

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

Incident Investigation Report

Report Date: March 23, 2023

Incident Number: E20210825-01 (Mule Fire)

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

Date and Time of the Incident: August 25, 2021 at 1400 hours

Location of Incident: [REDACTED]

Fatality/Injury: None

Property Damage: \$49,780 claimed as of September 23, 2021

Regulated Utility Facilities Involved: Girvan 1101, 12kV Circuit

Violation: Yes

I. Summary

On August 25, 2021, at approximately 1400 hours, a PG&E contracted work crew (Rokstad Power inc.) was replacing the service drop at [REDACTED] in Redding, California. While the journeyman lineman was cutting the second hot conductor of the service drop, the bolt bite style cutters contacted the hot conductor and the neutral conductor at the same time. The contact generated sparks which landed approximately 15 feet from the pole, causing a fire. The PG&E contracted work crew was unable to control the fire. The California Department of Forestry and Fire Protection (CAL FIRE) responded and contained the fire on the same day. The fire burned approximately 10 acres, one stand-alone garage and fencing.¹

Based on the Safety and Enforcement Division’s (SED) investigation, SED found that PG&E violated requirements in the Commission’s General Order (GO) 95 Rules for Overhead Electric Line Construction. SED identified the following PG&E violations:

¹ Pacific Gas and Electric Company. “Electric Incident Report Form - 20-Day report” (20-Day report), Page 2 through 3. September 23, 2021

Number	General Order Rule	Violations
1	GO 95, Rule 19	PG&E failed to preserve evidence (the fuses), which prevented SED from doing a thorough investigation.
2	GO 95, Rule 18.B.1.a.ii	PG&E failed to perform corrective action on Electric Overhead Tags 119117143, 118961974, 116805838, 118960151, and 120786027 within the six-month deadline.
3	GO 95, Rule 31.1	PG&E’s safety reassessments are not in accordance with accepted good practices.
4	GO 95, Rule 18.B.1.a.ii	PG&E failed to assign the correct corrective action deadline for Electric Overhead Tag 119117143.
5	GO 95, Rule 31.1	The journeyman lineman’s actions failed to follow accepted good practice and directly led to the fire.
6	GO 95, Rule 31.1	PG&E’s standard TD-1464S did not comply with Public Resources Code Section 4427.
7	GO 95, Rule 31.1	PG&E failed to place the water buffalo at the jobsite as required by their internal procedures.
8	GO 95, Rule 31.1	PG&E failed to train a contractor present on the jobsite, per PG&E standard TD-1464S, on how to perform work to prevent wildfires.

A. Rules and Requirements Violated

GO 95, Rule 18.B Maintenance Programs states in part:

(1) Companies shall undertake corrective actions within the time periods stated for each of the priority levels set forth below.

Scheduling of corrective actions within the time periods below may be based on additional factors, including the following factors, as appropriate:

- *Type of facility or equipment;*
- *Location, including whether the Safety Hazard or potential violation is located in the High Fire-Threat District;*
- *Accessibility;*
- *Climate;*
- *Direct or potential impact on operations, customers, electrical company workers, communications workers, and the general public.*

(a) The maximum time periods for corrective actions associated with potential violation of GO 95 or a Safety Hazard are based on the following priority levels:

(i) Level 1 -- An immediate risk of high potential impact to safety or reliability:

- *Take corrective action immediately, either by fully repairing or by temporarily repairing and reclassifying to a lower priority.*

(ii) 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; (3) 12 months for potential violations that compromise worker safety; and (4) 36 months for all other Level 2 potential violations.*

(iii) Level 3 -- Any risk of low potential impact to safety or reliability:

- *Take corrective action within 60 months subject to the exception specified below.*

EXCEPTION – Potential violations specified in Appendix J or subsequently approved through Commission processes, including, but not limited to, a Tier 2 Advice Letter under GO 96B, that can be completed at a future time as opportunity-based maintenance.

Where an exception has been granted, repair of a potential violation must be completed the next time the company’s crew is at the structure to perform tasks at the same or higher work level, i.e., the public, communications, or electric level. The condition’s record in the auditable maintenance program must indicate the relevant exception and the date of the corrective action.

GO 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;*

GO 95, Rule 31.1 Design, Construction and Maintenance states in part:

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

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

B. Witnesses

	Name	Title
1	Henry Sweat	CPUC Lead Investigator
2	Brandon Vazquez	CPUC Investigator
3	Jonathan Zulliger	CAL FIRE Captain
4		Rokstad/Crew Foreman
5		Rokstad/Journeyman Lineman #1
6		Rokstad/Journeyman Lineman #2
7		Rokstad/Journeyman Lineman #3
8		PG&E Employee
9		PG&E Employee

C. Evidence

	Source	Description
1	PG&E	Initial Online Incident Report, 8/25/2021
2	CPUC	Field Investigation, 9/20/2021
3	PG&E	20-day report, 9/23/2021
4	CPUC	Field Investigation of Evidence Collected, 11/4/2021
5	CPUC	Interview with Foreman, 11/5/2021
6	CPUC	Data Request #1, 10/26/2021
7	PG&E	Responses to Data Request #1, 11/23/2021 through 1/7/2022
8	CPUC	Data Request #2, 3/7/2022
9	PG&E	Responses to Data Request #2, 4/4/2022
10	CPUC	Data Request #3, 6/22/2022
11	PG&E	Responses to Data Request #3, 7/19/2022
12	CAL FIRE	CAL FIRE Investigation Report, and Attachments

II. Background

The Mule Fire ignited on August 21, 2021, at approximately 1400 hours near the transformer fed by the 12 kV Girvan 1101 circuit (Subject Circuit), serving [REDACTED], Redding, California. The fire burned approximately 10 acres, one stand-alone garage and fencing.² The Incident Location is in a Tier 3 High Fire Threat District. The Mule Fire started during installation of a new service drop.³ The existing service drop was replaced because it was supported near its midspan by a tree, which is called a “tree attach.”

Figure 1 shows the area where the Mule Fire started. Pole 1 supports the transformer from which the service drop originates that serves [REDACTED]. Pole 1 (SAP ID 101494005) is located approximately 100 yards south from Placer Road and 52 yards west from the residence at [REDACTED]. Pole 2 was added during construction to support the new service drop midspan, replacing the tree attach. The primary circuit is accessible by a service road that starts at Placer Road (highlighted in yellow) and runs southwards (white line in Figure 1).

On the day of the ignition, a weather station two miles from the Incident Location recorded a high of 90 degrees Fahrenheit (°F) at 1640 hours with a relative humidity of 14% and a low of 58.5 °F with a relative humidity of 52% at 0700 hours.⁴ The strongest wind gust was 12.4 mph at 1350 hours. PG&E’s Fire Potential Index Rating (a rating that increases as fire danger increases) was R4, which is defined by PG&E as, “Fire danger is critical. Using equipment and open flames is limited to specific areas and times.”⁵

² 20-Day report, Pages 2 and 3.

³ 20-Day report, Page 2.

⁴ 20-Day report, Page 3.

⁵ Pacific Gas and Electric Company. “Preventing and Mitigating Fires While Performing PG&E Work,” (Utility Standard: TD-1464S), Page 10. July 20, 2021.

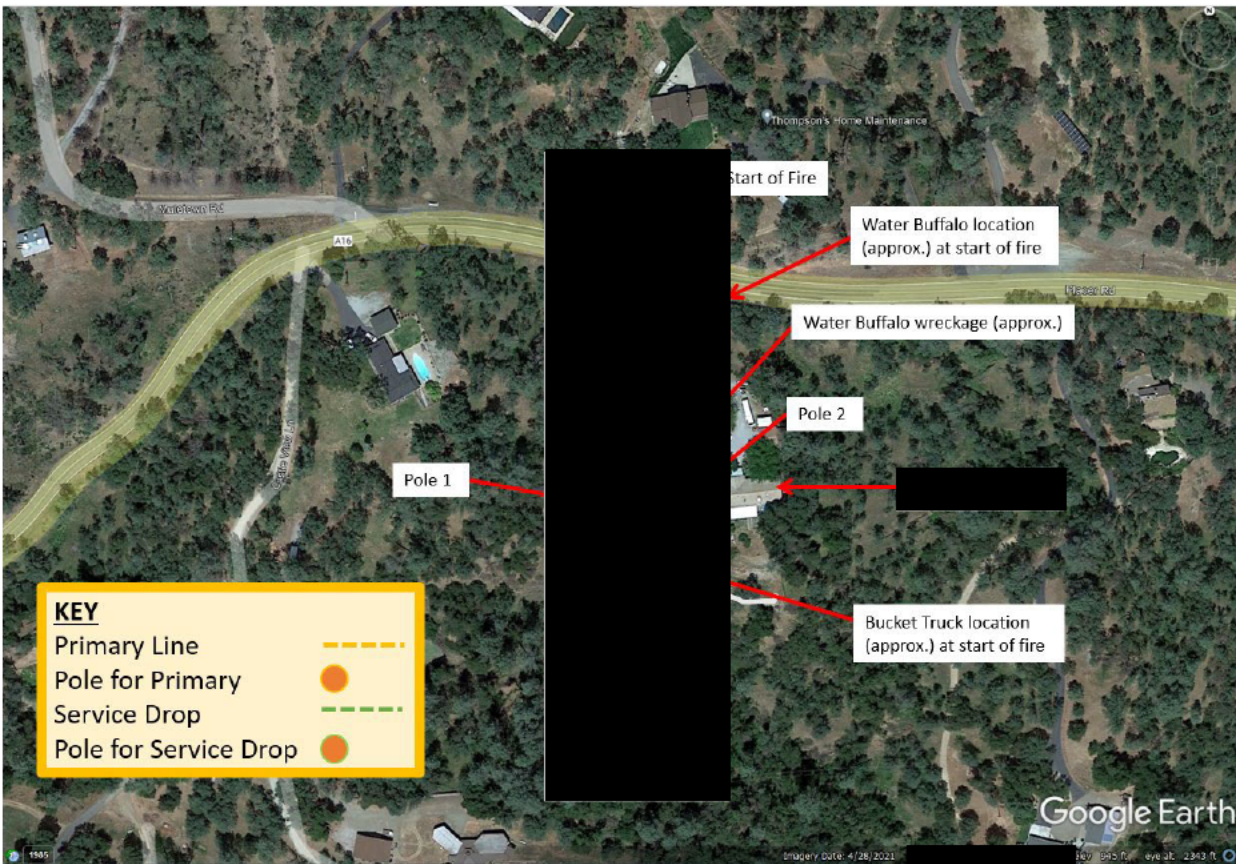


Figure 1: Sketch of Incident Location

III. SED Review and Analysis

SED reviewed and analyzed records, inspected and examined physical evidence, and interviewed witnesses related to this incident to determine compliance with Commission rules and regulations, specifically General Orders 95 and 165.⁶ SED conducted field observations of evidence collection and reviewed PG&E’s operations and maintenance procedures and relevant records. SED submitted three data requests to PG&E. The questions included requests for procedures, records, forms, and responses to specific questions related to the Mule Fire. SED also reviewed CAL FIRE’s investigation report, the associated exhibits and photos.

A. Event Timeline

On June 6, 2020, a PG&E inspector observed, “Secondary service attached to tree “Tree Attach” secondary service is rubbing hard against tree due to hard strain. Tree is dying.”⁷ As a result of this observation, the PG&E inspector created the work order (or “tag”) Electric Overhead Tag 119117143 to remove the tree attach by removing the old service drop and replacing it with a new service drop and pole. The tag was due on June 6, 2021. On April 19, 2021, a PG&E inspector performed a safety re-assessment and proposed a new due date of April 20, 2022 for Electric Overhead Tag 119117143. On August 23, 2021, a PG&E vegetation crew performed vegetation work to clear brush for a 10-foot radius around the pole that supports the transformer.⁸

On August 25, 2021, a PG&E contracted work crew arrived to install the new pole and service drop. In order to perform the work, a transformer level outage was planned, but upon arriving the work crew observed that the transformer had bushing mounted liquid fuses.⁹ PG&E informational job aid TD-2908P-01-JA243 states that work crews should not operate some bushing mounted liquid fuses as they are prone to breaking.¹⁰ As a result, the crew decided to perform the work energized.^{11, 12} At 1400 hours, while the journeyman lineman cut the second hot conductor of the service drop, the bolt bite style cutters contacted the hot conductor and the neutral conductor at the same time.¹³ Figure 3 shows the cut service drop and transformer.¹⁴ The contact between the bolt bite cutters and the hot conductor generated sparks which landed approximately 15 feet from the pole.¹⁵ The multitude of sparks ignited vegetation around the

⁶ This investigation did not assess whether PG&E complied with its Wildfire Mitigation Plans (WMP), as compliance with the WMP falls within the jurisdiction of the Office of Energy Infrastructure and Safety (OEIS).

⁷ Pacific Gas and Electric Company. “Electric Overhead Tag Notification #119117143” (EC Tag #119117143), Page 2. Date Identified June 6, 2020. Latest comments added August 26, 2021.

⁸ EC Tag #119117143, Page 2.

⁹ 20-Day report, Page 2.

¹⁰ Pacific Gas and Electric Company. “Operating Liquid-filled and Current Bushing Mounted Cutouts,” (TD-2908P-01-JA243), Page 1. April 15, 2015.

¹¹ 20-Day report, Page 2.

¹² A service drop is composed of three wires, two energized (or “hot”) conductors, and one neutral.

¹³ Pacific Gas and Electric Company. “Attachment 12_Post Incident Photos,” Page 18. August 25, 2021.

¹⁴ Pacific Gas and Electric Company. “Apparent Cause Evaluation (ACE) Report: Redding Mule Fire Incident,” (ACE Report), Page 14. October 27, 2021.

¹⁵ ACE Report, Pages 11 through 16.

pole, including the vegetation that had been removed from the base of the pole and piled outside of the cleared 10-foot radius. The PG&E contracted work crew attempted to control the fire with on-site equipment and a water buffalo parked on Placer Road but were unsuccessful. The water buffalo needed to be towed to the site of the ignition to fight the fire and did not start until the second attempt, eventually being abandoned when the crew fled to safety. CAL FIRE responded with an airtanker and engines, successfully containing the fire the same day.¹⁶

The incident caused an outage that affected six customers. On August 26, 2021, at 0855 hours, 379 additional customers were de-energized to complete repairs to restore service to the six impacted customers. The power to all customers was restored at 0951 hours on August 26, 2021.¹⁷



Figure 2: Bolt bite style cutters that made contact. The hole in the cutters (red arrow) was damaged when the cutter electrically connected the energized conductor and neutral.

¹⁶ ACE Report, Pages 11 through 16.

¹⁷ ACE Report, Page 16.

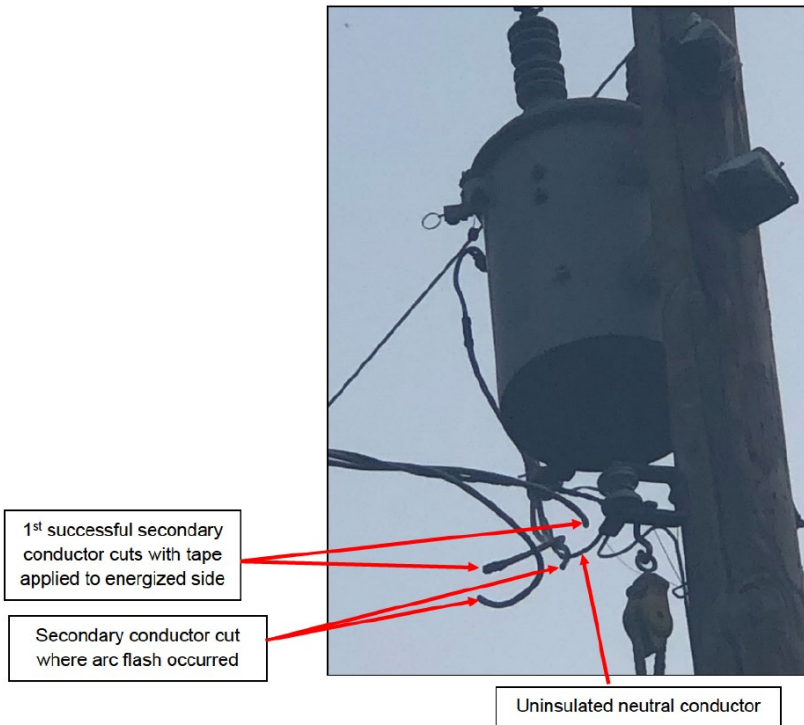


Figure 3: Transformer with cut service drop with annotation by PG&E.

B. Fire Authority Report

The following section discusses CAL FIRE’s Investigation Report.

1. Summary

The CAL FIRE report generally confirms the narrative of the incident discussed in PG&E’s 20-day report. CAL FIRE’s investigation determined the fire ignited around the utility pole.¹⁸ Additionally, according to the CAL FIRE report, the journeyman lineman that started the fire told CAL FIRE that, “he was careless and grounded his tool causing an arc.”¹⁹ The same journeyman lineman further stated to CAL FIRE that he “initially saw two or three small fires near the base of the utility pole after his tool arced.”²⁰ The CAL FIRE report also states that fire suppression resources belonging to the utility were not pre-staged to fight a fire.²¹

2. Analysis

The conclusions of the CAL FIRE report will be discussed in conjunction with the violations in the following sections.

¹⁸ CAL FIRE, “CAL FIRE Investigation Report – Case Number: 21CASHU009196 – MULE Incident” (CAL FIRE Investigation Report), Page 14. August 25, 2021

¹⁹ CAL FIRE Investigation Report, Page 7.

²⁰ CAL FIRE Investigation Report, Page 7.

²¹ CAL FIRE Investigation Report, Page 15.

C. Field Observations

1. Site Visit at Incident Location

On Friday, September 17, 2021, at 1000 hours, SED conducted a site visit and met with four individuals from CAL FIRE at the intersection of Muletown Road and Placer Road near [REDACTED] in Redding, California. Figure 4 shows a view of Pole 1 and Pole 2 from the ground. The PG&E contractor’s truck and attached water buffalo were abandoned onsite, burnt, and melted (Figure 5). At the site, SED observed that Pole 1, its electrical transformer, and secondary line were all replaced with new equipment (Figure 6). The garage from the residence at [REDACTED] was standing but was damaged by the fire.

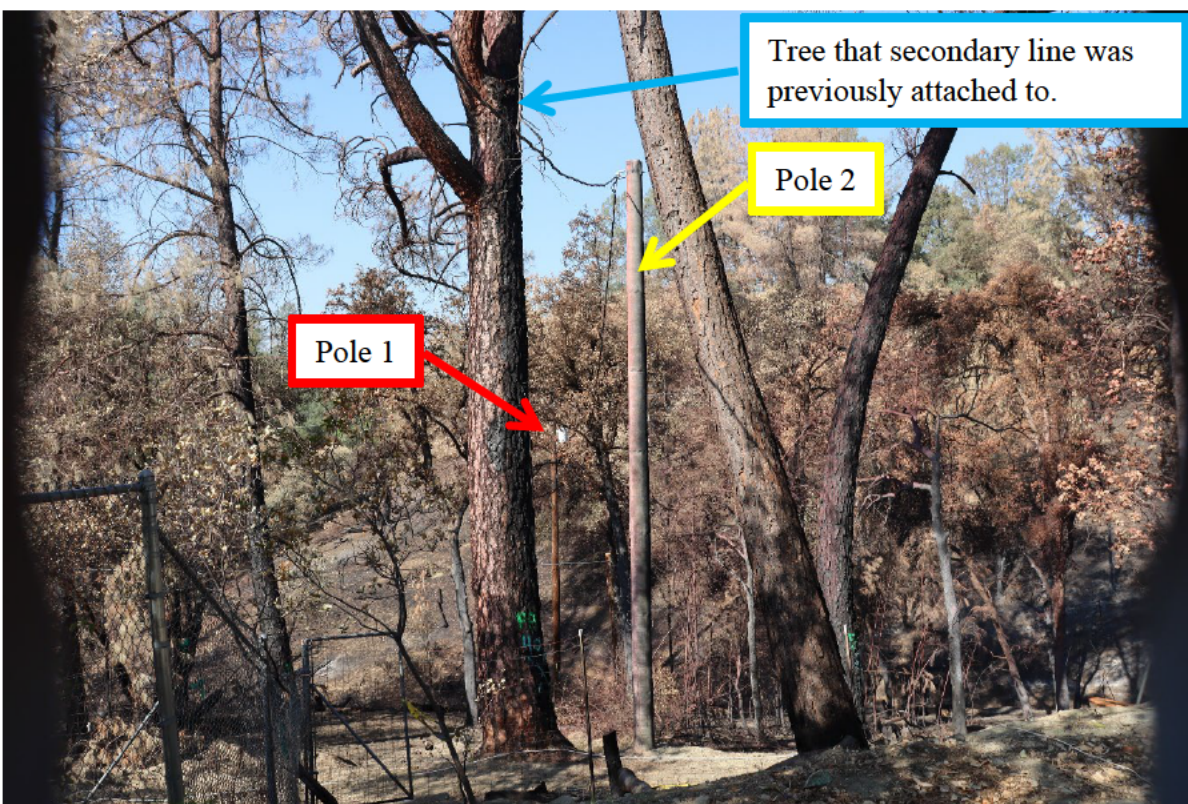


Figure 4: Photo standing near house looking toward distribution line. Red arrow points to Pole 1, yellow arrow points to Pole 2, and the blue arrow points to the tree that the secondary line had previously been attached to.



Figure 5: Abandoned remnants of contractor's truck and water buffalo



Figure 6: New pole (Pole 1) and transformer

2. Site Visit to PG&E's Evidence Warehouse

On Thursday, November 4, 2021, at 0945 hours, SED conducted a second site visit and met with three PG&E employees at PG&E's Evidence Warehouse at [REDACTED]

SED reviewed the evidence PG&E collected from the Incident Location. The collected evidence consisted of the transformer, insulators, two poles, molding, and sections of the secondary line. PG&E did not preserve the transformer's fuses, so SED was unable to observe them. SED focused its investigation on the secondary line which consisted of two insulated conductors and a neutral. The secondary line showed signs of an arc flash that showered molten metal. The first conductor cut was still taped at one end. The second conductor was disfigured where it had been cut (Figure 7 and Figure 8).



Figure 7: Disfigured conductor (supply side)

Figure 8: Disfigured conductor (load side)

3. Analysis of Field Observations

Violation 1

SED attempted to view the transformer’s fuses during the site visit to PG&E’s Evidence Warehouse where they stored the evidence collected. PG&E failed to retain the transformer’s fuses. The transformer’s fuses are key pieces of evidence as the type of fuse led to the decision to work on energized lines. Additionally, the fuses were the primary protective device that protected the system when the journeyman lineman made contact between the hot conductor and the neutral.

PG&E collected evidence connected to both ends of the fuses but failed to preserve the fuses. As a result, SED was unable to conduct a proper inspection of the transformer fuses. Per GO 95, Rule 19, PG&E is required to and should have preserved the fuses to assist in SED’s investigation. SED finds that PG&E’s failure to preserve the fuses is a violation of GO 95, Rule 19, which requires that a utility grant Commission staff access to any factual or physical evidence under the utility or utility agent’s physical control, custody, or possession related to the incident.

D. Document Review and Investigation

1. Inspections / Work Orders

PG&E’s work orders are subject to deadlines required by GO 95, Rule 18. SED found PG&E in violation of GO 95, Rule 18.B.1.a.ii for failing to complete work orders within the corrective action deadline and failing to assign a work order the correct corrective action deadline. SED also found PG&E in violation of GO 95, Rule 31.1 for as the safety re-assessment process does not meet accepted good practice.

Inspections/Work Orders: Procedures and Standards

GO 95, Rule 18 requires regulated utilities to establish maintenance programs for its facilities and sets maximum time periods to complete corrective actions associated with potential violations of GO 95 or Safety Hazards.²² Priority Level 1 is an immediate risk and requires corrective action immediately; Priority Level 2 is a risk of moderate potential impact and requires corrective action within 6 months in Tier 3 HFTD if a fire risk, within 12 months in Tier 2 HFTD if a fire risk or everywhere if worker safety is compromised, and 36 months for all others; Priority Level 3 is any risk of low potential impact and generally requires corrective action within 60 months unless there is an exception approved by GO 95, Appendix J. The requirements are presented in Table 1.

To implement GO 95 Rule 18, PG&E created a multitude of standards. Utility Standard: TD-8123S, titled “Electric System (T/S/D) Patrol, Inspection, and Maintenance Program,” describes PG&E’s processes and procedures for patrolling, inspecting and maintaining their transmission, substation and distribution systems.²³ To this end, Utility Standard: TD-8123S describes the process for corrective action if an issue is encountered by PG&E. Each corrective action is assigned a Priority Level which matches the Priority Levels from Rule 18, except for Priority Level 2 where PG&E requires corrective action within 6 months in Tier 3 HFTD and 12 months otherwise.²⁴ The requirements are presented in Table 1 next to the GO 95, Rule 18 requirements.

²² California Public Utilities Commission. “Rules for Overhead Electric Line Construction.” (General Order No. 95), Last revised January 16, 2020.

²³ Utility Standard:TD-8123S, Page 1.

²⁴ Utility Standard:TD-8123S, Page 4.

Table 1: Priority Levels for Corrective Actions for GO 95, Rule 18 and Utility Standard: TD-8123S

Priority	Condition Level	Corrective Action Deadline	
		GO 95, Rule 18	Utility Standard: TD-8123S
Level 1	High Risk	Immediate	Immediate
Level 2	Moderate Risk	(1) 6 months in Tier 3 HFTD for potential violations that create fire risk, (2) 12 months in Tier 2 HFTD that create fire risk, (3) 12 months worker safety is compromised, and (4) 36 months for all other potential violations	(1) Within 6 months in Tier 3 HFTD, (2) 12 months otherwise
Level 3	Low Risk	Within 60 months unless there is an exception approved by GO 95, Appendix J	Within 60 months unless there is an exception approved by GO 95, Appendix J

PG&E’s prioritizes work orders (or “tags”) using Utility Bulletin: TD-8999B-001 titled “PG&E’s 2019 Corrective Tag Execution Approach.”²⁵ This document describes five levels of tags: Priority A tags require immediate response or stand-by, Priority B tags require corrective action within 3 months, Priority E and F tags are prioritized based on wildfire risk circuit prioritization, and Priority H tags will be executed as part of a system hardening/proactive removal. Based on the significant increase in volume of the tags due to the 2019 Wildfire Safety Inspection Program (WSIP), PG&E anticipated that many tags would not be completed by the initially scheduled completion date. As a result, before each fire season, PG&E monitors and performs a safety re-assessment for Priority E, F and H tags. At that point, each tag is re-assigned a due date, typically one year after the safety re-assessment unless the tag requires escalation to Priority A or B.²⁶ Safety re-assessments are not only used for tags generated by the 2019 WSIP, but for all tags.²⁷

²⁵ Pacific Gas and Electric Company. “PG&E’s 2019 Corrective Tag Execution Approach,” (Utility Bulletin: TD-8999B-001), Page 2. November 23, 2019.

²⁶ Utility Bulletin: TD-8999B-001, Page 3.

²⁷ Pacific Gas and Electric Company. “Response to Data Request SED-002-Mule Fire,” Response to Question 9. April 4, 2022.

Table 2: Tag Prioritization

Tag's Priority	Tag Type	Response/Time
A	Emergency	Immediate
B	Urgent	Address within 3 months of the identification date
E & F	Risk-Based	Prioritize based on wildfire risk circuit prioritizations
H	Distribution Only	Execute as part of system hardening/proactive removal projects

Inspections/Work Orders: Work Orders

SED requested all open work orders (or “tags”) for the portion of the Girvan 1101 circuit spanning three structures in both directions of Pole 1. SED also requested all work orders associated with Pole 1 from the past five years, and the rebuild following the Mule Fire.

PG&E was addressing Electric Overhead Tag 119117143 when the Mule Fire ignited. The tag was to remove the tree attach by removing the old service drop and replacing it with a new service drop and pole. PG&E identified the corrective action on June 6, 2020 and assigned a due date of June 6, 2021, 12 months after identification.²⁸ PG&E categorized the tag as Priority E and Level 2.²⁹ Level 2 tags in Tier 3 HFTDs require corrective action within 6 months per GO 95 Rule 18 and Utility Standard: TD-8123S. PG&E stated the tag was likely incorrectly assigned a 12-month due date rather than a 6-month due date because of an error in their internal system. The error in the internal system caused the system to fail to identify the tag as related to an asset in HFTD Tier 3.³⁰ On April 19, 2021, 10 months after identification of Tag 119117143, PG&E re-assessed per Utility Bulletin: TD-8999B-001 and suggested a new due date for corrective action of April 20, 2022.³¹ PG&E completed the work for this tag on August 26, 2021.

On April 30, 2020, PG&E identified an improper jumper connection and issued Electric Overhead Tag 118961974 with an assigned deadline for corrective action by October 30, 2020.³² PG&E identified the tag as Priority E and Level 2. PG&E performed a safety re-assessment on April 30, 2021, after the required corrective action deadline. PG&E did not complete this tag until August 6, 2021.

There were five tags on the span at the Mule Fire incident location open as of December 16, 2021.³³ Table 3 summarizes their due dates and status. PG&E identified three out of the five tags

²⁸ EC Tag #119117143, Page 1.

²⁹ Pacific Gas and Electric Company. “Response to Data Request SED-001-Mule Fire,” Response to Question 18. January 7, 2022.

³⁰ Pacific Gas and Electric Company. “Response to Data Request SED-002-Mule Fire,” Response to Question 7. April 4, 2022.

³¹ EC Tag #119117143, Page 2.

³² Pacific Gas and Electric Company. “Completed Work Orders,” Pages 22 through 25. December 16, 2021.

³³ Pacific Gas and Electric Company. “Open Work Orders.” December 16, 2021.

as Priority E. PG&E then reassessed Electric Overhead Tags 116805838 and 118960151 per TD-8999B-001 since they were found in 2020. Electric Overhead Tag 120786027 was created in 2021, so the yearly re-assessment was not performed before the start of the Mule Fire. PG&E did not complete the Priority E tags within the required timeframe for a Level 2 priority level per PG&E Standard TD-8123S. PG&E failed to use the criteria in TD-8999B-001 to determine that the condition could be extended.

Table 3: Open Work Orders

Tag #	Identified	Original Due Date	WSIP Reassessment Dates	Priority
116805838	3/21/2019	9/18/2019	4/29/2020, 4/10/2021	E
118959903	4/29/2020	4/29/2025	4/10/2021	F
118960094	4/29/2020	4/29/2025	4/10/2021	F
118960151	4/29/2020	10/29/2020	4/10/2021	E
120786027	4/9/2021	10/9/2021	n/a	E

2. Analysis of Inspections/Work Orders

Violation 2

Electric Overhead Tags 116805838, 118960151, 118961974, 119117143, and 120786027 were Level 2 tags. GO 95 Rule 18.B.1.a.ii states that Level 2 priority corrective actions must be completed within six months for potential violations that create a fire risk in Tier 3 HFTDs. PG&E reassessed each of these tags per TD-8999B-001. However, PG&E’s reassessment of the tags does not exempt PG&E from complying with meeting the deadlines for corrective action prescribed by GO 95, Rule 18. SED finds that PG&E’s failure to perform corrective action on these five work orders within six months is a violation GO 95, Rule 18.B.1.a.ii.

Table 4: Violations for Late tags

Tag #	Identified	GO 95 Due Date
116805838	3/21/2019	9/18/2019
118960151	4/29/2020	10/29/2020
118961974	4/30/2020	10/30/2020
119117143	6/6/2020	12/6/2021
120786027	4/9/2021	10/9/2021

Violation 3

PG&E’s internal standards and bulletins and GO 95 sets deadlines for corrective action to reduce risks to the system. The deadlines for corrective actions in GO 95, Rule 18 are not permitted to

be extended except under reasonable circumstances. PG&E has not demonstrated that reasonable circumstances existed to warrant extension of the corrective actions.³⁴ As part of this investigation, SED identified four tags which were re-assessed after their initial corrective action deadline: Electric Overhead Tags 119117143, 118961974, 116805838, and 118960151. After PG&E performed the safety re-assessments, PG&E assigned a deadline of one year for corrective action, which is longer than the initial deadline for corrective action of six months mandated by GO 95, Rule 18. The safety re-assessment process disregards the mandated risk-reduction by both GO 95 and PG&E’s Utility Standard: TD-8123S. The process permits PG&E to continue to re-assess each year, which ignores the risk reduction specified in GO 95, Rule 18 and is therefore not accepted good practice. For instance, Electric Overhead Tag 116805838 was identified in 2019 and re-assessed in both 2020 and 2021. SED finds that PG&E’s failure to maintain their equipment in accordance with accepted good practice is a violation of GO 95, Rule 31.1.

Violation 4

PG&E incorrectly assigned Electric Overhead Tag 119117143’s corrective action due date to be 12 months after identification instead of six months as required by both Utility Standard: TD-8123S and GO 95, Rule 18.B.1.a.ii. SED finds that PG&E failed to correctly assign the corrective action due date, a violation of GO 95, Rule 18 B.1.a.ii.

3. ACE Report

PG&E performed an internal investigation of the Mule Fire and generated an Apparent Cause and Evaluation (ACE) Report.³⁵ The goal of the ACE report is to provide insight into the conditions leading up to the incident, detail possible causes, and identify corrective actions. The following conclusions are directly taken from the ACE report regarding the cause of the Mule Fire:

- The language in the NECA [National Electric Contractor’s Association] Safety Rules “Redbook” is not specific enough in methods to “avoiding contact” when working on secondary energized conductors below 300V (page 9).
- SAFE-1503WBT training is not consistently profiled to employees and contractors that are impacted by the rules (page 9).
- For secondary energized work in high fire risk areas, the established requirement is to maintain an adequate distance between conductors. There is no specific requirement to insulate conductors. The employee did not apply any insulation to protect from unintended contact even though there was difficulty pulling a large enough loop to use the cutting tool (page 27).

³⁴ GO 95, Rule 15.1 further requires that a utility obtain Commission approval for exemption or modifications of any requirements, including Rule 18. Thus, even if the extensions were reasonable, PG&E had not requested nor received Commission approval for the extensions.

³⁵ ACE Report, Page 9, 27 and 28.

- A 5-gallon water backpack should have been available at the work location to address the grass fire once it started. Also, firefighting tools for each person at the job location should have been deployed (page 27).
- The energized secondary conductor should have been separated more to prevent contact by the cutting tool on the neutral line (page 27).
- The employee was holding the cutter with his right hand and resting the other handle on his shoulder while holding the energized conductor in his left hand. The metal cutting tool should not have been able to contact the neutral line (page 27).
- Crew should have had working communication method(s) before starting work (page 27).
- The fire watch was equipped with a shovel and chemical fire extinguisher, and not a water backpack (page 27).
- The water buffalo should have been positioned within 200-feet of the work location to be sure it could be effectively used (page 27).
- The crew should have positioned the pickup and water buffalo for easy evacuation in case a fire started and got out of control (page 27).
- The crew was not adequately trained to plan, position, and utilize fire mitigation tools and equipment in the event of a fire (page 28).
- The guidance provided in PG&E Utility Standard TD-1464 Rev.5, Preventing and Mitigating Fires While Performing PG&E Work is not specific enough for PG&E and contractor field crews to effectively mitigate fires under the changing environmental conditions (page 28).

4. ACE Report Analysis

SED generally agrees with the conclusions listed in the ACE report. Violations related to the conclusions from the ACE report will be discussed in Section D.6 of this report.

5. Relevant Procedures and Standards at Time of Incident

SED finds PG&E in violation of GO 95, Rule 31.1 for failing to follow their own prescribed work practices, having standards that do not meet the minimum requirements of the Public Resources Code (PRC), and failing to train its employees and contractors for fire prevention.

Relevant Procedures: Utility Standard: TD-1464S

PG&E’s work practices to prevent fires during construction, maintenance and repairs are contained in Utility Standard: TD-1464S, “Preventing and Mitigating Fires While Performing PG&E Work.”³⁶ The standard is mandatory for all PG&E employees and contractors performing work on or near facilities that could result in the ignition of a fire. PG&E structured the standards as a series of risk mitigation measures that must be done regardless of the conditions, in addition to risk mitigation measures that must be implemented as the Fire Index Rating increases. Since

³⁶ Utility Standard: TD-1464S, Page 1.

the Fire Index Rating was R4 on August 25, 2021 (the date of the Mule Fire), Utility Standard: TD1464S required workers to follow Sections 2.7.3, 2.7.4 and 5.2.1. These sections are quoted below:

- Section 2.7.3 (page 5): *Do not start any fire that could escape control through careless or negligent actions.*
- Section 2.7.4 (page 6): *While performing stationary ground level jobs or activities from which a spark, fire, or flame may originate (e.g., welding, cutting, grinding), all flammable material (e.g., grass, leaf litter, including snags) must be removed down to the mineral soil around the operation for a minimum of 10 feet.*

a. IF the jobsite is not stationary

OR IF it cannot be sufficiently cleared due to vegetation density at the base of a pole, erosion concerns, or when work is being performed at the top of a pole or tower (e. g., install and removal of master grounds on a de-energized transmission line adjacent to an energized transmission line)

AND the fire index rating is “R1”, “R2”, “R3” or “R4” or not within a fire index area

THEN there must be a Working Fire Watch assigned at the jobsite.

- Section 5.2.1 (page 9): *Ensure there is at least 120 gallons of water at the jobsite with at least 200 feet of hose with 40 psi at the nozzle.*

Workers are also required to have firefighting tools, including, but not limited to, chemical and water-backpack fire extinguishers. Since Electric Overhead Tag 119117143 was performed at the top of a pole, Section 2.7.4 did not require clearing to mineral soil at the base of the pole; only a working fire watch was required.³⁷

The PG&E contractors used a water buffalo to meet the requirements of Section 5.2.1. The water buffalo was a trailer mounted, 500-gallon water tank with a pump and a 200-foot hose used for fire prevention. While performing the work for Electric Overhead Tag 119117143, the contractors parked the water buffalo on the street approximately 292 feet away from where work was being performed on Placer Road (Figure 9).³⁸ In response to a data request asking if the water buffalo was located at the jobsite, PG&E responded: “We are of the opinion that the water buffalo was at the jobsite in accordance with the standard as it existed at the time.”³⁹ SED was unable to identify any work performed in the immediate vicinity of Placer Road near where the water buffalo was parked at the start of the Mule Fire.

³⁷ Pacific Gas and Electric Company. “Response to Data Request SED-002-Mule Fire,” Response to Question 15 and 16. April 4, 2022.

³⁸ ACE Report, Page 3.

³⁹ Pacific Gas and Electric Company. “Response to Data Request SED-002-Mule Fire,” Response to Question 19. April 4, 2022.

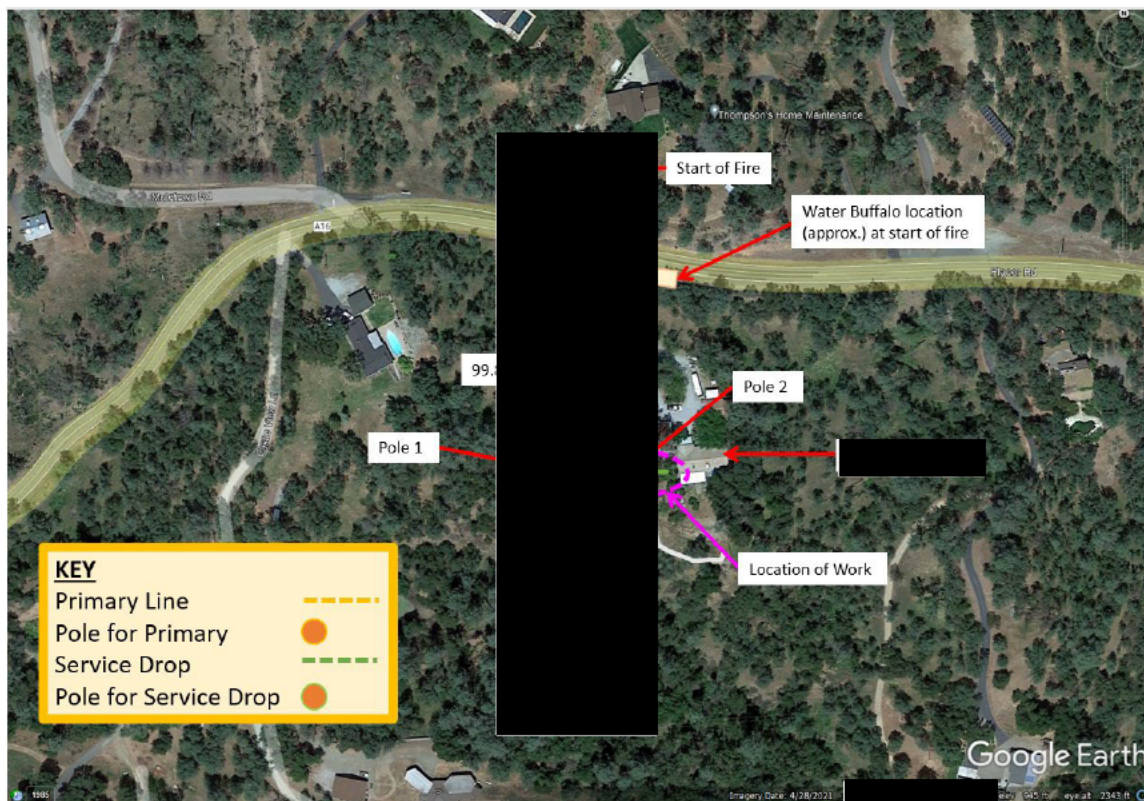


Figure 9: Sketch showing the distance from Pole 1 to the street, the location of the Water Buffalo at the start of the fire and the location where work was performed

Relevant Procedures: SAFE 1503BWT

SAFE 1503BWT is PG&E’s Fire Danger Precautions Course. TD-1464S states that the training “targets PG&E employees working on any forest, brush or grass-covered lands” and is “profiled to the target audience as mandatory.” The training course generally teaches employees and contractors the requirements of TD-1464S, including work procedures and the use of fire suppression tools, like a fire extinguisher.

SED reviewed the contractor’s training records for SAFE-1503BWT. One contractor’s training was expired at the time of the incident.⁴⁰ PG&E stated that the contractor’s job classification was mistakenly not profiled as a job classification that required SAFE-1503BWT training, causing the lapse in qualification.⁴¹ This error was corrected on March 23, 2022.⁴²

⁴⁰ Pacific Gas and Electric Company. “ISN Training Records,” Page 1. January 7, 2022.

⁴¹ Pacific Gas and Electric Company. “Response to Data Request SED-002-Mule Fire,” Response to Question 10. April 4, 2022.

⁴² Pacific Gas and Electric Company. “Response to Data Request SED-002-Mule Fire,” Response to Question 10. April 4, 2022.

Relevant Procedures and Standards at Time of Incident: Public Resources Code Section 4427

An additional requirement for working during fire season is Public Resources Code (PRC) Section 4427 which states:

During any time of the year when burning permits are required in an area pursuant to this article, no person shall use or operate any motor, engine, boiler, stationary equipment, welding equipment, cutting torches, tarpots, or grinding devices from which a spark, fire, or flame may originate, which is located on or near any forest-covered land, brush-covered land, or grass-covered land, without doing both of the following:

(a) First clearing away all flammable material, including snags, from the area around such operation for a distance of 10 feet.

(b) Maintain one serviceable round point shovel with an overall length of not less than forty-six (46) inches and one backpack pump water-type fire extinguisher fully equipped and ready for use at the immediate area during the operation.

This section does not apply to portable powersaws and other portable tools powered by a gasoline-fueled internal combustion engine

The journeyman lineman cut the service drop with handheld wire cutters. In response to Data Request 2, Question 12 asking if PG&E violated PRC 4427, PG&E stated the use of handheld wire cutters is not one of the activities listed in PRC 4427 that would trigger the mitigation fire risk requirements of PRC 4427.⁴³

Relevant Procedures: The Red Book

PG&E requires its contractors to follow the “California Safety Manual Code of Safe Work Practices Accident Prevention Rules (Red Book).”^{44, 45} The Red Book details safe work practice procedures. Section 2.05 of the Red Book specifies the “minimum working distance from energized conductors or apparatus, which are not properly covered with approved protective equipment. This includes extended reach, falling, and material or equipment whether insulated or not.” For 50 to 300 volts, the minimum working distance is specified as “Avoid Contact.” Figure 10 and Figure 11 are both from the Red Book and depict the Minimum Approach Distance.⁴⁶ Figure 11 shows that the minimum approach distance starts at the end of a conductive object,

⁴³ Pacific Gas and Electric Company. “Response to Data Request SED-002-Mule Fire,” Response to Question 12. April 4, 2022.

⁴⁴ Pacific Gas and Electric Company. “Response to Data Request SED-002-Mule Fire,” Response to Question 13. April 4, 2022.

⁴⁵ Western Line Constructor Chapters, Inc., National Electrical Contractors Association. “Section 2.0 of California Safety Manual Code of Safe Work Practices Accident Prevention Rules (Red Book),” Page 20 through 21. July 1, 2020.

⁴⁶ Western Line Constructor Chapters, Inc., National Electrical Contractors Association. “Section 2.0 of California Safety Manual Code of Safe Work Practices Accident Prevention Rules (Red Book),” Page 21 through 22. July 1, 2020.

which in this incident would be the bolt cutters and the neutral. In this case, the requirements would be to avoid contact between energized line, the bolt cutters, and the neutral.

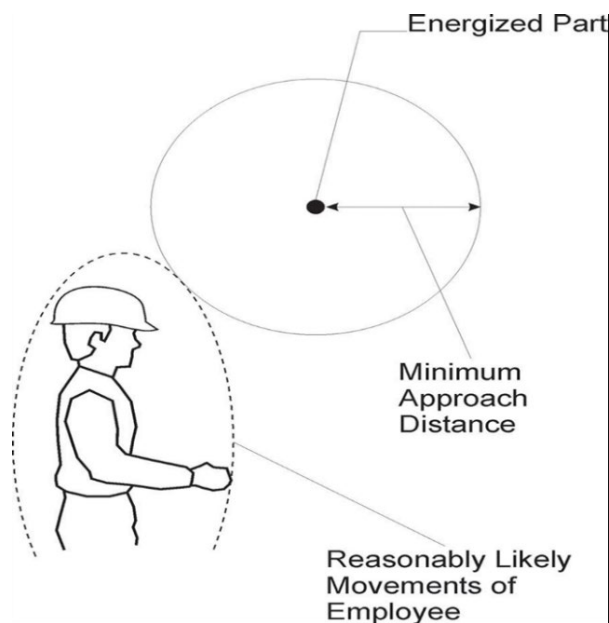


Figure 10: Depiction of Minimum approach distance

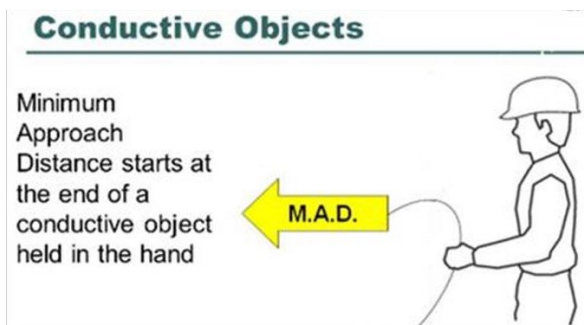


Figure 11: Depiction showing that the minimum approach distance starts with the end of the conductive object

PG&E’s Utility Procedure: TD2360P-01 “Rubber Glove Work Methods, 50 V to 21 kV” has similar requirements as the Red Book. However, Utility Procedure: TD2360P-01’s requirements often exceed the requirements in the Red Book. For instance, Section 3.1.4 states “Always USE approved insulating protective equipment on adjacent conductors where there is a possibility of simultaneous contact by the employee, tools, or equipment.”⁴⁷ This procedure would require installing insulating protective equipment, like an insulating blanket, on the neutral to prevent accidental contact. Utility Procedure: TD2360P-01 is a requirement for PG&E employees but does not apply to PG&E contractors.⁴⁸ PG&E contractors were performing the energized work that led to the Mule Fire so the requirements did not apply. SED notes that following Utility Procedure: TD2360P-01 likely would have prevented the Mule Fire.

⁴⁷ Pacific Gas and Electric Company. “Rubber Glove Work Methods, 50 V to 21 kV,” (Utility Procedure: TD2360P-01). Page 8. August 15, 2018.

⁴⁸ Pacific Gas and Electric Company. “Response to Data Request SED-002-Mule Fire,” Response to Question 13. April 4, 2022.

6. Analysis of Relevant Procedures

Violation 5

The ACE report states that the journeyman lineman held the cutter with his right hand and rested the other handle on his shoulder, while holding the energized conductor in his left hand. This position did not allow the journeyman lineman to maintain control of the cutter, which resulted in the cutter slipping and contacting the neutral line. This unsafe and careless action started the Mule Fire. The CAL FIRE report confirms that the journeyman lineman that performed the work stated he was careless. This action violates Utility Standard: TD-1464S, Section 2.7.3.

Additionally, the journeyman lineman was unable to properly control the cutter to prevent it from contacting the neutral and the energized conductor at the same time. This is a violation of Section 2.05 of the Red Book, which states that contact must be avoided. While it was an accident, the journeyman lineman failed to recognize the danger and take appropriate precautions to avoid contact between the neutral, energized wire and the cutter. As a result, SED finds PG&E did not follow its internal procedures and accepted good practice. This is a violation of GO 95, Rule 31.1.

Violation 6

SED finds the requirements in Utility Standard: TD-1464S Revision 5 do not meet the minimum requirements of PRC 4427. When any person performs the activities set forth in PRC 4427, PRC 4427 requires that a person first perform the required mitigation measures of clearing all flammable material within 10 feet. Utility Standard: TD-1464S Section 2.7.4 only requires clearing of the ground when performing ground level jobs. Utility Standard: TD-1464S does not requiring cleaning of the ground activities (such as operating a grinding device) were performed at the top of a pole. PG&E confirmed this difference in their utility standard requirements, stating the following:

When TD-1464S was developed, Section 2.7.4 was established to meet the requirements defined within PRC-4427, “performing ground level jobs or activities that would produce a spark, fire, or flame.” Regardless of the height of a pole, Section 2.7.4 was not considered to be effective for pole top operations.⁴⁹

This requirement is in direct contradiction with PRC 4427, which contains no exceptions for the location of the work being performed. PRC 4427 was developed to prevent fires by mandating accepted good work practices based on known local conditions and work activities. SED finds PG&E failed to create a procedure that met the minimum requirements of PRC 4427, which constitutes a violation of GO 95, Rule 31.1.

Violation 7

⁴⁹ Pacific Gas and Electric Company. “Response to Data Request SED-002-Mule Fire,” Response to Question 10. April 4, 2022.

TD-1464S Revision 5, Section 5.2.1 required that there be at least 120 gallons of water at the jobsite with at least 200 feet of hose with 40 psi at the nozzle in R4 conditions. The water buffalo met or exceed the requirements for 120 gallons of water and 200 feet of hose. At the start of the Mule Fire, the contractor parked the water buffalo on the street approximately 292 feet away from where work was being performed. The contractor did not perform work in the vicinity of the water buffalo; all of the work performed was in the vicinity of Pole 1 and Pole 2 as shown in Figure 9. Access to the jobsite was limited due to a variety of obstructions including a narrow access path, sloped ground, trees, fences and other debris. Consequently, the water buffalo could not have been used to fight any potential ignitions resulting from the work from where it was parked, due to both the hose not being long enough and the obstructions. As a result, the workers needed to move the water buffalo to fight the fire. SED concludes that the water buffalo was not properly placed at the jobsite in violation of PG&E’s own procedures. PG&E’s ACE report confirms SED’s conclusion that the water buffalo was not positioned correctly.⁵⁰ SED finds that PG&E failed to follow its own procedures which constitutes a failure to follow accepted good practice while performing work, a violation of GO 95, Rule 31.1.

Violation 8

Utility Standard: TD-1464S requires SAFE-1503BWT training for all employees and contractors working on “any forest, brush or grass-covered lands.” PG&E failed to train one contractor that performed work at the jobsite. PG&E admits in their ACE report “SAFE-1503WBT training is not consistently profiled to employees and contractors that are impacted by the rules.”⁵¹ PG&E failed to follow its own procedures to adequately train its contractors so that they can act in accepted good practice for known local conditions. As a result, SED finds that PG&E violated GO 95 Rule 31.1.

IV. Conclusion

Based on the evidence reviewed, SED’s investigation identified eight (8) violations of General Order 95 by PG&E:

1. PG&E’s failure to preserve evidence (the fuses), which prevented SED from doing a complete investigation, is a violation of **GO 95, Rule 19**.
2. PG&E’s failure to perform corrective action on Electric Overhead Tags 119117143, 118961974, 116805838, 118960151 and 120786027 within the six-month deadline is a violation of **GO 95, Rule 18.B.1.a.ii**.
3. PG&E’s safety reassessments are not in accordance with accepted good practices, a violation of **GO 95, Rule 31.1**.

⁵⁰ ACE Report, Page 27.

⁵¹ ACE Report, Page 9.

4. The failure to assign the correct corrective action due date for Electric Overhead Tag 119117143 is a violation of **GO 95, Rule 18**.
5. The journeyman lineman’s careless action was a failure to follow PG&E’s internal procedures and accepted good practice, a violation of **GO 95, Rule 31.1**.
6. PG&E internal standard at the time of the fire Utility Standard: TD-1464S did not comply with PRC 4427. PG&E’s failure to write standards in compliance with the law is a failure to comply in accepted good practice for local conditions, a violation of **GO 95, Rule 31.1**.
7. PG&E’s failure to place the water buffalo at the jobsite is a failure to follow accepted good practice while performing work, a violation of **GO 95, Rule 31.1**.
8. PG&E’s failure to train each individual present on jobsite with SAFE-1503BWT is a failure to follow PG&E internal procedures and is a violation of **GO 95, Rule 31.1**.

V. Attachments