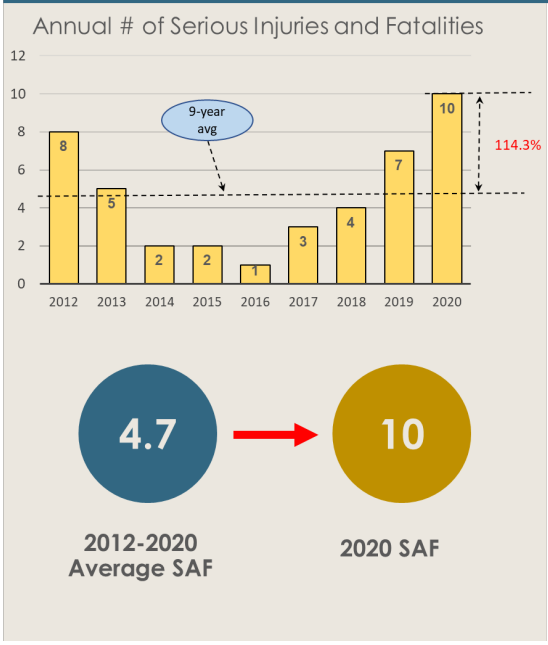
PG&E has not identified drivers of the Contractor DART rate. Mitigations include a Contractor Safety Program being evaluated as part of the 2020 RAMP Report and a Contractor work management system.

Bias controls are primarily determined by OSHA regulations and are verified annually by an external third party.

Seasonality:

The monthly data does not indicate any significant seasonal trend.

PG&E Metric 20: Contractor Serious Injuries & Fatalities (SIF) ← Lagging ⊕ Injuries



METRIC DEFINITION

of contractor work-related injuries or illnesses annually that result in a fatality, inpatient hospitalization for more than 24 hours (other than for observation purposes), a loss of any member of the body, or any serious degree of permanent disfigurement

Bias controls

- Data is compiled by the Law Department and all Contractor SIF events are reviewed by Corporate Safety.
- Internal Audits and/or external Third-Party reviews are utilized to verify that bias controls.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 9 years of data (2012-2020) on Metric 20. PG&E states that "contractor serious injuries have been trending upwards due to the increase in work considered high risk, including vegetation management associated with the wildfire mitigation response." They also increased the exposure to this risk with an increase in the total number of contractors and contractor hours worked.

PG&E has identified potential drivers of the Contractor SIF metrics (E.g., Increase in hazardous work activities). Mitigation activities include investigating all Contractor SIF incidents, communicating results across the enterprise, and tracking all corrective actions to closure.

Bias controls include a monthly review by management, verification by an external third party, and required reporting to Cal OSHA.

As noted previously the small number of reported occurrences relative to the total risk exposure results in a high level of statistical uncertainty. SIF numbers are so few relative to the total risk exposure that the reported variations from year to year do not necessarily represent improvements or worsening of safety performance. To assess trends with low numbers, longer assessment times are needed to provide credible findings. Nonetheless, just as with Employee SIFs (above) any number of SIFs is very troubling. PG&E has proposed multiple mitigations related to contractor safety in Chapter 17 of their 2020 Risk Assessment and Mitigation Phase (RAMP) Report (A.20-06-012).

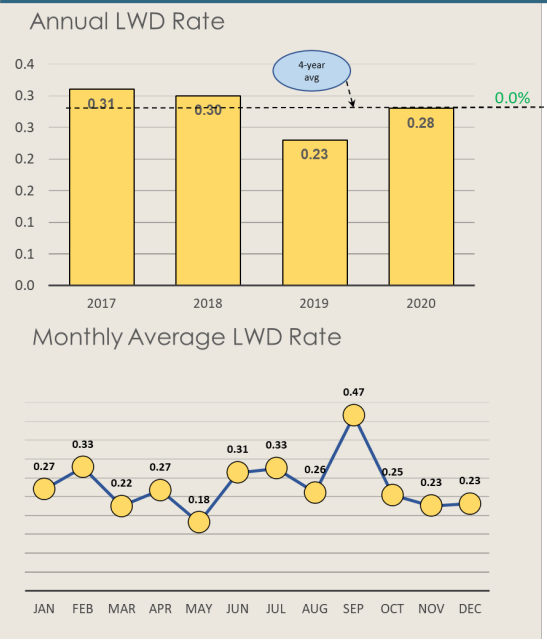
Additionally, it would be more useful to collect SIF data as a rate for example, how frequently SIF events occur for every 200,000 hours worked, or for approximately every 100 employees. This would allow for comparisons across utilities with substantially different populations of contractors and control for differences in the number of contractor hours worked in each year. As such as part of R.20-07-013, SPD recommended that SIF data be recorded as rates in both Safety and Operational Metrics for use in the Enhanced Oversight and Enforcement process resulting from Decision 20-05-053 and as reported by all utilities as in these Safety Performance Metrics Reports.

Seasonality:

Monthly data was not provided.

PG&E Metric 21: Contractor Lost Workday (LWD) Case Rate

Lagging — Injuries



METRIC DEFINITION

This measures the number of LWD cases incurred for contractors and staff augmentation (excluding contractors) per 200,000 hours worked, or for approximately every 100 employees.

Bias controls

- OSHA regulates the definition of a LWD case.
- The PG&E specific information is self-reported by contractors.
- The contractor company safety OSHA logs are verified annually by an external third party.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 4 years of monthly data on Metric 21. Due to the small number of reported years, it is not feasible to identify any long-term trends from the data.

PG&E has not identified drivers of the Contractor DART rate. Mitigations include a Contractor Safety Program that was included in Chapter 17 of the 2020 RAMP Report and a Contractor work management system.

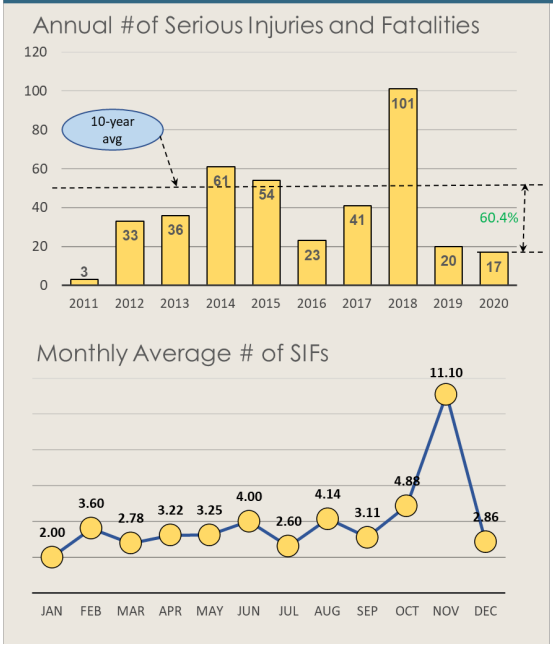
Bias controls are primarily determined by OSHA regulations and are verified annually by an external third party.

Seasonality:

The monthly data does not indicate any significant seasonal trend.

PG&E Metric 22: Public Serious Injuries & Fatalities (SIF)

Lagging — Injuries



METRIC DEFINITION

Public SIF – A fatality or personal injury requiring in-patient hospitalization involving utility facilities or equipment. Equipment includes utility vehicles used during the course of business.

Bias controls

- Data is compiled by the Law Dept.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 10 years of monthly data on Metric 22. PG&E states that "counts have varied across years with a significant uptick in 2018 due to the wildfires." The largest spike is associated with the Camp Fire, which resulted in the death of 86 people.

PG&E has identified wildfires, electrical contact, and motor vehicles incidents with PG&E assets as primary drivers of this metric. According to their 2021 Wildfire Mitigation plan PG&E plans to expend $14.8 billion on efforts to reduce wildfire mitigation between 2020 and 2022. These proposed investments fall into several categories of investments designed to reduce risk of ignition that is a primary precursor to Public SIFs over the reporting period. These categories include risk and mapping, situational awareness, grid design and hardening, asset management and inspections, vegetation management, grid operations, and emergency planning. Additional expenditures are outlined in their 2020 RAMP.

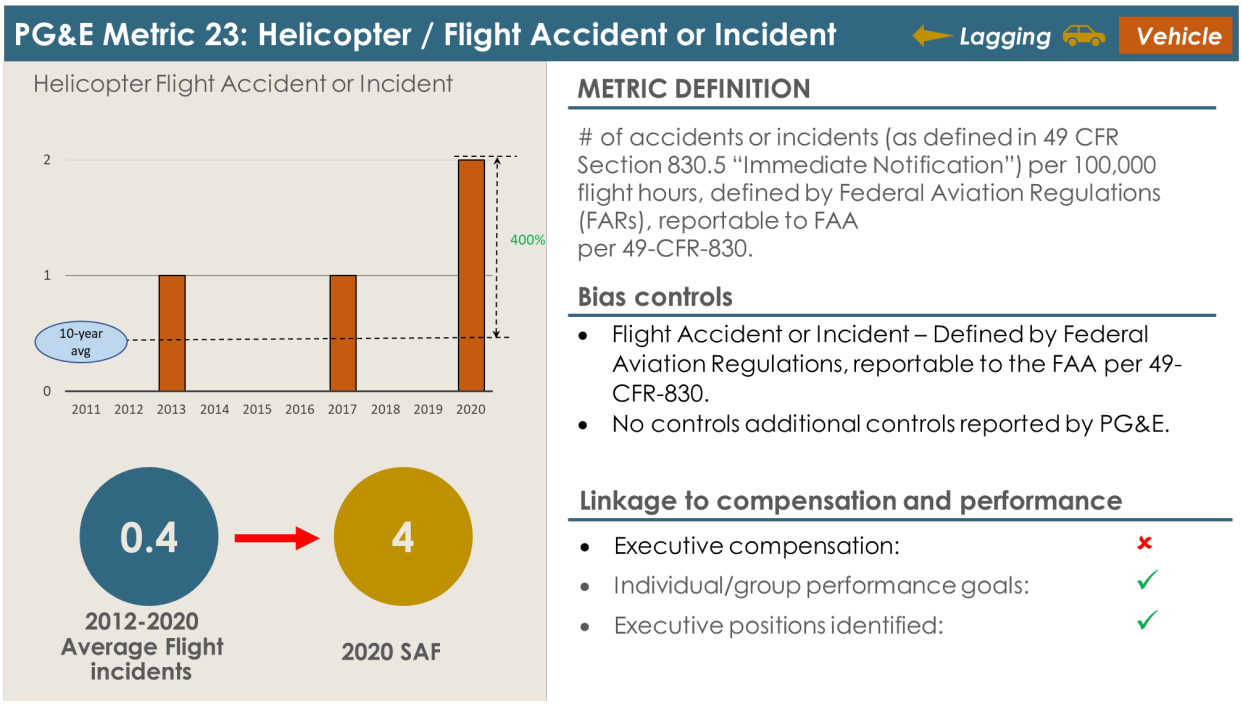
Chapter 15 (Third-Party Safety Incidents) of PG&E's 2020 RAMPs includes proposed mitigations to address the other primary drivers of public SIFs (electrical contact and motor vehicle incidents).

PG&E's risk management remains a concern for the Commission, and they are currently in step 1 of the Enhanced Oversight and Enforcement process for failing to appropriately prioritize enhanced vegetation management projects based on wildfire risk. The Commission held a virtual public workshop to discuss and obtain public feedback on PG&E's Corrective Action Plan on June 23rd aimed at reducing wildfire and public safety risk. The Corrective Action Plan is intended to help ensure PG&E prioritizes its enhanced vegetation management based on wildfire risk throughout its electric system. To ensure risk drivers that could result in Public SIFs prioritized, SPD proposed several electric system risks be included in PG&Es Safety and Operational Metrics criteria.

Bias controls include compliance review by the PG&E's Legal Department.

Seasonality:

The monthly data is significantly impacted by the fall wildfire season.



Observations:
PG&E submitted 10 years of data consisting of 4 events.

PG&E has not identified root causes for these incidents. However, FAA reports and NTSB investigations provide detailed information and review of each incident.

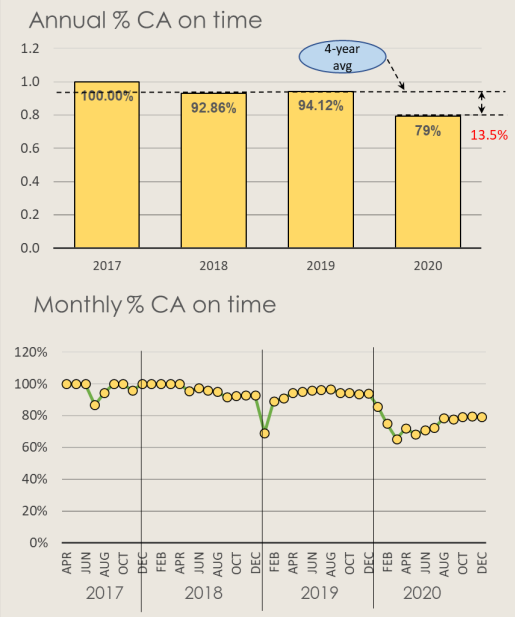
PG&E does not state any internally defined bias controls; however, bias controls include FAA reporting and NTSB investigation regulations.

In response to prior incidents, PG&E initiated policy changes to reduce the risk associated with helicopter flights by contractors and employees. These changes include a prohibition on flying underneath wires of any kind, requiring that human and cargo exchanges can only take place at established landing zones or pre-approved work locations, modifications to landing procedures, and a requirement that all passengers wear three or four-point seat restraints. PG&E also states that they have increased the number of Helicopter Operations Specialists from three to six for the purposes of increasing field oversight and safety expertise.

Seasonality:
There were four incidents in 10 years. All took place in the summer months and three of the four were associated with safety-related patrols. One took place in in June, two in July and one in August.

PG&E Metric 24: % SIF Corrective Actions on time

Leading | Injuries



METRIC DEFINITION

Percentage of Serious Injury and Fatality Corrective Actions Completed on Time – A SIF corrective action is one that is tied to a SIF actual or potential injury or near hit.

Bias controls

- This metric is reviewed by Internal Audit on a quarterly basis.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 4 years of on Metric 24. PG&E states that "2017 was the first year that this metric was tracked and included Electric, Gas and Generation.

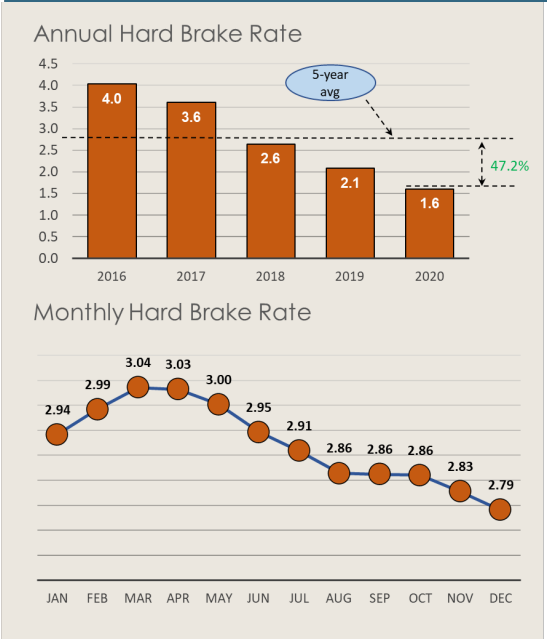
PG&E reports that "In 2020, 79 percent of corrective actions coming from SIF investigations were closed on-time, compared with 94 percent in 2019. The drop from 2019 to 2020 can largely be attributed to the pandemic, which caused cancellations of field visits or delayed shipment of tools or materials required to complete corrective actions on time."

Seasonality:

The monthly data shows no clear monthly trend.

PG&E Metric 25: Hard Brake Rate

Leading | Vehicle



METRIC DEFINITION

Total number of hard braking events (greater than or equal to 8 mph per second decrease in speed) per thousand miles driven in a given period.

Bias controls

- Data on Hard Brake Rate is provided by a third-party vendor.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 5 years of data on Metric 25. In 2019 PG&E stated that "The hard brake rate (HBR) has been in steady decline between 2016 and 2019. During the 2017-2019 time period, the number of vehicles tracking hard braking increased from 6,500 to approximately 8,000." In 2020, PG&E quotes the same statistics indicating that no new vehicles have been added to the hard tracking inventory.

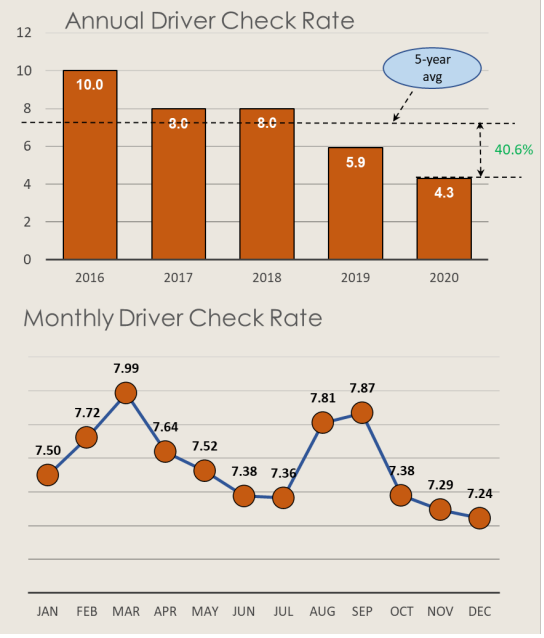
Bias control is managed by the third-party vendor that provides the HBR data.

Seasonality:

The monthly data shows no clear seasonal trend.

PG&E Metric 26: Driver Check Rate

Leading | Vehicle



METRIC DEFINITION

This metric measures the total number of Driver Check complaint calls received per 1 million miles driven by vehicles included in the Driver Check Program.

Bias controls

- Data on driver check calls is provided by a third-party vendor.

Linkage to compensation and performance

- Executive compensation: ✗
- Individual/group performance goals: ✓
- Executive positions identified: ✓

Observations:

PG&E submitted 5 years of data on Metric 26. PG&E states the driver complaint rate has dropped 50 percent since 2016. For every complaint there is an e-mail to the Supervisor, which requires follow-up and coaching with the employee.

PG&E has not identified any drivers of this metric.

Bias control is managed by the third-party vendor that provides the HBR data.

Seasonality:

The monthly data shows no clear seasonal trend. While there are spikes on the chart in March and August/September, over the course of the year, the variation is less than one driver check per 1 million miles.

Conclusion & Recommendations

PG&E 's second SPM Report complies with requirements in D.19-04-020.

PG&E's performance metrics show a pattern of sustained improvement on safety metrics associated with their gas operations. This is likely the result of an increased emphasis on gas safety following the San Bruno pipeline explosion and recent changes in underground gas storage statutes and regulations. An exception to this overall improvement in gas operations is gas pipelines cross bored into wastewater lines which saw year over year increase.

The metrics also reveal a pattern of improvements to vehicle safety, which could be attributable to PG&E's deployment of automated vehicle fleet tracking and reporting systems operated by a third party.

Areas demonstrating a need for improvement include wildfire risk drivers, such as distribution and transmission wires down.

PG&E's performance on injury metrics is inconsistent. Several metrics showed a negative performance, including Employee SIF's (metric 14) increasing from 4 to 6 incidents, Employee LWD rate (metric 16) increasing by more than 10%, Contractor SIF (metric 20) increasing from 7 to 10 incidents, and Contractor LWD (metric 21) rate increasing by 20%. During the same time period, the DART rate and the OSHA reportable rates all improved. While the pandemic and other changes to PG&E operations may have impacted the 2020 Metric values it is unclear whether these metrics are intercorrelated. Additionally, the strength of using these metrics as indicators of more broad-based safety performance of PG&E operations and its contractors is still being determined.

As noted earlier, some metrics such as SIFs would be more useful for comparison and contextual purposes if they were expressed as rates rather than raw numbers. For example, PG&E's employee SIFs are not comparable to SDG&E's SIFs because PG&E has substantially more employees and thus more exposure. It is also important to note that for SIFs, it is not possible at this point to draw conclusions about trends or predict future year SIFs based on reportable data because the population of incidents relative to exposure is so small. It will take several years to discern meaningful patterns on low this type of low populations metric. As mentioned, SPD, as part of R.20-07-013, proposed changing SIF metrics to rates.

Based on the review of this data, SPD plans on engaging Cal OSHA to request their input and recommendations on interpreting and improving injury related metrics going forward. SPD also plans on conferring with SED regarding PG&E's gas distribution pipeline integrity management program that PG&E has procedures in place to prevent occurrence of cross-bores.