ATTACHMENT B

SED Investigation Report

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

Incident Investigation Report

Report Date: July 16, 2025

Incident Number: E20220908-02 (Mosquito Fire)

Regulated Utility Involved: Pacific Gas and Electric Company (PG&E)

Date and Time of the Incident: September 6, 2022, at 1817 hours

Location of Incident: Near Oxbow Reservoir and north of Fire Road 23 at latitude 39.006768° and longitude -120.743725°

Fatality/Injury: No fatalities, two injuries reported

Property Damage: 76,788 acres burned, 78 structures destroyed, 13 structures damaged, and over $135.9 million estimated property damages (PG&E and third parties)

Regulated Utility Facilities Involved: PG&E's Middle Fork #1, Oxbow Tap and Weimar #1 60 kV transmission circuits

Violations: Yes

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I. Summary

The Mosquito Fire ignited on September 6, 2022, at or near Pacific Gas and Electric Company (PG&E) Pole 014/191 (Oxbow Junction Pole). Oxbow Junction is north of the Rubicon River and east of Foresthill, in a Tier 3 High Fire Threat District (HFTD). Switches 47 and 49 were attached to the Oxbow Junction Pole to control the flow of power between three PG&E transmission circuits attached to this pole. Electrical arcing at the lowest jumper on the pole, between the lower phases of Switches 47 and 49, most likely ignited the fire.[1]

The California Department of Forestry and Fire Protection (CAL FIRE) did not attribute any fatalities to the fire. The fire caused 2,699 customer outages, burned 76,778 acres, and forced widespread evacuations. The fire damaged or destroyed 91 structures and resulted in injuries to two firefighters. The fire caused property damage to PG&E and other parties of about $135.9 million.

The Safety and Enforcement Division's (SED) investigation included review and analysis of physical evidence and related documents for the Oxbow Junction Pole and attached equipment; review of photographs and audio and video recordings; and interviews of PG&E subject matter experts (SMEs).

SED also reviewed photographs, inspection reports, work orders, and other PG&E documents for nearby PG&E electrical facilities. Additionally, SED reviewed PG&E's policies and procedures as well as actual practices associated with its "Central Internal Review Team" (CIRT).
Based on SED's review, SED found that PG&E violated various requirements of General Order (GO) 95 and Resolution 4184-E. These violations are summarized in Table 1 below:

[1] SED does not determine the cause of fires. The United States Forest Service (USFS) is the lead fire authority for the Mosquito fire, including determining the cause of the fire. SED may revise this report when USFS releases its report.

Table 1: Violations of CPUC Rules and Requirements

	Rule	Violations
1.	GO 95, Rule 18	PG&E cancelled repair work for loose tie wires at Poles 000/003, 014/186A, and 009/130 in a Tier 3 HFTD. Rule 18 requires that PG&E repair these loose tie wires within six months of identification because they create a fire ignition risk.
2.	GO 95, Rule 18	PG&E failed to meet the Tier 3 HFTD six-month deadline under Rule 18 deadline to correct three Level 2 priority issues for Poles 014/186(A) and 014/186(C).
3.	GO 95, Rule 19	SED instructed PG&E on September 23, 2022, to preserve Pole 09/131 and attached equipment. PG&E disposed of the pole and equipment on October 22, 2022.
4.	GO 95, Rule 31.1	PG&E failed to complete function testing for the Oxbow Junction Pole Switches 47 and 49, as required by PG&E's inspection and maintenance policies and Rule 31.1.
5.	GO 95, Rule 31.1	PG&E failed to clear vegetation within a 10-foot radius of the Oxbow Junction Pole and up to a height of eight feet during the fire season as required by PG&E's operating agreement with the United States Forest Service (USFS) and Rule 31.1.
6.	GO 95, Rule 31.1	PG&E's CIRT canceled six repairs without adequate justification required by PG&E policies, in violation of Rule 31.1.
7.	GO 95, Rules 37 and 54	PG&E failed to maintain required clearance between the Oxbow Junction Pole and its lower jumper cable on September 6, 2022, violating Rule 37 clearance requirements, as modified by Rule 54.4(D).
8.	Resolution E-4184	PG&E filed an initial report on September 8, 2022, instead of by September 7, 2022, as required by Resolution E-4184.

A. Rules and Requirements Violated

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

> *Companies shall undertake corrective actions within the time periods stated for each of the priority levels set forth below. . .*
>
> *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 violations that create a fire risk located in Tier 3 of the High Fire-Threat District; (2) 12 months for potential violations that create a fire risk located in Tier 2 of the High Fire-Threat District.

General Order 95, Rule 19 – Cooperation with Commission Staff; Preservation of Evidence Related to Incidents Applicability of Rules states in part:

Each utility shall provide full cooperation to Commission staff in an investigation into any major accident (as defined in Rule 17) or any reportable incident (as defined in CPUC Resolution E-4184), regardless of pending litigation or other investigations, including those which may be related to a Commission staff investigation. Once the scene of the incident has been made safe and service has been restored, each utility shall provide Commission staff upon request immediate access to: Any factual or physical evidence under the utility or utility agent's physical control, custody, or possession related to the incident. . .

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

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."

General Order 95 Rule 37 – Minimum Clearances of Wires above Railroads, Thoroughfares, Buildings, Etc. states in part:

[C]learances between conductors, guys, messengers or trolley span wires and buildings, poles, structures, or other objects, shall not be less than those set forth in Table 1. . .

General Order 95 Rule 54 - Conductors states in part that modifications of the basic clearances in Table 1 (see Rule 37) are contained in Rule 37 and sections of 54.4(D). In particular, 54.4(D)(6) Deadended on Pole, sub-section (b) states in part:

Where conductors are supported on a climbable pole in vertical configuration, the energized portions of such conductors shall have clearances of not less than … 18 inches from the surface of pole for voltages in excess of 7,500 volts.

CPUC Resolution 4184-E states in part:

Within 2 hours of a reportable incident during normal working hours or within 4 hours of a reportable incident outside of normal working hours, the utility shall provide notice to designated CPUC staff of the general nature of the incident, its cause and estimated damage. The notice shall identify the time and date of the incident, the time and date of notice to the Commission, the location of the incident, casualties that resulted from the incident, identification of casualties and property damage, and the name and telephone number of a utility contact person.

B. Witnesses

	Name	Title
1.	Ed Pike	CPUC Lead Investigator
2.	Mihail Cucu	CPUC Investigator
3.	Will Dundon	CPUC Investigator
4.	Jasdeep Lally	CPUC Investigator
5.	[redacted]	PG&E Principal Incident Investigator
6.		PG&E Systems Operator
7.		PG&E Systems Operator
8.		PG&E Transmission Trouble Responder
9.		PG&E Supervising Engineer for System Protection
10.	Sophia Fong	US Forest Service Lead Investigator

C. Evidence Received

	Source	Date	Description
1.	PG&E	September 8, 2022	Initial Incident Report
2.	CPUC	September 23, 2022	Evidence Preservation Instructions to PG&E (email)
3.	PG&E	October 6, 2022	20-Day Report
4.	CPUC	October 21, 2022	Site Visit Observation Report #1
5.	CPUC	October 26, 2022	Site Visit Observation Report #2
6.	CPUC	October 28, 2022	Site Visit Observation Report #3
7.	CPUC	November 29, 2022	Site Visit Observation Report #4
8.	CPUC	December 20, 2022	Data Request SED-01
9.	PG&E	January 23, 2023	Response to SED-01 (Tranche 1)
10.	PG&E	February 10, 2023	Response to SED-01 (Tranche 2)
11.	PG&E	February 24, 2023	Response to SED-01 (Tranche 3)
12.	CPUC	May 17, 2023	Data Request SED-02
13.	PG&E	June 16, 2023	Response to SED-02 (Tranche 1)
14.	PG&E	June 30, 2023	Response to SED-02 (Tranche 2)
15.	PG&E	July 21, 2023	Response to SED-02 (Tranche 3)
16.	CPUC	August 1, 2023	Data Request SED-03
17.	PG&E	August 30, 2023	Mosquito Fire Presentation (by [redacted] on Behalf of PG&E)
18.	PG&E	September 1, 2023	Response to SED-03 (Tranche 1)
19.	PG&E	September 5, 2023	PG&E Photos showing dumpsters in area where PG&E Disposed of Pole 09/131
20.	PG&E	September 21, 2023	Response to SED-03 (Tranche 2)
21.	CPUC	October 10, 2023	Data Request SED-04
22.	PG&E	November 9, 2023	Response to SED-04 (Tranche 1)
23.	PG&E	December 1, 2023	Response to SED-04 (Tranche 2)
24.	CPUC	December 21, 2023	Data Request SED-05
25.	CPUC	January 19, 2024	Site Visit Observation Report #5

26.	PG&E	January 24, 2024	Response to SED-05 (Tranche 1)
27.	PG&E	February 7, 2024	Response to SED-05 (Tranche 2)
28.	CPUC	February 27, 2024	Data Request SED-06
29.	PG&E	March 22, 2024	Response to SED-06 (Tranche 1)
30.	PG&E	April 5, 2024	Response to SED-06 (Tranche 2)
31.	CPUC	April 22, 2024	Data Request SED-07
32.	PG&E	May 9, 2024	SED-07 Responses (Tranche 1)
33.	PG&E	May 16, 2024	SED-07 Response (Tranche 2)

II. Background

The Mosquito Fire ignited on September 6, 2022, at approximately 1800 hours (see Figure 1 below). A nearby PG&E weather station measured a temperature of 102 degrees Fahrenheit[2] but PG&E stated that the conditions did not meet the criteria for a Public Safety Power Shut-off event.[3]

Figure 1: Mosquito Fire ignition near Oxbow Junction Pole (shown near lower right side of photo).[4]

[2] PG&E Mosquito Fire 20-Day Report (October 6, 2022) (20-Day Report).

[3] DRU11846_PGE-CPUC_06162023_SED_002_Mosquito Fire_Q014 (June 16, 2023) provided in response to SED-02 Q14.

[4] Image source: PCWA Files Lawsuits Against PG&E, Seeks Damages Related to Mosquito Fire, Roseville Today (December 27, 2022), available at https://www.rosevilletoday.com/news/auburn/pcwa-lawsuit-pge-mosquito-fire/ (last viewed September 27, 2024).

Three 60 kilovolt (kV) transmission circuits (Middle Fork #1, Oxbow Tap and Weimar #1) converge at the Oxbow Junction Pole north of the Rubicon River and east of Foresthill, California, as shown below in Figure 2. The Mosquito Fire ignition area and all poles shown in Figure 2 are located in a Tier 3 HFTD.[5]

Figure 2: Orange line indicates Weimar #1 circuit to Foresthill sub-station; yellow indicates Middle Fork #1 circuit to Middle Fork Powerhouse; purple indicates Oxbow Tap.[6] Red marker indicates Oxbow Junction Pole location. Green markers indicate other pole locations.

The fire was contained on October 22, 2022, at 1018 hours. It burned 76,788 acres, destroyed 78 structures, and damaged 13 structures.[7] CAL FIRE did not report any fatalities[8] and local media reported two firefighter injuries.[9] PG&E reported spending approximately $35.9 million to repair its

[5] Tier 3 HFTD are areas where there is an extreme risk (including likelihood of wildfire and potential impacts on people and property) from utility related wildfires. See HFTD maps at https://www.cpuc.ca.gov/industries-and-topics/wildfires/fire-threat-maps-and-fire-safety-rulemaking (last viewed October 3, 2024). Mosquito Fire ignition location of 39.00591, -120.7447 from CAL FIRE webpage "Mosquito Fire," available at https://www.fire.ca.gov/incidents/2022/9/6/mosquito-fire/(last viewed October 3, 2024).

[6] Locations are based on PG&E data. Map prepared in Google Earth.

[7] CAL FIRE webpage "Mosquito Fire," and CAL FIRE "Incident Update" https://www.fire.ca.gov/incidents/2022/9/6/mosquito-fire/updates/52799595-c17b-4169-9eeb-bfc94a748f97 (last viewed September 27, 2024).

[8] CAL FIRE "Incident Update."

[9] "Forest Service opens criminal investigation into Mosquito Fire's start, PG&E says in filing," The Sacramento Bee, September 26, 2022. https://www.sacbee.com/news/california/fires/article266367576.html#storylink=cpy"

facilities.[10] PG&E estimated its liability, including third-party damage claims, at $100 million as of December 31, 2023.[11]

III. Fire Authority Report

USFS is the lead agency in this fire investigation. As of the date of this report, USFS had not yet issued its fire investigation report for the Mosquito Fire. SED may revise this investigation report once USFS releases their investigation report.

IV. SED Review and Analysis

A. Circuit Configuration and Timeline of Events

1. Configuration of Circuits Served by Oxbow Junction Pole on September 6, 2022

At the time of the incident, the Oxbow Junction Pole supported three transmission circuits and two switches serving these circuits. PG&E's Middle Fork #1 and Weimar #1 60 kV transmission circuits connect to the Oxbow Junction Pole.[12] In addition, a short PG&E 60 kV transmission circuit called the "Oxbow Tap" connects the six-megawatt Placer Couty Water Authority (PCWA) Oxbow Powerhouse to the Oxbow Junction Pole.

Switch 49 at the Oxbow Junction Pole was usually closed, connecting the Weimar #1 line to the Oxbow Junction Pole (and allowing power to flow from the Oxbow Powerhouse to the Weimar #1 line). Switch 47 was usually open to isolate the Middle Fork #1 circuit from the Oxbow Junction Pole. This switch configuration prevents a fault on the Middle Fork #1 line from impacting the Weimar #1 line and vice-versa. PG&E could close Switch 47 to connect the Middle Fork #1 circuit to the Oxbow Junction Pole and allow the flow of power from Middle Fork #1 through Switch 47 to the Weimar #1 circuit if Switch 49 was also closed.

Each of the three circuits is served by circuit breakers (CBs) at other locations (as discussed further below). These CBs can open or close to electrically isolate and de-energize each circuit on a planned basis, or to protect electrical equipment or reduce wildfire risk in response to unexpected voltage or current outside the range programmed into the CB.[13]

2. Timeline of Events on September 6, 2022

At 0000 hours on September 6, 2022, Switch 47 was open, isolating the Middle Fork #1 circuit from the Oxbow Junction Pole. Switch 49 was closed, connecting the Oxbow Tap and Weimar #1 circuits via the Oxbow Junction pole.

[10] DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q030_R001.pdf (March 22, 2024) provided in response to SED-06 Q30.

[11] See PG&E SEC Form 10-K filed on February 22, 2024, page 61.

[12] See Figure 2 above.

[13] When a CB contacts are closed, power can flow through the CB. When the CB contacts are open, power cannot physically flow through the CB, de-energizing a line or segment that is isolated by the CB.

At approximately 1508 hours, the Oxbow Tap voltage dropped below the normal operating range of the Oxbow Powerhouse, causing CB 42 at the Oxbow Powerhouse to open and take the powerhouse offline.[14] PG&E planned to bring the Oxbow Powerhouse back online by closing Switch 47 to connect the Middle Fork #1 circuit with the Oxbow Tap and Weimar #1 circuits to increase voltage on the Oxbow Tap circuit (and Weimar #1 circuit). Increasing the Oxbow Tap voltage to within the operating range of the Oxbow Powerhouse would allow the powerhouse to resume operation.[15]

Table 2 below lists switch and CB operations as PG&E executed its plan to bring the Oxbow Powerhouse back online. At PG&E's direction, the Northern California Power Agency (NCPA), scheduling coordinator for PCWA generation facilities, closed CB 32 at PCWA's Middle Fork Powerhouse at 1815 hours.[16] Closing CB 32 energized Switch 47 for one second or less before CB 32 relayed and tripped open, de-energizing Switch 47.[17] Immediately thereafter, PG&E received an Energy Management System signal that CB 32 was closed again, despite PG&E not having given "the NCPA Operator permission … [to close CB 32]."[18] This second close would have briefly re-energized Switch 47 before CB 32 tripped open again and de-energized the switch.

[14] 20-Day Report, p. 2. Low voltage on the Weimar #1 circuit resulted in low voltage on the Oxbow Tap line, which was connected to the Weimar #1 circuit. CB 42 opened at the Oxbow Powerhouse, electrically isolating the Oxbow Powerhouse from the Oxbow Tap and thus also the Weimar #1 line.

[15] 20-Day Report, p. 2.

[16] 20-Day Report, p. 3.

[17] Closing CB 32 energized the section of the Middle Fork #1 circuit between CB 32 and the Oxbow Junction Pole, briefly energizing Switch 47. See 20-Day Report, page 2. A relay trip means that the relay opened the CB because the data reflecting current and other conditions on the circuit fell outside the operating parameter programmed into the relay, which could occur due to an electrical fault.

[18] 20-Day Report, p. 2.

Table 2: Summary of PG&E data regarding switch and CB operations on September 6, 2022[19]

Time	Event
15:11:49	CB 42 located at the Oxbow Powerhouse opened on a relay trip.[20]
18:06:57	NCPA remotely opened CB 32 located at PCWA's Middle Fork Powerhouse.
18:10:54	PG&E remotely opened CB 52 located on the Weimar circuit.[21] Thus, Middle Fork CB 32, Weimar CB 52, and Oxbow CB 42 were open and the Oxbow Junction Pole was de-energized.
18:12	PG&E remotely closed Switch 47 while the Middle Fork #1-60 kV and Weimar #1-60 kV circuits were de-energized.[22]
18:15:03	NCPA remotely closed Middle Fork CB 32. CB 52 remained open.[23]
18:15:04	A relay tripped open Middle Fork CB 32.
18:15:21	Middle Fork CB 32 closed a second time but a relay tripped CB 32 open within one second[24]
18:40:58	PG&E remotely closed Weimar CB 52 to re-energize the Weimar #1 60 kV circuit.

At 1817 hours, NPCA reported to PG&E's Grid Control Center that a fire had ignited near Switch 47 at Oxbow Junction.[25] Approximately 11 minutes later at 1828 hours, PG&E staff asked NCPA staff, "whether there was a fire or 'just arcing' at Switch 47."[26]

At 1820 hours, PG&E dispatched a transmission trouble responder. At 2000 hours, a CAL FIRE Battalion Chief Incident Commander gave the trouble responder permission to drive to the Oxbow Junction. The trouble responder reported later that Switch 47 appeared to be closed.[27]

[19] PG&E DR1 Q19 supplement (April 10, 2023) contains the data listed in this table unless otherwise noted.

[20] PG&E DR1 Q19 supplement (April 10, 2023) states that that PG&E received this data from PCWA.

[21] CB 52 serves PG&E's Weimar Substation and can open or close the connection of the Weimar #1 line to the Weimar-Halsey 60 kV line. See PGE-CPUC-00012135 revised, provided by PG&E as a supplement to SED-01 Q18.

[22] PG&E 20-day report dated October 6, 2022, page 3.

[23] [redacted], PG&E Supervising Engineer for System Protection, explained during a June 16, 2022, meeting between SED and PG&E that CB 52 was open at the time the fire ignited.

[24] PG&E stated that it received this data from PCWA.

[25] PG&E 20-day report.

[26] DRU11846_PGE-CPUC_06162023_SED_002_Mosquito Fire_Q021 (May 17, 2023) provided in response to SED-02 Q21.

[27] PG&E 20-day report.

At 1150 hours on September 7, 2022, PG&E restored service to the 2,699 customers affected by the service interruption.[28] The Mosquito Fire continued to burn for 46 days until full containment on October 22, 2022, according to CAL FIRE.[29]

B. Site Observations

SED observed evidence in the field at the Oxbow Junction area, at a CAL FIRE facility, and at a PG&E contractor storage facility. See Table 3 and further discussion below.
Table 3: Site Observation Visits

Visit #	Date	Purpose
1.	9/22/22	Observe the Oxbow Junction Pole and attached equipment, nearby poles and conductors, and the terrain in the Oxbow Junction area.
2.	9/30/22	Observe PG&E evidence collection near the Oxbow Junction Pole; and take additional photographs of the local terrain, surrounding vegetation, and the fallen Pole 09/131.
3.	10/19/22	Observe batteries that previously powered motors which operated Switches 47 and 49.
4.	11/3/22	Observe collection of three conductor sections originally attached to the Oxbow Junction Pole (before the Oxbow Junction Pole was seized by USFS).
5.	1/19/24	Observe Oxbow Junction Pole and attached equipment seized by USFS, and evidence collected by USFS from the ground near the Oxbow Junction Pole.

1. Site Observation #1 – September 22, 2022

SED investigators met USFS and PG&E staff at PG&E's Foresthill substation. USFS staff communicated protocols for the site visit and prohibited touching or collection of any evidence. USFS, PG&E, and SED staff then proceeded to Oxbow Junction, which was controlled by USFS.[30]

General Observations
SED investigators observed dead trees and burned vegetation, as well as surviving vegetation, in the area around Oxbow Junction.

[28] PG&E 20-day report. Attachment 7 to PG&E's 20-day report states that PG&E first because aware of a customer outage at 1810 hours ("FNL", or "First No Light"). The report does not specify whether this time is related to when CB32 opened or other grid operation(s) in response to the fire.

[29] See CAL FIRE webpage "Mosquito Fire."

[30] USFS communicated to SED that USFS had recently removed unspecified evidence as necessary to prevent damage from rainstorms.

Figure 3: View of Oxbow Junction Pole (14/191) and grey rectangular switch control boxes, with steep terrain to the right (north) of the pole.[31]

The terrain north of Oxbow Junction is very steep, as shown in Figure 3. The area immediately next to the base of the Oxbow Junction Pole is nearly vertical, and higher up the hillside is steep with loose dirt and unstable rocks. Thus, SED investigators could not safely observe PG&E equipment on the side of the pole facing the hill such as the Switch 47 upper control rod. (PG&E photos of this equipment are shown later in this report.)

The metal Oxbow Junction Pole was labeled 14-191. SED investigators did not observe any major structural damage to this pole. SED estimates the coordinates based on Google Earth as latitude 39.006768° longitude -120.743725°.

SED investigators observed conductors for at least one full pole span in each direction from this pole. SED did not observe any trees, branches, or other vegetation in contact with PG&E

[31] SED took this photo from the east side of the Oxbow Junction Pole during site visit #1 on September 22, 2022.

conductors, poles, or other equipment aside from a fallen pole and attached equipment as discussed below. SED investigators did not see any unusual conductor sag.

PG&E Switches

PG&E staff informed SED investigators that Switch 47 controls the connection of the Middle Fork #1 60 kV circuit to the Oxbow Junction Pole and is normally open, preventing the flow of power between this circuit and the pole.[32] Switch 49 controlling the Weimar #1 circuit is normally closed. Both switches can be opened and closed either manually or remotely. Each circuit and switch includes three phases (i.e. top, middle, and lower phase based on the respective location on the pole) for a total of six phases between the two switches as shown below in Figure 4.

Figure 4: Switches 47 and 49 on Oxbow Junction Pole[33]

All phases for both Switches 47 and 49 appeared closed, meaning that the end of the blade that rotates touched the jaws and closed that connection as shown in Figure 5 below.

[32] See SED Site Observation Report for September 22, 2022, site visit. See p.5.

[33] SED staff took this photo September 22, 2022.

Figure 5: Switch 47 bottom phase in closed position. Red circle shows rotating end of blade within jaws.[34]

SED investigators could not see some parts of the switch equipment facing the hill to the north of the pole and thus could not observe any marks and/or other signs of electrical arcing or other damage.

Additional PG&E Poles

SED investigators saw Pole 09/131 on the ground (Figure 6 below) two poles east of Oxbow Junction. SED investigators were unable to access the pole due to its location on a steep hillside (Figure 7 below).

Figure 6: Partially burned pole 09/131 on Middle Fork #1 line.[35]

[34] SED staff took this photo September 22, 2022.

[35] SED staff took this photo September 22, 2022.

Figure 7: Terrain near fallen Pole 09/131 - east of Oxbow Junction[36]

Observations and Evidence Collection

PG&E staff photographed the Oxbow Junction Pole from a bucket truck and with a drone. PG&E staff "observed a jumper on the lowest phase of the Oxbow Junction Switch 47 at PG&E Pole 014/191 that did not appear to have the proper clearance from the interconnection switch rod. Photos taken during that visit also showed damage to the interconnection switch [i.e., control] rod."[37] The control box contained a motor that connected to this control rod and could open and close all three phases of Switch 47.

PG&E's September 22, 2022, photographs of this pole (see Figure 8 and Figure 9) show the lowest phase jumper bending toward the pole. In contrast, the middle and upper phase jumpers bend away

[36] SED staff took this photo September 22, 2022.

[37] 20-day Report, p. 3.

from the pole. PG&E photographs also show the lower jumper contacting or essentially contacting the control rod (Figure 10) and evidence of scorch marks on the rod (Figure 11).

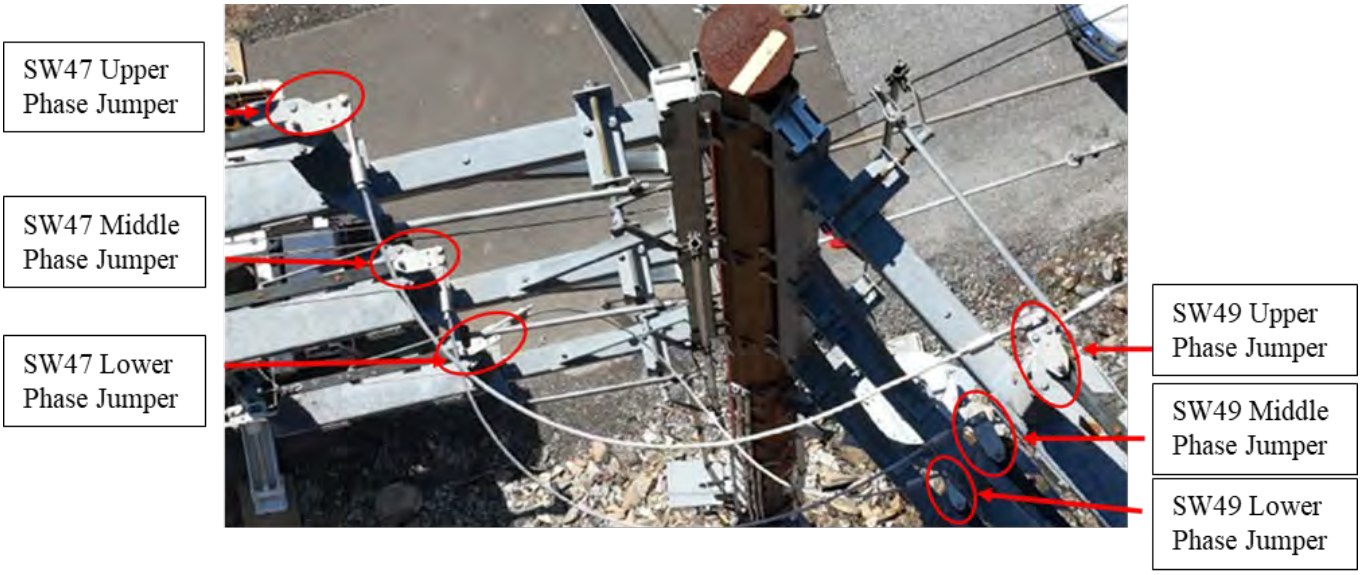

Figure 8: Oxbow Junction Pole on September 22, 2022, with jumper connector pads circled.[38]

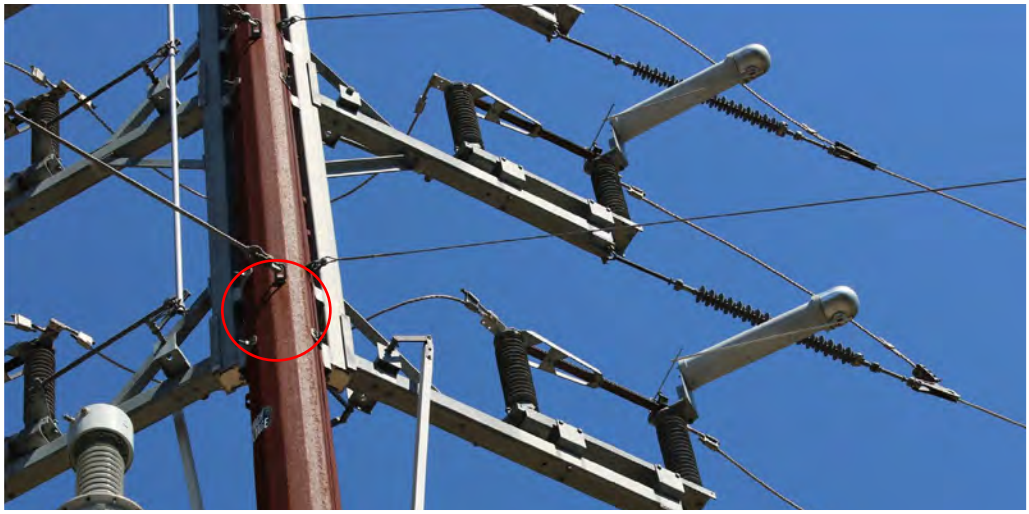

Figure 9: Left side of photo shows Switch 49 and right side shows Switch 47. Red circle shows jumper connecting to lowest phase of Switches 47 and 49.[39]

[38] Photo PGE-CPUC-00012446 provided by PG&E as supplemental response to SED-01 Q9. SED added red circles and labels. Photo taken September 22, 2022, per "Pacific Gas and Electric Company: Mosquito Fire," [redacted]., PGE-CPUC-00022591, provided August 30, 2023 - see PGE-CPUC-00022608.

[39] PGE-CPUC-00012295 April 18, 2023, provided as attachment to response to SED-01 Q9.

Figure 10: Jumper wire kinked on lowest phase of Switch 47.
Red circle indicates damaged section of control rod.[40]

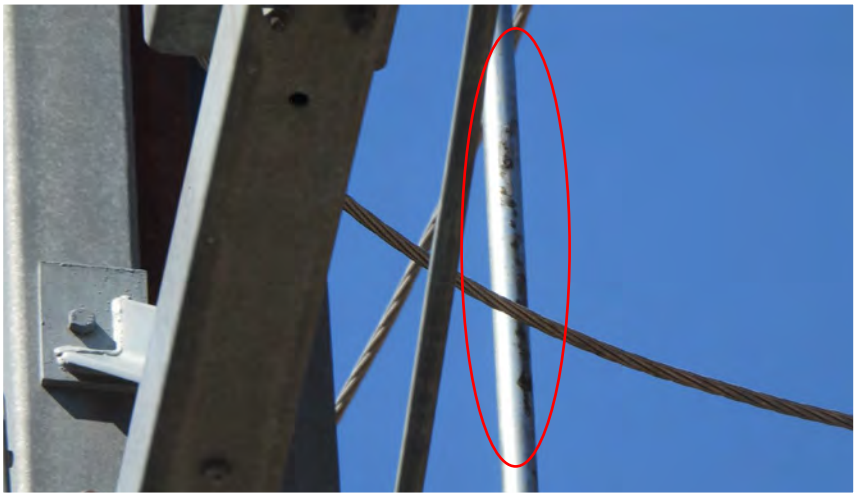

Figure 11: Control rod next to Switch 47 jumper.
Red indicates damaged section of control rod.[41]

[40] PGE-CPUC-00012403 April 18, 2023, provided as attachment to response to SED-01 Q9.

[41] PGE-CPUC-00012393 April 18, 2023, provided as attachment to response to SED-01 Q9.

2. Site Observation #2 – September 30, 2022

SED investigators returned to Oxbow Junction on September 30, 2022, and took additional photographs of the local terrain and vegetation. SED investigators also took additional photographs of Pole 09/131 from a distance (Figure 12 below).

Figure 12: Pole 09/131 on ground two poles east of the Oxbow Junction Pole location, showing burned base (circled at left) and the unburned crossarm (circled at right)[42]

Prior to Site visit #2, the USFS removed and took possession of the Oxbow Junction Pole and transformer, the control box, rods, vacuum interrupters, jumper assemblies, and switch 49 jumper.[43] Aside from conductors, SED staff did not see any part of the Oxbow Junction Pole on September 30, 2022.

Figure 13: Weimar #1 circuit conductors on the ground north of former Oxbow Junction Pole location.[44]

[42] SED took this photo during the September 30, 2022, Site Observation Visit.

[43] Email from [redacted] of PG&E to Ed Pike September 25, 2022. USFS separately provided SED with an inventory of 34 items that USFS seized on September 24, 2022.

[44] SED took this photo during the September 30, 2022, Site Observation Visit.

SED investigators observed disconnected Weimar #1 circuit conductors not seized by USFS just north of Oxbow Junction. These conductors were previously connected to the Oxbow Junction Pole. SED investigators also saw the conductors for the Oxbow Tap and the Middle Fork #1 circuits that were previously attached to the Oxbow Junction Pole and subsequently spliced together.

3. Site Observation Visit #3 – October 19, 2022

SED investigators met with PG&E staff and representatives from other organizations at a PG&E contractor facility in Santa Clara to observe two pairs of batteries that had provided power to the motor operators for Switches 47 and 49. The batteries were locked in a control box during the September 22, 2022, site observation visit. USFS removed these batteries along with the Oxbow Junction Pole and returned the batteries to PG&E on September 24, 2022.[45]

PG&E staff stated during the site observation visit that the condition of the batteries was unchanged from September 24, 2022.[46] SED investigators observed and photographed both pairs of Power Sonic model PS-12180 NB batteries including PG&E contractor measurements of the voltage of the batteries.

4. Site Observation #4 – November 3, 2022

On November 3, 2022, SED investigators drove to Oxbow Junction, where SED investigators and third-party representatives observed PG&E's collection of several conductors as evidence at SED's request.[47]

[45] PG&E staff informed SED on October 12, 2022, that the USFS seized the batteries on September 24, 2022, and then transferred the batteries to PG&E staff at the Forest Hill substation later that day. PG&E then transferred the batteries to PG&E's contractor (October 12, 2022, email "Evidence collection/ repair work notification" from [redacted], PG&E staff, to SED staff Ed Pike).

[46] See SED Site Observation Report for October 19, 2022, site visit (third visit). See p.2.

[47] See Figure 2 showing the locations of relevant poles and circuits at the incident location.

Conductor Collection

Figure 14: Conductor collection by helicopter and bucket truck[48]

The condition of the conductors prior to collection appeared unchanged from the September 30, 2022, site visit. The ends of the Weimar circuit #1 conductors that were previously connected to the Oxbow Junction Pole lay on the ground. The conductor serving Middle Fork #1 circuit was spliced together in the air with conductor serving the Oxbow Tap.[49]

PG&E collected conductor sections, as shown in Figure 14 above, using two helicopters and a bucket truck. PG&E's contractor then inspected and collected the conductors as evidence.

SED observed pitting, as shown in Figure 15 below, on all three phases of the conductor sections that were formerly near Pole 09/132. PG&E staff stated that birds, branches, or debris can cause this pitting (i.e. by creating a path for arcing if they bridge or partially bridge between conductors).

[48] SED took this photo on November 3, 2022, during Site Observation Visit four.

[49] PG&E stated that USFS did not take conductor segments between the Oxbow Junction Pole and other poles. USFS did take the jumpers for Switches 47 and 49 as noted below in discussion of Site Observation Visit #5.

Figure 15: Surface damage to south phase of conductor formerly attached to Pole 09/132.[50]

SED investigators also observed marks on the ends of the Oxbow Junction conductor. Based on SED's observations of these marks, abrasion could have caused these marks when USFS cut and dropped the conductor on September 24, 2022, or when PG&E collected the conductor on November 3, 2022.

Figure 16: Marks on conductor section formerly attached to south side of Pole 14/190.[51]

Pole 09/131 replacement

SED observed that PG&E had removed the fallen and partially burned Pole 09/131 and installed a replacement. PG&E staff said that PG&E removed this equipment and placed it in dumpsters.[52] PG&E disposed of this pole and associated equipment despite SED's September 23, 2022, instructions that PG&E preserve this evidence.

5. Site Observation Visit #5 – January 19, 2024

On January 19, 2024, SED investigators and legal counsel along with other organizations attended USFS's Mosquito Fire evidence viewing at a CAL FIRE facility in Grass Valley.

[50] SED took this photo on November 3, 2022, during Site Observation Visit #4.

[51] SED took this photo on November 3, 2022, during Site Observation Visit #4.

[52] PG&E email dated November 1, 2022, from PG&E to SED and titled "[EXTERNAL] RE: Preservation of Evidence for Mosquito Fire - please respond ASAP." SED later learned that PG&E removed and disposed of this evidence on October 22, 2022, as discussed later in this report.

SED observed the following evidence:

- The upper section of the Oxbow Junction Pole and attachments and two lower sections of the base of the pole.
- Vacuum breakers, conductor sections, and other equipment that USFS separated from the Oxbow Junction Pole when seizing the pole.
- Small metallic objects collected by USFS from the ground near the Oxbow Junction Pole prior to evidence viewing by SED on September 22, 2022.
- Tarps and plastic wrappings used to collect the items listed above.

At the CAL FIRE facility, SED observed some elements of the Oxbow Junction Pole that were not viewable during SED's initial September 22, 2022, site visit, due to their location on the pole and proximity to a steep hill. Figure 8, as shown earlier in this report, shows a view from above the pole of the lower jumper connected to lower phase jumper connector pads.[53] The lower jumper attached to Switch 47 curved into the control rod, while the middle (connected to middle phase jumper connector pads) and upper jumper (connected to upper phase jumper connector pads) for Switch 47 curved away from control rod.

Lower jumper and control rod

SED staff observed and photographed the position of the lower phase jumper between Switches 47 and 49, which matched photos taken by PG&E on September 22, 2022. The lower jumper curves from Switch 47 into the upper section of the Switch 47 control rod, contacting the rod as shown below in Figure 17. The curve of the jumper changes where it contacts the control rod, indicating that the control rod exerts pressure on the jumper and causes an inflection point. Unlike the lower jumper, the upper and middle jumpers curve around the pole.

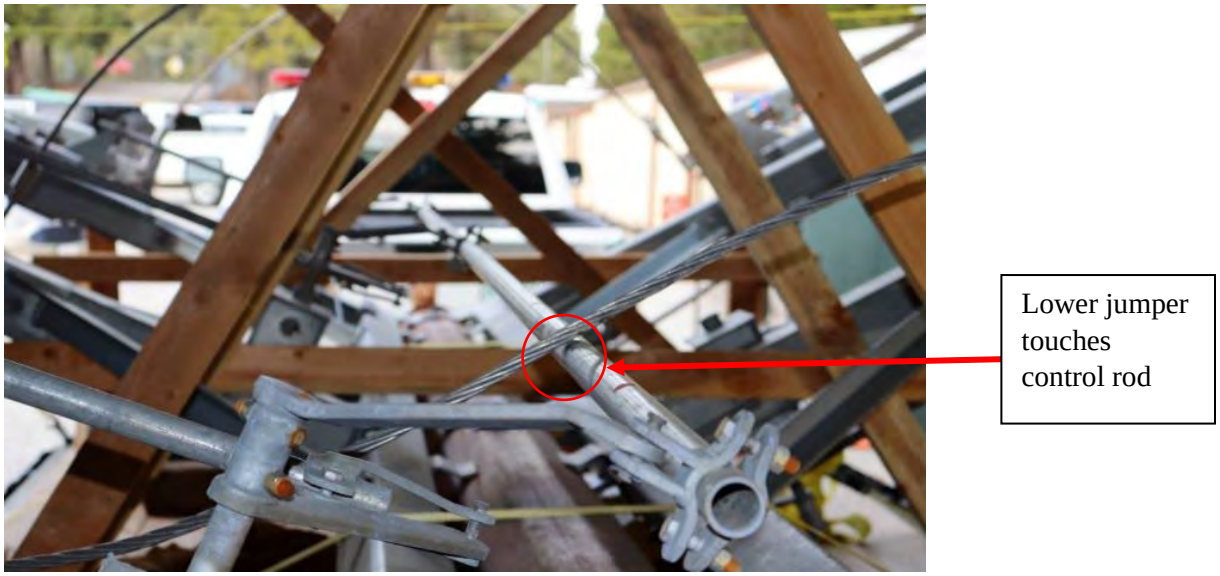

Figure 17: SED staff observed lower phase jumper touching control rod[54]

[53] PG&E refers to the jumper connector pads as "swivels."

[54] SED took this photo on January 19, 2024, during Site Observation Visit #5.

SED staff observed unusual black marks on the upper control rod and sections of the rod where the top layer of metal had apparently flaked off the rod (see Figure 17 and Figure 18). SED staff also observed dark marks on the rectangular lower section of the control rod that appeared consistent with scorching damage. In addition, SED staff observed pitting and discoloration on the jumper near where it contacted the control rod.

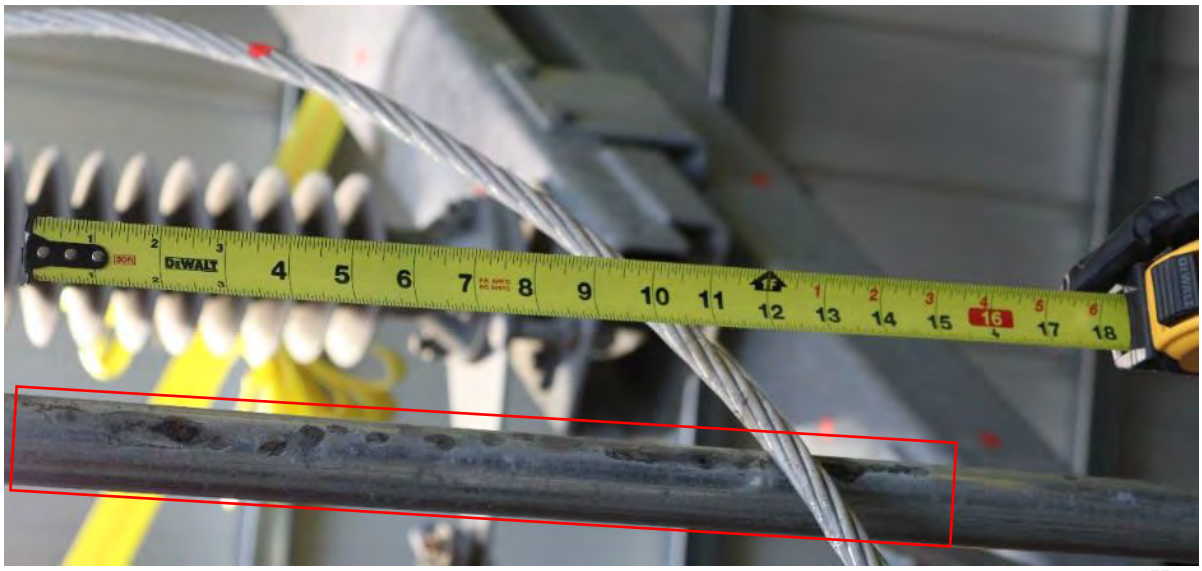

Figure 18: Control rod scorch marks and flaking near contact with lower jumper.[55]

The control rod is not electrically isolated from the metal structural part of the pole. Thus, the scorch marks and flaking on the control rod and pitting on the jumper are consistent with an electrical fault caused by the jumper touching the pole at the control rod. Contact between the jumper and the pole created a fault path via the control rod and the main metal structural part of the pole into the ground.

[55] SED took this photo on January 19, 2024, during Site Observation Visit #5. The investigator stood near Switch 47. USFS placed the red stickers on equipment for its own reference.

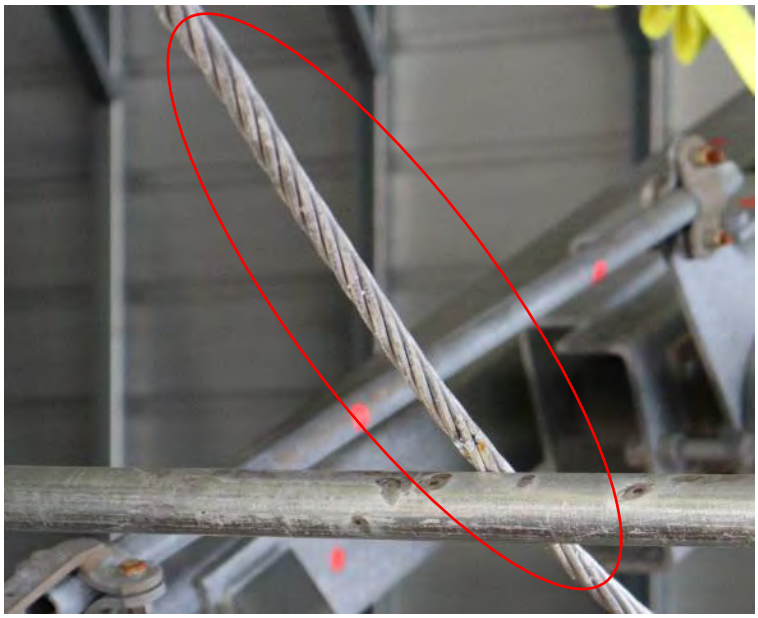

Figure 19: Pitting on lower phase jumper.[56]

Switch 47 Lower phase jumper connector pad

SED observed the connection of the Switch 47 lower phase to a four-hole jumper connector pad or "jumper connector pad." Figure 20 below shows the jumper connector pad and the terminal attached to the jumper cable to the left of the terminal.

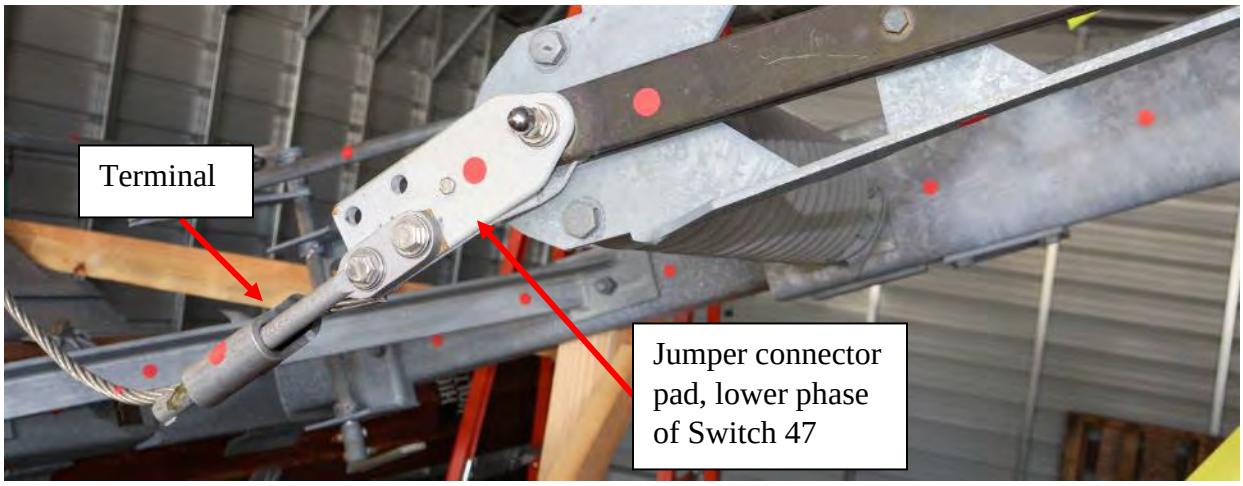

Figure 20: Jumper connector pad, which connects to lower phase of Switch 47 and terminal (left of jumper connector pad), which connects to lower phase jumper.[57]

[56] SED took this photo on January 19, 2024, during Site Observation Visit #5.

[57] SED took this photo on January 19, 2024, during Site Observation Visit #5.

SED did not observe any signs of damage or deterioration to the visible sections of the nut and other hardware connecting the jumper connector pad to the switch shown in Figure 21 below. SED could not observe the bolt holding the jumper connector pad because the bolt was covered by attached equipment.

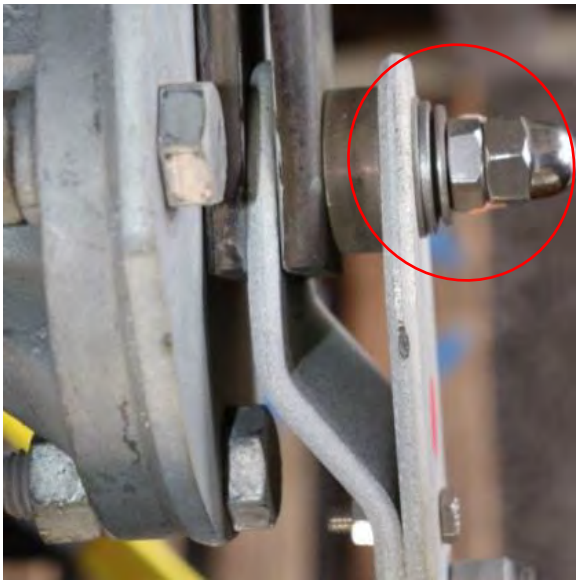

Figure 21: Hardware connecting jumper connector pad to lower Switch 47;
SED circled visible hardware in red.[58]

PG&E stated that while "some incidental movement of the jumper, terminal, and jumper connector pad is normal and expected during switch operations," the jumper connector pad should not rotate significantly when the free end of the switch blade rotates to open and close the switch.[59],[60] Based on PG&E's statement, the jumper connector pad and the Switch 47 lower jumper bolted to that pad should remain stationary with the jumper curving away from the control rod, similar to the middle and upper jumpers. However, SED observed that the Switch 47 jumper connector pad position changed between when PG&E photographed the jumpers during an inspection prior to the Mosquito Fire and when SED observed the jumper connector pad[61].

SED also observed that the lower jumper connector pad was connected to Switch 49 at an unusual angle of approximately 30 degrees from in line with the closed switch blade, as shown in Figure 22 below. The aerial photograph of the pole taken by PG&E on September 22, 2022, shows the top phase jumper connector pad in line with the switch blade when the switch is closed, in contrast to the lower jumper connector pad observed by SED on January 19, 2024. The misalignment of the

[58] SED took this photo on January 19, 2024, during Site Observation Visit #5.

[59] DRU12861_EI_EI220906A_Foresthill_PD_DR_CPUC_Q007_R001.pdf provided by PG&E on January 24, 2024, in response to SED-05 Q7.

[60] Figure 5 shows the free end of the switch blade.

[61] PGE-CPUC-00023883, provided in response to SED-002, Q17 (October 04, 2023) was part of an aerial overhead inspection. On page 2 of DRU11846_PGE-CPUC_10042023_SED_002_Mosquito Fire_Q017_Supplemental, PG&E stated that this photo was taken May 16, 2022.

Switch 49 lower jumper connector pad appeared to contribute to the position of the lower jumper allowing contact with the control rod.

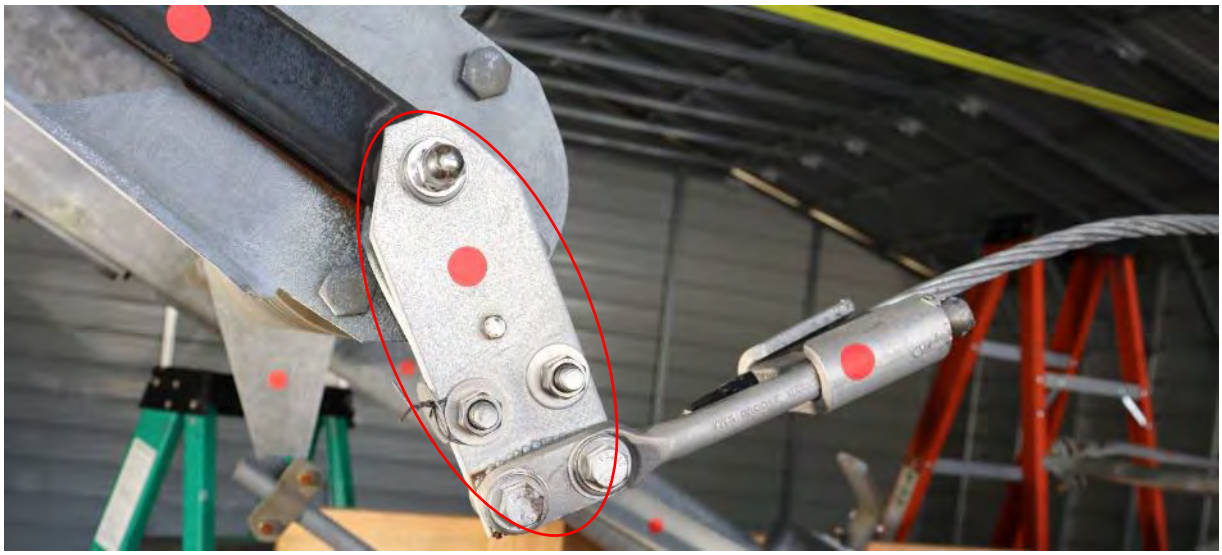

Figure 22: Jumper connector pad which connects the lower jumper to lower phase of Switch 49.[62]

Additional Equipment from Oxbow Junction Pole

Figure 23 below shows scorch marks on a conductor section that connected to the Switch 49 bottom phase.[63]

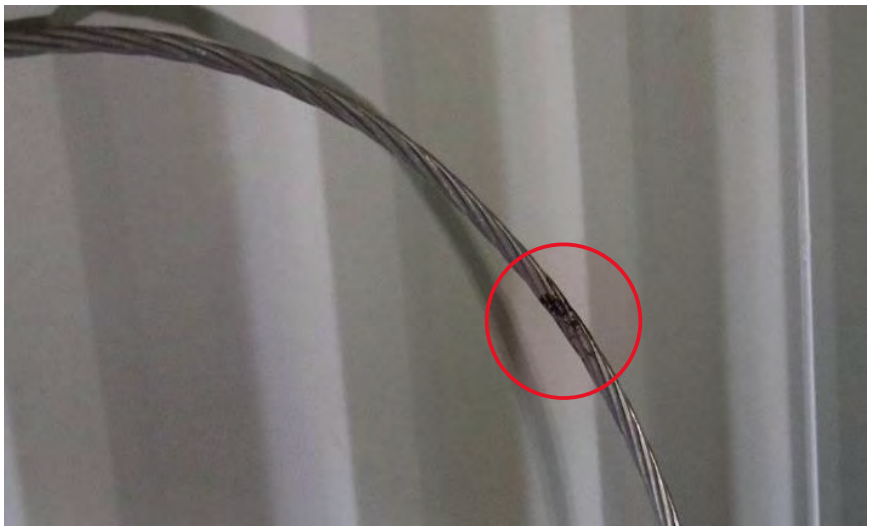

Figure 23: Scorch mark on conductor collected by USFS from Switch 49 bottom phase.[64]

[62] SED took this photo on January 19, 2024, during Site Observation Visit #5.

[63] USFS labeled the conductor as "Switch 49 inner jumper extension" and posted a sign "Switch 49 bottom" where this conductor was displayed.

[64] SED took this photo on January 19, 2024, during Site Observation Visit #5.

SED also observed conductor pitting,[65] shown in Figure 24 below. USFS evidence tags indicate that this conductor was formerly attached to the lowest phase of Switch 49.[66] Electrical faults such as the September 6, 2022, fault commonly cause such pitting. SED cannot definitively determine when the pitting on the Switch 49 lowest phase conductor occurred. SED also observed some additional dark marks that appeared to have eroded over time on a different section of the same conductor and thus likely occurred prior to September 6, 2022.

As shown in Figure 24, an evidence container (sealed with red tape) contains a small silver-colored bead that detached from the lower phase of Switch 49 after USFS collected this equipment, including the pitted section noted above.

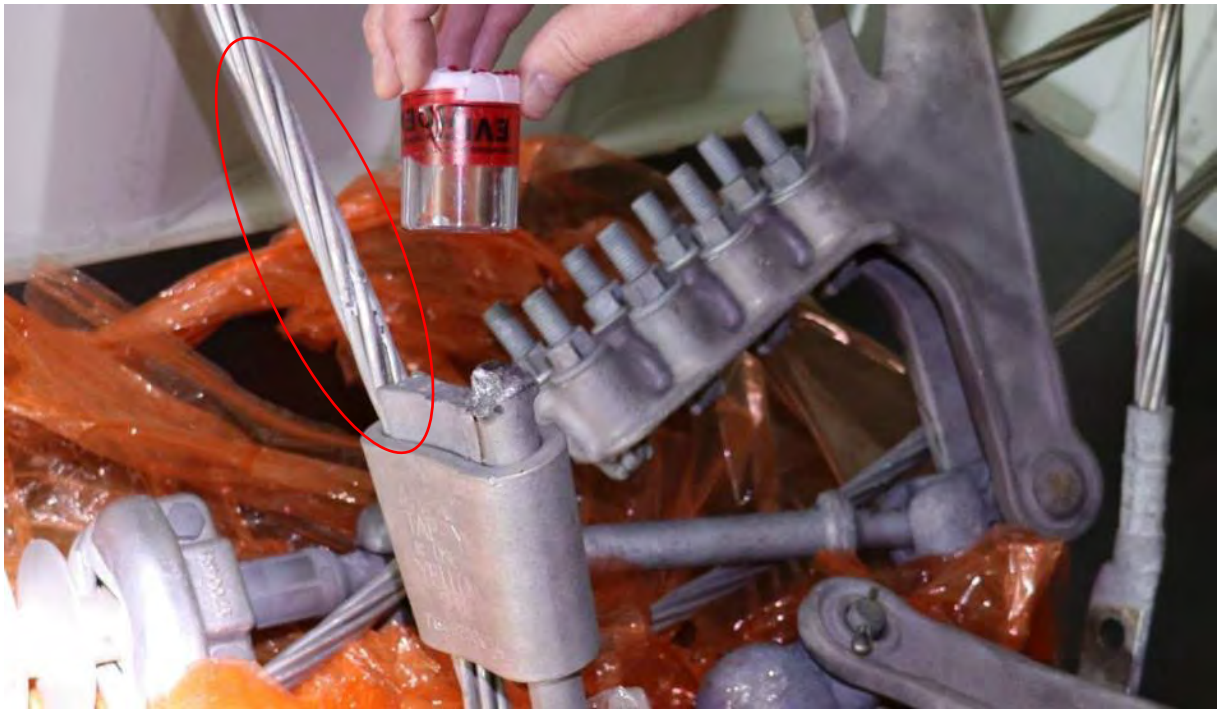

Figure 24: Switch 49 lower phase conductor section pitting.[67]

[65] Pitting occurs when some areas of the surface of the conductor melt and fall to the ground or re-solidify on the conductor surface.

[66] USFS labeled the conductor as “Switch 49 inner jumper extension” and posted a sign “Switch 49 bottom” where this conductor was displayed.

[67] SED took this photo on January 19, 2024, during Site Observation Visit #5.

Metallic Objects Collected from Ground Near Oxbow Junction Pole

USFS collected several metallic flakes from the ground near the Oxbow Junction Pole on September 17, 2022, as shown in Figure 25 below.[68] The color of these flakes (steel or a similar silver colored metal) matches the upper section of the control rod shown earlier. As noted earlier, Figure 18 shows damage to the control rod, including areas where the top layer of metal apparently flaked off and was later collected by USFS as evidence. This evidence indicates that the lower jumper touched the upper control rod on September 6, 2022, causing an electrical fault that flaked these small pieces of metal from the upper control rod.

Figure 25: Examples of metallic flakes collected by USFS.[69]

C. Document Review and Investigation

SED reviewed and analyzed records and audio and video recordings, interviewed PG&E SMEs, and examined physical evidence to determine compliance with Commission safety regulations including GO 95. PG&E provided records in response to seven SED data requests totaling 237 questions. The questions requested transmission system operation and electrical fault data, installation and maintenance procedures, inspection forms and procedures, inspection reports, maintenance and work order records, and other information related to the Mosquito Fire and PG&E compliance with Commission requirements for electrical facilities in the Oxbow Junction area.

[68] All containers were marked with the date September 17, 2022, except for one container marked with the date September 24, 2022.

[69] SED took this photo on January 19, 2024, during Site Observation Visit #5.

1. PG&E Failed to Implement Maintenance Requirements for Switches 47 and 49, in Violation of GO 95, Rule 31.1.

Oxbow Junction Pole Switches 47 and 49 operational issues

The nameplates on Switches 47 and 49 indicate they were manufactured in March 2009. PG&E believes that they were installed shortly thereafter.[70] PG&E staff could open and close the switches either from the control box on the pole, or remotely through a Supervisory Control and Data Acquisition (SCADA) system command.

On April 25, 2022, at around 0000 hours, a PG&E trouble responder discovered that the lower phase of Switch 47 had only partially opened in response to an earlier PG&E SCADA command on April 20, 2022, at 1713 hours.[71] The lower phase of the switch had melted.[72] PG&E replaced the entire lower phase switch assembly except for the base and pole-side insulator by April 25, 2022.[73] PG&E attempted to operate Switch 47 several times after the lower phase Switch 47 repairs and before the Mosquito Fire on September 6, 2022.[74] While PG&E reported successfully operating Switch 47 several times, on April 30, 2022, four attempts to remotely open and close the switch via SCADA commands failed.[75] In addition, PG&E initially suspected that closing Switch 47 on an energized circuit on August 26, 2022, caused arcing at the Oxbow Junction Pole.[76] Faulty operation of Switch 47, such as a partial close, could cause such arcing. However, a PG&E trouble responder did not find evidence of arcing at the switch.[77]

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[70] PGE-CPUC_02102023_SED_001_Q68 Mosquito Fire (February 10, 2023) provided in response to SED-01 Q68.

[71] DRU11846_PGE-CPUC_06302023_SED_002_Mosquito Fire_Q031.pdf (June 30, 2023) provided in response to SED-02 Q31.

[72] PGE-CPUC-00013488.pdf (July 21, 2023), provided in response to SED-02 Q11. See page 1 covering April 24 and April 25, 2022, of this PG&E "Switching Log" (number T22-008397).

[73] DRU11846_PGE-CPUC_06302023_SED_002_Mosquito Fire_Q031.pdf (June 30, 2023) provided in response to SED-02 Q31(b); page 2 of PGE-CPUC-00005010, PG&E "Electric Overhead Tag Notification #123404435" (notification was printed October 21, 2022; last entry is dated April 27, 2022) provided in response to SED-01 Q30. The repair was completed by April 25, 2022 (PGE-CPUC-00005023.pdf, see email dated April 25, 2022, at 1445 hours).

[74] See Section VII of this report. As noted in the Appendix, the switch operation data is from Attachment 1 to PGE response to SED-02 Q11.

[75] See Section VII of this report. As noted in the Appendix, the switch operation data is from Attachment 1 to PGE response to SED-02 Q11.

[76] On August 26, 2022, at approximately 07:25 PG&E remotely closed Switch 47. Soon after, the Middle Fork Circuit Breaker (CB) 32 and Weimar CB 52 relayed, i.e., the circuit breakers opened. PG&E Grid Control Center personnel initially suspected that arcing at the Oxbow Junction Pole caused CB 32 and CB 52 to open (PGE-CPUC_03172023_SED_001_Q70 Mosquito Fire.pdf (March 17, 2023) provided in response to SED-01 Q70, p. 2).

[77] A PG&E inspection found no evidence of arcing according to a PG&E transcript dated January 17, 2022. (PGE-CPUC-00012131, provided March 17, 2023, in response to SED-01 Q70). This transcript reflects a recorded call from the PG&E trouble responder to the PG&E system operator on August 26, 2022, at 08:02 (PGE-CPUC_03172023_SED_001_Q70 Mosquito Fire.pdf (March 17, 2023) provided in response to SED-01 Q70).

PG&E maintenance requirements for Switches 47 and 49

PG&E's "Switch Maintenance and Inspection Program for Electric Transmission" or "Utility Procedure TD-1006P-02" contains specific function testing and other inspection requirements.[78] At the time of the Mosquito Fire, the procedure included the following function test requirements:[79]

- Lubricate switch components (section 4.1 sub-section 5);
- Perform function testing of motorized switch operation (section 4.2); and
- Test SCADA communication functionality (section 4.3).

PG&E acknowledged that Utility Procedure TD-1006P-02 required function tests every six years for Switches 47 and 49 beginning on March 31, 2015, unless triggered sooner.[80] PG&E's first six-year deadline to complete function testing requirements was March 31, 2021.

Table 1. Switch Inspection Cycle

Voltage	Switch Type	Structure Type	Detailed Visual Inspection [2]	Function Test (Years)
500 kV[1]	N/A	N/A	N/A	N/A
230 kV	Manual	Steel	• Max 6 years or as triggered. • Visual inspections must be done more frequently with structural inspections cycles described in TD-1001M-B009	6 or as triggered
115 kV 60 kV/70 kV	Manual	Wood		
		Steel		
	Motor-Operated	Wood		
		Steel		

[1] 500 kV switch maintenance is performed within the Substation Maintenance Plan.

[2] Detailed visual inspection may not be performed on the same set of switches as the function test, during the same time frame.

Figure 26: PG&E transmission switch inspection and function testing cycles.[81]

[78] PGE-CPUC-00013797, provided on July 21, 2023, as an attachment to response to SED DR2 Q26, Utility Procedure: TD-1006P-02, Switch Maintenance and Inspection Program for Electric Transmission revision 1, published March 5, 2021 (Utility Procedure TD-1006P-02).

[79] Utility Procedure TD-1006P-02, function testing requirements in section four.

[80] The following issues can trigger a function test apart from the six-year cycle: component failure, components proven defective through testing or the Material Problem Report (MPR) process, or intermittent or unknown status alarms through SCADA. DRU11846_PGE-CPUC_07212023_SED_002_Mosquito Fire_Q026.pdf (July 21, 2023) responses to SED-02 Q26(b)(ii) and Q26(c).

[81] Utility Procedure TD-1006P-02.

PG&E claims that observing the switch during operation accomplishes the purposes of function testing.[82] PG&E acknowledges, however, that it did not perform the function testing requirements at Switches 47 or 49 between September 6, 2012, and September 5, 2022.[83],[84] First, visual inspection does not lubricate the switch components. Second, PG&E did not provide documents showing that PG&E verified proper operation of the SCADA system during a visual inspection (i.e. activating the SCADA system and coordinating between an inspector on site during the attempted operation and PG&E staff controlling the SCADA system during the attempted SCADA-initiated switch operation). PG&E's history of problems with remote SCADA operation of Switch 47 and arcing at the switch suggests that complete function testing including all maintenance procedures was critical.[85]

GO 95, Rule 31.1 requires that unless otherwise specified in the rules, all "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." Such accepted good practices include the utility's own requirements, such as the function testing requirements under TD-1006P-02 Section 4. Accordingly, PG&E violated Rule 31.1 by failing to complete Section 4 function testing requirements. The violation began on March 31, 2021 (the first six-year deadline for PG&E's function testing requirements) and continued until September 6, 2022.

2. PG&E Violated General Order 95, Rule 37 as Modified by Rule 54.4(D) when the Lower Phase Jumper Contacted the Oxbow Junction Pole.

PG&E failed to maintain adequate clearance between the Switch 47 lower jumper and the Oxbow Junction Pole. The Switch 47 control rod is considered part of the pole because it is not electrically insulated from the pole's central metal support.[86] The inadequate clearance created an electrical fault path from the jumper to the ground via the Switch 47 upper control rod and the Oxbow Junction Pole main metal support.

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[82] DRU11846_PGE-CPUC_07212023_SED_002_Mosquito Fire_Q026.pdf (July 21, 2023), provided in response to SED-02 Q26, section (b)(ii).

[83] DRU11846_PGE-CPUC_07212023_SED_002_Mosquito Fire_Q026.pdf (July 21, 2023), provided in response to SED-02 Q26(b)(iii). No function testing was performed at Switches 47 and 49 between September 6, 2012, and September 5, 2022. During that time, Switches 47 and 49 were operated several times a year.

[84] A PG&E inspector completed only the inspection sections of a "Transmission Line Switch Inspection Function Test" form for the Oxbow Junction Pole on April 23, 2021, and not the function testing section on page 6. See PGE-CPUC-00000640.pdf, provided on February 10, 2023, in response to DR1 Q11. This document is the "Electric Transmission Line Switch Inspection Function Test" form (form revision 0 dated March 2021) for the April 23, 2021, Oxbow Junction Pole inspection (the inspection and inspector review fields of this form are dated April 23, 2021; no other date is listed on the form).

[85] DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q010_R001.pdf (March 22, 2024), response to SED-06 Q10, states that PG&E does not review or approve manufacturer testing of switches—which increases the importance of function testing in the field to verify proper operation.

[86] DRU11846_PGE-CPUC_06302023_SED_002_Mosquito Fire_Q016_CONF (June 30, 2023) provided in response to SED-02 Q16.

Observations and photos of Oxbow Junction Pole lower jumper show lack of clearance.
As previously noted, SED observed the lower phase jumper touching the Oxbow Junction Pole via the Switch 47 control rod during evidence viewing on January 19, 2024. PG&E stated that this jumper has sufficient rigidity to hold certain equipment in place.[87] Thus, the jumper's position had not changed between the last switch operation on September 6, 2022, and SED's observation of the jumper on January 19, 2024.

PG&E's 20-Day Report[88] acknowledged that the jumper appeared to lack sufficient clearance when PG&E viewed this equipment on September 22, 2022.[89] The 20-Day Report also states that September 22, 2022, photos show signs of damage to the Switch 47 control rod.[90]

A PG&E photo from a May 16, 2022, inspection[91] shows that the lower jumper's orientation to the Oxbow Junction Pole was similar to the middle and upper jumpers. The Switch 47 lower jumper connector pad was oriented at roughly a 90-degree angle to the bracket (i.e., the bracket attaching the switch to the pole) and aimed the jumper away from the pole.

In contrast, SED observed the lower jumper connector pad oriented in-line with this bracket on January 19, 2024 (as noted earlier in this report). SED also observed on January 19, 2024, that the lower connector pad aimed the lower jumper toward the pole, consistent with Figure 8 earlier showing this equipment on September 22, 2022.

The Switch 49 lower jumper connector pad also appeared misaligned during January 19, 2024, evidence viewing (as noted earlier in this report). This misalignment potentially contributed to the change in the position of the lower jumper (unless the connection of this jumper connector pad to the switch was loose and the lower jumper pulled this pad out alignment when the lower jumper moved).[92]

PG&E has not provided evidence that the lower jumper position changed between May 16, 2022, and September 6, 2022. Thus, the lower jumper position likely changed on September 6, 2022, during switching operation and immediately before the Mosquito Fire ignited.

[87] DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q018_R001.pdf (April 5, 2024) provided in response to SED-06 Q18.

[88] 20-Day Report, p. 3.

[89] See Figure 8.

[90] As shown in Figure 11.

[91] See PGE-CPUC-00023883.

[92] The Switch 47 lower jumper connector pad was misaligned by 90 degrees when viewed by SED and played the larger role in causing the lower jumper to contact the control rod compared to the Switch 49 lower jumper connector pad misalignment.

Lack of clearance resulted in arcing damage to control rod and lower jumper.
The lack of clearance between the lower jumper and the Oxbow Junction Pole resulted in arcing, scorching, metal flaking on the control rod, and pitting on the jumper.

- On January 19, 2024, SED observed dark marks on the Switch 47 upper control rod consistent with scorching; areas of the rod where metal had flaked off' and the metallic flakes (which a color matching the upper control rod) that USFS collected from the ground on September 17, 2022.[93] PG&E stated that pictures from an inspection on May 16, 2022, (Figure 27 below) show the jumper and control rod without this damage.[94], [95]
- On January 19, 2024, SED observed pitting on the lower phase jumper near where this jumper contacted the Oxbow Junction Pole (as noted earlier).
- PG&E acknowledged that dark marks from the rectangular lower section of the control rod visible during the September 22, 2022, site visit are consistent with damage from an electrical fault.[96]

Based on evidence reviewed by SED, arcing, as evidenced by the damage to the lower phase jumper and control rod, most likely created an ignition source for the Mosquito Fire.

[93] See section IV.B describing Site Observation Visit #5 and showing evidence labels marked with the September 17, 2022, collection date.

[94] PG&E states that it "had not observed metal flakes missing from [the control rod] or other damage to the upper section of either the Switch 47 or Switch 49…[control] rod" before the Mosquito Fire ignition on September 6, 2022, noting that photos taken during PG&E's May 16, 2022, aerial overhead inspection also did not indicate damage. PG&E DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q001_R001.pdf, response to SED-06 Q1.

[95] PG&E stated that it "had not observed the black marks on the Switch 47 [control] rod" before the ignition of the Mosquito Fire, noting that photos from PG&E's May 16, 2022, aerial overhead inspection do not show any black marks on the Switch 47 control rod. DRU11846_PGE-CPUC_06302023_SED_002_Mosquito Fire_Q016_CONF (June 30, 2023), provided in response to SED-02 Q16.

[96] DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q003_R001.pdf (August 5, 2024) provided in response to SED-06 Q3.

Figure 27: Switch 47 upper control rod and lower jumper on May 16, 2022, showing no visible damage.[97]

General Order 95 Rule 37 and Rule 54 clearance requirements

GO 95, Rule 37 requires a minimum clearance of 12 inches between conductors and the Oxbow Junction Pole (see Table 1, case 9 and column F, based on the voltage of the circuits served by the Oxbow Junction Pole).[98] Rule 54.4(D)(6)(b) modifies this Rule 37 clearance requirement with a stricter clearance requirement of 18 inches between conductors and the surface of poles where circuits "dead end," such as was the case with the Oxbow Junction Pole. The Oxbow Junction Pole also met the other criteria that trigger an 18-inch clearance requirement due to its voltage and conductor configuration.[99] Accordingly, PG&E violated Rule 37 (as modified by Rule

[97] This figure shows SED's crop of PG&E photograph PGE-CPUC-00012113. See DRU11846_PGE-CPUC_06302023_SED_002_Mosquito Fire_Q016_CONF.pdf (June 30, 2023), response to SED-02 Q16(b)(ii) indicating that PG&E took the original photo during an aerial overhead inspection on May 16, 2022.

[98] GO 95, Rule 37, Table 1 case 9 column F applies to supply conductors with voltage between 22.5 and 300 kV. This case requires a minimum clearance from the surface of the pole of 1/4 of the minimum pin spacing shown in Table 2 Case 15 which equals 12 inches (1/4 of the 48-inch minimum pin spacing for Case 15, column I for supply conductors between 75,000 and 150,000 volts).

[99] Section 54.4-D (6) applies when circuits dead-end at a pole (rather than continuing past the pole). The Weimar #1 circuit, Middle Fork #1 circuit, and the Oxbow Tap circuits all dead-end at the Oxbow Junction Pole. Section 54.4(D)(6)(b) sets the minimum clearance at 18 inches for climbable poles with conductors in a

54.4(D)(6)(b)) because the lower phase jumper had zero clearance from the Oxbow Junction Pole when the jumper contacted the upper section of the Switch 47 control rod.

3. PG&E Failed to Clear Vegetation from the Base of the Oxbow Junction Pole in Violation of GO 95, Rule 31.1.

Pole Vegetation Clearance Requirements

GO 95, Rule 31.1 states in part that where CPUC rules do not contain specific maintenance practices "…maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for the … maintenance of communication or supply lines and equipment." Accordingly, established vegetation clearance requirements in the "Operations and Maintenance Plan Electric Facilities on National Forest System Lands within the Pacific Southwest Region" (O&M Plan) represent "good practices" enforceable under Rule 31.1, given the location of the Oxbow Junction Pole within the Tahoe National Forest boundary.[100] The O&M plan specifies "required activities to operate and maintain safe and reliable electric and ancillary facilities."[101]

The O&M Plan requires removing vegetation from around the Oxbow Junction Pole annually before the onset of fire season and maintaining bare ground through the entire fire season.[102] The fire season began on May 16, 2022, for the area where the Oxbow Junction Pole is located.[103] PG&E acknowledged that the Oxbow Junction Pole was subject to such pole vegetation clearance requirement prior to the Mosquito Fire.[104]

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vertical configuration and voltages exceeding 7,500 kV such as the circuits connected to the Oxbow Junction Pole.

[100] "Operations and Maintenance Plan Electric Facilities on National Forest System Lands within the Pacific Southwest Region" (O&M Plan), updated August 2020, p. 1-1. PGE-CPUC-00022270 provided (September 1, 2023) in response to SED-03 Q20.

The O&M Plan was prepared by PG&E and Southern California Edison for the U.S. Department of Agriculture Forest Service. Andy Williams, PG&E Vice President, signed the plan on December 20, 2018, as shown on PDF page 41.

[101] The O&M Plan "describes the Utility's required activities to operate and maintain safe and reliable electric and ancillary facilities throughout the 11 local National Forests (Forests) with Pacific Gas and Electric Company" (p. 1-1, PDF p. 13). O&M Plan requirements parallel the vegetation practices specified in Public Resources Code section 4292 while extending these requirements to additional poles.

[102] O&M Plan p. A-1, PDF p. 46.

[103] DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q027_R001.pdf (March 25, 2024), response to SED-06 Q27. PG&E stated that Pole 014/191 is located in the Nevada-Yuba-Placer California Department of Forestry and Fire Protection CAL FIRE unit. CAL FIRE determined the beginning of the fire season.

[104] DRU11846_PGE-CPUC_07212023_SED_002_Mosquito Fire_Q004 provided (July 21, 2023) in response to SED-02 Q4.

Figure 28 below (left image) below illustrates the requirements including clearing the ground within a 10-foot radius of the pole and to a height of eight feet above ground level.[105] Figure 28 (right image) shows the requirement to clear a cylinder up to eight feet above ground for a sloped surface.

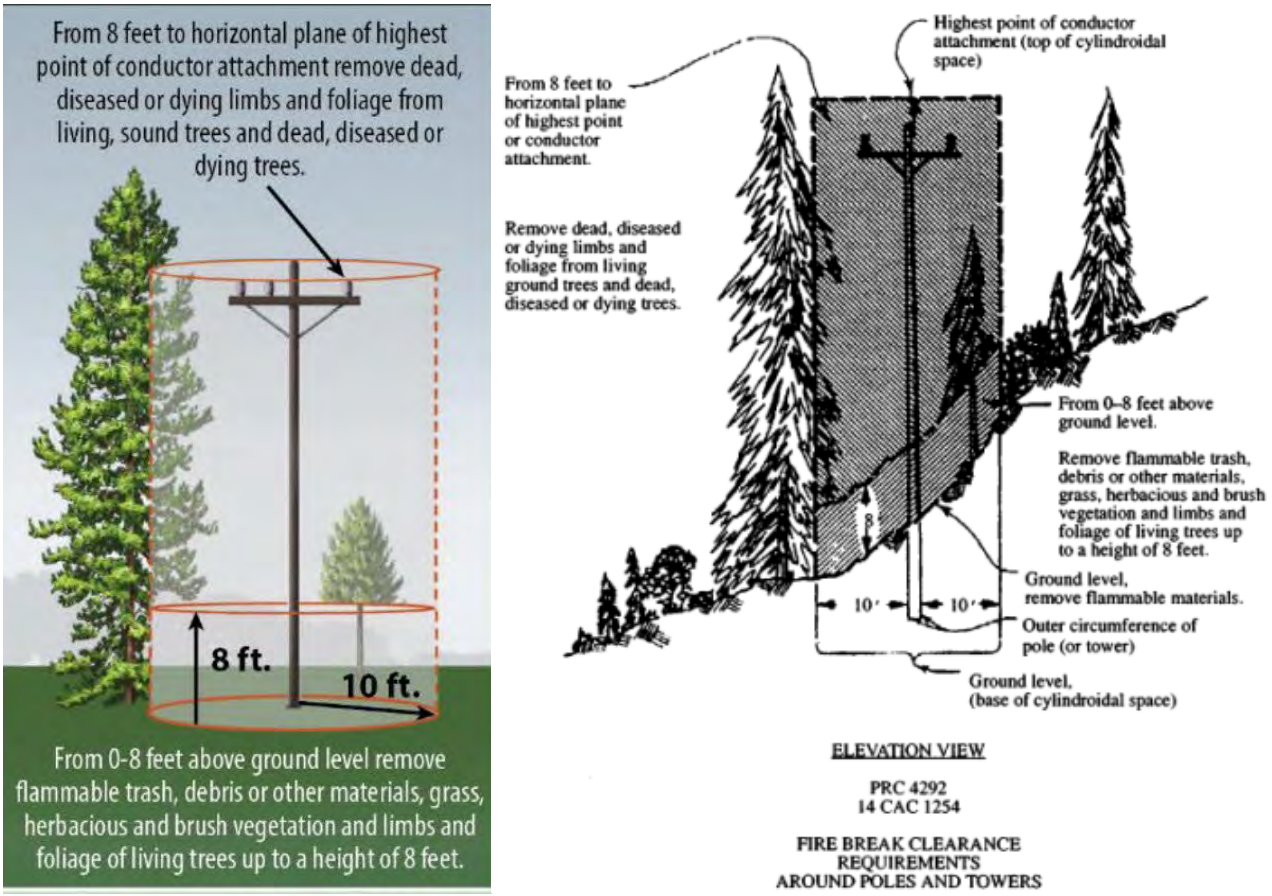

Figure 28: Pole clearance requirements for level ground (left)[106] and sloped ground (right).[107]

[105] See Appendix A of the O&M Plan for more details.

[106] O&M Plan, p. B-10.

[107] Cal. Code Regs., tit. 14, Div. 1.5, Ch. 7, Art. 4, Fig. 2: "Fire Break Clearance Around Poles and Towers;" Cal. Code Regs., tit. 14, § 1254, "Minimum Clearance Provisions--PRC 4292."

Figure 29 below shows vegetation on the grassy slope. This slope is north of the Oxbow Junction Pole and extends to the west and east.[108]

Figure 29: Vegetation near Oxbow Junction Pole on June 11, 2022[109]

SED asked PG&E to provide measurements of the distance from the Oxbow Junction Pole to a point on the hillside where the terrain transitions from a rocky surface to a grassy slope (as shown in Figure 30, below). PG&E stated that the distance from the pole to points along the hillside at [the height of the terrain change] was "between 8.6 feet and 10.7 feet." [110] Thus, a 10-foot radius cylinder around the pole included vegetation on the hill.

[108] Email (February 28, 2024) from [redacted], PG&E Regulatory Relations contact, to Ed Pike, SED staff confirmed the orientation of the slope re: the pole.

[109] Photo shown on Bates numbered page PGE-CPUC-00004787 of document PGE-CPUC-00004780, a June 11, 2022, Transmission Notification provided (Feb 24, 2023) in response to SED-01 Q61.

[110] DRU12861_EI_EI220906A_Foresthill_PD_DR_CPUC_Q002_R001.pdf (February 7, 2024) provided in response to SED-05 Q2(a).

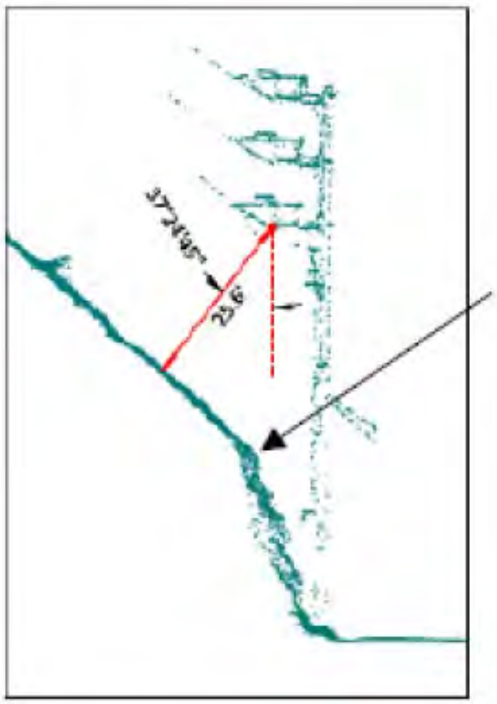

Figure 30: Reference point (black arrow) for measurements of distance from Oxbow Junction Pole to slope.[111]

Pole clearance history

PG&E provided SED with vegetation clearance records from 2017 to the date of the fire. These records, as shown in the Appendix of this report, indicate that PG&E cleared vegetation around the Oxbow Junction Pole several times between April 2017 and November 18, 2021.[112] However, PG&E did not clear vegetation from the pole between November 18, 2021, and September 6, 2022.[113] On May 2, 2022, PG&E issued Work Request ESBI000-0804W to a former PG&E contractor[114] to clear the pole (and others) but the work was not completed for the Oxbow Junction Pole[115] as shown in Figure 31 below (The two cells next to this work order are blank instead of

[111] DRU12861_EI_EI220906A_Foresthill_PD_DR_CPUC_Q002_R001.pdf provided (February 7, 2024) in response to SED-05 Q2(a).

[112] PGE-CPUC-00007447 or "Pole History t179404" (November 2, 2022) provided (March 17, 2023) in response to SED-01 Q12. Oxbow Junction Pole is numbered t179404 in this document. The table contained in PGE-CPUC-00007447 is shown in the Appendix of SED's incident investigation report.

[113] DRU12142_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_003_Q002.pdf (September 21, 2023) provided in response to SED-03, pp. 1-2.

[114] DRU12142_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_003_Q003.pdf provided (September 21, 2023) in response to SED-03 Q3. The PG&E document indicates that PG&E terminated this contractor in the summer of 2022.

[115] DRU12142_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_003_Q002.pdf (September 21, 2023), provided in response to SED-03 Q2(d). See pp. 1-2 of PG&E's document.

stating "complete" and the date of completion for pole t179404, the Oxbow Junction Pole).[116] PG&E did not identify a specific reason why this work was not completed.[117]

	Directions:	GO RIGHT AT SPLIT .3 MI TO P.					
	Comments:	TAKE MOSQUITO RIDGE RD 11 MILES TO NATIONAL FOREST RD 23 ON RIGHT, THEN GO .7 MILES TO SPLIT to rafter river access .3mi to pole on right !W120743258N39008223					
	Pole: T179404	Clr-NoChm	Deferred	**VMA:** NONE	EBSI0000880P	Complete	11/18/2021
					EBSI0000804W		

Figure 31: Excerpt from PG&E Vegetation Clearing Records[118]

PG&E's failure to comply with the O&M Plan pole clearance requirements left flammable vegetation near the Oxbow Junction Pole in violation of GO 95, Rule 31.1. This violation began on May 16, 2022, the start of the fire season as noted above, and continued until the area burned on September 6, 2022, during the Mosquito Fire.

4. PG&E Failed to Repair Loose Tie Wires at Poles 000/003, 014/186A and 009/130 in Violation of GO 95, Rule 18.

Utilities commonly secure jumpers and other conductors to utility pole insulators with tie wires. PG&E has acknowledged the need to repair loose tie wires to avoid "the jumper/conductor coming off the insulator, potentially resulting in phase-to-phase or phase-to-ground contact, which could result in a risk of arcing."[119]

PG&E policies require identification and repair of loose tie wires. PG&E's "Electric Transmission Preventive Maintenance" (ETPM) Manual requires correcting broken and loose tie wires as either an "A" (immediate) or "B" level priority.[120] The manual also contains criteria for whether to elevate these issues to priority "A" based mainly on whether the conductor is well seated with vertical load (see Figure 32 below). The ETPM Manual requires correcting these issues as a "B" priority if they are not elevated to the "A" priority level.

[116] PGE-CPUC-00007439, attachment to PG&E response (March 17, 2023) to SED-01 Q12. Document title is Work Request ESBI000-0804W (printed by PG&E on November 1, 2022). The document shows that a number of poles were cleared but pole T179404 (the Oxbow Junction Pole) was not cleared.

[117] DRU12142_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_003_Q003.pdf states in part "PG&E has not identified a specific reason why Pole T179404 was not worked in May 2022. However, PG&E is aware that the vendor responsible for completing that work order, [redacted], was generally behind schedule in performing clearance work during this time period. In light of [redacted] delays during this period, PG&E terminated its relationship with [redacted] in the summer of 2022 and transferred its pole-clearing work to a new vendor."

[118] Excerpt from PGE-CPUC-00007447.

[119] DRU11846_PGE-CPUC_07212023_SED_002_Mosquito Fire_Q047 (July 21, 2023) provided in response to SED-02 Q47a and b, describes potential risks of a loose jumper and/or insulator tie wire.

[120] PGE-CPUC-00013063 provided (June 16, 2023) as an attachment to response to SED-02, Q43.The document title is Electric Transmission Preventive Maintenance Manual (ETPM Manual) TD 1001M, dated August 31, 2020, revision 5, see p. 22, Table 4.

Component[1]	Priority Code			
	A (Immediate)	B (3 months)	E (12 months)	F (24 months)
Conductor-Steel (CONS) **Conductor-Wood (CNDW)** **Shield Wire/OPGW, ADDS, non-ADSS lashed[4] (SHLS) (SHLW)** **Jumpers (JUMS) (JUMW)** **Tie Wire (TIES, TIED)**	Corrosion >50% material loss Gunshot >40% of strands broken Arcing Broken or loose tie wire (conductor not well seated in the saddle with vertical load or not fully captured with tie wire)	Broken strands and out-of-lay strands (e.g., gunshot) 15 - 40% Dwg 028855 Corrosion 40% - 50% material loss Conductor clearances Broken or loose tie wire (conductor well seated in the saddle with vertical load or partially captured with tie wire) Broken ground wire, loose connector, tie wire, or weight Twisted bundled conductor	Corrosion 10 - 40% material loss Uneven sag (send to engineering for evaluation) Conductor kinked/pinched at clamp Broken strands and out-of-lay strands (e.g., gunshot) 5 - 15% Dwg 028855 Vibrating	**24-month tags for fiber cable only. See Section 2.4.8.**

Figure 32: PG&E EPTM Manual Table 4 excerpt. SED added red highlights.[121]

In addition, PG&E issued a May 10, 2022, document reminding staff to identify loose tie wires for repair because "multiple pole fires [started due to] conductors not being properly secured to insulators."[122] This document shows a loose tie wire and resulting pole fire (see Figure 33).

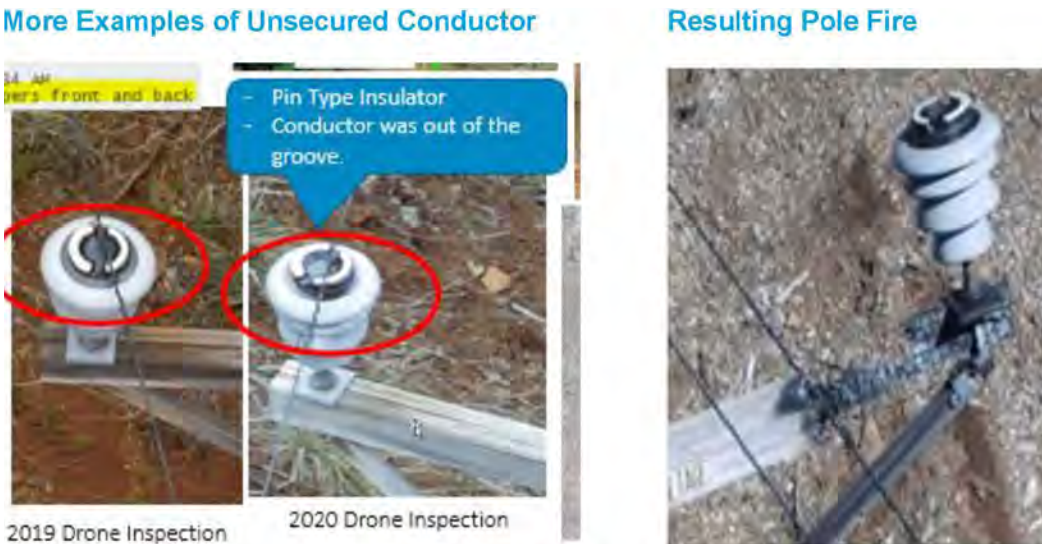

Figure 33: Loose tie wire (left) and resulting pole fire (right)[123]

[121] ETPM Manual, revision 5 p. 22.

[122] PGE-CPUC-00024565 (December 1, 2023) provided in response to SED-04 Q21. Title is "Five Minute Meeting Topic: Reminder during Inspections to Ensure Conductors are Properly Secured to Insulators via Tie Wires or Clamps" (May 10, 2022).

[123] Five Minute Meeting Topic: Reminder during Inspections to Ensure Conductors are Properly Secured to Insulators via Tie Wires or Clamps, p. 2.

The Appendix of this report shows other examples of 1) loose and 2) broken tie wires.[124]

PG&E cancelled repairs instead of repairing a loose tie wire at Pole 000/003

PG&E's May 25, 2022, Pole 000/003 inspection summary, noted that sections of tie wire were not secured to the center phase insulator (see Figure 34 below).[125] Because the pole is in a Tier 3 HFTD, PG&E's inspector and SME reviewer set a 90-day deadline for repairs consistent with PG&E policies. Rule 18 requires correcting this Level 2 priority hazard within 6 months (i.e., by November 25, 2022) based on the inspection finding that the tie wire required correction but not immediately.

Figure 34: Pole 000/003 center phase loose tie wire May 25, 2022[126]

PG&E's Centralized Internal Review Team (CIRT) incorrectly cancelled this notification on June 1, 2022, stating "Reviewed per … ETPM criteria and cancels this notification [i.e. work order] tie wire is not loose conductor also well seated and held tight."[127] This cancellation ignores the findings in the inspection report and is contrary to PG&E policies which require correcting loose tie wires. CIRT based its determination on criteria (i.e. whether conductor was well seated) that are relevant only for determining whether to escalate repairs to priority level "A." Therefore, PG&E violated GO 95, Rule 18 for failing to correct the loose tie wire.

[124] PGE-CPUC-00023106, provided in response to SED-03 Q16 (September 21, 2023). Document title is Identifying Conductor and Clearance Conditions TD-1001M-JA10 (published January 20, 2023, effective February 20, 2023). See pp. 4 and 6. The document requires repairing loose and broken tie wires.

[125] PGE-CPUC-00012836, provided (June 7, 2023) as a supplemental response to SED-01 Q15. SED believes that the date field on this Transmission Notification, which says May 25, 2022, refers to both the date of the inspection and the date of the Transmission Notification.

[126] PGE-CPUC-00012836, Bates stamped pages PGE-CPUC-000128642 (left photograph) and PGE-CPUC-000128644 (right photograph).

[127] PGE-CPUC-00012835. Provided as, provided (June 7, 2023) as supplemental response to SED-01 Q15. The last entry in this internal PG&E communication was dated June 1, 2022.

PG&E cancelled repairs and failed to correct a loose tie wire at Pole 014/186A

PG&E's June 9, 2022, Transmission notification 123833466 for Pole 14/186 states "LEFT POLE TIE WIRE NOT TO STANDARD."[128] PG&E also refers to the left pole as Pole 14/186(A), and the right pole as Pole 14/186(C).[129] Figure 35 below shows this loose tie wire.

Figure 35: PG&E photos of loose tie wire, Pole 014/186(A), May 26, 2022[130]
(SED outlined in red the loose tie wires)

PG&E staff set a 90-day deadline to correct the issue.[131] Rule 18 also requires that PG&E correct the loose tie wire as a Level 2 priority hazard in this Tier 3 HFTD.[132] However, PG&E's CIRT canceled notification 123833466 for Pole 014/186(A) on June 14, 2022 and stated "WORK WILL BE/HAS BEEN COMPLETED UNDER NOTIFICATION 121584077."[133] However, Notification 121584077 addressed only Pole 014/186(C) and not Pole 014/186(A).[134]

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[128] PGE-CPUC-00025080.pdf provided March 22, 2024. This document is the June 9, 2022, Transmission Notification for this pole. The notification also refers to a loose tie wire on the right pole.

[129] DRU12845_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q003_R001.pdf (December 21, 2023), supplemental response to SED4 Q26(a). PG&E stated that the left pole is designated "A" and the right pole is designated "C."

[130] Left photo is cropped from PGE-CPUC-00013953. Right photo is cropped from PGE-CPUC-00013956. PG&E relied on photos including these two to determine the condition of the left child, i.e. pole 014/186(A), as of May 26, 2022, per DRU12511_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q025_R001.pdf, provided (December 1, 2023) in response to SED-04 Q25 (b)(i).

[131] PGE-CPUC-00025080.pdf, "Transmission Notification" for Pole 014/186(C) (dated June 9, 2022), p. 1.

[132] DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q004_R001.pdf (March 22, 2024) provided in response to SED-06 Q4 states that all "child" poles of pole 186 are in a Tier 3 HFTD.

[133] PGE-CPUC-00024568 (an electronic communication stating that CIRT cancelled the notification) provided (December 1, 2023) as an attachment to PG&E's response to SED-04 Q25.

[134] PGE-CPUC-00005494, "Corrective Work Form Electric Transmission Line for line correction #121584077" (Notification 121584077) provided (March 17, 2023) as an attachment to SED-01 Q30.

Notification 121584077 addresses pole "014 186 RIGHT", i.e. 014/186(C). PG&E refers to the right child of pole 014/186 as pole 014/186(C) – see the top row on page two of Table A (provided by PG&E as a supplemental response to SED-02 Q45).

Figure 36 below shows the group of poles that contains both 014/186(A) and 014/186(C).

Figure 36: Photo from June 17, 2021, transmission notification.[135]
PG&E did not specifically identify the label (e.g., 14/186(A), etc.) for each pole.

PG&E made several inaccurate or contradictory claims in responses to SED data requests. First, PG&E's claimed on December 1, 2023, that the tie wire was "snug" and the jumper is snug to the insulator.[136] However, this claim was not supported by evidence because the inspection report shows that the tie wire was visibly loose and "uplifting" away from the insulator as shown in Figure 35 above. A strand of tie wire lay on top of the insulator rather wrapped tight around the "neck" of the insulator.

Second, PG&E's claim that two Poles (014/186(A) and 014/186(C)) were repaired under notification 121584077, is not consistent with the documents PG&E said support its claim (see summary in Table 4 below).[137] Figure 37 below shows that PG&E issued Notification 121584077 for a "single wood pole," Pole 014/186(C).[138] The notification shown in this figure also states that tie wire was repaired (i.e., retied) at a single insulator. On December 11, 2023, SED asked PG&E to

[135] PG&E provided PGE-CPUC-00005497.pdf, which contains this photo on Bates number page PGE-CPUC-00005503, in response to SED-1 Q30.

[136] DRU12511_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q025_R001.pdf (December 1, 2023) provided in response to SED-04 Q25(c)(i). This question asked PG&E to state "whether the tie wire was loose" or "snug against the biscuit." PG&E responded that "the tie wires appear sufficiently tight and snug against the biscuit. The jumper is snug to the pole insulators."

[137] DRU12511_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q025_R001.pdf provided (December 1, 2023) in response to SED-04 Q25 (b)(ii). PGE claimed that "the work was completed under Notification 121584077." Notification 121584077 contradicts PG&E's claim.

[138] A "field submission" entry for the tie wire repair states that PG&E staff retied a single insulator and thus repaired only one pole. Notification 121584077 p. 3.

provide evidence showing that Notification 121584077 addressed both Pole 014/186(C) and Pole 014/186(A), but PG&E failed to provide such evidence.[139]

Table 4: PG&E claims that tie wire was repaired at Pole 014/186(A)

Source	PG&E Claim	What Document States
June 17, 2021, Notification 121584077 for Pole 014/186(C)	Document shows that PG&E repaired two poles including 014/186(A)	PG&E repaired only one tie wire at 014/186(C)
Construction Completion Checklist for Notification 121584077	Document shows that PG&E repaired two poles including 014/186(A)	PG&E repaired tie wire per notification 121584077 for Pole 014/186(C)

Corrective Work Form
Electric Transmission Line

T3 DI WEIMAR #1 14/186 RPR INSW

LC # 121584077
Priority B - Urgt Compliance
Work Type 630 - ICW-Maintain Wood Strs > 60kV

Line Name 60152 WEIMAR #1
Functional Location ETL.7560.POLE.WDPS - 60152 WEIMAR #1-WOOD POLE STR
Equipment 44948153 014/186 RIGHT SINGLE WOOD POLE
Structure ID 014/186
Main Work Center SACTO - Sacramento
Required End Date 12/17/2021
Planner Group TLN - ET Line
Order # 45210962
Voltage
Wood ☐ Steel ☐

Field Submission Date/Time: 08/02/2022 at 9:03 AM
Comments: Retied insulator filled woodpecker holes

08/08/2022 08:09:17 PS[redacted]
UNABLE TO CLOSE NOTIF. CCSC DATE IS INCORRECT. REQUESTING COMP STATUS REMOVAL FOR CORRECTION.
08/08/2022 12:16:53 PST[redacted]
REMOVED COMP TASK PER [redacted] DATE TO BE REVISED BASED ON CCSC FORM.

Figure 37: Notification 121584077 for tie wire repair for Pole 014/186(C).[140]

[139] See DRU12845_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q002_R001.pdf (December 21, 2023) supplemental response to SED-04 Q25 (repeating, without valid support, earlier claims that PG&E completed the repair under Notification 121584077).

[140] Notification 121584077, p.3. SED added red boxes.

PG&E also claimed that repairs were completed at Pole 014/186(A) based on a Construction Completion Standard Checklist (CCSC) form stating that repairs were completed under Notification 121584077.[141] Notification 12154077 addressed only Pole 014/186(C) as shown earlier, and the CCSC form does not show that PG&E repaired Pole 014/186(A) in addition to Pole 014/186(C).

PG&E also claimed that specific photographs document a tie wire repair at Pole 014/186(A), but none of these photos show a tie wire attached to an insulator.[142] Therefore, SED finds that PG&E violated Rule 18 for failing to show that it corrected the loose tie wire at Pole 014/186(A).

PG&E improperly canceled repairs to Pole 009/130

A June 22, 2022, Transmission Notification Inspection Summary for Pole 009/130 states: "All phases have loose tie-wire with uplift, Insulator B-Urgent"[143] A PGE inspector created the notification, and a PG&E SME affirmed this finding. Rule 18 requires that PG&E correct this loose tie wire in a Tier 3 HFTD within six months.

PG&E repaired a similar loose but not fully detached tie wire shown in a May 25, 2022, inspection report for nearby Pole 009/132 (see Figure 38).[144] The notification states that CIRT reviewed based on the EPTM and agreed to the repair which was completed.[145]

[141] PGE stated in a February 28, 2024, email (from PG&E staff [redacted], Regulatory Relations, to SED staff Ed Pike) that "The CCSC form for LC 121584077 (produced as PGE-CPUC-00005568, PGE-CPUC-00005553) states that following the completion of the repair, the "tie wires [were] installed properly" on Pole 014/186, which reflects that the tie wires were repaired and installed properly on both the left and right child of Pole 014/186." However, PG&E misrepresented the content of this form. The form contains a check-box indicating "Tie wires installed properly when required", which indicated the type of repair and not the number of poles repaired. (PG&E staff checked this box.) The form does not explicitly state the number of poles addressed; the only indication of the quantity of pole(s) repaired is the reference to a notification for a single pole.

[142] PG&E's supplemental response to SED-04 Q25 (DRU12845_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q002_R001.pdf, December 21, 2023) states that "The photos documenting the completed [tie wire repair at the 014/186 left pole 186(A)] are at PGE-CPUC-00005512, PGE-CPUC-00005528, PGE-CPUC-00005548-51, PGE-CPUC-00005553, PGE-CPUC-00005561, PGE-CPUC-00005566, PGE-CPUC-00005568, PGE-CPUC-00005570, PGE-CPUC-00005574." The photos PG&E cited do not show a tie wire.

[143] PGE-CPUC-00013826 provided (July 21, 2023) as an attachment in response to SED-02 Q39. This document is a June 22, 2022, Transmission Notification Inspection Summary for Pole 009/130.

[144] PGE-CPUC-00012640, "TRANSMISSION NOTIFICATION" (created May 25, 2022), provided as a supplemental response to SED-01 Q11.

[145] See PGE-CPUC-00012638, notification ("LC") 123713662, (attached to PG&E's June 7, 2023, supplemental response to SED-01_Q11), on page PGE-CPUC-00012639, PG&E replaced the pole which would include replacement of the tie wire per a Transmission OH CCSC dated on November 6, 2022, which is a sub-set of PGE-CPUC-00023133 (no title) provided as an attachment to response (September 21, 2023) to SED-03 Q17. The CCSC page numbers are PGE-CPUC-00023142 and PGE-CPUC-00023143.

Figure 38: Loose tie wire at Pole 009/132 (middle phase)[146]
(SED outlined in red the loose tie wire)

In contrast, CIRT canceled the notification for tie wire repairs at Pole 009/130 on June 25, 2022.[147] CIRT stated "[reviewed] per PG&E ETPM criteria and [canceled] this notification. Insulators are within acceptable tolerance."[148] CIRT's decision to cancel the notification was inconsistent with the PG&E policies discussed earlier because loose tie wires require repairs before they become completely detached and create a fire hazard.[149] In addition, PG&E acknowledged on July 21, 2023, in response to an SED data request that the tie wire was loose[150] and a June 22, 2022, inspection identified "heavy damage" to tie wires.[151] PG&E subsequently made a contradictory claim, in response to a different data request, that the tie wire was snug against the biscuit and not loose while acknowledging "slack" in the tie wire.[152]

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[146] Photo source is PGE-CPUC-00012640.pdf, a May 25, 2022, Transmission Notification provided (June 7, 2023) as a supplemental response to SED-01 Q11.

[147] PGE-CPUC-00013837, a June 25, 2022, electronic communication (provided in response to SED-02 Q39) shows that PG&E cancelled the repair.

[148] DRU12511_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q020_R001.pdf response to SED-04 Q20(a) (December 1, 2023) states that PG&E "did not have to correct the condition identified in notification 123912664 [regarding pole 009/130 tie wire replacement] because upon review of the notification, CIRT determined that the tie wires were in acceptable condition. See PGE-CPUC-00013837, previously produced."

[149] See, for example, PGE-CPUC-00023106, p. 6.

[150] DRU11846_PGE-CPUC_07212023_SED_002_Mosquito Fire_Q039.pdf (July 21, 2023), PG&E response to SED-02 Q3, refers to Aerial OH inspection form PGE-CPUC-00000921. PG&E's response also states that based on review of aerial photos that a June 22, 2022, this Aerial OH Inspection form noted that the tie wires were in poor condition due to the visible outward fraying. The outward fraying indicated the tie wire was loose. The tie wire should be snug against the biscuit.

[151] PGE-CPUC-00000921.pdf, June 22, 2022, Aerial Overhead Inspection report.

[152] DRU12511_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q020_R001.pdf (December 1, 2023), response to SED-04 Q20(b)(i), states that "photos …. [show] the tie wires are not loose and are snug against the biscuit. Although some of the outer loops of the tie wire … appear to have additional slack, the inner loops of the tie wire are tight." PG&E also claimed in response to Q20(b)(iii) that "Figure 3 (PGE-CPUC-00013832) shows a minor amount of conductor uplift on the far side of the insulator; the uplift is

PG&E's failure to correct the loose tie wire created at least a moderate fire ignition risk and violated GO 95, Rule 18 repair requirements for Level 2 priority hazards.

5. PG&E Completed Three Repairs at Poles 014/186(A) and 014/186(C) Late, in Violation of GO 95, Rule 18.

GO 95, Rule 18 "Maintenance Programs and Resolution of Potential Violations of General Order 95 and Safety Hazards" sets deadlines for correcting potential safety issues including "six months for potential violations that create a fire risk located in Tier 3 of the High Fire-Threat District." PG&E corrected the following Level 2 priority hazards after the applicable Rule 18 deadlines:

Pole 014/186A Woodpecker hole

On June 23, 2021, a PG&E inspector found woodpecker damage on Pole 014/086(A) located in a Tier 3 HFTD. PG&E's LC 121584079 assigned the repairs priority E, with a required end date of December 17, 2021.[153] According to PG&E's description of the potential risk from this woodpecker damage, the condition matches a Rule 18 Level 2 (1) priority hazard with a maximum deadline of six month for repairs.[154] PG&E violated Rule 18 from the Rule 18 repair deadline, until it repaired the woodpecker hole August 1, 2022.[155]

Pole 14/186(C) Loose Tie Wire

On June 17, 2021, PG&E found a loose tie wire on Pole 014/186(C), the right "child" of Pole 014/186. in a Tier 3 HFTD.[156] Page two of the notification states "Need to tie jumper on insulator as current tie is off." As noted earlier, a loose tie wire creates a potential safety hazard. PG&E set an internal repair deadline of six months (December 17, 2021), which is consistent with the Rule 18

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within acceptable standards because the tie wires are tight on the insulator." This claims conflict with PG&E policy that requires correcting loose tie wires with visible uplift; and the notification showing that the tie wire was loose.

PG&E repeated the claim that "the tie wires were not loose" in response to SED-06 Q7 without providing any additional information beyond repeating this prior claim. See DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q007_R001.pdf provided March 22, 2024.

[153] See DRU12511-Electric Incident-EI220906A-Foresthill-Property Damage-2022 Mosquito (November 9, 2023), provided in response to SED-04 Q28(b); and LC 121584079, produced as PGE-CPUC-00005410 attached to PG&E's March 17, 2023, response to SED-01 Q30.

[154] DRU12511-Electric Incident-EI220906A-Foresthill-Property Damage-2022 Mosquito, provided in response to SED-04 Q28(c), states that "[the] primary risk of a woodpecker hole at this location would be pole top or insulator hardware failure … due to rot or further woodpecker activity."

[155] See DRU12511-Electric Incident-EI220906A-Foresthill-Property Damage-2022 Mosquito. PG&E stated that PG&E performed a field safety reassessment ("FSR") on November 8, 2021, to determine if this condition had worsened and needed to be completed by the required deadline of December 17, 2021. PG&E staff revised the funded repair date to May 6, 2022. PG&E performed an additional FSR on June 15, 2022; and determined there was no change in the condition of the damage and revised the funded repair date to June 15, 2023. This work was completed on August 1, 2022.

[156] Notification 121584077, right pole or 014/186(C); see also DRU12511_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q026_R001 (December 1, 2023), provided in response to SED-04 Q26 (stating that a photo showing a loose tie wire at pole 014/186 (source PGE-CPUC-00013908) shows the right child of pole 14/186).

deadline for Level 2 priority hazards. However, PG&E documentation shows that that loose tie wire was not repaired until August 2, 2022.[157]

PG&E's Centralized Internal Review Team (CIRT) delayed PG&E's internal deadlines for the loose tie wire repair twice during Field Safety Reassessments (FSRs). On November 29, 2021, CIRT added a note to the notification stating that work should be completed by May 6, 2022, and on June 17, 2022, CIRT added a note to the notification stating that work should be completed by September 15, 2022.[158] PG&E's notification for this repair does not provide any explanation for setting repair deadlines that are later than the original repair date.[159] PG&E failed to repair this condition within the Rule 18 deadline.

Pole 14/186C Missing guy wire insulation

On August 20, 2019, PG&E found that Pole 14/186C needed guy wire insulators.[160] The pole was in a Tier 3 HFTD.[161] PG&E's own deadline for repairs based on the level "B" priority set in the notification was November 19, 2019.[162] However, PG&E did not repair the missing guy wire insulators until May 7, 2020, and did not provided any explanation for why the repair was delayed.[163]

Rule 18 required PG&E to correct this Level 2 priority hazard within six months, by February 20, 2020. Thus, PG&E violated Rule 18 by failing to complete repairs by February 20, 2020.

6. PG&E Disposed of Pole 09/131 in Violation of GO 95, Rule 19.

During SED's first site observation visit, SED observed Pole 09/131 on the ground near where the Mosquito Fire ignited. On September 23, 2022, at 1149 hours SED instructed PG&E via email to "preserve as evidence" Pole 09/131, the cross-arms and insulators and other attachments and all jumpers and conductors within 50 feet of the pole.[164] SED also directed PG&E to inform SED as

[157] Notification 121584077, shown earlier in this report.

[158] Notification 121584077.

[159] Notification 121584077.

[160] PGE-CPUC-00006178.pdf, provided (March 17, 2023) as attachment to response to SED-01 Q30, Corrective Work Form Electric Transmission Line (print date of February 14, 2023) line correction (or notification) 117783297.

[161] See PGE-CPUC-00006178.pdf.

[162] PGE-CPUC-00006200.pdf provided (March 17, 2023) in response to SED-01 Q30. Document title is Transmission Notification for pole 014/186C (August 20, 2019). PG&E's EPTM sets a 3-month deadline for correcting priority "B" conditions – see Table 5 (p. 19) of rev 4 and Table 3 (p.15) of revision 5.

[163] DRU11846_PGE-CPUC_06302023_SED_002_Mosquito Fire_Q046.pdf provided (June 30, 2023) in response to SED-02 Q46(c) contains the repair date and also states that PG&E "has not been able to ascertain" why the corrective work was not completed by the PG&E deadline of November 18, 2019.

[164] Email (September 23, 2022) subject "RE: Mosquito Fire - PG&E Incident No: 220908-15274" from Ed Pike to the PG&E Incident Investigator. PG&E later stated that this fire-damaged pole was numbered 09/131.

soon as possible of any plans to remove this equipment; the chain of custody for this evidence; and other information related to collection and preservation of this evidence.[165]

However, PG&E disposed of this pole and associated equipment on October 22, 2022,[166] and did not notify SED until November 1, 2022.[167] PG&E later informed SED that this equipment was potentially located in multiple dumpsters and PG&E did not know which dumpsters might contain the pieces.[168]

PG&E destroyed evidence despite SED's request and Rule 19 requirements.[169] PG&E's failure to preserve evidence denied SED the opportunity to 1) observe evidence and the condition of such evidence in the field; and 2) if necessary, direct PG&E to collect and preserve the evidence for potential further examination and analysis.

PG&E violated GO 95, Rule 19 for failing to preserve Pole 09/131 as requested, preventing SED from accessing this evidence.

7. PG&E's CIRT Canceled Repairs Near the Oxbow Junction Pole Without Justification in Violation of GO 95, Rule 31.1.

SED found errors regarding CIRT cancelation of notifications in the Oxbow Junction area

The PG&E policy that created PG&E's Transmission CIRT process in 2019 states that CIRT was created to support wildfire inspections and prioritize reliability and wildfire and other safety issues.[170] SED reviewed records for 13 poles near the Oxbow Junction and found six examples, as shown below in Table 5, where CIRT cancelled repairs recommended in an inspection report but

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[165] Email (September 23, 2022) subject "RE: Mosquito Fire - PG&E Incident No: 220908-15274" from Ed Pike to the PG&E Incident Investigator.

[166] DRU11846_PGE-CPUC_06162023_SED_002_Mosquito Fire_Q050.pdf (June 16, 2023) provided in response to SED-02 Q50.

[167] Email "[EXTERNAL] RE: Preservation of Evidence for Mosquito Fire - please respond ASAP" from the PG&E Incident Investigator to Ed Pike dated November 1, 2022. The email stated in part "The pole that was down due to fire damage (structure 009/131) was replaced last week. The downed pole and all its associated hardware have been disposed of."

[168] Email "RE: [EXTERNAL] Re: Mosquito fire - Pole 09/131" from PG&E's Incident Investigator, to Ed Pike, SED lead investigator, dated September 13, 2023. PG&E also stated "Parts of pole 09/131 may be in any of the six dumpsters" at the disposal site.

[169] Rule 19 requires that "Each utility shall provide full cooperation to Commission staff in an investigation into … any reportable incident (as defined in CPUC Resolution E-4184)…. Once the scene of the incident has been made safe and service has been restored, each utility shall provide Commission staff upon request immediate access to: Any factual or physical evidence under the utility or utility agent's physical control."

[170] "CIRT supports the Wildfire Safety Inspection Program … by prioritizing identified conditions that may impact overhead (OH) transmission equipment reliability or introduce a potential wildfire ignition or public or personnel safety risk." See CIRT Utility Procedure TD-1001P-10 (August 6, 2019), revision 0, no effective date listed. Provided by PG&E as PGE-CPUC-00013459 in response (June 30, 2023) to SED-02 Q46. PG&E provided PGE-CPUC-00022164, revision 1 of the CIRT Utility Procedures document (published February 2, 2023, effective date of April 2, 2023) in response to SED-03 Q11.

CIRT failed to meet the PG&E policy requirements for justifying such cancellations. Utility Procedure TD-1001P-10[171] section 3.5 requires that CIRT:

"a. DOCUMENT the basis for closure in the long text of the notification using one of the following justifications:

- The criteria in TD-1001M [PG&E's ETPM manual]
- A technical basis that explains why the condition is normal and is not a degradation of any required design function."

In practice:

- In some cases, CIRT cited PG&E's ETPM as a justification for canceling repairs but the ETPM conflicts with CIRT's decision or does not address the condition.
- In some cases, CIRT's stated justification did not address the actual condition in the field.

Table 5: Examples of improperly cancellated notifications

Pole 014/187 - Four wedge connectors
Pole 000/003 - Chipped insulator
Pole 009/131 - Cotter pin and key
Pole 000/003 - Vegetation obscuring section of guys and anchors
Pole 000/003 and Pole 009/130 - Loose tie wires

In each of these examples, CIRT's cancellation of the relevant notification violated PG&E policy and GO 95, Rule 31.1.

Canceled notification example - four wedge connectors at Pole 014/187

PG&E's May 27, 2022, Transmission Notification inspection summary for Pole 014/187 shows that a PG&E inspector and a PG&E SME agreed to recommend repairs for "4 jumper connectors not shot or seated" as shown in Figure 39 below.[172] PG&E inspection manuals show that the wedge connector is normally fully inserted, as shown for example in Figure 40 below.[173] In contrast, the partially inserted wedges at Pole 014/187 are not normal.

[171] PGE-CPUC-00013459 provided (June 30, 2023) in response to SED-02 Q46. Document title is "Centralized Inspection Review Team (CIRT)" Utility Procedure TD 1001P10, revision 0. See pp 9 and 10. Publication date August 6, 2019, no effective date listed.

[172] PGE-CPUC-00012821 provided (June 7, 2023) to supplement PG&E's response to SED-01 Q15. Document title is Transmission Notification, see p.1. The inspector labeled the condition Priority A; and the SME inspection report reviewer labeled the condition Priority B.

[173] See Figure 2 of PG&E's "WEDGE AND U-BOLT TYPE CONNECTORS FOR TRANSMISSION 028854 CONDUCTORS Asset Type Electric Transmission and Distribution" dated December 17, 2020,

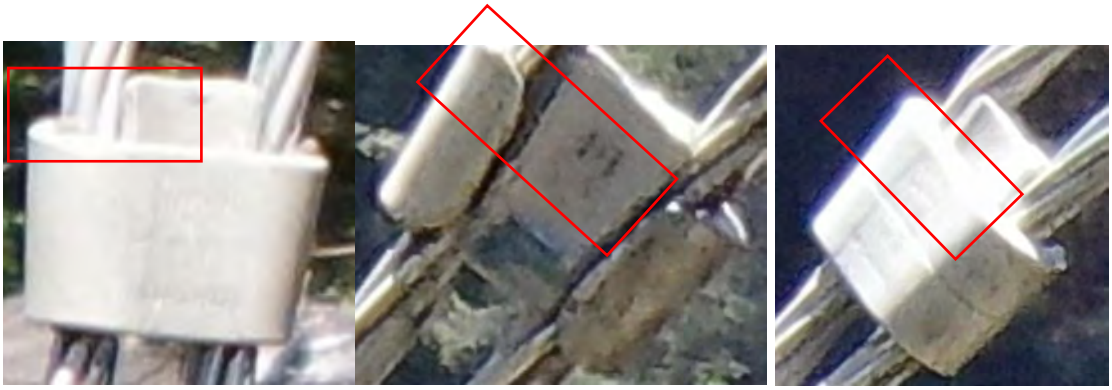

Figure 39: Wedge connectors at Pole 014/187
(SED outlined in red area of wedge not fully seated)

Figure 40: Photo of fully inserted wedge from PG&E manual[174]

The partially inserted wedges created a safety issue. PG&E stated that "not shot or seated" means that an A-shaped wedge is partially inserted into u-shaped housing and not locked. Thus, the wedge could become loose.[175] The inspection summary states that "the jumpers can open up" and result in "a loose tail"[176] meaning that that the conductor could come loose and potentially ignite a fire.

revision 4 for another example of a fully inserted wedge (provided September 21, 2023, as PGE-CPUC-00022999, an attachment to response to SED-03 Q13(b)).

[174] PGE-CPUC-00023106 provided (September 21, 2023) in response to SED-03 Q16. Document title is "Identifying Conductor and Clearance Conditions" TD-1001M-JA10, page 8, published January 20, 2023, effective February 20, 2023.

[175] DRU11846_PGE-CPUC_07212023_SED_002_Mosquito Fire_Q044.pdf (July 21, 2023) provided in response to SED-02 Q44.

[176] PGE-CPUC-00012821 provided (June 7, 2023) to supplement PG&E's response to SED-01 Q15. Document title is "Transmission Notification." See p.1. The inspector labeled the condition Priority A; and the SME labeled the condition Priority B.

CIRT cancelled the May 28, 2022, notification for the partially inserted wedges at Pole 014/187 on May 31, 2022. The cancellation states that CIRT "reviewed per PGE ETPM criteria and cancels this notification hardware is in acceptable condition."[177]

As noted earlier, PG&E policies in effect at that time require that CIRT provide one of two justifications to document the basis for canceling a notification:[178] CIRT did not comply with either option for justifying the cancellation of this notification:

- CIRT incorrectly claimed that the ETPM provided a basis for canceling the repair. The EPTM does not contain any criteria for wedge connectors.[179]
- CIRT did not provide a technical explanation of why partially inserted wedges are normal and did not explain why partially inserted wedges are not a degradation of any required design function.

Cancelled notification example - Pole 000/003 chipped insulator

On June 25, 2021, a PG&E inspection found an insulator bell at Pole 000/003 with a chip over two inches. The inspector and a PG&E SME agreed on a December 25, 2021, repair deadline.[180] The ETPM requires that insulators with a chip greater than 1 ½ inches must be repaired.[181]

On July 1, 2021, CIRT cancelled the notification to repair this insulator bell.[182] CIRT stated "reviewed per PG&E ETPM criteria and cancels this notification insulator is in acceptable condition per photos provided."[183] This conclusion is contrary to the ETPM Manual. CIRT did not provide a technical justification for why this insulator, with a chip greater than 1 ½ inches, should not be repaired and did not explain why the chipped insulator is not a degradation of any required design function.

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[177] PGE-CPUC-00012820 (last entry dated May 23, 2022) provided (June 7, 2023) to supplement response to SED-01 Q15.

[178] "Centralized Inspection Review Team (CIRT)" Utility Procedure TD 1001P10, revision 0, pp. 9-10. Publication date August 6, 2019, no effective date listed.

[179] PG&E stated that "When evaluating the May 27, 2022 notification, the CIRT review team determined that the guidance in Table 4 of the ETPM did not apply because the wedge connectors were sufficiently seated" (see PG&E Ref. DRU13140-Electric Incident-EI220906A-Foresthill-Property Damage-2022 Mosquito Fire provided (March 22, 2024) in response to SED-06 Q6). CIRT did not record any such information; nor did CIRT provide any technical justification for canceling this notification, in the absence of criteria in the EPTM justifying the cancellation. (PG&E's response to this data request also states that PG&E made similar claims in response to SED-03 Q13 and SED-04 Q34).

[180] PGE-CPUC-00024068.pdf provided (November 9, 2023) in response to SED-04 Q29. Document title is Transmission Notification (June 25, 2021).

[181] PG&E's Electric Transmission Preventive Maintenance Manual v5 August 31, 2020, page 24, lists an insulator with a chip greater than 1 ½ inches as a condition that requires repairs.

[182] Provided as PGE-CPUC-00024067.pdf (November 9, 2023) in response to SED-04 Q29.

[183] Provided as PGE-CPUC-00024067.pdf. PG&E stated that this condition was incidentally corrected after the original repair deadline as part of Pole 000/003 replacement due to Mosquito Fire damage. DRU12511_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q029_R001.pdf provided (November 9, 2023) in response to SED-04 Q29.

Canceled notification example - Pole 009/131 Cotter Pin and Key
A PG&E inspection found an “unseated cotter key on a guy” on Pole 009/131 during a May 26, 2022, inspection.[184] The inspector and PG&E SME agreed on a 90-day repair deadline to correct the partially inserted key at Pole 009/131.

Figure 41 shows examples of other PG&E keys that are fully inserted (seated), i.e. the key is inserted into the hole in the pin until the straight section is entirely inserted and only the rounded end is outside of the hole. Figure 42 below shows the key at Pole 009/131 was only about halfway inserted. PG&E’s ETPM requires that PG&E correct a "Missing/loose/not fully seated cotter key or retainer pin," such as the partially seated (i.e., inserted) pin at Pole 009/131.[185]

Figure 41: Examples of PG&E fully inserted cotter keys[186]

[184] PGE-CPUC-00012811 provided (June 7, 2023) as attachment to PG&E supplemental response to SED-01 Q15.

[185] ETPM, TD 1001M, page 24 August 31, 2020, revision 5.

[186] Left photograph: PGE-CPUC-00014459 provided (July 21, 2021) as a supplemental response to SED-02 Q31. See Page PGE-CPUC-00014465 of document titled Transmission Notification for 024/188C and dated December 10, 2020.

Right photograph: PGE-CPUC-00014960 provided (July 21, 2021) in response to SED-02 Q31. Rotated 180 degrees for consistency with other photographs. PG&E did not identify the structure.

Figure 42: Partially seated cotter key at Pole 009/131 on May 26, 2022[187]
(red arrow shows unseated section)

CIRT cancelled this notification on May 31, 2022, and stated "CIRT …. Reviewed per ETPM criteria and cancels this notification. Cotter keys are seated and pose no threat."[188] CIRT did not comply with PG&E requirements (as noted above) to document the justification for canceling the notification:

- CIRT mistakenly stated that all keys were seated (inserted) and failed to address the actual condition documented in the inspection report.
- CIRT's decision conflicts with the ETPM which requires correcting the partially seated key.
- CIRT failed to provide a technical basis explaining why the partially unseated key is normal and not a degradation of any required design function.

Canceled notification example - Pole 000/003 vegetation obscuring guys and anchors
On May 25, 2022, a PG&E aerial overhead inspector recommended "vegetation removal around down-guys, vegetation around guy and anchor."[189] Figure 43 below shows vegetation obscuring anchors and sections of the guy wire. On June 25, 2021, a PG&E inspector recommended removing vegetation and noted that the vegetation prevented the inspector from completing an inspection[190]

[187] PGE-CPUC-00012811.pdf provided (June 7, 2023) as supplemental response to SED-01 Q15. Document is titled Transmission Notification Inspection Summary Pole 009/131 (May 26, 2022). See image on page PGE-CPUC-00012819.

[188] PGE-CPUC-00012810 response (June 7, 2023) to SED-01 Q15. PG&E electronic communication with entries May 28, 2022, and May 31, 2022.

[189] DRU12511_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q031_R001.pdf (December 1, 2023) provided in response to SED-04 Q31.

[190] PGE-CPUC-00012684 provided (June 7, 2023) in response to SED-01, Q15. This June 25, 2021, Transmission Notification prepared by a PG&E inspector (apparently for an aerial inspection) and approved by an SME states "Unable to Inspect Guy Wire Anchor, Vegetation Needs Removal."

consistent with EPTM guy and anchor inspection requirements.[191]

Figure 43: Vegetation obscuring guy wires at Pole 000/003[192]

On June 1, 2022, CIRT cancelled the May 25, 2022, recommendation to remove vegetation. CIRT stated "CIRT ... cancels this notification [because] vegetation does not present a threat to structure or ignition source."[193] CIRT failed to comply with PG&E requirements for justifying cancellation of this notification:

- CIRT's decision conflicts with PG&E's EPTM requirement to complete inspections as noted above; and
- Based on the EPTM, vegetation that prevents a complete inspection is not normal.[194]

[191] ETPM states "During detailed inspections … inspect all guy wire assemblies looking for any indication which may suggest the guy splice, automatic guy deadend, guy anchor, or buried guy anchor has internal deterioration …."(p. 32). In addition, PG&E policies require correction of conditions such as "Anchor rod concrete has significant cracking" and "Guy tails in contact with earth" (p. 21, Table 4).

[192] PGE-CPUC-00012836 produced (June 7, 2023) as a supplemental response to SED-01 Q15. See Bates numbered page PGE-CPUC-00012849 of this May 25, 2022, Transmission Notification.

[193] PGE-CPUC-00012852 provided (June 7, 2023) as a supplemental response to DR1 Q15.

[194] PG&E did not remove the vegetation. DRU12511_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q031_R001.pdf states that "PG&E inspected both the guy wire and anchor during a June 14, 2022, ground inspection." PG&E referenced a June 14, 2022, inspection report for the pole (including guys and anchors) that does not specifically discuss the vegetation that overgrew the anchor and part of the guy.

Cancelled notification examples - Pole 000/003 and Pole 009/130 loose tie wire repairs
As noted in earlier discussion of Rule 18 violations (see section IV.B.5), CIRT cancelled repair work for loose tie wires at Pole 000/003 and 009/130 near Oxbow Junction.[195] In both instances, CIRT claimed to have reviewed the conditions based on PG&E's ETPM. However, CIRT's decisions conflict with the ETPM and other PG&E policies that require correcting the loose tie wires. CIRT failed to show that this loose tie wire was not unusual – PG&E manuals show that a loose tie wire was not usual - and not a degradation of any required function.[196]

The CIRT Process Raises Broad Safety Concerns
As part of its investigation of the Mosquito Fire, SED reviewed statistics related to CIRT actions between 2020-2023. In addition to the violation related to the Mosquito Fire, SED's findings raise the following concerns related to CIRT.

8. CIRT's cancellation of notifications for recommended repairs without adequate justification presents a safety risk.

During this period, CIRT canceled the majority of repairs recommended in transmission inspection reports created by PG&E inspection staff and approved by a PG&E SME. Specifically, SED found that CIRT reviewed 447,365 recommendations and cancelled approximately 314,000 of the 447,365 recommendations reviewed, as shown in in Figure 44 below.[197]

[195] PGE-CPUC-00013837 regarding pole 009/130 states "REVIEWED PER PG&E ETPM CRITERIA AND CANCELS THIS NOTIFICATION INSULATORS ARE WITHIN ACCEPTABLE TOLERANCE" and PGE-CPUC-00012835 regarding Pole 000/003 states "REVIEWED PER PG&E ETPM CRITERIA AND CANCELS THIS NOTIFICATION. TIE WIRE IS NOT LOOSE CONDUCTOR ALSO WELL SEATED AND HELD TIGHT."

[196] As noted earlier, PG&E acknowledged to SED that "the tie wire was loose" at Pole 009/130. As discussed earlier in this report, PG&E later claimed, in conflict with this acknowledgement and several PG&E policies, that the tie wire was not loose because it was not fully detached from the insulator.

[197] See data sources in the footnote for the Figure below.

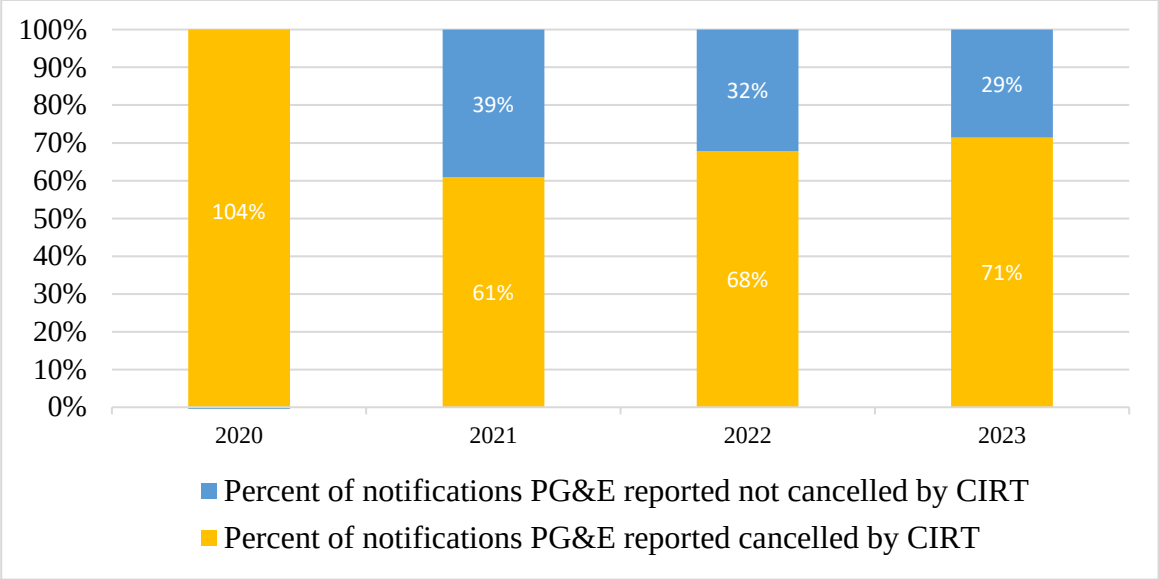

Figure 44: CIRT rate of notification cancellation
(PG&E data for CIRT notification cancellations in 2020 is approximate and exceeds PG&E data for number of 2020 notifications reviewed by 4%).[198]

[198] DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q021_R001.pdf (March 22, 2024) provided in response to SED-06 Q21(b) states:

- At some point, CIRT cancelled approximately 36,476 notifications created in 2020.
- At some point, CIRT cancelled approximately 64,563 notifications created in 2021.
- At some point, CIRT cancelled approximately 83,231 notifications created in 2022.

SED07 Q1 DRU13446_EI_EI220906A_Foresthill_PD_DR_CPUC_Q001_R001.pdf provided in response to SED-07 Q1 (May 9, 2024) states that CIRT cancelled 131,119 notifications created in 2023.

DRU12511_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q033_R001.pdf (December 1, 2023) provided in response to SED-04 Q33(c) states that CIRT reviews all aerial, ground, and climbing inspection forms that result in a notification except A-priority emergency notifications.

- In 2020, CIRT reviewed at least 35,024 notifications resulting from inspections
- In 2021, CIRT reviewed at least 106,062 notifications resulting from inspections.
- In 2022, CIRT reviewed at least 122,743 notifications resulting from inspections.

DRU13446_EI_EI220906A_Foresthill_PD_DR_CPUC_Q002_R001.pdf (May 9, 2024) provided in response to SED-07 Q2 states that

- CIRT reviewed approximately 183,536 notifications that were created in 2023.

The notifications created in a year may not align exactly with the notifications reviewed by CIRT in that year. For instance, notifications created at the end of a given year may be reviewed by CIRT at the beginning

Additionally, SED identified a number of instances where CIRT canceled recommended repairs without adequate justification required by PG&E policies as noted earlier. PG&E did not provide any evidence that CIRT attempted to communicate with staff knowledgeable about the inspection report before canceling the repairs. In addition, during the time period reviewed by SED, CIRT never reviewed an inspection report to check for overlooked safety concern(s). These deficiencies indicate that PG&E's policies and practices regarding CIRT do not reflect accepted good practice for the given local conditions.

Prior to February 2, 2022, PG&E did not have a system for tracking "reason codes" that identify the category of reason for CIRT cancellations of recommended repairs[199], limiting visibility into the number of repair recommendations cancelled because CIRT disagreed with the inspector and their SME reviewer. In 2023, the first full calendar year that CIRT used reason codes for canceling repairs, CIRT cancelled 71% of recommended repairs. As shown in Figure 45 below, CIRT routinely cancelled repair recommendations because CIRT disagreed with a transmission inspection report. CIRT cancelled 75,901 repairs due to disagreement with these reports compared to 52,417 repairs that CIRT did not cancel.

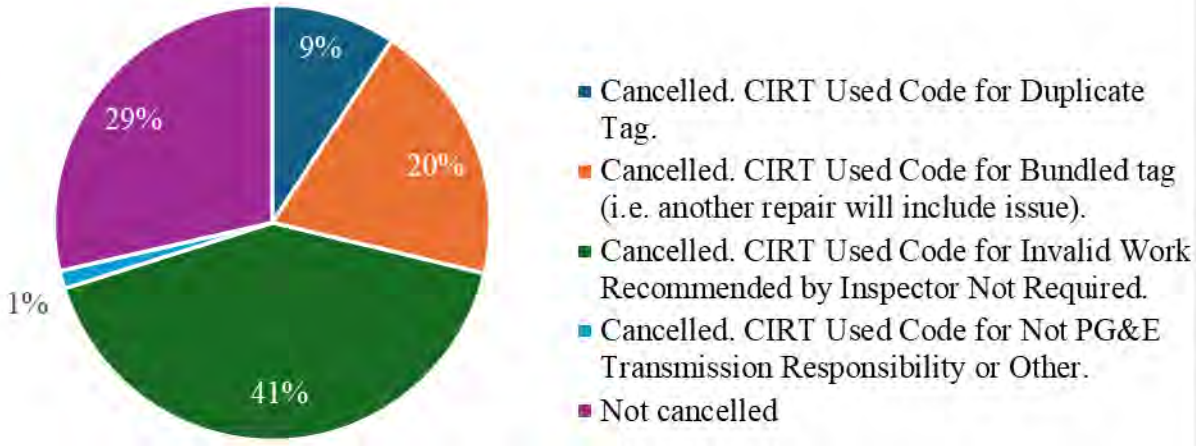

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Figure 45: CIRT review of 2023 transmission inspection reports recommending repairs[200]

of the subsequent year. SED has observed that CIRT generally reviews notifications soon after they are created.

[199] DRU13140-Electric Incident-EI220906A-Foresthill-Property Damage-2022 Mosquito Fire provided (March 22, 2024) in response to SED-06 Q21.

[200] DRU13446_EI_EI220906A_Foresthill_PD_DR_CPUC_Q001_R001.pdf (May 9, 2024) provided in response to SED-07 Q1 provides data on 2023 transmission notification cancellations by "reason code." DRU13446_EI_EI220906A_Foresthill_PD_DR_CPUC_Q002_R001.pdf provides data on the total number of notifications CIRT reviewed in 2023 as noted earlier.

PG&E's "Utility Procedure TD 1001P10,"[201] states in part that "CIRT may REVIEW inspection forms with no notifications to confirm that no nonconformances were overlooked during the detailed inspection." However, between 2020 and 2022 and CIRT never reviewed an inspection report to check for overlooked safety issue(s).[202] During this same time period, CIRT reviewed at least 263,829 notifications that recommended repairs and cancelled about 70% of these notifications as discussed earlier.[203] PG&E's efforts, outside of CIRT, to check final inspections for potential missed safety issues was very limited. For example, PG&E did not check whether any ground or climbing final inspection reports overlooked safety issues from 2020 to 2022[204] and reviewed 20% of all aerial inspections.[205]

This pattern affected notifications originated by field inspectors and by the "inspection review specialists" responsible for the completeness of inspection reports. An Inspection Review Specialist (IRS) reviewed ground and aerial inspection for accuracy and completeness from 2020 to 2022.[206] PG&E identified 5685 repair recommendations generated during by an IRS for ground inspections[207] and CIRT cancelled 3245 of these repair recommendations as shown in Figure 46

[201] PGE-CPUC-00022164. Document number title is "Transmission Centralized Inspection Review Team CIRT" and number is Utility Procedure TD 1001P10 (Published February 2, 2023, and effective April 2, 2023, revision 1).

[202] DRU12511_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q033_R001.pdf.

[203] As noted earlier, DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q021_R001.pdf gives the total number cancelled each year from 2020-2022 (totaling 184,270) and DRU12511_EI_EI220906A_Foresthill_PD_2022 Mosquito_DR_CPUC_Q033_R001.pdf provides the number of notifications reviewed each year from 2020-2022 (totaling 263,829).

[204] DRU12861_EI_EI220906A_Foresthill_PD_DR_CPUC_Q012_R002.pdf (May 16, 2024) provided by PG&E as a supplemental SED-05 Q12(b) response. Initial aerial and ground inspections are reviewed by an Inspection Review Specialist (who can add or remove recommended repair(s)) before they are finalized. PG&E stated that a Lead Inspection Review Specialist reviews 20% of aerial inspections but not ground inspections.

[205] DRU12861_EI_EI220906A_Foresthill_PD_DR_CPUC_Q012_R002.pdf (May 16, 2024) provided by PG&E as a supplemental response to SED-05 Q12(b). PG&E indicated that a Lead Inspection Review Specialist reviews 20% of aerial inspections but not ground inspections.

[206] DRU12861_EI_EI220906A_Foresthill_PD_DR_CPUC_Q012_R001.pdf (May 16, 2024, supplemental response) provided in response to SED-05 Q12. This document also states "PG&E's aerial and ground transmission inspection teams have in place a work verification and review process, pursuant to which an Inspection Review Specialist (IRS) reviews every inspection for accuracy and completeness. Approximately 20% of all aerial inspections are also reviewed by a Lead IRS for the same purpose." Footnote 1 states the number of transmission notifications created (by year).

[207] DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q024_R002.pdf (May 16, 2024, supplemental response to SED-06 Q24) states "PG&E IRSs created approximately 523 corrective transmission notifications based on issues they identified following review of ground inspections in 2020. PG&E IRSs created approximately 3,504 corrective transmission notifications based on issues they identified following review of ground inspections in 2021. PG&E IRSs created approximately 1,658 corrective transmission notifications based on issues they identified following review of ground inspections in 2022. PG&E IRSs created approximately 3,719 corrective transmission notifications based on issues they identified following review of ground inspections in 2023."

below.[208] (PG&E does not track notifications created by IRS for aerial inspections). This data indicates that efforts by PG&E SMEs to recommend repairs for safety issues missed in an initial inspection report were often over-ruled by CIRT.

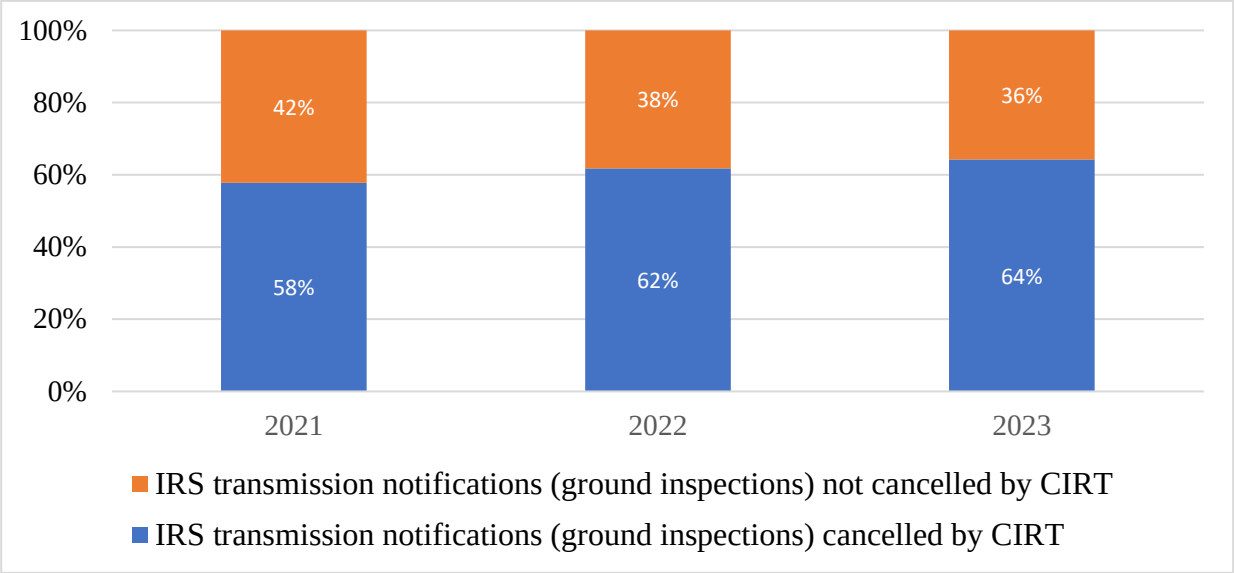

Figure 46: CIRT cancellation of transmission notifications created by PG&E IRS SMEs[209]

[208] DRU13446_EI_EI220906A_Foresthill_PD_DR_CPUC_Q005_R001.pdf (May 16, 2024) provided in response to SED-07 Q5(b).

"PG&E's systems are therefore not able to generate the number of corrective notifications created as a result of issues identified by a PG&E Lead IRS following a review of an aerial inspection.

PG&E's systems do differentiate between notifications that arise from issues identified by an inspector as part of a ground inspection and issues identified by an IRS following review of a ground inspection.

In 2020, CIRT cancelled 203 transmission corrective notifications created by a PG&E IRS based on issues the IRSs identified following review of ground inspections. In 2021, CIRT cancelled 2,006 transmission corrective notifications created by a PG&E IRS based on issues the IRSs identified following review of ground inspections. In 2022, CIRT cancelled 1,025 transmission corrective notifications created by a PG&E IRS based on issues the IRSs identified following review of ground inspections. In 2023, CIRT cancelled 2,389 transmission corrective notifications created by a PG&E IRS based on issues the IRSs identified following review of ground inspections."

[209] DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q024_R002.pdf (May 16, 2024, supplemental response to SED-06 Q24); and DRU13446_EI_EI220906A_Foresthill_PD_DR_CPUC_Q005_R001.pdf (May 16, 2024) provided in response to SED-07 Q5(b).

In April 2023, PG&E adopted a System Inspections Quality Control (SIQC) program that reviewed a sample of all aerial, ground, and climbing inspections (including but not limited to transmission inspections) for accuracy and completeness.[210] SIQC staff can create new notifications for repair work, but CIRT can then cancel such notifications similar to other notifications.[211] In 2023, SIQC staff reviewed 1,593 notifications that CIRT had cancelled because it disagreed with an inspection report. SIQC reversed 33 CIRT cancellations.[212] The small number of cancelled notifications reviewed by SIQC provided little oversight of CIRT and did not significantly alter PG&E's focus on canceling recommended repair work.

9. PG&E's policies for CIRT review lack adequate internal communications and accountability.

PG&E policies do not require that CIRT: 1) communicate with the relevant inspector and SME to confirm the reason that an inspection report recommended repair work; or 2) attempt to resolve internal disagreements prior to canceling notifications.[213] SED's review of PG&E records regarding CIRT's cancellation of recommended repair work in the area of the Mosquito Fire do not show any such communication between CIRT and the SMEs and inspectors who recommended these repairs.

Lack of communication between CIRT staff and other PG&E staff responsible for detecting safety issues reduces the effectiveness of PG&E's inspection and maintenance program for several reasons:

- CIRT staff may not understand conditions in the field, which apparently contributed to some of CIRT's mistaken cancellations of repair work discussed earlier;
- In a number of instances, PG&E inspection staff and SMEs reviewing inspection reports understood that the original recommended repairs were consistent with

[210] DRU12861_EI_EI220906A_Foresthill_PD_DR_CPUC_Q012_R002.pdf (May 16, 2024) provided as an amended response to SED-05 Q12. As attachments to this report, PG&E produced TD-8123P-203 ("System Inspections (SI) Quality Control") Rev. 0 (produced as PGE-CPUC-00025067) and its attachments (PGE-CPUC-00024860, PGE-CPUC-00024878). These documents set forth procedures for the SIQC team to ensure that safety issues are not omitted from inspections.

[211] System Inspections Quality Control, rev 0, section 6.1.

[212] DRU13446_EI_EI220906A_Foresthill_PD_DR_CPUC_Q004_R001.pdf (May 9, 2024) provided in response to SED-07 Q4. Of these 1593 notifications reviewed, SIQC identified 33 instances where CIRT mistakenly cancelled a prior notification. PG&E stated that these erroneous cancellations were corrected.

In addition, SIQC created approximately 2,244 transmission notifications in 2022 and approximately 2,876 corrective transmission notifications in 2023. These totals reflect all notifications created by SIQC and are not limited to notifications related to CIRT. DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q025_R001.pdf (April 5, 2024) provided in response to SED-06 Q25.

[213] CIRT Utility Procedure TD 1001P10, revision 0, publication date August 6, 2019, no effective date listed. See also "Transmission Centralized Inspection Review Team (CIRT)" Utility Procedure TD 1001P10, revision 1 published February 2, 2023, and effective April 2, 2023.

PG&E policies and procedures, but CIRT apparently did not because it cancelled the repairs; and

- CIRT's frequent disagreement with PG&E's field inspection staff and their SME reviewers on the need for safety-related repairs shows that CIRT operated with significantly different standards and goals than PG&E inspection staff and SMEs. [214]

PG&E lacks a formal process to detect and correct errors when CIRT overrules PG&E inspectors and SMEs and cancels repair recommendations, which is especially important since CIRT routinely cancels such recommendations. PG&E finished an informal quality control process (T-CIRT Quality Manual) on November 28, 2023, but has not formally adopted any such process.[215]

10. PG&E Submitted a Late Initial Report in Violation of Resolution E-4184.

Resolution E-4184, issued August 21, 2008, requires that PG&E file an Electric Ignition Report within four hours of reportable events outside of normal working hours. For example, utilities must report events that are the subject of significant public attention or media coverage and are attributable or allegedly attributable to utility facilities; events that involve damage to property of the utility or others estimated to exceed $50,000; and others.[216]

PG&E claimed that it did not file an Electric Ignition Report until September 8, 2022, because PG&E could not definitively determine whether the Mosquito Fire was attributable or allegedly attributable to PG&E facilities.[217] However, NCPA staff told PG&E staff that "switch 47 has a fire" during a recorded call beginning at 18:17:12 on September 6, 2022.[218] In addition, PG&E received real-time alarm data indicating that two electrical faults had likely occurred on the circuit served by

[214] Data for 2023 shows that CIRT usually disagreed with repair recommendations by PG&E inspectors and their SME reviewers as discussed earlier.

[215] PG&E provided DRU13140_EI_EI220906A_Foresthill_PD_DR_CPUC_Q023_R001.pdf (March 22, 2024) provided in response to SED-06 Q23.

PG&E also stated that in 2021 it began implementing an automatic quality control process for notifications similar to the T-CIRT Quality Manual. This process appears to apply to notifications created by an inspector rather than to CIRT's work. See DRU13446_EI_EI220906A_Foresthill_PD_DR_CPUC_Q004_R002.pdf (May 16, 2024) provided as a supplemental response to SED-07 Q4 and the T-CIRT Quality Manual p.6. The T-CIRT Quality Manual p.6 states that this process "is not designed to tell when a GK [Gatekeeper] and/or SME have made an incorrect decision."

[216] Appendix A of Resolution E-4184, which contains the revised "DECISION 06-04-055 APPENDIX B "ACCIDENT REPORTING REQUIREMENTS."

[217] DRU11846_PGE-CPUC_06162023_SED_002_Mosquito Fire_Q051.pdf provided (June 16, 2023) in response to SED-02 Q51.

[218] See transcript dated September 16, 2022, provided as PGE-CPUC-000012114 (March 17, 2023) as a supplemental response to SED-01 Q53. In response, PG&E staff asked at 1828 hours on September 6, 2022, "whether there was a fire or 'just arcing' at Switch 47. DRU11846_PGE-CPUC_06162023_SED_002_Mosquito Fire_Q021 provided (June 16, 2023) in response to SED-02 Q21.

Switch 47 (as noted earlier in Table 2) at or near the time of the Mosquito fire ignition.[219] Therefore, PG&E staff knew that the fire was "attributable or allegedly attributed to the utility's electric facilities" by about 1817 hours on September 6, 2022.[220] In addition, PG&E staff observed Switch 47 soon after 2000 hours, which should have provided further confirmation that the fire ignited at or near PG&E electrical facilities and provided PG&E staff an opportunity to observe the condition of relevant equipment.[221] PG&E violated Resolution E-4184 beginning on September 7, 2022, until PG&E filed an initial report September 8, 2022 at 1005 hours.

D. Findings and Violations

SED's investigation finds 12 total violations of CPUC requirements as detailed below. SED found these violations after reviewing and analyzing inspection and maintenance records; physical evidence; photographs and voice recordings; and PG&E's actions before, during, and after the Mosquito 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.

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 actions within the time periods stated for each of the priority levels set forth below*
>
> *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 violations that create a fire risk located in Tier 3 of the High Fire-Threat*

[219] PGE-CPUC_04102023_SED_001_Q19 Mosquito Fire_Supplemental.pdf provided (April 10, 2023) as a supplemental response to SED-01 Q19. PGE stated that "The limited real-time alarm data PG&E receives from PCWA indicates that Middle Fork CB 32 opened at 18:15:04 in response to a relay trip. The real-time alarm data PG&E receives from PCWA also indicates that Middle Fork CB 32 closed again at 18:15:21 and opened again at 18:15:22 in response to a relay trip. Please see PGE-CPUC-00000005." The relay trips indicate that the relays tripped open the circuit breakers in response to abnormal circuit conditions such as an electrical fault.

[220] In addition, the fire met other criteria for reporting by the morning of September 7, 2022, such as extensive public attention and media coverage. The fire caused mandatory evacuations and poor air quality, resulting in significant public attention and significant media attention - either of which is sufficient to trigger an Electric Ignition Report if the incident is attributable or allegedly attributable to utility facilities. See for instance "Evacuations in Placer, El Dorado counties as Mosquito Fire grows", ABC10, 6:42 am, September 7, 2022; and "Wildfires causing hazardous air in Placer County. Here are the latest readings, forecasts", Ryan Lillis, Sacramento Bee. September 7, 2022.

[221] 20-Day Report, p. 3.

District; (2) 12 months for potential violations that create a fire risk located in Tier 2 of the High Fire-Threat District.

1. Violations 1A, B, and C: Three Instances of GO 95, Rule 18 Violations for Missing Maintenance Deadlines

PG&E corrected three separate Level 2 safety issues at poles in a Tier 3 HFTD after the GO 95, Rule 18 deadline:

- PG&E repaired a woodpecker hole at Pole 014/186(A) under transmission notification 121584079 on August 1, 2022, instead of the December 23, 2021, deadline.
- PG&E repaired a loose tie wire at Pole 014/186(C) under transmission notification 121584077 on August 2, 2022, instead of the December 17, 2021, deadline.
- PG&E installed guy wire insulation at Pole 014/186(C) under transmission notification 117783297 on May 7, 2020, instead of the February 20, 2020, deadline.

GO 95, Rule 18.B.1.a.ii. requires that PG&E correct Level 2 safety issues located in Tier 3 HFTD within six months from the time of identification. PG&E provided no documentation of why repairs were not completed within the required time frame. PG&E violated GO 95, Rule 18 for failing to complete the repairs by the required maintenance deadline.

2. Violations 2A, B, and C: Three Instances of GO 95, Rule 18 Violations for Failing to Correct Loose Tie Wires

PG&E's Electric Transmission Preventive Maintenance Manual[222] and PG&E's May 10, 2022, "Five Minute Meeting Topic: Reminder during Inspections to Ensure Conductors are Properly Secured to Insulators via Tie Wires or Clamps" [223] require the correction of loose tie wires to prevent unsafe conditions. The Five Minute Meeting Topic document highlights past examples of pole fires in PG&E's system caused by loose or broken tie wires. PG&E staff documented the following loose tie wires, but PG&E failed to repair these loose tie wires:

- A PG&E inspector and SME documented a loose tie wire at Pole 000/003 in a May 25, 2022, transmission notification.
- A PG&E inspector and SME documented a loose tie wire at Pole 009/130 in a June 22, 2022, transmission notification.
- A PG&E inspector and SME documented a loose tie wire at Pole 014/186A in a June 9, 2022, transmission notification 123833466. This notification was

[222] TD 1001M, Rev. 5, August 31, 2020.

[223] "Five Minute Meeting Topic: Reminder during Inspections to Ensure Conductors are Properly Secured to Insulators via Tie Wires or Clamps" at 1 ("Recent events involving pole fires and unplanned outages have identified the need to clarify construction and inspection standards related to tie wires and conductor attachments to transmission poles. Failure to properly secure conductor to insulators on wooden transmission can lead to hot spots at the hardware due to leakage currents, resulting in ignition on the pole.")

cancelled because PG&E expected that work on the loose tie wire would be completed under transmission notification 121584077. However, transmission notification 121584077 only documents repairs to Pole 014/186C and not the tie wire repair at Pole 014/186A.

PG&E violated GO 95, Rule 18 for failing to correct these three loose tie wires.

General Order 95, Rule 19 – Cooperation with Commission Staff; Preservation of Evidence Related to Incidents Applicability of Rules states in part:

> *Each utility shall provide full cooperation to Commission staff in an investigation into any major accident (as defined in Rule 17) or any reportable incident (as defined in CPUC Resolution E-4184), regardless of pending litigation or other investigations, including those which may be related to a Commission staff investigation. Once the scene of the incident has been made safe and service has been restored, each utility shall provide Commission staff upon request immediate access to: Any factual or physical evidence under the utility or utility agent's physical control, custody, or possession related to the incident; The name and contact information of any known percipient witness; Any employee percipient witness under the utility's control; The name and contact information of any person or entity that has taken possession of any physical evidence removed from the site of the incident*

3. Violation 3: GO 95, Rule 19 Violation for Failing to Preserve Evidence

On September 23, 2022, SED instructed PG&E to preserve as evidence Pole 09/131, the cross-arms and insulators and other attachments and all jumpers and conductors within 50 feet of the pole. PG&E disposed of Pole 009/131 and attached equipment on October 22, 2022,[224] and did not notify SED until November 1, 2022. PG&E's failure to preserve evidence and provide full cooperation with SED's investigation violated GO 95, Rule 19.

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

> *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.*

4. Violation 4: GO 95, Rule 31.1 Violation for Failing to Complete Switch Maintenance at Oxbow Junction Pole

In the absence of another specific, applicable CPUC rule, GO 95, Rule 31.1 requires that a utility follow its internal procedures because by adopting them, the utility has established that those procedures are accepted good practices. PG&E did not complete function testing required by PG&E's "Switch Maintenance and Inspection Program for Electric

[224] See DRU11846_PGE-CPUC_06162023_SED_002_Mosquito Fire_Q050.pdf provided on June 16, 2023, in response to Data Request SED-PG&E-002, Question 50.

Transmission," (Utility Procedure TD 1006P 02) at Switches 47 and 49. Utility Procedure TD 1006P 02 includes function testing requirements and represents a "best practice" for these switches. PG&E's history of operational problems involving Switch 47 emphasizes the importance of completing all maintenance and inspection requirements.[225] Thus, PG&E violated GO 95, Rule 31.1 for failing to complete function testing for Switches 47 and 49.

5. Violation 5: GO 95, Rule 31.1 Violation for Failing to Clear Vegetation Around the Oxbow Junction Pole

PG&E's "Operations and Maintenance Plan Electric Facilities on National Forest System Lands within the Pacific Southwest Region"[226] requires that PG&E clear vegetation within a 10-foot radius of the Oxbow Junction Pole, up to a height of 8 feet from the ground. The vegetation clearance section of PG&E's O&M plan represents a "best practice" under GO 95, Rule 31.1. PG&E's failure to comply with this plan, which left flammable vegetation near the Oxbow Junction Pole during the 2022 fire season, violated GO 95, Rule 31.1.

6. Violation 6: GO 95, Rule 31.1 Violation Because PG&E's CIRT Failed to Adequately Justify Cancelled Repair Work

CIRT cancelled six repairs for PG&E equipment near the Oxbow Junction Pole without providing adequate justification as required by PG&E's internal policies. CIRT's failure to justify cancellation of the recommended repair work listed below violated Rule 31.1.

Table of six cancelled notifications found near Oxbow Junction pole

Pole 014/187 - Four wedge connectors (notification dated May 27, 2022)
Pole 000/003 - Chipped insulator (notification dated June 25, 2021)
Pole 009/131 - Cotter pin and key (notification dated May 26, 2022)
Pole 000/003 - Vegetation obscuring section of guys and anchors (notification dated May 25, 2022)
Pole 000/003 and Pole 009/130 - Loose tie wires (notifications dated May 25, 2022, and June 22, 2022, respectively)

General Order 95, Rule 37 – Minimum Clearances of Wires above Railroads, Thoroughfares, Buildings, etc. states in part:

> *. . .clearances between conductors, guys, messengers or trolley span wires and buildings, poles, structures, or other objects, shall not be less than those set forth in Table 1, at a temperature of 60° F. and no wind.*

[225] For example, on April 25, 2022, PG&E found the lower phase of Switch 47 burned. Subsequently, on April 30, 2022, four attempts to open and close Switch 47 via SCADA failed. Later, PG&E staff suspected arcing at Switch 47 on August 26, 2022. However, PG&E staff did not find evidence of arcing in the field.

[226] Issued December 2018 and updated August 2020.

General Order 95, Rule 54 – Conductors states in part:

> *. . .modifications of the basic clearances in Table 1 (see Rule 37) are contained in Rule 37 and sections of 54.4 (D), including 54.4 (D)(6) Deadended on Pole sub-section (b) which states in part, "Where conductors are supported on a climbable pole in vertical configuration, the energized portions of such conductors shall have clearances of not less than 15 inches from the surface of the pole for voltages between 750 and 7,500 volts and 18 inches from the surface of pole for voltages in excess of 7,500 volts."*

7. Violation 7: GO 95, Rule 37 as Modified by Rule 54 Violation – Lack of Clearance between Lower Phase Jumper and Pole

PG&E failed to maintain the required clearance between the Oxbow Junction Pole and the jumper cable connecting the lower phases of Switches 47 and 49 on September 6, 2022, and created an electrical fault path. PG&E violated GO 95, Rule 37 clearance requirements as modified by Rule 54.

Resolution 4184-E – Adoption of Web-Based Emergency Reporting System for Utilities and Generation Asset Owners states in part:

> *Within 2 hours of a reportable incident during normal working hours or within 4 hours of a reportable incident outside of normal working hours, the utility shall provide notice to designated CPUC staff of the general nature of the incident, its cause and estimated damage.*

8. Violation 8: Resolution 4184-E Violation for Late Initial Notification

PG&E was required to file an initial notification regarding the Mosquito Fire by September 7, 2022, because PG&E staff were aware that the Oxbow Junction Pole ignited or potentially ignited the Mosquito Fire soon after the fire started at about 1800 hours on September 6, 2022. In addition, PG&E staff were present at the location at about 2000 hours on that date. PG&E did not provide this initial notification until September 8, 2022, in violation of Resolution 4184-E.

V. Conclusion

SED's review of 13 transmission poles in the Oxbow Junction areas found 12 violations of a GO 95 safety requirement. These violations show that PG&E has not properly prioritized and implemented safety efforts, increasing wildfire risk within a Tier 3 extreme high fire threat district. Fires such as the Mosquito Fire, which led to widespread property damage and disruption to communities as well as two reported firefighter injuries, show the importance of correcting these types of failures. In addition, SED found that PG&E's widespread practice of canceling repairs recommended by a PG&E inspector and SME failed, in many instances, to follow PG&E's own policy requirements, violating GO 95.

VI. Appendix: Oxbow Junction Pole Vegetation Clearance History

Pole History - t179404:

0	NATIONAL FOREST RD 23-02 , FORESTHILL				SSD: 47- [redacted]		1/18/2021 5:10:19 PM
	Directions:	GO RIGHT AT SPLIT .3 MI TO P.					
	Comments:	TAKE MOSQUITO RIDGE RD 11 MILES TO NATIONAL FOREST RD 23 ON RIGHT, THEN GO .7 MILES TO SPLIT to rafter river access .3mi to pole on right !W120743258N39008223					
	Pole: T179404	Clr-NoChm	Deferred	VMA: NONE	EBSI0000880P	Complete	11/18/2021
					EBSI0000804W		
0	NATIONAL FOREST RD 23-02 , FORESTHILL				SSD: 47- [redacted]		/25/2020 2:22:17 PM
	Directions:	GO RIGHT AT SPLIT .3 MI TO P.					
	Comments:	TAKE MOSQUITO RIDGE RD 11 MILES TO NATIONAL FOREST RD 23 ON RIGHT, THEN GO .7 MILES TO SPLIT to rafter river access .3mi to pole on right !W120743258N39008223					
	Pole: T179404	Clr-NoChm	Deferred	VMA: NONE	EBSI0000697P	Complete	4/13/2021
					EBSI0000606W	Complete	9/24/2021
					EBSI0000229R	Complete	9/24/2021
0	NATIONAL FOREST RD 23-02 , FORESTHILL				SSD: 47- [redacted]		11/1/2019 10:12:33 AM
	Directions:	GO RIGHT AT SPLIT .3 MI TO P.					
	Comments:	TAKE MOSQUITO RIDGE RD 11 MILES TO NATIONAL FOREST RD 23 ON RIGHT, THEN GO .7 MILES TO SPLIT to rafter river access .3mi to pole on right !					
	Pole: T179404	Clr-NoChm	Deferred	VMA: NONE	SISI0000250P	Deferred	2/3/2020 7:10:08 AM
					SISI0000190W	Complete	5/12/2020 9:52:25 AM
					SISI0000011R	Complete	7/29/2020 8:42:50 AM
0	NATIONAL FOREST RD 23-02 , FORESTHILL				SSD: 47- [redacted]		0/22/2018 9:59:02 AM
	Directions:	GO RIGHT AT SPLIT .3 MI TO P.					
	Comments:	TAKE MOSQUITO RIDGE RD 11 MILES TO NATIONAL FOREST RD 23 ON RIGHT, THEN GO .7 MILES TO SPLIT to rafter river access .3mi to pole on right !					
	Pole: T179404	Clr-NoChm	Deferred	VMA: NONE	SISI0000022P	Complete	3/13/2019 10:19:30 AM
					SISI0000017W	Complete	6/27/2019 9:29:33 AM
0	NATIONAL FOREST RD 23-02 , FORESTHILL				SSD: 47- [redacted]		10/12/2017 9:15:58 AM
	Directions:	GO RIGHT AT SPLIT .3 MI TO P.					
	Comments:	TAKE MOSQUITO RIDGE RD 11 MILES TO NATIONAL FOREST RD 23 ON RIGHT, THEN GO .7 MILES TO SPLIT to rafter river access .3mi to pole on right !					
	Pole: T179404	Clr-NoChm	Deferred	VMA: NONE	EBSI0000568P	Complete	3/14/2018 10:23:19 AM
					EBSI0000467W	Complete	6/6/2018 9:35:34 AM
0	NATIONAL FOREST RD 23-02 , FORESTHILL				SSD: 47- [redacted]		0/26/2016 10:40:02 AM
	Directions:	GO RIGHT AT SPLIT .3 MI TO P.					
	Comments:	TAKE MOSQUITO RIDGE RD 11 MILES TO NATIONAL FOREST RD 23 ON RIGHT, THEN GO .7 MILES TO SPLIT to rafter river access .3mi to pole on right !					
	Pole: T179404	Clr-NoChm	Deferred	VMA: NONE	EBSI0000407P	Complete	4/3/2017 9:48:11 AM
					EBSI0000337W	Complete	5/23/2017 1:34:58 PM

Figure 47: Oxbow Junction Pole vegetation clearance work from 2017 through 2022[227]

[227] This table is based on SED's excerpt of PGE-CPUC-00007447 provided (March 17, 2023) in response to SED-01 Q12. Pole T179404 is the Oxbow Junction Pole.

VII. Appendix: Switch 47 and 49 Operation

Table 6: PG&E Switch 47 and 49 operation November 30, 2021, through September 6, 2022[228]

PG&E Document Reference	#	Date/Time (SED-002, Q11(a))[229]	Action (SED-002, Q 11(b))	Reason for Operation (SED-002, Q11(c))	Energized ? (SED-002, Q 11(d))	Qualified Worker Present? (SED- 002, Q11(e))	Operation Successful ? (SED-002, Q 11(f))[230]	Protective Device(s) Operated? (SED-002, Q 11(g))
PGE-CPUC-00010531	47	12/9/2021 8:42:59	Close	Clear Weimar 60kV Bus	Yes	No	Yes	No
PGE-CPUC-00013506		12/10/2021 19:02:36	Open	Return Weimar 60kv bus test program				
PGE-CPUC-00010311	47	1/3/2022 19:24:29	Close	De-Energize Weimar Substation	Yes	No	Yes	No
		1/3/2022 20:19:29	Open	Re-Energize Weimar Substation				
PGE-CPUC-00010212	49	2/21/2022 7:35:29	Open	Clear Oxbow 60 kV Tap Line	Yes	Likely[231]	Yes	No
		2/21/2022 12:53:49	Close	Restore Oxbow 60 kV Tap Line				
PGE-CPUC-00013476	47	3/21/2022 9:59:53	Close	Middle Fork-Gold hill 230KV line Clearance	Yes	No	Yes	No
		3/23/2022 19:05:48	Open					
PGE-CPUC-00010366	47	3/30/2022 1:58:20	Close	Clear Weimar #1 60 kV line for testing Weimar CB 52	Yes	No	Yes	No
		3/30/2022 2:03:20	Open	Restore Weimar #1 60 kV line following testing Weimar CB 52.				
PGE-CPUC-00011002	47	4/19/2022 8:10:07	Close	Deenergize Weimar 60 kV bus for distribution work.	Yes	No	Yes	No
		4/19/2022 8:33:42	Open	Restore Weimar 60 kV bus following distribution work.				
PGE-CPUC-00009783	47	4/20/2022 6:58:45	Close	Deenergize Middle Fork substation for customer work.	Yes	No	Yes	No
		4/20/2022 17:15:12	Open	Restore following Middle Fork substation work			No	Yes CB52/CB32 c-phase[232]

[228] Source for table and footnotes: Attachment 1 to PG&E's response to SED-02 Q11.

[229] Date and time data based on the EMS alarms. See PGE-CPUC-00011791-CONFIDENTIAL (provided March 17, 2023, as attachment to PG&E response to SED-01 Q25) alarm data for June 30, 2022. That data, however, is not associated with any operation of Switch 47 in the field.

[230] PG&E listed an operation as successful if a test or an attempt to change switch position was successful.

[231] A switch log indicates PG&E remotely opened Switch 49 while a transmission trouble responder was working in the area. PG&E cannot confirm whether PG&E staff was physically present during switching.

[232] See PG&E's response to SED-01 Q24 and SED-02 Q8 for additional CB 52 and CB 32 information.

PGE-CPUC-00013488	47	4/25/2022 11:01:30	Close	Repair and Test Switch 47	No	Yes[233]	Testing completed-successful	No
		4/25/2022 11:09:53	Open					
PGE-CPUC-00011414	47	4/27/2022 13:03:20	Close	Clear Weimar 60 kV Bus for testing.	Yes	No	Yes	No
		4/27/2022 15:50:17	Open					
PGE-CPUC-00011437	47	4/30/2022 12:11:23	Close	Clear Weimar CB 52[234]	Yes	No	No	No
		4/30/2022 12:11:29	Open					
		4/30/2022 12:32:27	Close					
		4/30/2022 12:32:44	Open					
		4/30/2022 14:43:15	Close			Yes	Yes	
		4/30/2022 18:25:53	Open					
PGE-CPUC-00013495	47	5/7/2022 13:06:06	Close	Test new Switch 47 motor operator	No	Yes[235]	Testing - completed successful	No
		5/7/2022 14:18:03	Open					
		5/7/2022 14:32:13	Close					
		5/7/2022 14:33:53	Open					
		5/7/2022 14:42:13	Close					
		5/7/2022 14:43:53	Open					
PGE-CPUC-00011198	47	8/26/2022 7:25:59	Close	Clear Weimar #1 60 kV line on system trouble	Yes	No	Yes	Yes- CB52/ CB32 - a, c phases[236]
		8/28/2022 15:32:36	Open			Yes		No
PGE-CPUC-00001982	47	9/6/2022 18:12:37	Close	Transfer Foresthill load to Middle Fork	No	No	Yes[237]	Yes - CB32 - c phase

[233] Log T22-008397 states steps to clear the Weimar #1 60 kV and Middle Fork #1 60 kV lines on April 25, 2022, and repair and test Switch 47. This log does not show that Switch 47 was opened and closed on April 25, 2022; other PG&E records show this operation. PGE-CPUC-00011791-CONFIDENTIAL. PG&E understands that qualified electric workers were present during Switch 47 repairs and opened and closed it per PGE-CPUC-00004931 (LC Notification 123404435); and PGE-CPUC-0004931 (LC Notification 123404454).

[234] After four attempts to remotely operate Switch 47 failed, PG&E operated the switch in person.

[235] Log T22-009032 lists steps to clear sections of Weimar #1 and Middle Fork #1 on May 7, 2022, and replace and test the Switch 47 motor operator. The log does not show that Switch 47 was opened and closed on that date but PG&E understands that staff successfully opened and closed it for testing. See PGE-CPUC-00005057 (LC Notification 123485996), PGE-CPUC-00005067-68 (Transmission Construction Completion Standard Checklist) and PGE-CPUC-00011791-CONFIDENTIAL.

[236] After PG&E closed Switch 47, CB 52 and CB 32 operated due to a fault between Foresthill and Weimar Substations. PGE-CPUC-00009804 (Work Card T22-010178) and PGE-CPUC-00013486 (Notification 124378986).

[237] PG&E considers the operation successful because Switch 47 changed from open to closed.

VIII. Additional Tie Wire Examples

Figure 48 below highlights a 2023 PG&E internal guidance document that requires repair of loose and broken tie wires. The left photo shows an example of a loose tie wire that requires repairs.[238] In this case, the conductor that is well seated, i.e. still sitting in the insulator groove. The right photo shows a broken tie wire and an unseated conductor, which also requires repairs. PG&E published this document January 20, 2023.

Figure 48: Photos of loose tie wires from Identifying Conductor and Clearance Conditions[239]

[238] PGE-CPUC-00023106, provided in response to SED-03 Q16 (September 21, 2023). Document title is Identifying Conductor and Clearance Conditions TD-1001M-JA10 (published January 20, 2023, effective February 20, 2023). See pp. 4 and 6.

[239] Identifying Conductor and Clearance Conditions, pp. 4 and 6.

IX. Appendix: List of Acronyms

CAL FIRE - California Department of Forestry and Fire Protection

CB – Circuit breaker

CCSC - Construction Completion Standard Checklist

CIRT – PG&E Transmission Centralized Internal Review Team

ETPM Manual – PG&E Electric Transmission Preventative Maintenance Manual

FSR – Field Safety Reassessment

GO – General Order

HFTD - High Fire Threat District

IRS - Inspection Review Specialist

LC – Line correction

NCPA - Northern California Power Authority

O&M Plan - Operations and Maintenance Plan Electric Facilities on National Forest System Lands within the Pacific Southwest Region (prepared by PG&E and Southern California Edison for the U.S. Department of Agriculture Forest Service, Pacific Southwest Region).

PG&E – Pacific Gas & Electric Company

PCWA - Placer County Water Authority

SCADA - Supervisory control and data acquisition

SIQC - System Inspections Quality Control

SED – Safety and Enforcement Division

SME - Subject matter expert

SIQC - System Inspections Quality Control

USFS – United States Forest Service