CALIFORNIA PUBLIC UTILITIES COMMISSION
Safety and Enforcement Division
Wildfire Safety and Enforcement Division

Incident Investigation Report

Report Date: December 7, 2023

Incident Number: E20220602-03

Regulated Utility Involved: Pacific Gas and Electric Company

Date and Time of the Incident: May 31, 2022 at 1530 hours

Location of Incident: 2300-2302 Old Soda Springs Rd., Napa, CA. (38.372100°, -122.275268°)

Fatality/Injury: None

Property Damage: $0 non-utility property / $71,132.83 utility[1]

Regulated Utility Facilities Involved: Pueblo 1105 12kV

I. Summary

On May 31, 2022 at 1535 hours, the Old Fire ignited in Napa, California. The Old Fire was located in a Tier 2 High Fire Threat District (HFTD) and Pacific Gas and Electric Company (PG&E) reported that the fire affected the Pueblo 1105 12 kV circuit (the Subject Circuit). The California Department of Forestry and Fire Protection (CAL FIRE) determined that the cause of the fire was PG&E's electrical conductors making contact and sparking above dry vegetation. There were no injuries, fatalities, or structural damage to non-utility property as a result of the fire, however two electrical distribution poles were burned by the fire and later replaced by PG&E. There were no customer outages as a result of the fire.

SED reviewed work orders for PG&E facilities in the vicinity of the fire and found four instances where PG&E failed to complete a work order within the timeframe required by General Order (GO) 95 Rule 18. In addition, SED reviewed the utility's Field Safety Reassessment (FSR) program, which evaluated several work orders in the vicinity of the fire. SED found PG&E used its FSR program to substantially delay work orders past the utility's internal due date and GO 95 Rule 18 due date. SED determined PG&E's use of the FSR program failed to follow accepted good practices for maintaining the utility's facilities and therefore violated GO 95 Rule 31.1. SED also reviewed PG&E's electrical fault data on the day of the Old Fire, eyewitness testimony, and the CAL FIRE report. SED agrees with CAL FIRE's finding that PG&E's conductors made contact and led to the ignition of the Old Fire. PG&E's failure to maintain the required clearances between conductors constitutes a GO 95, Rule 38 violation.

[1] Pacific Gas and Electric Company. "Response to DR-1, Question 1," Page 1. March 3, 2023.

A. Rules and Requirements Violated

SED's investigation of the incident found that PG&E violated the following requirements in the Commission's General Orders:

	General Order Rule	Violations
1.	GO 95, Rule 18	PG&E failed to complete Level 2 work to address the decayed Pole 102286081, identified in EC Tag #116791710, by the due date required by GO 95 Rule 18.
2.	GO 95, Rule 18	PG&E failed to complete Level 2 work to replace splitting crossarms and improper jumper connectors installed on Pole 102285897, which were identified during a Field Safety Reassessment of EC Tag #111994529, by the due date required by GO 95 Rule 18.
3.	GO 95, Rule 18	PG&E failed to complete Level 2 work to replace improper jumper connectors installed on Pole 102285909, which were identified during a Field Safety Reassessment of EC Tag #112003151, by the due date required by GO 95 Rule 18.
4.	GO 95, Rule 18	PG&E failed to complete Level 2 work to address heavy woodpecker damage on Pole 102285804, which was identified during a Field Safety Reassessment of EC Tag #112001375, by the due date required by GO 95 Rule 18.
5.	GO 95, Rule 31.1	PG&E used the FSR program to delay maintenance and repair work multiple times, which resulted in maintenance work being delayed beyond the utility's internal due dates and in some cases beyond GO 95 Rule 18 required due dates. The PG&E procedures which govern the FSR program do not allow the utility to delay the corrective action deadlines, but PG&E has utilized the FSR program to do so. This is contrary to the FSR's program's risk-reduction objectives and is a violation of GO 95 Rule 31.1 by failing to use accepted good practices in the maintenance of the utility's facilities.
6.	GO 95, Rule 38	PG&E failed to maintain the required clearance between the south phase and middle phase conductors between Pole 121270661 and Pole 103949547. Failure to maintain the required clearance led to the conductors making contact, sparking, and igniting the Old Fire.

General Order 95, Rule 18 – Maintenance Programs and Resolution of Potential Violations of General Order 95 and Safety Hazards states in part:

> *Companies shall undertake corrective action within the time period stated for each of the priority levels set forth below…*
>
> *Level 1 – An immediate risk of high potential impact to safety or reliability: Take corrective action immediately, either by fully repairing or by temporarily repairing and reclassifying to a lower priority.*

Level 2 – Any other risk of at least moderate potential impact to safety or reliability: Take corrective action within specified time period (either by fully repair or by temporarily repairing and reclassifying to Level 3 priority). Time period for corrective action to be determined at the time of identification by a qualified company representative, but not to exceed: (1) six months for potential violation that create a fire risk located in Tier 3 of the High Fire Threat District; (2) 12 months for potential violations that create fire risk located in Tier 2 of the High Fire Threat District; (3) 12 months for potential violations that compromise worker safety; and (4) 36 months for all other Level 2 potential violations.

Level 3 – Any risk of low potential impact to safety or reliability: Take corrective action within 60 months subject to the exception specified below.[2]

General Order 95 Rule 31.1 – Design, Construction and Maintenance states in part:

Electrical supply and communication systems shall be designed, constructed, and maintained for their intended use, regard being given to the conditions under which they are to be operated, to enable the furnishing of safe, proper, and adequate service.

For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for the design, construction, or maintenance of communication or supply lines and equipment.

GO 95, Rule 38 – Minimum Clearance of Wires from Other Wires states in part:

The minimum vertical, horizontal or radial clearances of wires from other wires shall not be less than the values given in Table 2 and are based on a temperature of 60° F. and no wind. Conductors may be deadended at the crossarm or have reduced clearances at points of transposition, and shall not be held in violation of Table 2, Cases 8–15, inclusive.

The clearances In Table 2 shall in no case be reduced more than 10 percent, except mid-span in Tier 3 of the High Fire-Threat District where they shall be reduced by no more than 5 percent, because of temperature and loading as specified in Rule 43 or because of a difference in size or design of the supporting pins, hardware or insulators.[3]

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[2] Exception: Potential violations specified in Appendix J or subsequently approved through Commission processes, including, but not limited to, a Tier 2 Advice Letter under GO 96B, that can be completed at a future time as opportunity-based maintenance. Where an exception has been granted, repair of a potential violation must be completed the next time the company's crew is at the structure to perform tasks at the same or higher work level, i.e., the public, communications, or electric level. The condition's record in the auditable maintenance program must indicate the relevant exception and the date of the corrective action.

[3] GO 95, Rule 38, page III-27.

B. Witnesses

	Name	Title
1.	Will Dundon	CPUC Lead Investigator
2.	Ed Pike	CPUC Investigator
3.	Henry Sweat	CPUC Investigator
4.	Doug Mackey	CAL FIRE Battalion Chief
5.	Scott Hylton	CAL FIRE Consultant Investigator
6.	[redacted]	PG&E Senior Director
7.	[redacted]	PG&E Supervisor
8.	[redacted]	PG&E Supervisor
9.	[redacted]	PG&E Investigator
10	REDACTED	Citizen witness
11.	REDACTED	Citizen witness
12.	REDACTED	Citizen witness

C. Evidence

	Source	Description
1.	PG&E	Initial Incident Report, 06/02/2022
2.	CPUC	Site Visit Observation Report, 06/03/2022
3.	PG&E	20-Day report, 06/01/2022
4.	CPUC	Data Request SED-001-Old Fire (DR-1), 06/26/2022
5.	PG&E	Response to DR-1, 08/30/2022 (Tranche 1)
6.	PG&E	Response to DR-1, 09/06/2022 (Tranche 2)
7.	CPUC	Data Request SED-002-Old Fire (DR-2), 11/02/2022
8.	PG&E	Response to DR-2, 12/09/2022
9.	CPUC	Data Request SED-003-Old Fire (DR-3), 02/02/2023
10.	PG&E	Response to DR-3, 03/02/2023
11.	CPUC	Data Request SED-004-Old Fire (DR-4), 02/17/2023
12.	PG&E	Response to DR-4, 03/03/2023
13.	CPUC	Data Request SED-005-Old Fire (DR-5), 03/17/2023
14.	PG&E	Response to DR-5, 04/07/2023
15.	CPUC	Data Request SED-006-Old Fire (DR-6), 04/19/2023
16.	PG&E	Response to DR-6, 05/03/2023
17.	CAL FIRE	Redacted Investigation Report, received 11/08/2023

II. Background

The Old Fire ignited on May 31, 2022 at 1535 hours. An eyewitness at one of the nearby homes observed a dust devil[4] that blew through electrical conductors at approximately the time of the incident. The Old Fire started near 2300-2302 Old Soda Springs Road, California, (the Incident Location) and burned 570 acres, according to CAL FIRE.[5] The origin point of the Old Fire is in a Tier 2 High Fire Threat District (HFTD).[6] There were no injuries, fatalities, or structural damage to non-utility property. PG&E reported that the Incident Location is served by the Pueblo 1105 12 kV circuit (the Subject Circuit), that two electrical distribution poles were burned by the fire and were later replaced by PG&E, and that no customer outages resulted from the fire.[7]

Figure 1 below shows a sketch of the Incident Location including the pole numbers, and the residence from which the witness saw the dust devil.

Figure 1: Sketch of Incident Location. Primary Line refers to the Subject Circuit conductors.

The high temperature was 86.1°F at 1530 hours on May 31, 2022. The relative humidity was as high as 82% at 0710 hours and as low as 12% at 1520 hours (approximately the time that the fire

[4] A dust devil is defined by the National Weather Service as "a small, rapidly rotating wind that is made visible by the dust, dirt or debris it picks up. Also called a whirlwind, it develops best on clear, dry, hot afternoons." https://w1.weather.gov/glossary/, accessed October 2, 2023.
[5] https://www.fire.ca.gov/incidents/2022/5/31/old-fire/, accessed June 5, 2023.
[6] capuc.maps.arcgis.com/apps/webappviewer/index.html, accessed June 5, 2023.
[7] Pacific Gas and Electric Company. Electric Incident Report Form for PG&E Reference Number EI22-531A" (Old Fire 20-Day Report), Page 2. July 1, 2022.

ignited). At 1530 hours the relative humidity was 16% and the wind speed was 3.1 mph from the southwest with gusts up to 10 mph.[8] These weather conditions[9] did not meet the criteria for Public Safety Power Shutoffs or Enhanced Power Safety Settings to be enabled on that day.[10]

III. Fire Authority Report

SED received a copy of the CAL FIRE Investigation Report for CAL FIRE Case Number 22CALNU009242 (CAL FIRE Report), on October 16, 2023. The CAL FIRE Report presented the Fire Authority's findings on the Old Fire Incident.[11]

The CAL FIRE Report stated that on Tuesday May 31, 2022 at 1535 hours, CAL FIRE Sonoma Lake Napa Emergency Command Center received a report of a vegetation fire near 2300 Old Soda Springs Rd. Per the CAL FIRE Report, the fire burned 570 acres of grass and brush and fire personnel worked for six days to extinguish the fire. As part of CAL FIRE's investigation into the cause of the fire, CAL FIRE interviewed witnesses at the Incident Location. Per the CAL FIRE Report, the witnesses interviewed reported that they observed a "dust devil make contact with power lines and shoot sparks."[12]

CAL FIRE also collected a section of two conductors from the Incident Location which were inspected by a consulting investigator, [redacted], on behalf of CAL FIRE. [redacted] determined the following regarding the conductors, "the markings on the conductor [were] consistent with line slaps." [13] The conductors were also reviewed by a Senior Principal Forensic Engineer at EFI Global, on behalf of CAL FIRE. The EFI Global engineer produced a report summarizing his findings. The CAL FIRE Report summarizes the EFI Global report findings as follows, "both conductors exhibited arcing during contact with each other, and the Molten ejecta resulting from such contact is a competent ignition source for combustibles below of the power lines."[14]

The CAL FIRE Report found PG&E in violation of Health and Safety Code section 13001 and Public Resources Code section 4421 due to CAL FIRE's determination that the cause of the fire was associated with the line slap between the south and middle PG&E conductors at the Incident Location. [15]

[8] Old Fire 20-Day Report, Page 4.
[9] Pacific Gas and Electric Company. "Response to DR-2, Question 5," Page 1. December 9, 2022. PG&E obtained historical weather data from Weather Observation Sites at Soda Canyon Road and Second Avenue in Napa, CA, which are approximately one mile and five miles from the Incident Location, respectively. This weather data provided by PG&E was the data recorded closest to the Incident Location that was available to SED.
[10] Pacific Gas and Electric Company. "Response to DR-1, Question 34," Page 1. August 30, 2022.
[11] California Department of Forestry and Fire Protection. "Investigation Report for Case Number 22CALNU009242." (CAL FIRE Report).
[12] CAL FIRE Report. Page 3.
[13] CAL FIRE Report. Page 22.
[14] CAL FIRE Report. Page 23.
[15] CAL FIRE Report. Page 2-3.

IV. SED Review and Analysis

SED reviewed records, inspected physical evidence, and analyzed witness statements related to this incident to determine compliance with Commission rules and regulations, specifically General Orders 95 and 165.[16] SED conducted field observations of evidence collection and reviews of PG&E's operations and maintenance procedures and relevant records. SED submitted six data requests to PG&E including requests for procedures, records, forms, and responses to specific questions related to the fire. SED also reviewed CAL FIRE's investigation report and the associated exhibits and photos.

A. Event Timeline

On May 31, 2022 at 1530 hours, two PG&E line reclosers (LR) on the Pueblo 1105 circuit (LR 426584 and LR 696) recorded a fault involving B phase, C phase, and ground according to PG&E.[17] Neither recloser opened to interrupt current on the circuit because LR 426584 was set to switch mode, so it could not act as a recloser at the time and could not interrupt current,[18] and the fault was not of sufficient magnitude and duration to cause LR 696 to operate.

PG&E's Hazard Awareness and Warning Center (HAWC) became aware of the Old Fire at 1535 hours, via the Integrated Reporting of Wildland Fire Information system (IRWIN).[19] CAL FIRE reported the same start time.[20] A PG&E trouble responder observed large amounts of smoke at approximately 1555 hours. CAL FIRE reported that the fire was contained June 5, 2022, at 1603 hours.[21]

SED reviewed a transcript of PG&E's interview of an eyewitness who observed the events just before and during the fire ignition.[22] The witness described multiple gusts of wind, likely dust devils, traveling through the area just before and during the fire ignition, including one which lifted about a dozen roof tiles from a neighbor's roof, and one which picked up loose vegetation. When the PG&E investigator asked if the witness observed tree branches or other vegetation in the dust devil that impacted the power pole, the witness responded, "No, it was just a huge dust devil and the power pole and power lines disappeared in it."[23] Per the witness statement, the witness observed a dust devil passing through the powerlines and described hearing a "pop," then seeing an arc with sparks that shot out from the pole and traveled away from them.[24] The

[16] This investigation did not include investigation into any violations related to the Wildfire Mitigation Plans as this is the Office of Energy Infrastructure Safety's (OEIS) jurisdiction.
[17] Old Fire 20-Day Report. Page 2. Line recloser 3022, close to the Pueblo substation near the address of [redacted], Napa, did not record any event on May 31, 2022.
[18] The recloser could be opened by the utility but would not open automatically in response to line conditions detected by the recloser.
[19] Old Fire 20-Day Report, Page 2.
[20] www.fire.ca.gov/incidents/2022/5/31/old-fire/, accessed June 5, 2023.
[21] www.fire.ca.gov/incidents/2022/5/31/old-fire/, accessed January 6, 2023.
[22] Pacific Gas and Electric Company. "Witness Statements" (Witness Statements), Pages 3-5. Provided in response to DR-2, Question 1. Provided to SED December 9, 2022, interview of witness performed June 7, 2022.
[23] Witness Statements, Page 4.
[24] Witness Statements. Page 4.

witness said that they saw a small fire start underneath the area of the powerlines where sparks hit the ground. The witness did not see any trees in the area that may have contacted the lines. When asked whether they saw power lines contacting each other the witness stated "No, but I lost sight of them for a brief moment when the dust devil traveled through the lines."[25]

A third-party witness photographed the fire just after it ignited as shown below in Figure 2.

Figure 2: Witness photo of the Old Fire just after ignition.[26]

CAL FIRE collected evidence on June 3, 2022, with SED present as described in the section below, and also retained two "Cutout door ELF 12 AMP" fuses from Pole ID# 102285566 (Fuse 1961) on June 3, 2022, and one SmartMeter on June 6, 2022. PG&E also replaced one pole on June 16, 2022, with SED also present, as described below.[27]

B. Field Observations

1. Site Visit #1 - June 3, 2022

On Friday, June 3, 2022, at 0940 hours, SED investigator Henry Sweat met with Doug Mackey from CAL FIRE; [redacted], a consultant to CAL FIRE; two other CAL FIRE investigators; and two contract electrical workers at 2300 Old Soda Spring Road in Napa. At 1040 hours, SED

[25] Witness Statements. Page 4.
[26] Pacific Gas and Electric Company. "Witness Photos," Page 2. Provided in response to DR-1, Question 27. August 30, 2022.
[27] Pacific Gas and Electric Company. "Response to DR-1, Question 2," Page 1. August 30, 2022.

investigator Will Dundon and PG&E staff arrived including, but not limited to, [redacted], Senior Director of North Coast Distribution, [redacted], Maintenance and Construction Supervisor, [redacted], a supervisor, and [redacted] a PG&E investigator.

CAL FIRE reported that an eyewitness saw a dust devil near the middle of a span of the Pueblo 1105 (12kV) circuit. At the Incident Location, the circuit comprises of three conductors. The eyewitness reportedly saw a flash that appeared to emanate from the conductors and then saw a bush ignite. Figure 1 earlier in this report shows a map of the Incident Location and residence of the eyewitness. While SED was on site, SED observed a small dust devil as well.

CAL FIRE collected one segment from the south conductor and one segment from the middle conductor from the span in question. Figure 3 below shows the entire span and indicates the location where the segments were collected. SED observed pitting in both the south and middle segments (as shown below in Figures 4 and 5) after they were collected by CAL FIRE. SED was unable to observe from the ground whether pitting occurred on any other conductor section due to the distance from the ground and because SED could not observe the top of the conductors from the ground. However, SED understands that CAL FIRE collected, and allowed SED to observe, all portions of the conductors that showed pitting. SED closely observed the two segments of the conductors once they were brought to the ground. The segment collected from the middle conductor was substantially longer than the segment from the south conductor, and SED understands that CAL FIRE took a longer section of the middle phase because a longer section of the middle phase had pitting compared to the south conductor pitting. The largest pit in the conductor appeared to be opposite the largest pit in the adjacent conductor. Figure 4 and Figure 5 show some of the pitting observed on each conductor.

Figure 3: View of Incident Location and approximate location where the pitting was observed.

Figure 4: Pitting on the south conductor.

Figure 5: Pitting on the middle conductor.

SED measured the span to be approximately 397 feet pole to pole. The pitting on both conductor sections was located 168 feet from the western pole, which is labeled Pole 121270661. The eastern pole was burned, so the pole number could not immediately be determined (Figure 6 below). However, PG&E later provided the eastern pole number which was labeled Pole 103949547.[28]

Figure 6: Burnt pole at east end of span.

[28] Pacific Gas and Electric Company. "Response to DR-1 Question 6," Page 1. August 30, 2022.

PG&E staff told SED investigators that line recloser 426584 was the nearest protective device. As noted above, PG&E stated in their 20-day report that this device did not open the circuit on May 31, 2022. During the site visit, PG&E told SED that the spacing between the north and south conductors was 40 inches at Pole 102286081 and 48 inches at Pole 103949547. PG&E later provided a LIDAR exhibit with the 20-Day Report which showed the conductor spacing in more detail.[29] Figure 7 below shows the dimensions between each conductor and the ground, as measured by the LIDAR scan in 2019.

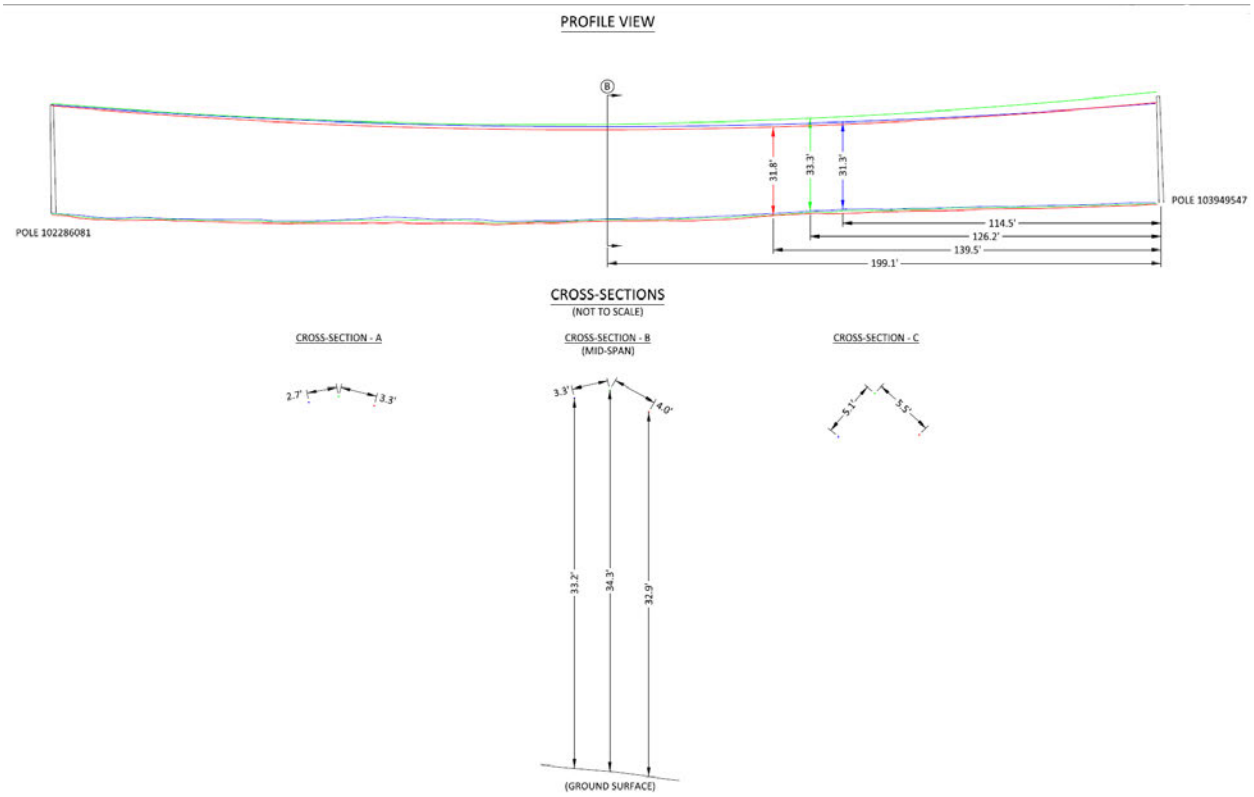

Figure 7: Clearance Dimensions from August 28, 2019 LIDAR scan of Incident Location.

During the site visit CAL FIRE consultants measured the distance from the ground surface to the pitted portion of the conductor at 33'-8" (north conductor), 35'-4" (middle conductor) and 34'-3" (south conductor). The 2019 LIDAR data PG&E later provided of the Incident Location indicated the shortest vertical distance between each conductor and the ground surface were 31.3' (north conductor), 33.3' (middle conductor), and 31.8' (south conductor).[30] The outside temperature at the time of CAL FIRE's measurements was 76°F.[31] SED reviewed historical weather data from the Atlas Peak Remote Automatic Weather Station (RAWS), which measured the peak outside temperature on the day of PG&E's LIDAR measurements as 80°F.[32]

[29] Pacific Gas and Electric Company. "LIDAR Exhibit," Page 1. Provided in response to DR-1, Question 32," Page 1. August 30, 2022. PG&E response was based on a LIDAR scan performed on August 28, 2019.
[30] LIDAR Exhibit, Page 1.
[31] SED measured the temperature during the site visit.
[32] https://mesowest.utah.edu/. Accessed July 31, 2023.

2. Site Visit #2 – June 16, 2022

On Friday, June 16, 2022, at 0815 hours, SED investigator Henry Sweat met with [redacted] from PG&E, a representative from PG&E's legal claims department, a PG&E pole intrusive inspection expert, and a PG&E work crew at the Incident Location in Napa. The work crew was on site to remove and replace a fire-damaged pole (Pole 103949547)[33] to the east of the Incident Location. Figure 8 below shows the pole replacement and Figure 1 above shows the general location of this pole.

Figure 8: Burnt pole on east end of span (Pole #103949547) being removed and loaded into truck (red arrow). A new pole replacement installed directly adjacent to original pole location (yellow arrow).

After Pole 103949547 was removed, PG&E used a screwdriver to probe the pole approximately one foot above grade and one foot, eight inches below grade, shown in Figure 9 below. SED did not observe decay before or during the probing. Before the pole was removed, the distance between the north and middle conductors was measured as 65 inches. The distance between the south and middle conductor was measured as 64 inches.

SED also observed the pole on the west end of the span at the Incident Location, Pole 102286081. SED probed two of the boring inspection holes used for intrusive testing: (1) the hole approximately 12 inches above grade, and (2) the hole approximately 24 inches above grade, shown in Figure 10 below. SED did not observe decay while probing either hole. SED did

[33] Pacific Gas and Electric Company. "Incident Map," Page 5. Provided as an attachment to the Old Fire 20-Day Report.

not probe any of the holes below grade. PG&E stated that the most recent intrusive inspection report did not note any decay.

Figure 9: Probing Pole 103949547 below grade.

Figure 10: Probing Pole 102286081 above grade.

C. Document Review and Investigation

1. Analysis of Electrical Fault on the Day of the Incident

The windy conditions on the day of the incident indicated to SED that there was potential that the electrical conductors on the Pueblo 1105 12kV circuit could have contacted one another and potentially caused sparks to ignite dry vegetation below. On June 7, 2022, PG&E interviewed multiple eyewitnesses who were standing outside a home near the Incident Location at the time of the incident. The eyewitnesses reported seeing a "wind gust" or a "dust devil" which lifted approximately a dozen roof tiles off the home they were standing in front of.[34] Then, one of the eyewitness reported seeing a dust devil carrying a tree branch approximately 4 feet to 6 feet in length, which landed west of the pond at the Incident Location.[35] That same eyewitness reported seeing another dust devil soon after which traveled through the powerline at Pole 102286081 and described hearing a "pop" and seeing sparks ignite vegetation below.[36]

SED reviewed the circuit data and fault records on the day of the incident for the Subject Circuit. The nearest protective devices to the incident location that recorded fault data were Line Recloser (LR) 426584 and LR 696. At the time of the incident, LR 426584 was set to switch mode and was not acting as a recloser at the time, which means LR 426584 would not have opened automatically in response to a fault. Thus, SED focused on the settings of LR 696 even though LR 426584 was slightly closer to the Incident Area.

[34] Witness Statements, Pages 1, 3.
[35] Witness Statements, Pages 4, 5.
[36] Witness Statements, Pages 3-5.

At 1531 hours on May 31, 2022, LR 696 recorded a phase-to-ground fault with a peak magnitude of 302 Amps, which was above the Minimum-to-Trip (MTT) amperage for LR 696. The fault duration lasted for 36 milliseconds. Then, 181 milliseconds later, another phase-to-ground fault was recorded by LR 696 with a peak magnitude of 219 Amps (above the MTT). The fault lasted for 88 milliseconds. In addition, for a single cycle (approximately 17 milliseconds), LR 696 recorded a phase-to-phase fault with a peak magnitude of 426 Amps.[37] Figure 11 below shows the oscillography data from the faults recorded by LR 696.[38]

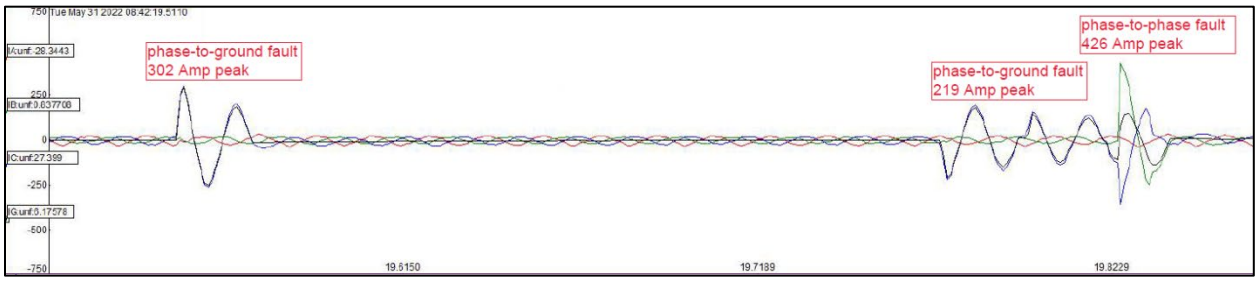

Figure 11: Oscillography Data from LR 696.

PG&E reported the following settings for LR 696 on May 31, 2022:

- a phase-to-ground fault of 302 Amps of a minimum of 689 milliseconds would cause the LR 696 to trip the circuit open,[39]
- a phase-to-ground fault of 219 Amps of a minimum of 1350 milliseconds would cause the LR 696 to trip the circuit open,[40]
- a phase-to-phase fault of 4000 Amps would be required to meet the High Current Lockout, or instantaneous trip, setting for a phase-to-phase fault which lasts only one cycle.[41]

Therefore, as noted above, the recorded duration of the phase-to-ground faults and the phase-to-phase fault did not meet or exceed the settings that would cause LR 696 to open the circuit.

PG&E also performed a simulation of a worst-case scenario fault[42] on the Subject Circuit. This analysis demonstrated that at the Incident Location (specifically at Pole 102286081) a worst-case phase-to-phase fault would have a fault amperage of 1490 Amps, and a phase-to-ground fault would have a fault amperage of 1173 Amps.[43] The table below summarizes the faults recorded on the day of the incident and the worst-case faults from the simulation.

[37] Pacific Gas and Electric Company. "Response to DR-2, Question 9," Pages 1-2. December 9, 2022.
[38] Pacific Gas and Electric Company. "LR 696 Oscillography," Page 1. Provided in response to DR-1 Question 31. Response provided August 30, 2022; data recorded May 31, 2022.
[39] Pacific Gas and Electric Company. "Response to DR-3 Question 5," Page 1. March 2, 2023.
[40] Pacific Gas and Electric Company. "Response to DR-3 Question 5," Page 1. March 2, 2023.
[41] Pacific Gas and Electric Company. "Device Settings," Page 2. Provided as an attachment to DR-1 Question 16 on August 30, 2022.
[42] A worst-case-scenario fault implies a maximum fault duty, meaning a fault with zero impedance.
[43] Pacific Gas and Electric Company. "Response to DR-1 Question 19," Page 1. August 30, 2022.

Fault #	Fault Type	Peak Amperage	Worst-Case Amperage
1	phase-to-ground	302 A	1173 A
2	phase-to-ground	219 A	1173 A
3	phase-to-phase	426 A	1490 A

Table 1: Summary of Faults Recorded by LR 696.

PG&E stated in its 20-Day Report for the incident that the utility's protection engineers noted that the magnitude and shape of the waveform was not consistent with direct line-to-line contact.[44] SED requested information from PG&E to substantiate this claim. PG&E responded and stated that a direct line-to-line fault would have had a higher magnitude, and the utility provided oscillography data from the protection devices on the Subject Circuit to compare to simulated "worst-case-scenario" fault data.[45] The oscillography data PG&E provided to SED appears to demonstrate that the electrical fault that occurred at the Incident Location did not meet the magnitude of a worst-case-scenario, but that is the extent to which PG&E substantiated the claim that the fault was not caused by direct line-to-line contact.

The CAL FIRE Report concluded that the conductors made contact based on the analysis of EFI Global, Senior Principal Forensic Engineer, Michael Oconner, who inspected the conductors. The EFI Global Report states:[46]

> *Evidence of arcing between aluminum conductors consists of mass loss on one conductor and deposition of mass on the other conductor. In this case, evidence of such arcing was observed in several locations. The arcing is produced when one conductor comes into contact with the other conductors and then the conductors part, causing a parting arc. In most cases, molten aluminum is ejected from the arcing location.*

The EFI Global Report included the photos in Figure 12 and Figure 13 to support its findings.

[44] Old Fire 20-Day Report, Page 4.
[45] Pacific Gas and Electric Company. "Response to DR-1, Question 31," Page 1. August 30, 2022.
[46] EFI Global. "Engineering Report for EFI Global File No: 024.08447." (EFI Global Report). December 11, 2022. Page 2. Provided to SED as Attachment 15 to the CAL FIRE Report.

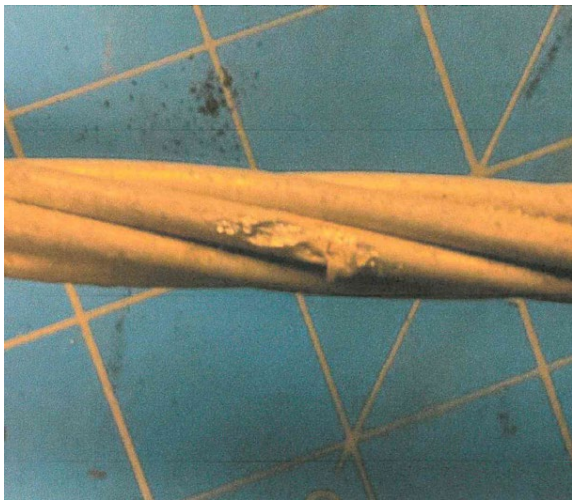

Figure 12: Arcing evidence on conductor, as photographed by EFI Global.

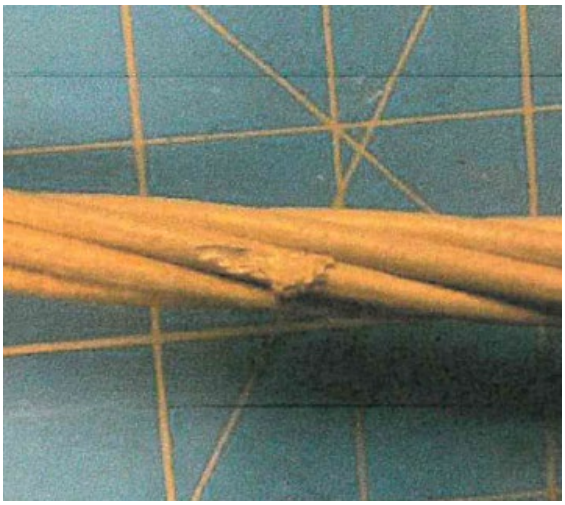

Figure 13: Arcing evidence on conductor, as photographed by EFI Global.

The EFI Global report concluded that both conductors showed evidence of direct contact, contrary to the conclusion of PG&E's protection engineers' review of the magnitude and waveform of the electrical fault.

The scope of SED's investigation is to determine whether PG&E violated the Commission's General Orders (GO) and any applicable rules or standards. GO 95 Rule 38, *Minimum Clearance of Wires from Other Wires* is the most applicable rule relating to the potential line-to-line contact.

GO 95 Rule 38 states, "the minimum vertical, horizontal, or radial clearances of wires from other wires shall not be less than the values given in [the table in this rule] and are based on a temperature of 60°F and no wind."[47] Rule 38, Table 2, Case No. 17F defines the minimum allowable radial clearance between conductors of the same circuit, on the same crossarm or pole, with a voltage between 7,500 – 20,000 volts, such as the Subject Circuit.[48] This minimum radial clearance is six inches, and Rule 38 allows for a 10 percent reduction in these clearances outside a Tier 3 HFTD.[49]

SED finds that PG&E failed to maintain a 5.4-inch minimum clearance for conductors at the Incident Location as required by GO 95 Rule 38. The CAL FIRE Report contains expert analysis of the physical evidence to sufficiently demonstrate that PG&E lines were in contact during the events which led to the Old Fire. Although PG&E provided simulated fault currents and oscillography data to support their claim that there was no direct line-to-line contact, this modeling exercise is less compelling evidence than the physical evidence and analysis of the

[47] GO 95, page III-27.
[48] GO 95, Table 2: *Basic Minimum Allowable Clearance of Wires from Other Wires at Crossings, in Midspans and at Supports*, page III-28.
[49] GO 95, Page III-29.

conductors performed by CAL FIRE's experts. SED agrees with CAL FIRE's conclusion that direct line-to-line contact ignited the Old Fire.

2. Analysis of Overdue Maintenance Work in the Incident Area

General Order (GO) 95[50] Rule 18 requires that each regulated utility establish maintenance programs for electrical facilities and sets maximum time periods to complete corrective actions associated with potential violations of GO 95 or Safety Hazards.[51] Rule 18 sets three levels of priority for corrective maintenance work. Priority Level 1 includes corrective actions needed to address an immediate risk of high potential impact to safety or reliability and GO 95 Rule 18 requires that utilities correct Level 1 issues immediately. Priority Level 2 includes corrective actions needed to address risks with moderate potential impact. GO 95 Rule 18 requires that utilities correct Level 2 issues within 6 months in Tier 3 HFTD and within 12 months in Tier 2 HFTD if the issue creates a fire risk or if worker safety is compromised; and otherwise within 36 months. Priority Level 3 includes any risk of low potential impact and GO 95 Rule 18 requires correction within 60 months in all areas, with some exceptions listed in Appendix J of GO 95.[52]

SED reviewed work orders for utility poles and associated equipment in the vicinity of the Incident Location to assess compliance with the GO 95 Rule 18 deadlines discussed above. Table 2 below shows a summary of the work orders SED identified as overdue as part of its investigation of the Old Fire.

Pole Number	PG&E EC Tag #	Date Level 2 Issue Identified	Rule 18 Due Date	Date Completed
102286081	116791710	03/20/2019	03/20/2020	Incomplete as of 04/17/23
102285897	111994529	06/26/2021	06/26/2022	Incomplete as of 08/25/2022
102285909	112003151	06/25/2021	06/25/2022	Incomplete as of 05/30/2023.
102285804	112001375	04/05/2021	04/05/2022	Incomplete as of 03/17/2023

Table 2: Summary of Overdue Maintenance Issues.

Pole 102286081 Decayed and Crowning at the Incident Location

SED found that PG&E staff determined on several occasions that damage to Pole 102286081, located at the Incident Location and in a Tier 2 HFTD, required correction.

[50] California Public Utilities Commission. "Rules for Overhead Electric Line Construction." (General Order No. 95, or GO-95), Page I-9 – I-11. Last revised January 16, 2020.
[51] For purposes of GO 95, Rule 18, "Safety Hazard" means a condition that poses a significant threat to human life of property. (GO 95, Page I-8.)
[52] GO 95, Page I-10. See potential exceptions in GO 95 Appendix J.

- PG&E created a work order labeled Electrical Corrective Tag (EC Tag) #116791710 on March 20, 2019, to replace a pole noted as decayed/rotten.[53] The EC Tag states that PG&E staff also noted on July 6, 2019, "pole top crowned and decayed."[54] The EC Tag has a "X" in the box next to "Pole Decayed/Rotten Replace, Priority "E."[55]
- Then on May 6, 2020, a PG&E Field Safety Reassessment (FSR) on EC Tag #116791710 states, "Pole, Decayed/Rotten, Replace," and that "Current field condition needs to be addressed before next fire season."[56] The 2020 FSR report states that the FSR was due by March 20, 2020 but was performed on May 6, 2020.[57]
- Later, a second FSR on April 2, 2021, confirmed again, "Pole, Decayed/Rotten, Replace" and noted "Pole is rotten with woodpecker damage. Tree has grown into communications wire and putting additional strain on pole." It also states, "Condition need to be address within the next 12 months."[58]
- However, the pole was still not replaced by the time PG&E conducted a third FSR on August 3, 2022, which also states, "Pole, Decayed/Rotten, Replace," "Condition still exists. No Change," and "Need to replace pole. Pole top is starting to decay/rot and is starting to split, and there is some minors [sic] burn marks and some woodpecker damage as well."[59]

SED finds this damage created at least a moderate potential impact to safety or reliability and therefore qualifies as a Level 2 priority issue per GO 95 Rule 18. Figure 14 below shows the split pole top and a conductor attached to an insulator at the top of the pole, and PG&E noted significant additional damage.[60] GO 95 Rule 18 requires that PG&E correct the damage to Pole #102286081 no later than March 20, 2020, i.e. 12 months after PG&E observed pole damage and created EC Tag #116791710 on March 20, 2019. PG&E staff also stated multiple times in the comments of the EC tag that the pole needed replacement, as described above.[61] Nonetheless, PG&E failed to meet the Rule 18 deadline.

[53] Pacific Gas and Electric Company. "Electric Overhead Tag notification #11671710." (EC Tag #116791710), Page 1. Provided in response to DR-1 Question 22. Provided to SED August 30, 2022, printed August 22, 2022.
[54] EC Tag #116791710, Pages 1-2.
[55] EC Tag #116791710, Page 5.
[56] EC Tag #116791710, Pages 2-3.
[57] Pacific Gas and Electric Company. "2020 Notification 116791710 FSR." Page 1. Provided in response to DR-2 Question 7. Provided to SED December 9, 2022.
[58] EC Tag #116791710, Page 3.
[59] EC Tag #116791710, Page 3. The document also states, "Loose hardware on eye bolt that need [sic] to be tightened."
[60] See GO 95. Appendix I pages I-3 contains Level 2 examples including pole damage with "Any other risk of at least moderate potential impact to safety or reliability." Page I-5 includes the Level 3 example of "Any risk of low potential impact to safety or reliability. The damage to this pole is not consistent with the description of Level 3 conditions due to structural issues with the potential for failure impacting safety and reliability, and impacting operations and customers, that were not mitigated.
[61] FSRs set new PG&E internal deadlines over time; however, the deadline under Rule 18 remained unchanged.

Figure 14: Damaged Top of Pole 102286081.[62]

Other Poles in Vicinity of Incident Location Subject to Field Safety Reassessments

In 2016, PG&E observed that a number of poles in the vicinity of the Incident Location were missing high voltage signs.[63] Figure 15 below shows a map of a number of these poles in relation to the Incident Location. Missing high voltage signs is one of the exceptions to the requirements of GO 95 Rule 18, as stated in Appendix J of the GO, however, PG&E noted additional higher priority maintenance issues during Field Safety Reassessments (FSRs) of three poles in the vicinity of the Incident Location: Pole 102285897, Pole 102285909, and Pole 102285804. These higher priority issues fell into the Level 2 priority category and have a due date of 12 months within a Tier 2 HFTD per GO 95 Rule 18.

[62] Pacific Gas and Electric Company. "Photo of Pole 102286081." Page 2. Provided in response to DR-2 Question 7. Photo taken August 3, 2022.

[63] PG&E first observed this condition on September 6, 2016, for Poles 102285905 and 102285909; on September 13, 2016, for Poles 102285793 and 102285804; September 19, 2016 for Poles 102285889 and 103156134; and September 28, 2016 for Pole 102285897.

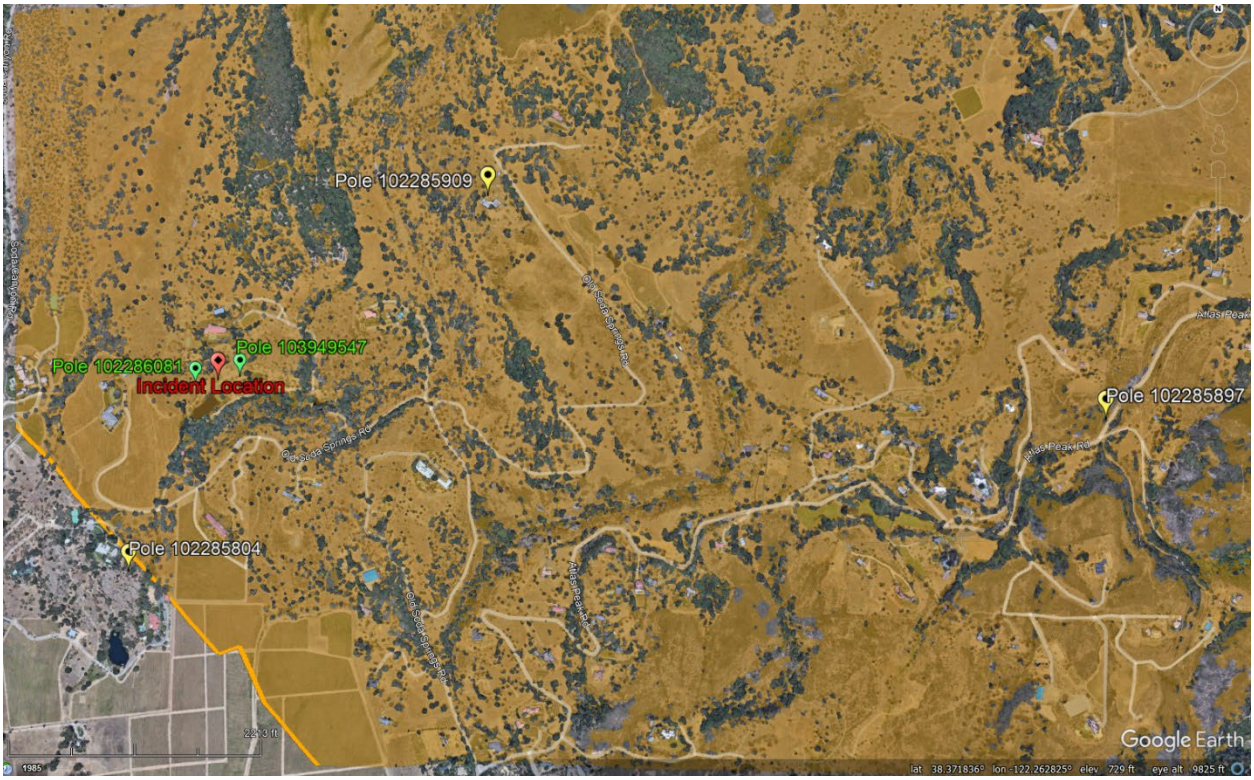

Figure 15: Map of Poles with Late Work Orders Near Incident Location. Orange overlay indicates Tier 2 HFTD.

Pole 102285897

On September 19, 2016, EC Tag #111994529 identified missing high voltage signs at Pole 102285897.[64] On June 26, 2021, PG&E identified two additional issues at Pole 102285897 during an FSR. PG&E observed splitting crossarms and secondary connectors in primary jumpers and noted that the work should be done within 12 months.[65] Pole 102285897 is located in a Tier 2 HFTD as shown in Figure 15 GO 95 Appendix I lists broken/damaged crossarms as a Level 2 priority issue. Despite identifying these issues, PG&E did not revise EC Tag #111994529 for this pole to include an appropriate deadline for this Level 2 priority issue. PG&E should have corrected this issue by June 26, 2022.[66] However, PG&E did not correct the Level 2 priority issue regarding the splitting crossarms as of August 25, 2022.[67] Thus, PG&E missed the GO 95 Rule 18 12-month deadline for corrective action.

[64] Pacific Gas and Electric Company. "Electric Overhead Tag notification #111994529." (EC Tag #111994529), Pages 1-2. Provided in response to DR-1 Question 8. Provided to SED August 30, 2022, printed August 25, 2022.
[65] (EC Tag #111994529), Page 2.
[66] GO 95, Page I-10.
[67] August 25, 2022 is the date the copy of EC Tag #111994529 provided to SED was printed, and as of print date, the work order was not complete.

PG&E also missed the GO 95 Rule 18 deadline for correcting the use of secondary connectors in primary service jumpers.[68] SED determined that the Level 2 deadline applies because the "service sleeve" type connectors PG&E used for primary jumper connections could stretch and deform during an electrical fault, and fail, or increase the chance of failure on a subsequent fault.[69] PG&E procedures instead require use of a wedge connector or alternatively an H-tap compression connector for aluminum conductors in distribution service.[70] PG&E missed the Rule 18 deadline of June 26, 2022, to correct this Level 2 priority issue.

Pole 102285909

EC Tag #112003151 identified missing high voltage signs at Pole 102285909 on August 6, 2016.[71] PG&E later identified "secondary connectors in primary jumpers" at Pole 102285909 during an FSR on June 25, 2021, an issue also found at Pole 102285897 as noted above.[72] The Rule 18 Level 2 priority deadline applies to the EC Tag for Pole 102285909, so this issue should have been corrected within 12 months. PG&E did not correct this issue as of August 25, 2022[73] and therefore missed the Rule 18 deadline of June 25, 2022.

Pole 102285804

EC Tag #112001375 identified missing high voltage signs at Pole 102285804 on September 13, 2016.[74] PG&E later identified that the pole was "badly split with heavy woodpecker damage" during an FSR on April 5, 2021.[75] Figure 16 below shows the damaged pole.

[68] Primary service refers to the conductors and equipment used to deliver electricity at distribution voltages, whereas secondary service refers to the conductors and equipment used to delivery electricity downstream of a transformer where the voltage has been lowered for customer usage.
[69] Pacific Gas and Electric Company. "Response to DR-6, Question 3," Page 1. Provided May 3, 2023. PG&E also stated, "Secondary connectors or "service sleeves" are made of a soft aluminum that may experience greater thermal expansion than the primary conductor in the event of a fault on the primary line."
[70] "Fired wedge connectors are the preferred connector for making primary…tap connections." See Page 1 of PG&E document "Fired Wedge Connectors for Primary and Secondary Distribution Lines" rev. 10, March 25, 2022; and page 1 of PG&E document "Connectors for Aluminum Conductors on Distribution Lines" rev. 15, August 15, 2017. Both documents were provided as attachments to DR-6 Question 2. PG&E stated on August 30, 2022, in response to DR-1 Question 4 that conductors at the Incident Location are aluminum conductors (steel reinforced).
[71] Pacific Gas and Electric Company. "Electric Overhead Tag notification #112003151." (EC Tag #112003151), Pages 1-2. Provided in response to DR-1 Question 8. Provided to SED August 30, 2022, printed August 25, 2022.
[72] EC Tag #112003151, Pages 2-3.
[73] August 25, 2022 is the date the copy of EC Tag #112003151 provided to SED was printed, and as of print date, the work order was not complete.
[74] Pacific Gas and Electric Company. "Electric Overhead Tag notification #112001375." (EC Tag #112001375), Pages 1-2. Provided in response to DR-1 Question 8. Provided to SED August 30, 2022, printed August 25, 2022.
[75] EC Tag #112001375, Page 2.

Figure 16: Pole 102285804 with signs of woodpecker damage. Photo taken by PG&E during 2021 FSR.[76]

This pole is located at the boundary of the Tier 2 HFTD as shown in Figure 15. Failure of this pole has the potential to ignite a fire that could easily burn into a Tier 2 HFTD. GO 95 Appendix I lists damaged poles as a Level 2 issue, and the potential for the pole to fail poses a risk that could ignite a fire in a Tier 2 HFTD. Therefore, Rule 18 requires PG&E to address this issue within 12 months. PG&E set an April 6, 2022 deadline to correct the issue, but PG&E had not resolved the issue as of August 25, 2022.[77]

3. Analysis of Field Safety Reassessment Program

In addition to the time periods specified by GO 95 Rule 18, PG&E has its own internal prioritization levels to comply with GO 95 Rule 18. When PG&E's distribution electrical utility assets are inspected and repair or corrective work is needed, the work is prescribed by an EC Tag. Each EC Tag is given a priority level which corresponds to different types of work and

[76] Pacific Gas and Electric Company. "FSR EC112001375 Photos," Page 4. Provided in response to DR-5 Question 4. Provided to SED on April 7, 2023, photos taken during FSR on April 5, 2021.
[77] A printed copy of EC Tag #112001375 was provided to SED on August 30, 2022 with a print date of August 25, 2022. Provided in response to DR-1 Question 8. As of the August 25, 2022 print date, the work order was not complete.

different required due dates. Priority A EC Tags require immediate response or stand-by; Priority B EC Tags require correction within 3 months; Priority E Tags require correction within 12 months, or six months in Tier 3 HFTD; and Priority F EC Tags require correction within five years for overhead assets.[78]

In November 23, 2019, PG&E released a bulletin titled "PG&E's Corrective Tag Execution Approach" (Procedure TD-8999B-001). PG&E released this bulletin because:

- PG&E's 2019 Wildfire Safety Inspection Program (WSIP) identified approximately 277,000 corrective actions; and
- PG&E anticipated "that a significant number of moderate and low priority tags (Priority E and F tags, respectively) will not be completed in accordance with the timelines established in PG&E's programs to meet General Order requirements.[79]

Procedure TD-8999B-001 summarizes PG&E's execution approach to review Priority E and F EC tags that had not been corrected prior to the start of the fire season "as determined by CAL FIRE".[80] PG&E called these reviews Field Safety Reassessments (FSR). Procedure TD-8999B-001 requires that a "trained and qualified inspector" inspect in the field the utility facilities identified in open (i.e. incomplete) Priority E and F EC tags,[81] and "document if there is an urgency in the field condition that would require escalation of the tag to Priority A or B."[82] PG&E's Corrective Tag Execution Approach was the governing procedure for the FSR program prior to PG&E's "Field Safety Re-Assessment (FSR) Process and Procedures" TD-8123, which became effective on August 7, 2022.[83]

PG&E has acknowledged that PG&E's Corrective Tag Execution Approach does not authorize delays to corrective actions, stating, "Neither TD-8999B-001 [PG&E's Corrective Tag Execution Approach] nor TD-8123-P200 [Field Safety Re-Assessment (FSR) Process and Procedures] enable PG&E to delay corrective action past the original required end date; rather the documents outline the requirements for a mitigation activity for tags that are already past due."[84]

SED has reviewed the FSR program's application to work orders in the vicinity of the Incident Location as part of its investigation. As previously stated in this report, SED reviewed EC Tag #116791710, which was created on March 20, 2019 and called for Pole 102286081 to be

[78] Pacific Gas and Electric Company. "Field Safety Re-Assessment (FSR) Process and Procedures" (TD-8123P-200), Page 7. Last revised July 7, 2022. Provided to SED in response to DR-3 Question 4, on March 2, 2023.
[79] Pacific Gas and Electric Company. "PG&E's 2019 Corrective Tag Execution Approach" (TD-8999B-001), Page 1. Published November 23, 2019, now obsolete and replaced by TD-8123P on July 7, 2022. Provided to SED in response to DR-3 Question 4, on March 2, 2023.
[80] TD-8999B-001, Page 1.
[81] TD-8999B-001, Page 3.
[82] TD-8999B-001, Page 3.
[83] Pacific Gas and Electric Company. "Response 002 to DR-5, Question 1," Page 1. April 12, 2023. PG&E's current procedure for Electric Distribution FSRs, Field Safety Re-Assessment (FSR) Process and Procedures, expands on the initial procedures from PG&E's Corrective Tag Execution Approach and provides additional guidance and timelines for inspections and FSRs.
[84] Pacific Gas and Electric Company. "Response to DR-5, Question 1," Page 1. April 12, 2023.

replaced by March 20, 2020, due to its decayed/rotten condition.[85] PG&E failed to complete the work by this deadline. Instead, PG&E performed an FSR on EC Tag #116791710 on May 6, 2020.[86] The FSR noted that the field condition needed to be addressed before the next fire season. PG&E then conducted two additional FSRs that delayed the deadline to August 4, 2023.[87] Therefore, the FSR process delayed PG&E's internal due date for the work by up to 1,232 days despite PG&E stating that its procedures do not enable the utility to use the FSR program to delay corrective action.

SED found that PG&E postponed internal deadlines multiple times through repeated FSRs. In addition to EC Tag #116791710, PG&E performed multiple FSRs on EC Tag #112003151, as previously discussed, and on EC Tag #111993189, a work order to install missing high voltage signs near the Incident Location.[88] The comments section of EC Tags #116791710, #112003151, #111993189 and other work orders reviewed as part of this investigation and others state, "Suggested New Due Date" and typically propose a 12-month extension to the due date for the work order each time it is subject to an FSR.[89] This is in direct conflict with PG&E's stated policies, as noted earlier, and undermines the utility's maintenance program for any overdue work order. In practice, PG&E's initial procedures for FSRs as outlined in TD-8999B-001, and its current procedures TD-8123P-200, fail to prevent delays to work order deadlines during the FSR process, and fail to limit how many times PG&E can subject a work order to an FSR.

Kirkland & Ellis LLP, the utility's federal monitor,[90] released a report in November 2021. This report stated the following regarding PG&E's FSR program:

> *"The FSR process, by which structures with pending, unresolved tags are periodically reviewed, is a stopgap measure put in place by PG&E to ensure that conditions do not further deteriorate while electric remediation work is pending, given the significant backlog of such work. While the Monitor team understands the need to reassess conditions when they are not timely remediated, FSRs divert resources away from enhanced inspections and execution of electric remediation work, and would, for the most part, be altogether unnecessary if PG&E were to address its asset repair tags in a timely way. In essence, while the FSR process is necessary, it has served to somewhat normalize the practice of not timely addressing "lower priority" repair tags, which can and do result in ignitions."*[91]

[85] EC Tag #116791710, Pages 1-3.
[86] Pacific Gas and Electric Company. "2020 Notification 116791710 FSR." Page 1. Provided in response to DR-2 Question 7. Provided to SED December 9, 2022.
[87] A second FSR was performed on April 2, 2021, which noted that the condition needed to be addressed within the next 12 months and suggested a new due date of April 2, 2022. PG&E did not complete the work within the next 12 months and performed a third FSR on August 4, 2022, which is after the due date for the maintenance work.
[88] Pacific Gas and Electric Company. "Electric Overhead Tag notification #111993189." (EC Tag #111993189), Pages 1-2. Provided in response to DR-1 Question 8. Provided to SED August 30, 2022, printed August 25, 2022.
[89] EC Tag #116791710, Page 3. EC Tag #112003151, Page 2. EC Tag #112001375, Page 2.
[90] Kirkland & Ellis LLP was appointed as in 2017 following a U.S. National Transportation Safety Board investigation of the 2010 San Bruno pipeline explosion.
[91] Kirkland and Ellis, LLP. "PG&E Independent Monitor Report of November 19, 2021." Page 37. https://s3.documentcloud.org/documents/21190278/usavpge-monitorreport-211123.pdf. Last accessed June 7, 2023.

D. Findings and Violations

SED reviewed and analyzed inspection and maintenance records, investigation reports related to this incident, and PG&E's actions before, during, and after the Old Fire in the Incident Location to determine the utility's compliance with Commission regulations. SED's investigation discovered four violations as detailed below.

General Order 95, Rule 18 – Maintenance Programs and Resolution of Potential Violations of General Order 95 and Safety Hazards states in part:

> *Companies shall undertake corrective action within the time period stated for each of the priority levels set forth below…*
>
> *Level 1 – An immediate risk of high potential impact to safety or reliability: Take corrective action immediately, either by fully repairing or by temporarily repairing and reclassifying to a lower priority.*
>
> *Level 2 – Any other risk of at least moderate potential impact to safety or reliability: Take corrective action within specified time period (either by fully repair or by temporarily repairing and reclassifying to Level 3 priority). Time period for corrective action to be determined at the time of identification by a qualified company representative, but not to exceed: (1) six months for potential violation that create a fire risk located in Tier 3 of the High Fire Threat District; (2) 12 months for potential violations that create fire risk located in Tier 2 of the High Fire Threat District; (3) 12 months for potential violations that compromise worker safety; and (4) 36 months for all other Level 2 potential violations.*
>
> *Level 3 – Any risk of low potential impact to safety or reliability: Take corrective action within 60 months subject to the exception specified below.*[92]

Violation 1

GO 95 Rule 18 requires correction of Level 2 issues that pose a risk of fire in Tier 2 HFTD within 12 months of identification. PG&E created EC Tag #116791710 on March 20, 2019 because the utility identified that Pole 102286081 was "decayed/rotten" and needed to be replaced by March 20, 2020. This work is a Level 2 priority because a decayed/rotten structure can lead to structure failures and energized lines contacting vegetation and sparking a fire. As of April 17, 2023, PG&E still had not completed this work, in violation of GO 95 Rule 18.

[92] Exception: Potential violations specified in Appendix J or subsequently approved through Commission processes, including, but not limited to, a Tier 2 Advice Letter under GO 96B, that can be completed at a future time as opportunity-based maintenance. Where an exception has been granted, repair of a potential violation must be completed the next time the company's crew is at the structure to perform tasks at the same or higher work level, i.e., the public, communications, or electric level. The condition's record in the auditable maintenance program must indicate the relevant exception and the date of the corrective action.

Violation 2
GO 95 Rule 18 requires correction of Level 2 issues that pose a risk of fire in Tier 2 HFTD within 12 months of identification. EC Tag #111994529 was created on September 19, 2016 by PG&E to install missing high voltage signs on Pole 102285897. During an FSR on June 26, 2021, PG&E identified splitting crossarms and connectors rated for secondary voltages in primary jumpers, which PG&E stated needed to be addressed within 12 months. As of August 25, 2022, PG&E still had not completed this work. The work identified during the 2021 FSR is classified as Level 2 priority work and poses a risk of fire because damaged crossarms and connectors that are rated for lower voltages than what they are being used for can lead to structural and equipment failures and spark a fire. PG&E's failure to complete this work in the time frame specified by GO 95 is a violation of Rule 18.

Violation 3
GO 95 Rule 18 requires correction of Level 2 issues that pose a risk of fire in Tier 2 HFTD within 12 months of identification. EC Tag #112003151 was created on August 6, 2016 by PG&E to install missing high voltage signs on Pole 102285909. During an FSR on June 25, 2021, PG&E identified connectors rated for secondary voltages in primary jumpers. As of August 25, 2022, PG&E still had not completed this work. The work identified during the 2021 FSR is classified as Level 2 priority work and poses a risk of fire because connectors rated for lower voltages than what they are being used for can lead to equipment failures and spark a fire. PG&E's failure to complete this work in the time frame specified by GO 95 is a violation of Rule 18.

Violation 4
GO 95 Rule 18 requires correction of Level 2 issues that pose a risk of fire in Tier 2 HFTD within 12 months of identification. EC Tag #112001375 was created on September 13, 2016 by PG&E to install missing high voltage signs on Pole 102285804. During an FSR on April 5, 2021, PG&E identified the pole was badly split with heavy woodpecker damage. As of August 25, 2022, PG&E still had not completed the work to address the damaged pole. The work identified during the 2021 FSR is classified as Level 2 priority work and poses a risk of fire because damaged poles can lead to structural failures and spark a fire. PG&E's failure to complete this work in the time frame specified by GO 95 is a violation of Rule 18.

General Order 95 Rule 31.1 – Design, Construction and Maintenance states in part:

> *Electrical supply and communication systems shall be designed, constructed, and maintained for their intended use, regard being given to the conditions under which they are to be operated, to enable the furnishing of safe, proper, and adequate service.*
>
> *For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for the design, construction, or maintenance of communication or supply lines and equipment.*

Violation 5
GO 95 Rule 31.1 requires utilities to use accepted good practices and extends to requiring regulated utilities to follow their internal procedures, as those are accepted as good practices by the utility. PG&E Procedure TD-8999B-001 and PG&E Procedure TD-8123P-200 set the procedures for FSRs. PG&E acknowledged that these procedures do not enable the utility to delay corrective action past the original required end date for a work order. Nonetheless, it is common practice for PG&E to delay internal maintenance and repair work deadlines via the FSR process as it did for EC Tags #116791710, #112003151, and #112001375. In many cases, this also delays the work order past the Rule 18 required deadline. This practice defies the purpose of the corrective action deadline, which is to promote risk-reduction, and repair and maintain the utility's facilities in a timely manner. This process is not logical, nor is it in line with good risk-reduction practices. PG&E's failure to maintain equipment according to PG&E's internal procedures for maintenance, missed due dates, and flawed FSR program is not an accepted good practice and is a violation of GO 95 Rule 31.1.

GO 95, Rule 38 – Minimum Clearance of Wires from Other Wires states in part:

> *The minimum vertical, horizontal or radial clearances of wires from other wires shall not be less than the values given in Table 2 and are based on a temperature of 60° F. and no wind. Conductors may be deadended at the crossarm or have reduced clearances at points of transposition, and shall not be held in violation of Table 2, Cases 8–15, inclusive.*
>
> *The clearances In Table 2 shall in no case be reduced more than 10 percent, except mid-span in Tier 3 of the High Fire-Threat District where they shall be reduced by no more than 5 percent, because of temperature and loading as specified in Rule 43 or because of a difference in size or design of the supporting pins, hardware or insulators.*[93]

Violation 6
GO 95 Rule 38 requires utilities to maintain an absolute minimum clearance of 5.4 inches between conductors of the same circuit, on the same crossarm or pole, with a voltage between 7,500 – 20,000 volts. **T**he CAL FIRE Report's expert analysis and review of physical evidence confirms that the south and middle phase conductors of the span between Pole 121270661 and Pole 103949547 had a clearance of zero inches since they made contact with one another and directly led to the ignition of the Old Fire. PG&E's failure to maintain the clearances between these conductors is a violation of GO 95, Rule 38.

[93] GO 95, Rule 38, page III-27.

V. Conclusion

SED's investigation finds multiple failures of PG&E's maintenance program in violation of GO 95. These violations include four instances of PG&E failing to meet GO 95 Rule 18 deadlines to complete work orders for maintenance issues which posed a moderate fire risk in a Tier 2 HFTD.

In addition, SED finds that PG&E violated GO 95 Rule 31.1 for failing to maintain its electrical facilities in accordance with accepted good practices. SED finds that PG&E uses its FSR program as a process to delay internal deadlines for maintenance and repair work, contrary to PG&E's own internal policies. For some EC Tags, PG&E repeatedly delayed internal deadlines via the FSR program. While PG&E's policies state that the FSR program is intended to manage risk by escalating the priority for an EC Tag if conditions worsen, in many cases the FSR program increases risk by delaying internal deadlines for priority repairs. SED found multiple instances where FSRs identified higher priority work issues, such as damaged cross arms or secondary connectors in primary jumpers, but these work orders were not escalated in priority, and they were not completed on time. PG&E used the FSR program in a way that allows the utility to evade its own maintenance due dates, and this action fundamentally undermines its ability to provide safe and reliable service.

Based on the conclusion from the CAL FIRE Report, which found that PG&E conductors made contact and directly ignited the Old Fire, SED finds PG&E in violation of GO 95 Rule 38, for failing to maintain adequate clearances between the conductors at the Incident Location on the day of the Old Fire. PG&E's failure to maintain adequate clearances between the conductors is in violation of GO 95 Rule 38 and directly led to the cause of the Old Fire.

If SED becomes aware of additional information that would modify SED's findings in this report, SED may re-open the investigation. If so, SED may modify this report and take further actions as appropriate.