

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

**Incident Investigation Report**

**Report Date:** October 9, 2023

**Incident Number:** W20210713-01

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

**Date and Time of the Incident:** July 13, 2021 at 0648 hours

**Location of Incident:** 39.874608, -121.378855, near Cresta Dam in Butte County

**Fatality/Injury:** 4 injuries

**Property Damage:** 1311 Structures destroyed, 94 damaged

**Regulated Utility Facilities Involved:** Bucks Creek 1101 Circuit

**Violation:** Yes

## **I. Summary**

On July 13, 2021, at 0648 hours, the Pacific Gas and Electric Company (PG&E) received a Supervisory Control and Data Acquisition (“SCADA”) alert regarding the Buck Creek 1101 Circuit.<sup>1</sup> The alert indicated that there was an outage at Cresta Dam, which is serviced by Bucks Creek 1101 Circuit. PG&E dispatched a troubleman (Dixie Troubleman) to investigate, who arrived at the dam at 1218 hours. The Dixie Troubleman observed blown fuses located on a pole up the hill from Cresta Dam. The Dixie Troubleman did not identify the reason the fuses blew while at Cresta Dam. When the Dixie Troubleman arrived at the location of the fuses at 1650 hours, he observed two of the three fuses blown, a tree resting on the circuit down the hill from the fuses, and a small fire. The Dixie Troubleman attempted to fight the fire in addition to radioing for help. The California Department of Forestry and Fire Protection (CAL FIRE) was contacted.

CAL FIRE determined that the fire was caused by a tree contacting electrical distribution lines owned and operated by PG&E.<sup>2</sup> The tree fell and hit the lines, which caused two of the three lines to become electrically connected, resulting in a phase-to-phase fault.<sup>3</sup> This fault blew two

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<sup>1</sup> SCADA is the system that PG&E uses to remotely monitor and control its electric circuits.

<sup>2</sup> CAL FIRE, “CAL FIRE NEWS RELEASE – CAL FIRE Investigators Determine Cause of the Dixie Fire” (CAL FIRE News Release (January 4, 2022), page 1.

<sup>3</sup> CAL FIRE, “CAL FIRE Investigation Report – Case Number: 21CABTU009205-58 – Dixie” (CAL FIRE Investigation Report) (July 13, 2021), page 45.

fuses. Even though two fuses operated and deenergized the lines, the third conductor remained energized and in contact with the tree, which caused a high-impedance fault. The energized line in contact with the tree eventually started a fire.

The Safety and Enforcement Division’s (SED) investigation found that PG&E violated requirements of the California Public Utilities Commission’s (CPUC) General Order (GO) 95 and the California Public Utilities Code (PU Code), as listed below:

<b>General Order Rule, Public Utilities Code</b>	<b>Violations</b>
GO 95, Rule 18.B	PG&E failed to complete Electric Overhead Tag 109671451 within the required deadline.
GO 95, Rule 18.B	PG&E failed to maintain records that show the correct date of the vegetation inspection.
GO 95, Rule 18.B	PG&E failed to maintain a complete set of records from its 2019 vegetation management routine inspection.
GO 95, Rule 31.1	PG&E failed to update Appendix A from its vegetation procedures to appropriately reflect the minimum distance requirements required by GO 95, Rule 35.
GO 95, Rule 31.1	PG&E failed to identify the tree on the line, which was observable from Cresta Dam.
GO 95, Rule 31.1	PG&E failed to maintain its 12 kV overhead conductors safely and properly by failing to identify a hazardous tree condition and not taking appropriate steps to prevent the Subject Tree from striking the overhead conductors.
Public Utilities Code Section 451	PG&E failed to adequately consider the hazard of Bucks Creek 1101 circuit in its response to the outage at Cresta Dam

## **A. Rules and Requirements Violated**

The following is a list of the rules and statutory requirements violated:

- **GO 95, Rule 18.B Maintenance Programs**
- **GO 95, Rule 31.1 Design, Construction and Maintenance**
- **Public Utilities Code Section 451**

## B. Witnesses

	<b>Name</b>	<b>Title</b>
1	Henry Sweat	CPUC Lead Investigator
2	Sam Mandell	CPUC Investigator
5	██████████	PG&E Incident Investigator
6	██████████	PG&E Claims Supervisor
8	██████████	PG&E Arborist
9	Matt Palades	CAL FIRE Lead Investigator
10	Shawn Zimmermaker	CAL FIRE Battalion Chief
11	Dixie Troubleman	PG&E Troubleman
12	NDCC Operator #1	PG&E Distribution Operator
13	PG&E Hydroelectric Operator	PG&E Hydroelectric Operator
14	PG&E Roving Operator	PG&E Roving Operator

### C. Evidence

	Source	Description
1	PG&E	Initial Online Incident Report, 7/18/21
2	CPUC	Field Investigation, 7/26/2021
3	Case 3:14-cr-00175-WHA	Documents 1408 - 1532, 7/28/2021 through 12/08/21
4	CPUC	Data Request #1, 8/4/2021
5	PG&E	Responses to Data Request #1, 8/6/2021 through 9/1/2021
6	CPUC	Data Request #2, 8/10/2021
7	KCBS	News report, 8/12/2021
8	PG&E	20-day report, 8/13/2021
9	PG&E	Responses to Data Request #2, 8/16/2021 through 5/25/2022
10	CPUC	Data Request #3, 8/16/2021
11	PG&E	Data Request #4, 8/24/2021
12	CPUC	Field Investigation, 8/25/2021
13	PG&E	Responses to Data Request #3, 8/26/2021
14	PG&E	Responses to Data Request #4, 9/24/2021 through 3/25/2022
15	CPUC	Field Investigation, 10/14/2021
16	CPUC	Field Investigation, 11/23/2021
17	CAL FIRE	Press Release, 1/4/2022
18	CPUC	Data Request #5, 1/31/2022
19		Email conversation, 2/3/2022 through 8/19/2022
20	PG&E	Responses to Data Request #5, 2/28/2022 through 8/8/2022
21	CPUC	Data Request #6, 7/27/2022/26/23/2022
22	PG&E	Responses to Data Request #6, 7/27/2022
23	CAL FIRE	Investigation Report and associated attachments
24	CAL FIRE	Arborist Report by McNeil Arboriculture Consultants LLC (Exhibit W)
25	CAL FIRE	Expert Report of Thomas S. Hylton (Exhibit X)

## **II. Background**

SED reviewed and analyzed records, examined physical evidence, and interviewed witnesses related to this incident to determine compliance with Commission rules and regulations, specifically GO 95 and GO 165.<sup>4</sup> SED conducted field observations of evidence collection and reviews of PG&E's operations and maintenance procedures and relevant records. SED submitted six data requests totaling 125 questions to PG&E. The questions included requests for procedures, records, forms, and responses to specific questions related to the Dixie Fire. SED also reviewed CAL FIRE's investigation report, associated exhibits, arborist report and photos.

The Dixie Fire started on July 13, 2021, just off Storrie Road near Cresta Dam in Butte County at approximately 39.874608, -121.378855 (Figure 1 and Figure 2). The fire was contained on October 26, 2021. The Dixie Fire burned 963,309 acres, destroyed 1,311 structures, damaged 94 additional structures and caused four injuries. CAL FIRE determined that the cause of the fire was a tree contacting electrical distribution lines on the Bucks Creek 1101 12 kV circuit owned and operated by Pacific Gas and Electric (PG&E).<sup>5</sup> The CAL FIRE report summarized causation of the fire as follows:

The fire ignited as a result of a 65' tall, damaged and decayed Douglas fir tree when it fell and contacted conductors at approximately 6:48 AM. Two of the three fuses blew (opened) upon initial contact with the conductors, but the third fuse remained closed and kept a line energized. The tree being in contact with energized conductors and the ground created a high impedance fault. The high impedance fault energized the tree, which caused heat and arcing to ignite a dry and receptive fuel bed over the course of 10 hours.<sup>6</sup>

Cresta Dam is located directly off Highway 70. While the ignition location of the fire is very close to Cresta Dam geographically, the incident location is up a very steep hill. Driving to the incident location from the dam involves an 18-mile circuitous drive, most of which is on a windy dirt road.

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<sup>4</sup> This investigation did not assess whether PG&E complied with its Wildfire Mitigation Plans (WMP).

<sup>5</sup> CAL FIRE Investigation Report, page 45; PG&E Electric Incident Report Form, 20-Day report (August 13, 2021) (20-Day report), page 1.

<sup>6</sup> CAL FIRE Investigation Report, page 5.

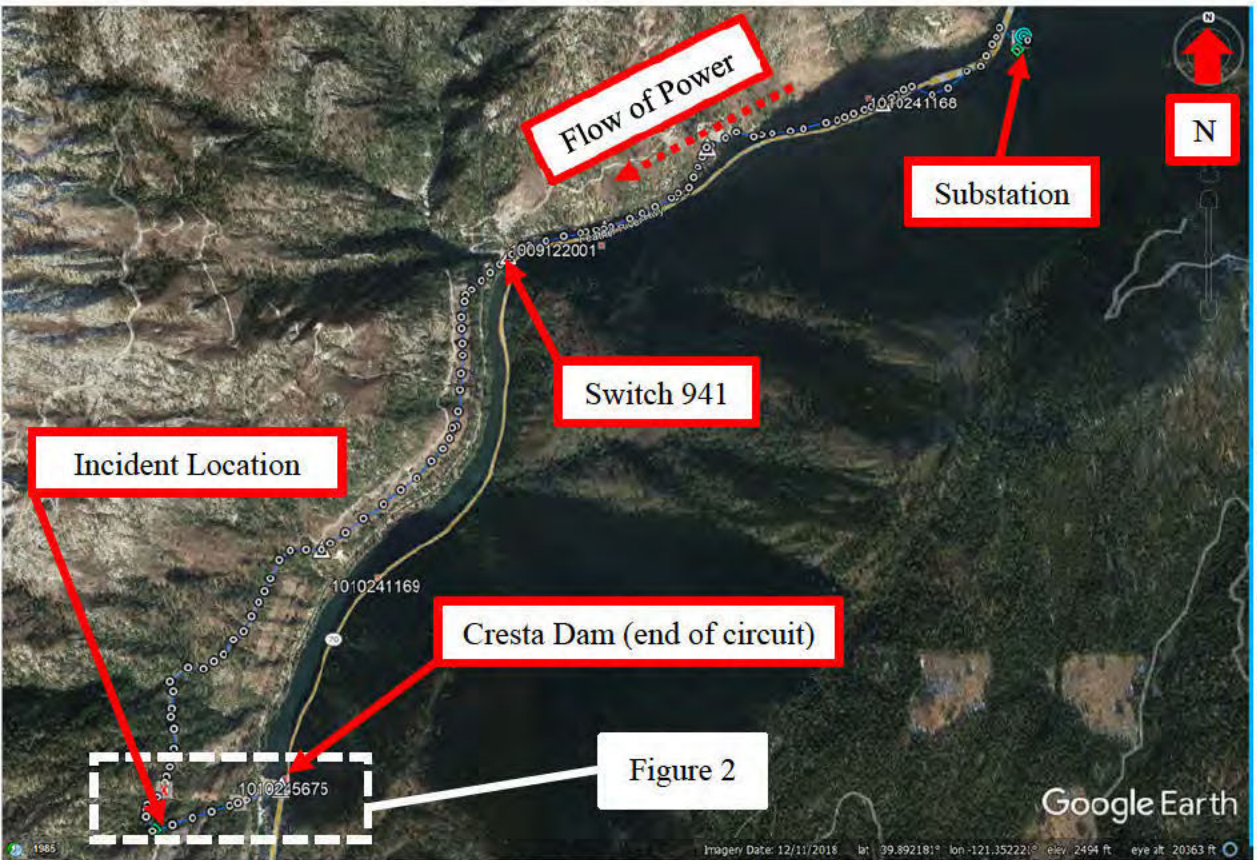


Figure 1: Circuit Map for Bucks Creek 1101 Circuit with important locations identified. The blue line is the pathway of the circuit. The white-outlined, black dots show the location of each pole. The green diamonds show the locations of fuses. The red Xs typically indicate the location of switches but can indicate other items. The white triangles typically indicate transformers.



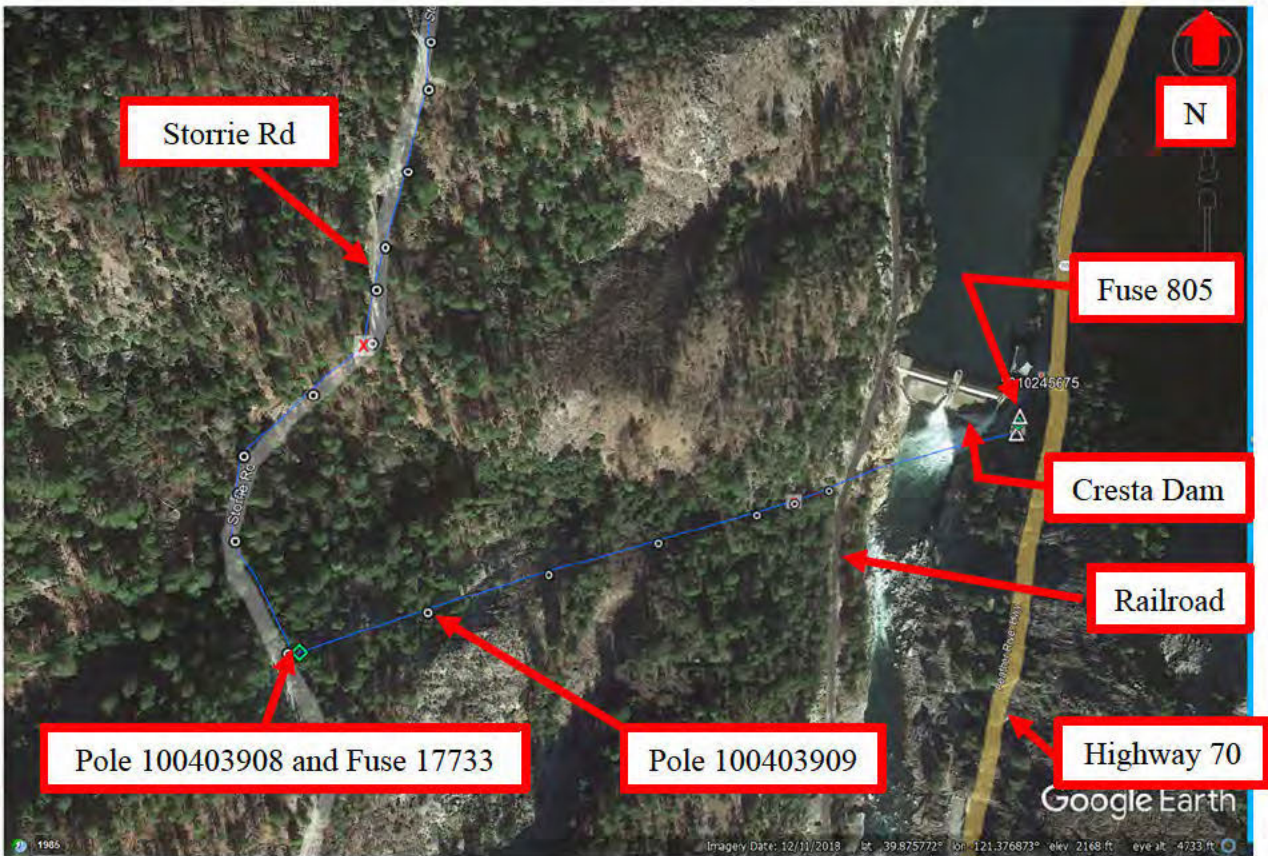


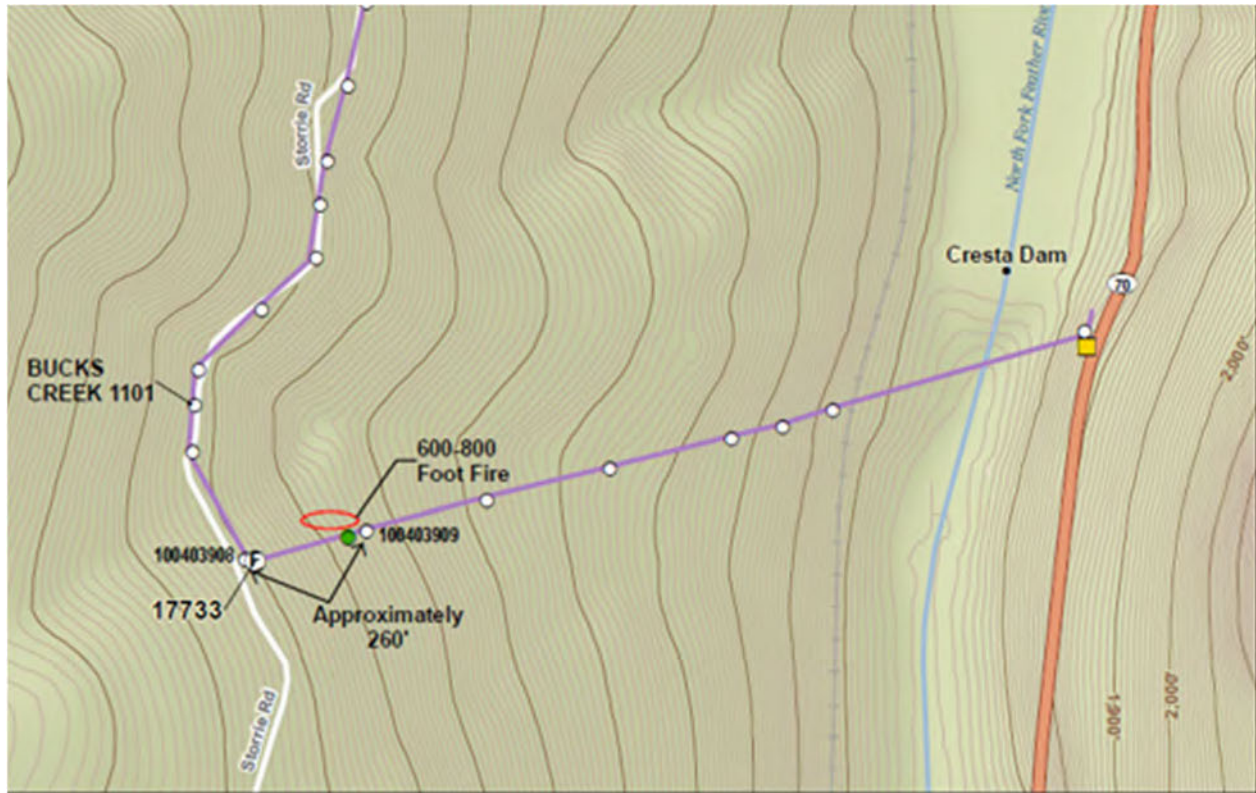
Figure 2: Incident location

The fire started adjacent to the span between two poles which are labeled with SAP Equipment ID 100403909 (Pole 100403909) and ID 100403908 (Pole 100403908). Pole 100403908 is uphill from Pole 100403909. Figure 3 is a sketch provided by PG&E which shows the location and size of the fire when the Dixie Troubleman arrived. Pole 100403908 has three fuses labeled Fuse 17733, shown in Figure 4, and is located directly adjacent to Storrie Road (Figure 4). At Pole 10403908, the distribution line turns away from Storrie Road downhill toward Pole 100403909 and Cresta Dam. North of Pole 100403908, the distribution line generally follows Storrie Road until the road dead ends. The line then travels cross country toward Highway 70. The circuit reaches Highway 70 roughly two miles north of Cresta Dam. [REDACTED]

Cresta Dam.<sup>7</sup> The Bucks Creek 1101 circuit was shortened when PG&E removed a section extending further along Storrie Road during the rebuild from the 2018 Camp Fire.<sup>8</sup>

<sup>7</sup> 20-Day report, page 3.

<sup>8</sup> Pacific Gas and Electric, "Construction Sketch – HWY 70 North & South of Pulga – Removal of Pole Line – Pulga" (May 20, 2019) (PG&E-DIXIE-CPUC-000001002), page 6.



### Bucks Creek 1101 Area of Interest

- Bucks Creek 1101
- Wood Pole
- Tree on Line
- Cresta Dam
- F Fuse
- Troubleman Viewed Line with Binoculars
- 600-800 Foot Fire



Figure 3: Sketch of fire size and location when the Dixie Troubleman arrived at the incident location at approximately 1650 hours. Sketch has been cropped for clarity.<sup>9</sup>

<sup>9</sup> PG&E, “Exhibit X-1” (August 25, 2021) (Exhibit X-1), page 2. Exhibit 1 was submitted to SED in response to Data Request 1, Question 4.



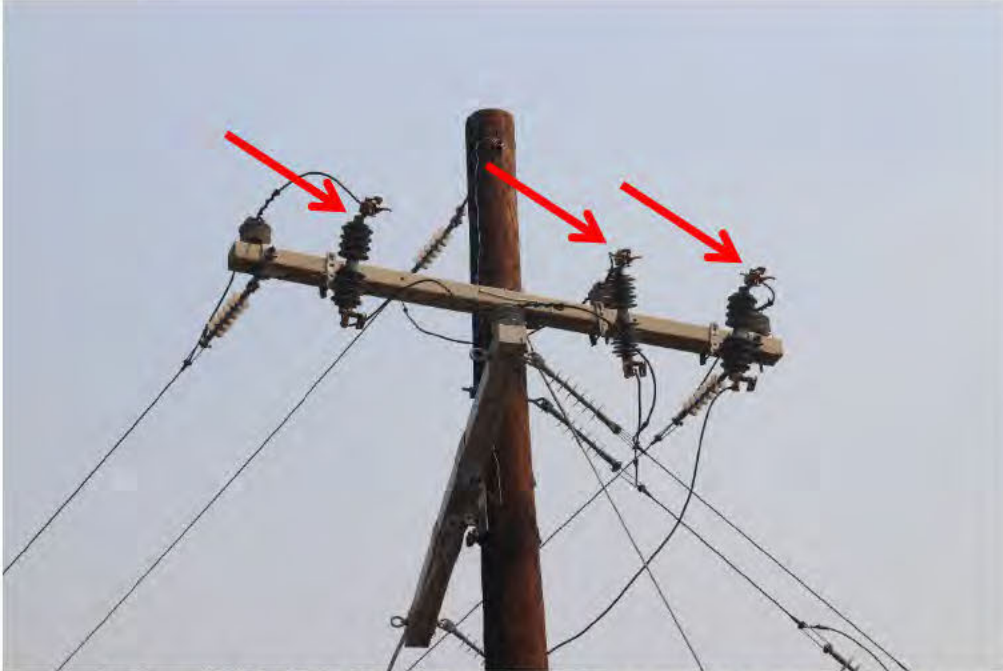


Figure 4: *Top of Pole 100403908. The three red arrows show the three fuse cutouts that hold the fuses comprising Fuse 17733.*<sup>10</sup>

Downstream of Switch 941, the circuit services three customers, which include [REDACTED] Cresta Dam and a [REDACTED] directly adjacent to Cresta Dam. Recloser 1101/2 was located at PG&E's Bucks Creek Substation and was electrically located at the beginning of Bucks Creek 1101 (Figure 1).

The tree that fell on the line was a Douglas fir approximately 65 feet tall (Subject Tree). The stump was located about 40 feet from the power line.<sup>11</sup> Figure 5 shows the Subject Tree leaning on the line. Figure 6 shows the Subject Tree stump before removal by CAL FIRE.

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<sup>10</sup> PG&E 20-Day Report, photo attachment 2021-07-18\_0031.

<sup>11</sup> PG&E Response to Data Request Dixie Fire-SED-004, Question 60 (September 24, 2021), page 1.



Figure 5: *Subject Tree leaning on the Bucks Creek 1101 circuit.<sup>12</sup> The photo was taken on July 18, 2021, standing near Pole 100403908 looking downhill toward Cresta Dam and Pole 100403909.*

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<sup>12</sup> PG&E. Photo: “2021-07-18\_0045,” attached to 20-day report.



Figure 6: *Subject Tree stump*<sup>13</sup>

The weather on the day of the fire did not meet PG&E’s criteria for implementation of a Public Safety Power Shutoff since there was no wind event forecasted and no Red Flag Warning issued by the National Weather Service.<sup>14</sup> Table i, below, shows weather data recorded at the three closest PG&E-owned weather stations to the incident location at 1700 hours on July 13, 2021:

Table i: *Recorded weather data on July 13, 2021 at 1700 hours.*<sup>15</sup>

<b>Station Name</b>	<b>Location</b>	<b>Temperature (F)</b>	<b>Relative Humidity (%)</b>	<b>Wind Speed (miles/hour)</b>
PG326	39.82864, -121.47166	84.7	19.91	11.2
PG468	39.76488, -121.48608	89.8	18.74	5.89
PG328	39.79947, -121.48370	92.4	16.55	3.63

<sup>13</sup> PG&E. Photo: “2021-07-18\_1285,” attached to 20-day report.

<sup>14</sup> PG&E Response to Data Request Dixie Fire-SED-004, Question 40 (September 24, 2021), page 1.

<sup>15</sup> PG&E “# Station: PG326” (PGE-DIXIE-CPUC-000001015); “# Station: PG468” (PGE-DIXIE-CPUC-000001016); “# Station: PG328” (PGE-DIXIE-CPUC-000001017) (July 13, 2021).



### **III. SED Review and Analysis**

This section describes SED's investigation, which includes a detailed event timeline, field observations, and a review of relevant documents from PG&E.

#### **A. Event Timeline**

The following is a timeline of the events of July 13, 2021, unless otherwise noted.<sup>16</sup>

1. 0648 – Line Recloser 1101/2 recorded current levels on two of the three Bucks Creek 1101 phase exceeding the Minimum to Trip threshold. The duration was less than 4/100s of a second and did not meet the minimum time length to trip the recloser.
2. 0721 (approximate, exact time unknown) – In response to a SCADA alert indicating loss of station power at Cresta Dam, PG&E Hydroelectric Operator asked a PG&E Roving Operator (Rover) of the outage alarms to investigate.
3. 0721 – Rock Creek Operator informed an operator at PG&E's Northern Distribution Control Center (NDCC) of the outage
4. 0852 – The Rover reported to Rock Creek Operator that station service was out at Cresta Dam and the lights were out in the tunnel next to the dam.
5. 0904 – The Rover concluded to the Rock Creek Operator that the outage was between the Bucks Creek Substation and Cresta Dam. This was reported to the NDCC at 0911 hours. The distribution operator at the NDCC stated they would dispatch a troubleman to investigate.
6. 0936 – A PG&E Dispatcher created a non-emergency Priority One field order (or "tag") for a troubleman (Quincy Troubleman) to investigate the outage. The Quincy Troubleman assigned to investigate the tag from Quincy, CA responded that the tag was not in his response area and should have been assigned to a troubleman located in Chico or Paradise.
7. 1047 – PG&E Dispatcher assigned tag to the Dixie Troubleman.
8. 1053 – Dixie Troubleman reported he was in route but stopped on the way to address another Priority One tag.
9. 1125 – Dixie Troubleman called the distribution operator at NDCC, who reported they were still seeing power reading on Bucks Creek 1101 from Line Recloser 1101/2. The NDCC Operator directed the Dixie Troubleman to check fuses on the circuit sources side of Cresta Dam: Fuse 805 and Fuse 17733. Fuse 805 is near Cresta Dam. Fuse 17733 is on the source side of Fuse 805 and is attached to Pole 100403908.
10. 1218 – Dixie Troubleman arrived at Cresta Dam. He observed Fuse 805 had not operated. He observed that the meter being served by the transformer one span upstream of Fuse 805 was de-energized. He patrolled the area to investigate the cause of the power outage but did not observe anything at Cresta Dam. Using binoculars, he visually inspected the portion of Bucks Creek 1101 running between Cresta Dam towards Fuse 17733. All the poles and wires that he could see on that circuit appeared to him to be up and in their

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<sup>16</sup> The source of the timeline information is PG&E's 20-Day report for the Dixie Fire, unless noted otherwise.



normal position, not bent or twisted. He saw what appeared to be an open fuse cutout at Fuse 17733 hanging down from Pole 100403908. This would indicate that one of the fuses at Fuse 17733 had operated. He did not see any vegetation on the circuit or any smoke or other indication of a fire. The Troubleman decided to drive to investigate Fuse 17733.

11. 1327 – Dixie Troubleman arrived at bridge two miles from Pole 100403908 and Fuse 17733. The bridge was under repairs. The Troubleman was informed it would be about two hours before he could pass. After speaking with the construction crew, he turned around.
12. 1500 (approximate) –Dixie Troubleman returned to Highway 70 to a location with cell service. He saw that he had received two priority zero emergency tags. He contacted the NDCC operator to ask if he should attend the priority zero tags. The NDCC operator advised that other troubleman were closer to the priority zero tags and that the Dixie Troubleman should address the outage at Cresta Dam. The Troubleman drove a different route from Highway 70 that reconnects with Storrie Road before the closed bridge on this trip to Pole 100403908 and Fuse 17733.
13. 1500 (approximate) – A Senior Power Generation Inspector thought he smelled and saw smoke southeast of Bucks Creek Powerhouse.<sup>17</sup> The inspector called the Rock Creek Switching Center and alerted the operator there that he smelled smoke. The operator alerted a PG&E helicopter pilot and asked the pilot to fly over the Bucks Creek area to look for smoke or signs of a fire. The PG&E helicopter pilot immediately rerouted from its current flight plan and flew over the Bucks Creek area. The pilot did not see a fire or any indication of fire during his flight over the Bucks Creek area.<sup>18</sup> The operator also asked an electrician working outside the Rock Creek Powerhouse if he smelled smoke. The electrician circled the facility; he did not smell smoke or see any sign of fire.<sup>19</sup>
14. 1630 – Dixie Troubleman returned to bridge.
15. 1650 – Dixie Troubleman arrived at Pole 100403908 and Fuse 17733. Dixie Troubleman observed two of three fuse cutouts open. He opened the third fuse. Before he opened the fuse, he observed a fire 60-80 yards downhill from his position, approximately 600 to 800 square feet in size. He also observed a tree leaning on the span between Pole 100403908 and Pole 100403909.
16. 1701 –A PG&E employee at the Rock Creek Powerhouse heard a radio call by a PG&E employee driving south on Highway 70 that observed a small plume of smoke.<sup>20</sup> CAL FIRE was notified at 1706 hours. The Dixie Troubleman attempted to put fire out. He then returned to his truck and spoke to his supervisor on the radio. After the conversation, he continued to fight the fire.

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<sup>17</sup> Cresta Dam and the ignition area are southwest of the Bucks Creek Powerhouse.

<sup>18</sup> PG&E. “Response to Data Request Dixie Fire-SED-005, Question 18,” (February 28, 2022), page 1.

<sup>19</sup> “Document 1479 - Responses to Orders for Further Responses Re Dixie Fire” (September 24, 2021) (Document 1479), page 10.

<sup>20</sup> PG&E. “Dixie Factual Summary,” (September 2, 2022), page 4.

17. 1730 – The Dixie Troubleman observed a CAL FIRE spotter plane followed by a CAL FIRE helicopter and fixed-wing aircraft for fire suppression.
18. 1900 – A CAL FIRE ground crew arrived.
19. 2000 – The Dixie Troubleman left the scene.
20. 2030 – PG&E de-energized Bucks Creek 1101 at Switch 941 at the request of CAL FIRE.
21. July 14, 2021 at 2000 – PG&E de-energized the entire Bucks Creek 1101 circuit at the request of CAL FIRE.

## **B. SED Field Observations**

### **1. Site Visit to Incident Location**

On Monday July 26, 2021 at 0900 hours, two SED investigators met with a large team from PG&E including but not limited to legal counsel, a claims supervisor, an incident investigator, a crew of linemen, a team from Exponent,<sup>21</sup> a fire investigation team hired by PG&E, as well as a few individuals not with PG&E, at a café 20 miles northeast of Oroville on Highway 70. From the café, SED traveled about an hour on dirt access roads and arrived at the incident location, adjacent to Storrie Road, at approximately 1100 hours. The first pole (Pole 100403908, Figure 7) was near the road and the span to the second pole (Pole 100403909, Figure 8) went down a steep hillside.<sup>22</sup>

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<sup>21</sup> Exponent is a consultant hired by PG&E.

<sup>22</sup> For a map showing the incident location and pole locations relative to Storrie Road, see Figure 2 of this report.



Figure 7: Pole 100403908. The fuse cutout and jumpers connecting the spans were removed by CAL FIRE.



Figure 8: Pole 100403909 (red arrow) down a steep hillside with very loose soil. The incident occurred closer to Pole 100403909.

When CAL FIRE previously collected evidence on July 18, 2021, they took the fuses and cutouts from Pole 100403908, jumpers on the conductors for Pole 100403908, several sections from each phase of the span, and the tree that was in the conductors. CAL FIRE had a crew splice replacement conductor back into the span and left the rest of the span on the poles. During the July 26 site visit, PG&E collected all three phases of the incident span and the insulators mounted on Pole 100403909 (Figure 9 and Figure 10). PG&E did not collect any vegetation as evidence.



Figure 9: One of the insulators from Pole 100403909



Figure 10: South phase conductor from the incident span

SED viewed Pole 100403909 and the surrounding area. Pole 100403909 appeared to be in sound condition and no obvious signs of fire were present. Copper insulators were observed near the pole where CAL FIRE had previously removed the conductor. CAL FIRE had previously collected a portion of the Subject Tree. The remaining portion of the tree was located near the pole (Figure 11 and Figure 12). The tree did not appear to be burned, and signs of ignition were not apparent on the tree.<sup>23</sup> There was a cluster of roots from the stump removed by CAL FIRE estimated to be 40 feet from Pole 100403909 (Figure 13). This root cluster was the base of the Subject Tree. The root shown in Figure 14 had a significant amount of rot at the center.

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<sup>23</sup> CAL FIRE had already removed the sections of the Subject Tree showing burns or signs of ignition when SED was on site.





Figure 11: *Base of Pole 100403909 showing fallen Subject Tree*



Figure 12: *Subject Tree*



Figure 13: *Cluster of roots*



Figure 14: *Root showing significant rot*

## 2. Cal Fire Evidence Locker and Cresta Dam

On Thursday October 15, 2021 at 1100 hours, SED representatives met a team from CAL FIRE at [REDACTED] in Oroville, including a Battalion Chief and the lead investigator for the Dixie Fire. Three representatives from the Butte County District Attorney's Office (DA) were also present.



The purpose of the site visit was to view the evidence CAL FIRE collected from the ignition site of the Dixie Fire. The following is a description of the evidence collected and related observations:

- Conductors
  - Multiple conductors showing signs of tree contact
  - Conductors typically had fibers from the tree embedded between the individual wires of the conductor (Figure 15).
  - Two conductors showing signs of arcing and phase-to-phase contact (Figure 16)
- Fuses (3)
  - Two fuses operated, one did not operate (Figure 17 and Figure 18)
  - The two fuses that operated appeared to have operated correctly.
- Fuse Cut Outs: No signs of misfiring fuses.
- Jumpers: No signs of arcing.
- Subject Tree
  - Burned portion of the trunk that was in contact with the energized conductor (Figure 19)
  - A tree limb that had folded up and contacted the energized conductor
  - Sections of the Subject Tree showing signs of decay. A segment of the tree where it broke off from the stump was severely burned (Figure 20).
  - Subject Tree stump with burn marks and decay (Figure 21).



Figure 15: *Energized conductor in contact with tree*



Figure 16: *Signs of arcing from phase-to-phase contact on conductor*



Figure 17: *One of two fuses that operated*



Figure 18: *Fuse that did not operate*



Figure 19: *Subject Tree trunk where energized conductor contacted tree.*



Figure 20: *Section of the Subject Tree trunk that failed causing the tree to fall.*





Figure 21: *Subject Tree stump. A large portion of tree trunk was damaged before the fire started.*

### Cresta Dam

From the CAL FIRE evidence locker in Oroville, SED representatives continued to Cresta Dam. The goal of the visit was to view, from the dam, the segment of the Bucks Creek Line where the fire originated.<sup>24</sup> Both Pole 100403909 that was closest to the fallen tree and Pole 100403908 that supported the fuses were visible from Cresta Dam without binoculars. With binoculars, features of the two poles and the line were easily distinguishable. SED observed that due to the positioning of the fuses, it would likely have been difficult to accurately determine how many fuses had blown. As of the date of the site visit, PG&E had not replaced the conductor between the two poles but had installed a single cable between the two poles. The cable was visible over the entire span between the two poles (Figure 22).

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<sup>24</sup> The Dixie Troubleman visually inspected the line from Cresta Dam on July 13, 2021 and had reported that “the fuse may have tripped on at least one of the three phases of the line. At that point, there was no vegetation seen on the line, nor any smoke or other indication of fire.” See Document 1408-1, *Declaration of [REDACTED] in Support of Response to Order Requesting Information on Dixie and Bader Fires* (July 28, 2021) (Document 1401-1), page 3. (Name of Declarant redacted in original.)





*Figure 22: View of the line from Cresta Dam. The white arrow shows approximately where the tree fell adjacent to Pole 100403909. Pole 100403908 that supported the fuses is at the top of the hill (blue arrow). The cable PG&E installed between the two poles is the white line directly below and to the right of the dashed red line and is indicated by two red arrows.*

### **3. SmartMeter Download**

On Tuesday, August 25, 2021 at 1000 hours, a SED investigator met with a team from PG&E at PG&E's Applied Technology Services Center located at [REDACTED] in San Ramon. PG&E's lead contact was the lead PG&E Investigator for the Dixie Fire who facilitated the site visit. Additional attendees were a PG&E engineer who worked with Smart Meters and a PG&E lab manager.



The purpose of the site visit was for PG&E to download data from SmartMeters collected for the investigations of the Dixie Fire and the Fly Fire. In total, four SmartMeters were collected for the Dixie Fire and eleven collected for the Fly Fire. A machine inside a faraday cage downloaded data from the SmartMeters (Figure 15).<sup>25</sup> Data was downloadable from all but two of the SmartMeters.<sup>26</sup> One of the two damaged SmartMeters, labeled Evidence Tag 7401 and collected for the Dixie Fire, had a melted plastic cover that prevented opening the device without potentially destroying the meter (Figure 24).

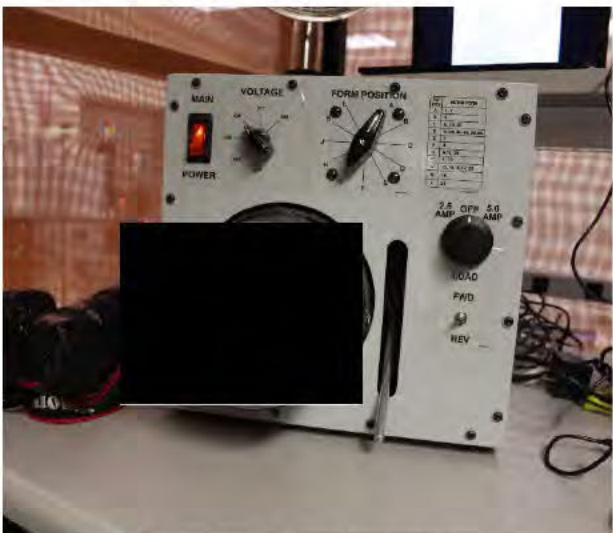


Figure 23: Machine downloading data from a SmartMeter



Figure 24: Melted SmartMeter from the Dixie Fire

#### 4. PG&E Evidence Collection Site Visit #2

On Tuesday, November 23, 2021 at 0900 hours, a SED investigator met a team from PG&E at a café approximately 20 miles northeast of Oroville on Highway 20. The PG&E contact was an arborist leading a large team of PG&E employees and contractors.

The purpose of the site visit was for PG&E to collect evidence from the Dixie Fire ignition site. At the site visit, PG&E collected portions of the Subject Tree not previously collected by CAL FIRE. PG&E's contracted tree workers dug out the root structure for the Subject Tree (Figure 25). The tree workers then cut and collected the exposed root structure. PG&E also collected the remaining segments of the subject tree's trunk not collected by CAL FIRE (Figure 26).

<sup>25</sup> A faraday cage is an enclosure made of conductive materials that block external electromagnetic fields, used to isolate and/or protect sensitive electronic equipment. The faraday cage in this case prevented the SmartMeters from synchronizing with PG&E's internal network.

<sup>26</sup> One of the two SmartMeters (labeled ID [REDACTED]) from which data could not be downloaded was collected for the Fly Fire investigation.



Figure 25: *Root structure dug out by PG&E contracted tree workers.*



Figure 26: *Portion of the collected Subject Tree in situ*

## **C. Document Review and Investigation**

SED submitted six data requests totaling 125 questions to PG&E. The questions included requests for procedures, records, forms, and responses to specific questions related to the Dixie Fire. The questions loosely consisted of the following categories: Inspections/Work Orders, Vegetation Management, System Operation and Additional Documents. Additionally, SED reviewed documents generated by the Federal Case 3:14-c-00175-WHA in the Northern California District Court (District Court Case).<sup>27</sup>

### **1. Inspections and Work Orders**

SED reviewed the five most recent patrol inspections and the three most recent detailed inspections on the portion of the circuit spanning five structures in both direction from the incident area. SED finds PG&E in violation of GO 95, Rule 18 for failure to complete Electric Overhead Tag 109671451 within the twelve-month corrective action deadline of October 30, 2015.

#### **Inspections**

The last two detailed inspections performed per GO 165 were in December 2016 and May 2021. PG&E did not identify required work at Pole 100403908 or Pole 100403909, or the adjacent spans.<sup>28</sup> In June 2019 and May 2020, PG&E performed patrols per criteria specified in GO 165. PG&E did not identify any items for related to Pole 100403908 or Pole 100403909.<sup>29</sup> PG&E also performed a Wildfire Safety Inspection Program inspection in May 2019, which is similar to a detailed inspection. PG&E identified Pole 100403908 as damaged and replaced the pole on July 21, 2019.<sup>30</sup>

#### **Work Orders**

There were two late work orders for poles within five spans of the immediate area of interest. The first was the work order for Electric Overhead Tag 109671451.<sup>31</sup> PG&E identified the scope of work originally as a crossarm replacement but changed the scope to a replacement of the entire pole due to decay.<sup>32</sup> A PG&E representative identified the corrective action on October

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<sup>27</sup> Generally, the District Court Case filings were generated in response to questions posed by Senior District Judge William Alsup.

<sup>28</sup> PG&E “Electric Maintenance Inspection Log” (December 12, 2016), page 1; “100403908 2021 OH Checklist (May 13, 2021), pages 1-5; “100403909 2021 OH Checklist” (May 13, 2021), pages 1-5.

<sup>29</sup> PG&E “Electric Maintenance Patrol Log” (December 6, 2019) page 1; “Electric Maintenance Patrol Log” (June 10, 2020), page 1.

<sup>30</sup> PG&E “NV-Electric Distribution Overhead Inspection – 18105179916” (May 19, 2019), page 6; “Electric Overhead Tag Notification #117385786” (EC Tag #117385786) (Identified June 6, 2019, latest comments added August 16, 2019), page 1.

<sup>31</sup> PG&E “Electric Overhead Tag Notification #109671451” (EC Tag #109671451), Date Identified October 30, 2014. Latest comments added February 21, 2017.

<sup>32</sup> EC Tag #109671451.



30, 2014 and set a due date of October 30, 2015.<sup>33</sup> The work was completed on November 16, 2016.<sup>34</sup> At the time the Electric Overhead Tag 109671451 was created, GO 95, Rule 18 required the time limit for corrective action to be determined by a qualified company representative, with a maximum time limit of 12 months when related to work safety and 59 additional months for all other purposes.<sup>35</sup> Because PG&E's qualified company representative determined a deadline of one year, the GO 95, Rule 18 compliance period is one year. In Data Request 5, Question 30, SED asked PG&E to provide a justification for the late work that would meet the requirements permitted by GO 95 Rule 18.A.2.b, which allows for extension of correction times under reasonable circumstances, such as permitting issues.<sup>36</sup> PG&E did not provide a justification.<sup>37</sup>

The second work order was for Electric Overhead Tag 117162503.<sup>38</sup> PG&E determined a pole replacement was required. PG&E identified the issue on May 4, 2019 and set the due date for June 30, 2019. The plans were submitted to Plumas County on May 28, 2019 but did not receive clearance until July 23, 2019. PG&E completed construction on October 3, 2019. With regards to the late completion, PG&E stated the following: "Electric Overhead Tag 117162503 was completed late due to delay in third-party environmental review" and "We believe that this justification satisfies the standard set forth by of GO 95, Rule 18.A.1.b, which states that correction times may be extended under reasonable circumstances such as permit requirements and third party [sic] refusal."<sup>39</sup>

## **2. Inspections and Work Orders Analysis**

PG&E failed to complete the Electric Overhead Tag 109671451 within the one-year deadline determined by a qualified company representative. Therefore, SED finds PG&E in violation of GO 95, Rule 18.

SED accepts the justification for Electric Overhead Tag 117162403, and agrees that GO 95, Rule 18.A.2 allows for an extension under reasonable circumstances such as permit requirements. The tag was completed after five months, which is beyond PG&E's initial internal deadline of eight weeks. While PG&E exceeded their internal deadline, GO 95, Rule 18.B.1.a.ii permits 12 months to complete Level 2 corrective actions. Taking the environmental permitting review into consideration, SED does not find a violation of GO 95, especially considering the corrective action was completed before the 12-month deadline.

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<sup>33</sup> EC Tag #109671451

<sup>34</sup> EC Tag #109671451

<sup>35</sup> California Public Utilities Commission, "Decisions Adopting Regulations to Reduce Fire Hazards Associated with Overhead Power Lines and Communication Facilities," Page B-4. January 12, 2012.

<sup>36</sup> PG&E Response to Data Request Dixie Fire-SED-005, Question 30 (March 25, 2022), page 1.

<sup>37</sup> Response to Data Request Dixie Fire-SED-005, Question 30, page 1.

<sup>38</sup> EC Tag #117385786

<sup>39</sup> Response to Data Request Dixie Fire-SED-005, Question 30, page 1.

### 3. Vegetation Management

This section discusses PG&E vegetation management practices and the vegetation patrols that could have identified and removed the Subject Tree. SED finds PG&E in violation of GO 95, Rule 31.1 for failing to update its procedures to meet the requirements of GO 95, Rule 35. SED also finds PG&E in violation of GO 95, Rule 18.B for failing to maintain records showing (1) the correct date of inspection for 2020, and (2) the areas that were inspected in 2019. Finally, SED finds PG&E in violation of GO 95 for failing to identify the Subject Tree as hazardous and thus failing maintain the 12kV overhead conductors safely and properly with accepted good practice.

#### Procedures

PG&E's vegetation management strategy is comprised of multiple programs. Two of the most relevant are the routine vegetation management program and the second patrols that include Catastrophic Event Memorandum Account (CEMA) patrols.<sup>40</sup>

The primary goal of the vegetation management program is to ensure safe and reliable operation of facilities and prevent foreseeable vegetation-related outages. In order to implement these goals, PG&E created a multitude of procedures including "Distribution Vegetation Management Standard" (DVMS),<sup>41</sup> "Distribution Routine Patrol Procedure" (DRPP),<sup>42</sup> "Vegetation Management Second Patrol Procedure,"<sup>43</sup> "Reporting Abnormal Field Conditions Procedure,"<sup>44</sup> "Vegetation Management Priority Tag Procedure,"<sup>45</sup> and "Facility Protect and Work Difficulty Classification Procedure."<sup>46</sup> The procedures implement the goals of the vegetation management program by requiring an annual patrol that identifies tree work on all overhead facilities. The annual patrol identifies hazard trees and trees that are either encroaching or are likely to encroach on the minimum distance requirements (MDRs) or minimum clearance requirements.

The MDRs from vegetation to distribution assets, such as conductors, are set by GO 95, Rule 35 at 1.5 feet generally and four feet for vegetation in High Fire Threat Districts (HFTDs). The PG&E Standards, DVMS and DRPP, set their MDRs as the MDRs specified in Appendix A, which is attached to both documents. Appendix A states that the MDR as required by GO 95,

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<sup>40</sup> A second patrol is used to reduce the vegetation risk in high hazard areas by performing a patrol approximately six months after a routine patrol. The goal of the patrol is to identify hazardous vegetation.

<sup>41</sup> PG&E "Distribution Vegetation Management Standard (DVMS)" (September 4, 2015).

<sup>42</sup> PG&E "Distribution Routine Patrol Procedure (DRPP)" (October 27, 2015).

<sup>43</sup> PG&E "Vegetation Management Second Patrol Procedure" (PG&E Procedure: TD-7102P-23) (July 31, 2019).

<sup>44</sup> PG&E "Reporting Abnormal Field Conditions Procedure" (PG&E Procedure: TD-7102P-09) (November 24, 2014).

<sup>45</sup> PG&E "Vegetation Management Priority Tag Procedure" (December 26, 2021).

<sup>46</sup> PG&E "Facility Protect and Work Difficulty Classification Procedure" (April 1, 2015).

Rule 35 is 1.5 feet generally and four feet in Santa Barbara County.<sup>47</sup> The MDRs in Appendix A reference a superseded version of GO 95.<sup>48</sup>

PG&E frequently does ad-hoc updates of its standards through bulletins. PG&E issued “TD-7102B-015, High Fire-Threat District Bulletin” on February 2, 2018. While this bulletin was active, it superseded the Appendix A MDRs referenced by the DRPP and DVMS.<sup>49</sup> The bulletin states that 48 inches of clearance is always required between vegetation and distribution voltage within the HFTD.<sup>50</sup> PG&E retired this bulletin on August 26, 2020, so the requirements of the bulletin no longer apply. PG&E provided no updates to Appendix A in effect for the period after August 26, 2020.<sup>51</sup> PG&E stated that the Vegetation Management Second Patrol Procedure requires an MDR of four feet, but this procedure only applies to second patrols.<sup>52</sup>

Another goal of PG&E’s vegetation management program is to identify and ameliorate Hazard Trees.<sup>53</sup> After identifying a Hazard Tree, the inspectors perform at least a Level One (limited visual) inspection as defined by the International Society of Arboriculture.<sup>54</sup>

GO 95 Rule 18.B requires that PG&E maintain an auditable maintenance program for its facilities and lines. To track the progress of vegetation management inspections, PG&E uses index maps signed by the vegetation management inspector to indicate that the map area was inspected. The map labeled AT112-C was missing from the 2019 vegetation management inspection records.<sup>55</sup> As of July 27, 2022, PG&E was not able to locate this record.<sup>56</sup>

### **Review of Recent Vegetation Inspections and Information Regarding the Subject Tree**

SED reviewed the documentation for the last five vegetation management inspections starting in 2016. The following is a timeline of the inspection cycle for 2020 and 2021:

- March 5, 2020 – CEMA vegetation management patrol.<sup>57</sup>

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<sup>47</sup> DRPP, page 19.

<sup>48</sup> GO 95 was updated by CPUC Decision 17-12-024 in 2017 to mandate a MDR of four feet in all HFTDs, but PG&E’s Appendix A was never updated accordingly.

<sup>49</sup> PG&E Response to Data Request Dixie Fire-SED-006, Question 3 (July 27, 2022), page 1.

<sup>50</sup> PG&E, “High Fire-Threat District Bulletin,” page 1 (February 15, 2018).

<sup>51</sup> Response to Data Request Dixie Fire-SED-006, Question 3, page 1.

<sup>52</sup> Response to Data Request Dixie Fire-SED-006, Question 3, Page 1.

<sup>53</sup> “Hazard Trees” are defined by PG&E’s DVMS as “Trees that are dead, show signs of disease, decay or ground or root disturbance, which may fall into or otherwise impact the conductors, towers or guy wires before the next inspection cycle”

<sup>54</sup> PG&E Response to Data Request Dixie Fire-SED-005, Question 23, page 1 (March 14, 2022).

<sup>55</sup> PG&E *Vegetation Management Bucks Creek 1101 2019 Index Map* (November 12, 2019).

<sup>56</sup> PG&E Response to Data Request Dixie Fire-SED-006, Question 4 (July 27, 2022), page 1.

<sup>57</sup> PG&E Response to Data Request Dixie Fire-SED-005, Question 23, page 1.

- December 3, 2020 – Date of annual routine patrol of the circuit. PG&E internal documentation (called an Index Map) reflects a date of completion on November 11, 2020, but SED understands the correct date is December 3, 2020.<sup>58</sup> PG&E did not know why the correct inspection date was not reflected on the index map.<sup>59</sup>
- January 14, 2021 – CEMA vegetation management patrol performed via helicopter.<sup>60</sup> No work beyond the 2020 routine patrol was identified.<sup>61</sup>
- June 5, 2021 – Vegetation work finished as required by the routine patrol on December 3, 2020.<sup>62</sup> PG&E is not aware of a regulatory required due date to perform the work after it is identified.<sup>63</sup>
- July 1, 2021 – Originally planned completion date of routine vegetation management patrol for 2021. The contractor was responsible for completing it within 60 days of the planned date. The patrol was scheduled for completion on July 23, 2021, but this did not occur due to the fire starting on July 13, 2021.<sup>64</sup>

As part of its routine vegetation management patrols and work, PG&E generates a document called “Inspection Record Detail.”<sup>65</sup> The Inspection Record Detail is a running list of all the trees worked along a specific length of the circuit since the record was created.<sup>66</sup> The Inspection Record Detail lists 11 trees total, three of which are trees on the span of line between Pole 100403909 and Pole 100403908: a true fir (labeled Tree 7) originally classified for removal but not removed; a Ponderosa pine (labeled Tree 8) that was trimmed on September 6, 2012; and a Ponderosa pine (labeled Tree 9) removed on September 6, 2012.<sup>67</sup>

As previously noted, the Subject Tree was a Douglas fir. PG&E’s Inspection Record Details going back to 2016 do not mention the Subject Tree. PG&E provided photos of the Subject Tree taken in 2019 (Figure 27), in which the Subject Tree’s canopy appeared green.<sup>68</sup> As described in SED’s Field Observation in section III.B.1, at least one of the eight roots had internal rot. SED

<sup>58</sup> PG&E *Vegetation Management Bucks Creek 1101 2020 Index Map* (November 11, 2020).

<sup>59</sup> PG&E Response to Data Request Dixie Fire-SED-006, Question 1, (July 27, 2022), page 1.

<sup>60</sup> PG&E Response to Data Request Dixie Fire-SED-005, Question 23 (February 28, 2022), page 1.

<sup>61</sup> CN Utility Consulting, Inc. *Document 1515-9: Declaration of [REDACTED] in Response to Nov. 3, 2021 Order* (November 16, 2021) (Document 1515-9), page 3. (Name of Declarant in redacted original.)

<sup>62</sup> PG&E Response to Data Request Dixie Fire-SED-005, Question 25 (March 14, 2022), page 1.

<sup>63</sup> PG&E Response to Data Request Dixie Fire-SED-005, Question 25 (March 14, 2022), page 2.

<sup>64</sup> PG&E Response to Data Request Dixie Fire-SED-005, Question 23 (February 26, 2022), page 1.

<sup>65</sup> PG&E. “Response to Data Request Dixie Fire-SED-005, Question 24,” Page 1. March 14, 2022.

<sup>66</sup> PG&E. “Response to Data Request Dixie Fire-SED-005, Question 24,” Page 1. March 14, 2022.

<sup>67</sup> PG&E. “Inspection Record Detail,” Page 1 and 2. November 17, 2020.

<sup>68</sup> PG&E. “Response to Data Request Dixie Fire-SED-004, Question 60,” Page 1. September 24, 2021. The color of the canopy is a key factor in vegetation management inspectors’ determinations of tree health.



was not on site when CAL FIRE cut down and removed a large portion of the Subject Tree and did not observe the tree in situ.

PG&E reported that based on LiDAR data, the Subject Tree was located at 39°52.487' and - 121°22.710' and was approximately 79.6 feet tall.<sup>69</sup> The tree's stump was approximately 40 feet from the powerline. When asked to describe the health, appearance, and general condition of the Subject Tree based on observations made after the tree fell, PG&E reported:

No PG&E arborist has been granted access to the bottom portion of the tree or the stump, both of which CAL FIRE (or another law enforcement agency) has removed. A PG&E arborist who reviewed photographs of the tree's roots taken on July 26, 2021 observed that one of eight roots of the tree shows signs of internal rot, but without further inspection has not reached a conclusion, for example, as to why the tree failed or whether there were any visible, external indications.<sup>70</sup>

CAL FIRE granted PG&E access to the view portions of the Subject Tree previously collected by CAL FIRE on October 20, 2021, at the invitation of Butte County District Attorney's office.<sup>71</sup> PG&E sent photos to SED. SED requested PG&E's observations and conclusions about the Subject Tree in Data Request 6, Question 5. PG&E asserted the work was protected by attorney-client privilege and protections of the attorney work product doctrine.<sup>72</sup> As a result, PG&E did not report any observations or conclusions based on that visit.

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<sup>69</sup> Response to Data Request Dixie Fire-SED-004, Question 60, page 1.

<sup>70</sup> Response to Data Request Dixie Fire-SED-004, Question 60, page 1.

<sup>71</sup> Response to Data Request Dixie Fire-SED-004, Question 41 (March 25, 2022), page 1.

<sup>72</sup> Response to Data Request Dixie Fire-SED-006, Question 5 (July 27, 2022), page 1.



Figure 27: *The yellow arrow points to the tree that fell on the circuit and started the Dixie Fire.*<sup>73</sup>

Tree workers who performed the patrols testified in the District Court Case about their process.<sup>74</sup> These workers included the consulting utility forester (CUF), who performed the inspection on December 3, 2020, and the senior consulting utility forester (SCUF) who both audited the CUF's patrol and performed the CEMA inspection on January 14, 2021.<sup>75</sup> The CUF testified that they follow the International Society of Arboriculture ("ISA") Utility Tree Risk Assessment Best Management Practices, which identifies three levels of assessment.<sup>76</sup> Most inspections are Level One or Limited Visual assessments, which are used to identify specific conditions or obvious defects.<sup>77</sup> A Level Two or Basic assessment requires the inspector to walk around the tree and

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<sup>73</sup> Pacific Gas and Electric. "Document 1416 - Exhibit P-5." Photo taken in 2019.

<sup>74</sup> See Document 1517-7: *Declaration of [REDACTED] in Response to the Court's November 3, 2021 Order* and Document 1515-9: *Declaration of [REDACTED] in Response to Nov. 3, 2021 Order*. (Name of Declarant redacted in original.)

<sup>75</sup> Document 1517-7, *Declaration of [REDACTED] in Response to the Court's November 3, 2021 Order* (November 16, 2021) (Document 1515-7), page 2; Document 1515-9: *Declaration of [REDACTED] in Response to Nov. 3, 2021 Order* (November 16, 2021) (Document 1515-9), page 2. (Name of Declarant redacted in original.)

<sup>76</sup> Document 1515-7, page 2.

<sup>77</sup> Document 1515-7, page 2.

look at the roots, trunk, and branches.<sup>78</sup> The CUF stated that a Level Two assessment is used when causes of concern are noticed during a Level One assessment.<sup>79</sup> After reviewing photos of the tree, including Figure 27 on page 30, the CUF made the following statements, among others:

- The CUF did not recall the Subject Tree in the photos, but it appeared to be a healthy fir<sup>80</sup>
- The CUF would have performed a Level One assessment of the tree by walking underneath the powerlines in the right-of-way and observing those trees for signs of disease distress or structural or compliance problems<sup>81</sup>
- The CUF did not recall performing a Level Two assessment of the Subject Tree.<sup>82</sup>
- The CUF did not see any indications from the photos that Level Two assessment should have been performed<sup>83</sup>

The CUF also stated that inspecting a tree's root structure is generally outside of the scope of inspections performed since the roots are buried.<sup>84</sup> The SCUF who audited the CUF's routine patrol for Bucks Creek 1101 circuit testified that they did not audit the portion of the patrol near the Incident Location.<sup>85</sup> The same SCUF conducted the CEMA patrol of Bucks Creek 1101 from a helicopter on January 14, 2021.<sup>86</sup> The SCUF observed two to three trees that required trimming, none of which were located near the Incident Location and all of which were noted during the routine patrol on December 3, 2020.<sup>87</sup> The SCUF also stated that based on review of the photos, it was unlikely that the SCUF would have identified the Subject Tree as requiring trimming or removal.<sup>88</sup>

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<sup>78</sup> Document 1515-7, page 2. A Level Three is performed rarely and is an advanced assessment.

<sup>79</sup> Document 1515-7, page 3.

<sup>80</sup> Document 1515-7, page 3.

<sup>81</sup> Document 1515-7, pages 3-4.

<sup>82</sup> Document 1515-7, page 5.

<sup>83</sup> Document 1515-7, page 5.

<sup>84</sup> Document 1515-7, page 4.

<sup>85</sup> Document 1515-9, page 2.

<sup>86</sup> Document 1515-9, page 2.

<sup>87</sup> Document 1515-9, page 3.

<sup>88</sup> Document 1515-9, page 3.

## **CAL FIRE Arborist Report**

The CAL FIRE Arborist Report (Arborist Report) describes extensive decay and defects at the base of the Subject Tree, as a result from 2008 Butte County Fire, and an unidentified event between 2015 and 2016.<sup>89</sup> The report states:

In my opinion the degraded condition of the base of the Douglas fir was the primary cause of failure of the tree and that defect would have been visible without extraordinary discovery effort, from under the conductors. It would have been visible as a catface, an open injury on the trunk. A cursory visual inspection around the base of the tree would have revealed the poor mechanical condition of the tree. A pre-inspector who was close to the tree for a brief visual inspection for any reason should have discovered the decay.<sup>90</sup>

The arborist describes the damage as follows:

Above the roots evidence suggest that the south side of the lower trunk was burned and killed over more than half its circumference. This would have formed a wound with no bark cover, visible as exposed and decaying wood. The extent of this would is well-illustrated in Figures 35 and 36. It is my opinion that most of the sound wood supporting the tree is represented graphically in Figure 36. The absence of sound wood where expected elsewhere is dramatic.<sup>91</sup>

Figure 28 below shows “Figure 36” from the Arborist Report. In discussing Figure 36, the arborist states the following:

Nearly all the wood in that column to the south toward the conductors is missing. It is my opinion that the missing wood through this stump was in a state of advanced decay, as seen higher in the tree trunk in Figure 8, and was either consumed complete by decay organisms or was so susceptible to combustion that it quickly burned in the 2021 fire.<sup>92</sup>

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<sup>89</sup> McNeil Arboriculture Consultants LLC. “Exhibit W: Arborist Report,” (October 10, 2021) (Arborist Report), page 20.

<sup>90</sup> Arborist Report, page 21.

<sup>91</sup> Arborist Report, page 21.

<sup>92</sup> Arborist Report, pages 20 and 21.



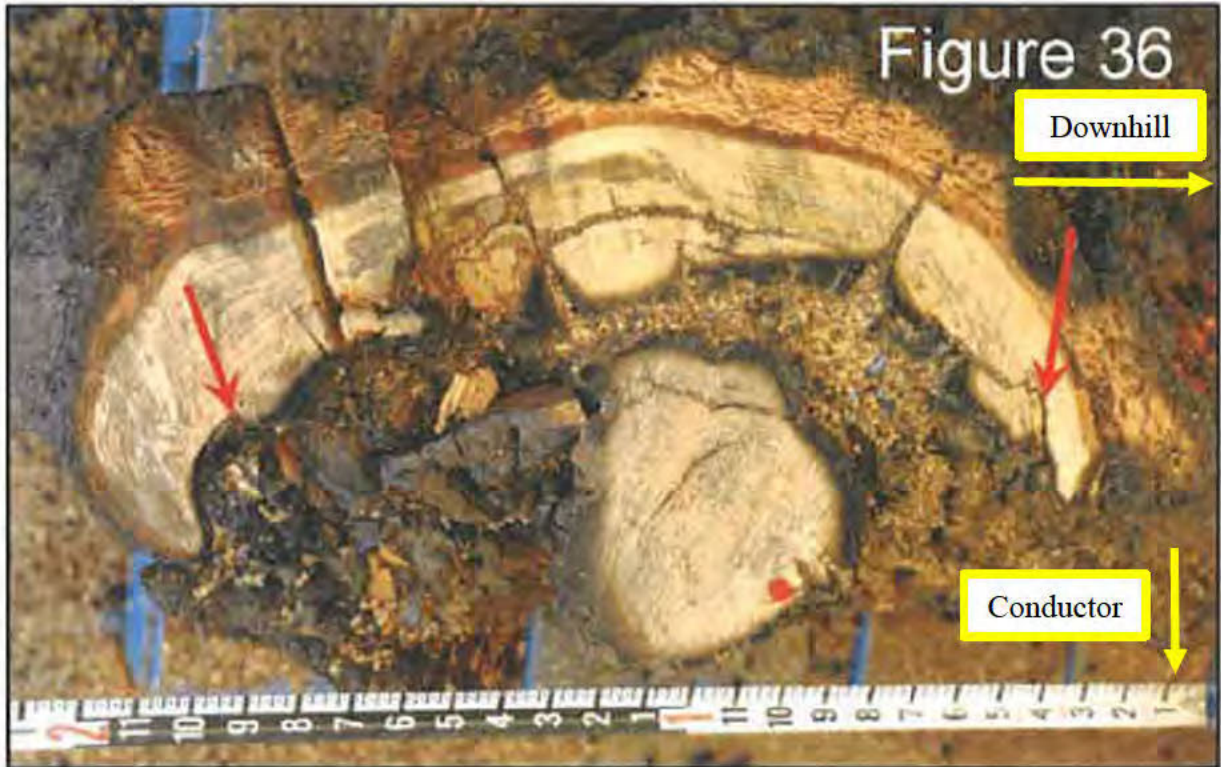


Figure 28: This is Figure 36 from the Arborist report. The photo is a cross section near the base of the tree. The red dot is the pith or original center of the tree.

#### 4. Vegetation Management Analysis

PG&E does not have any record of the Subject Tree that fell on the line as being a Hazard Tree.<sup>93</sup> GO 95, Rule 35 states that supply companies, such as PG&E, are responsible for removing hazard trees of which they have knowledge. Since PG&E did not have knowledge of the tree, SED did not identify a violation of GO 95, Rule 35.

CAL FIRE's Arborist Report states that PG&E failed to identify the Subject Tree that started the Dixie Fire as a Hazard Tree. The damage that triggered the deterioration of the Subject Tree occurred in 2008 with additional damage occurring between 2015-2016.<sup>94</sup> At minimum, PG&E failed to identify the Hazard Tree for five years. The Arborist Report also states that this damage was visible and should have been identified during a vegetation patrol.<sup>95</sup> Figure 28 (Figure 36 in the Arborist Report) shows a heavily damaged stump. PG&E's vegetation standards, such as DVMS, specify that one duty of the vegetation management patrols is to identify Hazard Trees that show signs of distress.

<sup>93</sup> "Hazard Trees" are defined by PG&E's DVMS as "Trees that are dead, show signs of disease, decay or ground or root disturbance, which may fall into or otherwise impact the conductors, towers or guy wires before the next inspection cycle."

<sup>94</sup> Arborist Report, page 20.

<sup>95</sup> Arborist Report, page 21.

## *Summary of Vegetation Management-Related Violations*

SED finds PG&E in violation of the following provisions of GO 95:

- PG&E's failure to identify the Hazard Tree is a violation of GO 95, Rule 31.1 for failing to maintain the 12kV overhead conductors safely and properly with accepted good practice.
- PG&E failed to timely update the minimum clearance requirements in its internal DVMS and DRPP procedures is a violation of GO 95, Rule 31.1, which requires that PG&E maintain its electrical supply system in accordance with accepted good practice for given local conditions.
- PG&E violated GO 95, Rule 18.B. in failing to maintain records showing the correct date of the 2020 routine vegetation management patrol inspection. PG&E's process for vegetation inspections is that an Index Map is signed after completion of the vegetation inspection for the map area. The patrol inspection was performed on December 3, 2020 but was signed as completed on November 11, 2020.<sup>96</sup>
- PG&E also violated GO 95, Rule 18.B. in failing to maintain complete records of the Index Map labeled AT112-C from the 2019 vegetation management inspection records.<sup>97</sup>

### **5. System Operation**

This section provides an overview of PG&E's typical process for responding to outages, and specifically examines PG&E's systems operations on July 13, 2021 in response to an alert of outage on the Bucks Creek 1101 circuit.

In reviewing PG&E's response to the outage, SED finds PG&E in violation of GO 95, Rule 31.1 for failing to identify the tree on the line from Cresta Dam, [REDACTED]. The tree on the line would have constituted a known hazard, which would have allowed the Dixie Troubleman to turn the power off at Switch 941.<sup>98</sup>

#### **a. Operations Personnel**

A brief description of the roles of PG&E personnel involved in responding to the outage is provided below:

*Dixie Troubleman* – The troubleman assigned to investigate the outage at the dam. A troubleman determines the cause of the outages, ensures the area and PG&E facilities are safe, and restores power to customers.<sup>99</sup>

*NDCC Operator #1* (the operator who first responded to the outage) –Distribution Operators are responsible for the operation of PG&E's electric distribution system, including

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<sup>96</sup> PG&E *Vegetation Management Bucks Creek 1101 2020 Index Map* (November 11, 2020).

<sup>97</sup> PG&E *Vegetation Management Bucks Creek 1101 2019 Index Map* (November 12, 2019).

<sup>98</sup> A detailed timeline of events on July 13, 2021 is provided in Section III.A of this report.

<sup>99</sup> PG&E Response to Data Request Dixie Fire-SED-005, Question 2 (March 14, 2022) page 1.

continuous SCADA monitoring of the Bucks Creek 1101 circuit, checking load and circuit information.<sup>100</sup> Distribution Operators are authorized to deenergize distribution lines to protect public safety and property.

*Hydro Operator #1* (the Hydro Operator who first called NDCC Operator #1 to discuss the outage at Cresta Dam) – The Hydro Operator is like a Distribution Operator, but for hydroelectric operations such as dams.

*Hydroelectric Roving Operator (Rover)* – A Rover’s primary responsibilities include checking station service, confirming that stand-by generators were running if there was a loss of power, and reporting his observations to the Hydro Operator at the Rock Creek Switching Center.<sup>101</sup> The Roving Operator was not responsible for identifying the source of the outage on the Bucks Creek 1101 Line.<sup>102</sup>

#### **b. PG&E Standard Procedures for Responding to Outages**

PG&E Distribution Operators are responsible for the operation of PG&E’s electric distribution system, including continuous monitoring of the Bucks Creek 1101 circuit.<sup>103</sup> After learning about an outage, a Distribution Operator reviews SCADA data and any other available information. SCADA is the system used to communicate with devices on a circuit, recording and sending data back and forth between the devices and the Distribution Operators. More specifically, when outages occur Distribution Operators note whether the circuit breaker is open, whether the load appears normal and balanced across all three phases, whether there is excessive ground current, and any other pertinent information, e.g., known hazards on the line like a tree or an active fire. The Distribution Operator may decide to contact PG&E Dispatch to send out a troubleman to further assess and address trouble on the circuit. The troubleman’s job is generally to determine the cause of the outage, ensure that the area and PG&E facilities are safe, and restore power to customers. The troubleman is required to communicate with the Distribution Operator before deenergizing the lines and is otherwise not permitted to de-energize the lines unless a safety hazard requires prompt action.<sup>104</sup>

When the Distribution Operator receives a SCADA alert, the alert has a priority level. The top level is Priority 10, reserved for fire detection.<sup>105</sup> Priority 10 requires immediate response and action. Priority levels P06-P09 are critical levels requiring immediate action, reserved for “circumstances that indicate potential loss of equipment, path interruption, or customer

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<sup>100</sup> PG&E. Document 1515, *Responses to Fifth Further Request for Responses Re Dixie Fire* (September 24, 2021) (Document 1515), page 14. As noted previously, SCADA stands for “supervisory control and data acquisition.”

<sup>101</sup> PG&E Response to Data Request Dixie Fire-SED-006, Question 6 (July 27, 2022), page 1.

<sup>102</sup> Response to Data Request Dixie Fire-SED-006, Question 6, page 1

<sup>103</sup> Document 1515, page 14.

<sup>104</sup> Response to Data Request Dixie Fire-SED-005, Question 2, page 2.

<sup>105</sup> PG&E. “Responding to Emergencies and Alarms” (Utility Procedure: TD-2700P-09) (February 2, 2020), page 3.



outage.”<sup>106</sup> Priority levels P04-P05 are critical levels “comprised of all security alarms, other significant substation trouble indicators, communication and field devices alarms.”<sup>107</sup> At P04-P05, however, immediate response is not required. The standard specifies further analysis and action as needed. The decision to dispatch personnel or monitor the situation at P04-P05 is based on “known concurrent activity and circumstances. In some instances, close monitoring may be enough; in others, dispatching personnel may be required.”<sup>108</sup>

PG&E only de-energizes lines for known hazards.<sup>109</sup> A PG&E Distribution Operator attested in the District Court Case that fuses often operate or “blow,” so a “blown fuse” alone is not a reason to deenergize the line.<sup>110</sup> Fuses operate in response to faults or spikes in current and may operate for a variety of reasons, often due to temporary issues that do not pose long-term safety hazards. A fuse is designed to protect the rest of the system from fault events downstream of the fault by cutting power downstream of the fuse, resulting in an outage.

Typically, distribution circuits have three phases. Each phase carries electricity, and normally each phase has a fuse. In some cases, a fault can affect only one or two of the phases, causing one or two of the fuses to operate. If two fuses operate to de-energize two of the three phases, the third phase could remain energized. This is called single phasing, which can damage customer equipment designed to use all three phases. Generally, a troubleman would open any remaining fuses to prevent single phasing.<sup>111</sup>

When a troubleman arrives at a site, they inspect the area to determine the cause of the outage and whether the line is safe to reenergize.<sup>112</sup> Often, the troubleman walks the entire portion of the deenergized circuit to make sure that there are no remaining hazards, such as a tree on the line. PG&E considers a tree on a line a safety hazard requiring prompt action. Upon discovery of a tree on the line, normally a troubleman would immediately deenergize the line.<sup>113</sup>

### **c. Procedures Followed on July 13, 2021**

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<sup>106</sup> Utility Procedure: TD-2700P-09, pages 4-5.

<sup>107</sup> Utility Procedure: TD-2700P-09, pages 4-5.

<sup>108</sup> Utility Procedure: TD-2700P-09, pages 4-5.

<sup>109</sup> PG&E Response to Data Request Dixie Fire-SED-001, Question 8 (August 31, 2021), page 1.

<sup>110</sup> PG&E. “Document 1532-1 – Declaration of [REDACTED] in Support of Response To Sixth Request re Dixie Fire” (Document 1532-1), Page 2. September 17, 2021. (Name of Declarant redacted in original.)

<sup>111</sup> Response to Data Request Dixie Fire-SED-005, Question 2, page 4.

<sup>112</sup> Response to Data Request Dixie Fire-SED-005, Question 2, page 1.

<sup>113</sup> Response to Data Request Dixie Fire-SED-005, Question 2, page 3.

The SCADA alert received at 0648 hours on July 13, 2021 was assigned P04. The SCADA alert indicated that the current measured by the recloser was above the minimum-to-trip (mtt).<sup>114</sup> The mtt is the lowest current value that PG&E has programmed the recloser to operate and turn off the power. The first alarm was followed closely by another notification which indicate that the current was below the mtt.<sup>115</sup> These alarms meant the current was briefly measured above the mtt levels before returning to normal.

The Distribution Operator requested that PG&E Dispatch send a troubleman to investigate the outage.<sup>116</sup> When dispatching a troubleman, PG&E Dispatch assigns a priority to the tag.<sup>117</sup> The priority for tags is different than the priority system for SCADA alarms. Priority 0 tags indicate “Timely Emergency Response” and apply to safety issues requiring an immediate response, such as fires, arcing/bare wires, and downed wires.<sup>118</sup> In contrast, Priority 1 tags, or “Same Day Response,” apply to non-emergency services to address issues such as outages of unknown causes.<sup>119</sup> PG&E Dispatch assigned a Priority 1 tag to the outage at Cresta Dam, indicating that the outage necessitated a same-day response but was not considered an emergency when a tag was assigned.<sup>120</sup>

When diagnosing trouble based on the SCADA alert, NDCC Operator #1 had multiple pieces of information available to assist in safely operating the system.<sup>121</sup> NDCC Operator #1 had access to SCADA alerts, but the alert just indicates priority and does not state what type of fault triggered the alarm.<sup>122</sup> NDCC Operator #1 also had access to historical information through the SCADA system.<sup>123</sup> This system transmits data at intervals of 15 and 30 seconds that includes the magnitude of electrical current (or load) on each phase and the calculated ground current.<sup>124</sup> This system only updates if the phase load changes by one amp from the last reported phase.<sup>125</sup> If the

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<sup>114</sup> The log description for the alert stated: “(P04) 1-Paradise Bucks Creek CB 1101 Ir above mtt is ALARM. See “Chico DO Switching Center SCADA” (July 13, 2021).

<sup>115</sup> Chico DO Switching Center SCADA log description for the alert stated: “(P04) 1-Paradise Bucks Creek CB 1101 Ir above mtt is NORMAL.”

<sup>116</sup> PG&E, “Document 1474-5 – 07-13-21 – 0914 - NDCC Operator #1 - Dispatcher” (July 13, 2021) (Document 1474-5), page 2.

<sup>117</sup> PG&E Response to Data Request Dixie Fire-SED-004, Question 53 (September 24, 2021), page 1.

<sup>118</sup> Response to Data Request Dixie Fire-SED-006, Question 53, page 1.

<sup>119</sup> A less urgent priority for tags, Priority 2, requires a scheduled response at a future date. Priority 2 is used for nonemergency services such as discontinuing gas and/or electric service.

<sup>120</sup> 20-Day report, page 2.

<sup>121</sup> PG&E Response to Data Request Dixie Fire-SED-005, Question 8, (March 14, 2022) pages 1-3. March 14, 2022.

<sup>122</sup> Response to Data Request Dixie Fire-SED-005, Question 8, page 1.

<sup>123</sup> Response to Data Request Dixie Fire-SED-005, Question 8, page 1.

<sup>124</sup> Response to Data Request Dixie Fire-SED-005, Question 8, page 2.

<sup>125</sup> Response to Data Request Dixie Fire-SED-005, Question 8, page 2.

data changes, the data is saved in the PI Historian database.<sup>126, 127</sup> The PI Historian database allowed NDCC Operator #1 to compare present load data to historical load data.<sup>128</sup> NDCC Operator #1 references reviewing the SCADA data on July 13, 2021 and stated the load data appeared normal.<sup>129</sup> SCADA data from July 13, 2021 is graphed and discussed in the attached Technical Addendum; no violations are identified associated with this data.

The Dixie Troubleman testified that he could not turn off Switch 941 because he was worried it would impact on downstream customers on the circuit like the ██████████.<sup>130</sup> On July 13, 2021, NDCC Operator #1 had access to PG&E's Digital Mapping System (DMS) to assist with understanding the circuit on July 13, 2021.<sup>131</sup> DMS displays maps and information regarding the circuits. This information includes customer information such as the name on the account, account number, SmartMeter number, service address, and sometimes a contact phone number.<sup>132</sup> DMS does not include information regarding customer equipment, such as back-up batteries, unless it is a critical customer such as a hospital.<sup>133</sup> For the Bucks Creek 1101 circuit, there are three customers beyond Switch 941: Cresta Dam, the ██████████ and ██████████ ██████████.<sup>134</sup> PG&E stated that ██████████ are not considered critical customers, and that it had not identified any records indicating awareness as of July 13, 2021 that the ██████████ had battery backup power.<sup>135</sup> The ██████████ did, in fact, have battery backup.<sup>136</sup> As a result, out of the three customers connected to the portion of the circuit downstream of Switch 941, two lost power due to the operation of Fuse 17733, while the third, which did not lose power, had battery backup. NDCC Operator #1 did not discuss these exact parameters of the circuit, but based on SED's understanding of the DMS system, the number of customers on the circuit should have been obtainable.

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<sup>126</sup> The PI Historian database is the database that stores the SCADA data.

<sup>127</sup> Response to Data Request Dixie Fire-SED-005, Question 8, page 2.

<sup>128</sup> Response to Data Request Dixie Fire-SED-005, Question 8, page 2.

<sup>129</sup> PG&E. "Document 1474-8 – 07 – 13 – 21 – 1125 – Dixie Troubleman – NDCC Operator #1," (Document 1474-8) (September 17, 2021), page 6.

<sup>130</sup> United States District Court, Northern District of California, "Testimony of Troubleman" (September 13, 2021) page 50.

<sup>131</sup> Response to Data Request Dixie Fire-SED-005, Question 8, page 2.

<sup>132</sup> Response to Data Request Dixie Fire-SED-005, Question 8, page 2.

<sup>133</sup> Response to Data Request Dixie Fire-SED-005, Question 8, page 2.

<sup>134</sup> PG&E. "Paradise 21-0089207 Outages" (August 7, 2021), page 6.

<sup>135</sup> Response to Data Request Dixie Fire-SED-005, Question 8, page 2.

<sup>136</sup> See email message from Shawn Lanka, ██████████ to Emily Fisher, CPUC Legal Division, subject: "California Public Utilities Commission - Wildfire Safety, Request for ██████████ Information" (August 19, 2022). SED confirmed with the ██████████ that it previously sent PG&E the information confirming battery backups, although ██████████ could not locate a record of the communication to PG&E. SED also confirmed that ██████████ in that location is not a critical customer as defined by Decision 20-05-051, as the ██████████ in that area is not used for civilian or military purposes.



The Dixie Troubleman and NDCC Operator #1 spoke for the first time at 1125 hours on July 13, 2021.<sup>137</sup> Their discussion indicates an extensive knowledge of the circuit and understanding that access to Fuse 17733 would be time-consuming.<sup>138</sup> During the call, the Dixie Troubleman referenced the difficulty of accessing Fuse 17733.<sup>139</sup> NDCC Operator #1 stated that because the load on the circuit appeared normally, the outage was probably related to the fuse.<sup>140</sup> NDCC Operator #1 also referenced a permanent tag on the DMS indicating no access to Fuse 17733.<sup>141</sup> No discussion of disconnecting power at Switch 941 as an alternative to accessing Fuse 17733 occurred.

### **Analysis of Distribution Operators' Actions**

After Hydro Operator #1 received an outage notification, they dispatched their Rover, who confirmed there was an outage at Cresta Dam and the [REDACTED].<sup>142</sup> The Distribution Operator requested PG&E Dispatch to assign a troubleman to investigate the outage further.<sup>143</sup> PG&E assigned the outage a Priority 1 tag, which was the correct Priority tag under relevant PG&E procedures since the cause of the outage was unknown. A Priority 1 tag necessitates a same day response, so a troubleman was dispatched.<sup>144</sup>

PG&E policy states that personnel can only turn off the power due to known hazards.<sup>145</sup> Per PG&E's testimony, fuse operation does not constitute a known hazard.<sup>146</sup> Accordingly, preemptive de-energization of the line before the tree was known to be in contact with the line would have been contrary to PG&E policy. However, de-energizing the line in this case would have had minimal to no impact on customers, since two of the three customers were already experiencing an outage and the third, the [REDACTED] had battery backup.

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<sup>137</sup> Document 1474-8, page 1.

<sup>138</sup> Document 1474-8, pages 4-6. The Dixie Troubleman and NDCC Operator #1 discussed the outage at Cresta Dam and properties of Bucks Creek 1101 circuit, including the layout of the protection equipment of Fuse 17733, Fuse 805 and Switch 941.

<sup>139</sup> Document 1474-8, page 5.

<sup>140</sup> Document 1474-8, page 6.

<sup>141</sup> Document 1474-8, page 6.

<sup>142</sup> 20-Day report, page 2.

<sup>143</sup> Document 1474-5, page 2

<sup>144</sup> Response to Data Request Dixie Fire-SED-004, Question 53, page 1.

<sup>145</sup> Response to Data Request Dixie Fire-SED-001, Question 8, page 1.

<sup>146</sup> Document 1532-1, page 2.

The Distribution Operators were also in charge of reviewing the load on the circuit. The operators stated that they did not find any issues with the load.<sup>147</sup> SED reviewed the load data and found this conclusion to be generally correct. An analysis of the load data is discussed in the Technical Addendum.

### **Overview of Dixie Troubleman Actions**

The Dixie Troubleman received the tag for the Cresta Dam outage at 1047 hours while enroute to another priority one tag.<sup>148</sup> After contacting the NDCC Operator #1 to learn more about the tag related to the Cresta Dam outage, the Dixie Troubleman addressed the first tag.<sup>149</sup> The Dixie Troubleman arrived at Cresta Dam at approximately 1230 hours, approximately two hours after receiving the tag and six hours after the original SCADA alert.<sup>150</sup> He determined that Fuse 805 was not blown. The Dixie Troubleman continued to investigate the outage, walking to the transformer located one span away on the line that runs to the Cresta Dam. The meter on the transformer was off, indicating that the power was out. He continued to patrol the area to discover the cause of the power outage. Using binoculars, he inspected the section of Bucks Creek 1101 circuit that connect from the dam to Fuse 17733.<sup>151</sup> Per the Dixie Troubleman's testimony in the District Court Case,

It appeared to me that all poles and wires on the line were up and in their normal positions, not bent or twisted. However, I could see what appeared to be a fuse hanging down from a pole on the circuit. That indicated to me that the fuse may have tripped on at least one of the three phases of the line. At that point, I did not see any vegetation on the line, nor did I see any smoke or other indication of fire.<sup>152</sup>

Figure 22 (see page 21 above) shows the span between Pole 100403908 and Pole 100403909 and was taken after the Dixie Fire in 2021. In response to Data Request 4, Question 32, PG&E provided a picture of the span taken in 2014 in advance of a pole replacement lower down the hill (Figure 29, below).<sup>153</sup> Though the primary focus of the photo in Figure 29 is not the span near the fire origin, the photo shows the entire span near the fire origin.

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<sup>147</sup> Document 1515, page 15.

<sup>148</sup> PG&E. "Document 1408-1 – Declaration of [REDACTED] in Response to Order Requesting Information on Dixie and Bader Fires" (July 28, 2021) (Document 1408-1), page 2. (Name of Declarant redacted in original.)

<sup>149</sup> Document 1408-1, page 2.

<sup>150</sup> Document 1408-1, page 2.

<sup>151</sup> Document 1408-1, page 3.

<sup>152</sup> Document 1408-1, page 3.

<sup>153</sup> PG&E Response to Data Request Dixie Fire-SED-004, Question 32 (photo attached as "PGE-DIXIE-CPUC-000005204\_CONFIDENTIAL").



Figure 29: *This photo was taken on November 13, 2014 (per the photo's metadata). The span of interest is highlighted with the red arrow. The red line shows the length of the span. The top oval connected to the red line is adjacent to Pole 100403908 which supports Fuse 17733. The bottom oval connected to the red line is adjacent to Pole 100403909, which is closer to where the tree rested after falling onto the line. The photo was taken as part of a pole replacement project at a pole lower down the hill.*

After his observations from Cresta Dam, the Dixie Troubleman determined that he needed closer observation of Fuse 17733 and drove to Pole 100403908. This drive is circuitous with an access road that requires driving at low speed. Two miles from Fuse 17733, the Dixie Troubleman encountered a bridge that was undergoing maintenance and temporarily unpassable. Construction workers indicated that the bridge would be open in about two hours.<sup>154</sup> The Dixie Troubleman left the bridge at 1335 hours to return to Highway 70 for cell service.<sup>155</sup> The Dixie Troubleman returned to the bridge at 1630 hours using a different route that reconnected with Storrie Road

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<sup>154</sup> Document 1408-1, page 3.

<sup>155</sup> PG&E "Exhibit X-2" (August 25, 2021) (Exhibit X-2), page 2. August 25, 2021



before the bridge.<sup>156</sup> The latter route appears to have taken 10 minutes longer than the first route. Despite a road closed sign at the bridge, the Dixie Troubleman was able to cross.<sup>157</sup> He arrived at Pole 100403908 at 1640 hours and saw that two of the three fuses on the pole had operated. As he exited his truck, he smelled smoke, but assumed it was coming from the Sugar Fire.<sup>158</sup> He opened the third fuse to prevent single phasing. From his vantage in the bucket lift, the Dixie Troubleman “could see a fire downhill from [his] position,” further stating that the fire:

[was] about two-thirds of the way to the next pole. The fire was to the left side of the right of way and roughly 600 or 800 square feet in an oval shape. The near edge of the fire was not at the right of way; the far edge was roughly 25 yards from the right of way. I could also see a tree leaning against the line. I did not see any breaks in the lines or damage to other equipment.<sup>159</sup>

The Dixie Troubleman radioed for help at 1655 hours after opening the third fuse.<sup>160</sup> A supervisor responded at 1656 hours.<sup>161</sup> The Dixie Troubleman did not hear a response from the supervisor and attempted to fight the fire.<sup>162</sup> He emptied his extinguisher and returned to his truck. He radioed again at 1706 hours and a supervisor responded on the radio at 1710 hours.<sup>163</sup> After speaking with his supervisor, he returned to fight the fire.<sup>164</sup> At this point he estimated the fire was about 1200 square feet.<sup>165</sup> At 1730 hours, CAL FIRE aerial assets arrived and started to suppress the fire. At 1900 hours, a CAL FIRE ground crew arrived. Around this time, a PG&E transmission supervisor arrived, and the Dixie Troubleman brought him to the site of the fire.<sup>166</sup> After they returned to the bridge, a CAL FIRE investigator arrived. The Dixie Troubleman informed the investigator of the two open fuses and the tree on the line.<sup>167</sup> The two PG&E employees left the scene at approximately 2000 hours.<sup>168</sup>

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<sup>156</sup> Exhibit X-2, page 2.

<sup>157</sup> Document 1408-1, page 4.

<sup>158</sup> The Sugar Fire burned northeast of Beckwourth, CA. Beckwourth is approximately 50 miles east of Cresta Dam.

<sup>159</sup> Document 1408-1, Page 4. The Dixie Troubleman’s description of the Dixie Fire when he arrived is shown diagrammatically in Figure 3 on page 7.

<sup>160</sup> PG&E “Document 1474-15 – Rough Transcript of July 13, 221 Dixie Troubleman Radio Calls between 16:55 and 17:16” (September 24, 2021) (Document 1474-15), page 1.

<sup>161</sup> Document 1474-15, page 1.

<sup>162</sup> Document 1408-1, page 4.

<sup>163</sup> Document 1474-15, page 1.

<sup>164</sup> Document 1408-1, page 4.

<sup>165</sup> Document 1408-1, page 4.

<sup>166</sup> Document 1408-1, page 5.

<sup>167</sup> Document 1408-1, page 5.

<sup>168</sup> Document 1408-1, page 5.

## **Analysis of the Dixie Troubleman's Actions**

Upon arriving at Cresta Dam, the Dixie Troubleman's primary responsibility was to validate the tag, investigate the tag and isolate causes of the trouble.<sup>169</sup> Therefore, the Dixie Troubleman inspected Fuse 805 and the transformer adjacent to Cresta Dam. The Dixie Troubleman did not observe anything that he believed would have caused the outage.<sup>170</sup> At that point, the Dixie Troubleman used binoculars to look up the hill to investigate Fuse 17733. He stated that he thought at least one of the fuses had operated because he could see them hanging. Based on training and experience in investigating tags and signs of trouble, the Dixie Troubleman should have reasonably expected that any observable signs of trouble, such as a tree on the line, would be located on the portion of the circuit between Cresta Dam and Fuse 17733. The Dixie Troubleman testified that he used his binoculars to do a visual patrol of the portion of the circuit between Cresta Dam and Fuse 17733 but did not see a tree leaning on the line or other potential causes of trouble.<sup>171</sup>

SED visited Cresta Dam and used multiple sets of binoculars and cameras to view the same section of the circuit viewed by the Dixie Troubleman. While the tree was not present when SED viewed this section, the span of circuit that the tree contacted was easily visible from the dam. CAL FIRE's report states that the tree lying on the line was visible with the naked eye, and clearly visible with binoculars from Cresta Dam.<sup>172</sup>

[REDACTED] The Dixie Troubleman was able to identify the blown fuses, which are substantially smaller than the tree. A comparison of Figure 22 on page 21, taken after the Dixie Fire in 2021, and Figure 29 on page 41 taken in 2014, shows little change in the condition of the area under and around the circuit. Therefore, the probability that that there was vegetation or other items that could have obscured this portion of the line before the fire is very low.

[REDACTED] Upon identifying a known hazard, the Dixie Troubleman could have promptly de-energized the line by shutting off power at Switch 941. SED finds that PG&E failed to identify a [REDACTED] tree hazard on the line from Cresta Dam, and accordingly violated GO 95, Rule 31.1 by failing to perform the inspection of the line in accepted good practice.

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<sup>169</sup> PG&E Response to Data Request Dixie Fire-SED-005, Question 2, page 2.

<sup>170</sup> Document 1408-1, Page 3.

<sup>171</sup> Document 1408-1, Page 3.

<sup>172</sup> CAL FIRE Investigation Report, Page 27

## 6. Overall Risk of Bucks Creek 1101 Circuit

SED investigated the overall risk of the Bucks Creek 1101 Circuit to contextualize PG&E's response to the initial SCADA alert at 0648 and subsequent outage at Cresta Dam. SED finds PG&E in violation of PU Code Section 451 for failing to provide utility service necessary to promote the safety of the public in failing to prioritize the response to the outage at Cresta Dam.

The SCADA alert occurred at 0648 hours, but the Dixie Troubleman did not arrive at Fuse 17733 until 1650 hours.<sup>173</sup> NDCC Operator #1 was aware of the outage by 0721 hours after a PG&E Hydroelectric Operator called to confer about the outage.<sup>174</sup> The PG&E Hydroelectric Operator sent a Rover to investigate the outage.<sup>175</sup> The Rover verified the outage and that the [REDACTED] also lost power.<sup>176</sup> The Dixie Troubleman was assigned to investigate further and arrived at Cresta Dam at 1218 hours after addressing another tag.<sup>177</sup> The Dixie Troubleman arrived at the bridge at 1327 hours en route to look at Fuse 17733 and could not proceed at that time due to bridge work.<sup>178</sup> The Dixie Troubleman left and was unable to return until 1630 hours due to the length of the road, even though the bridge work was done at approximately 1520 hours.<sup>179</sup> The Dixie Troubleman did not arrive at the Fuse 17333 until 1650 hours, approximately 10 hours after the initial SCADA alert.

The bridge work impeding access to Fuse 17333 started between 0900 and 0930 hours.<sup>180</sup> A prompt, prioritized response from PG&E to the Cresta Dam outage could have enabled the Dixie Troubleman to access the fuses before the bridge work started, or to stay at the bridge to access Fuse 17733 as soon as the bridge was passable., or alternatively, the Dixie Troubleman could have opened Switch 941 after returning to cell service on Highway 70 and realizing that accessing Fuse 17733 would take additional time.

### Bucks Creek 1101 Circuit Wildfire Risk Ranking

PG&E created the 2021 Wildfire Distribution Risk Model (Model) to rank circuit segments in HFTDs based on wildfire risk.<sup>181</sup> The Model is described at length in its 2021 Wildfire

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<sup>173</sup> 20-Day report, page 2.

<sup>174</sup> 20-Day report, page 2.

<sup>175</sup> 20-Day report, page 2.

<sup>176</sup> 20-Day report, page 2.

<sup>177</sup> 20-Day report, page 2.

<sup>178</sup> 20-Day report, page 3.

<sup>179</sup> 20-Day report, page 3; CAL FIRE Investigation Report, page 37.

<sup>180</sup> CAL FIRE Investigation Report, Page 37

<sup>181</sup> PG&E Response to Data Request Dixie Fire-SED-004, Question 49 (October 8, 2021), page 1.

Mitigation Plan. The Model is used to prioritize wildfire mitigation programs such as System Hardening and Enhanced Vegetation Management.<sup>182</sup> The Model is not used to inform decision-making for purposes of operating the system.<sup>183</sup> The Model has two components, the Equipment Risk Model and Vegetation Risk Model.<sup>184</sup> The Equipment Risk Model is the probability of ignition from equipment failure, whereas the Vegetation Risk Model is the probability of ignition from contact from vegetation.<sup>185</sup> The Equipment Risk Model includes the chance of probability from contact from vegetation.<sup>186</sup> Bucks Creek 1101 was ranked 11 out of 3635 circuits for the Equipment Risk Model and 568 out of 3074 circuits for the Vegetation Risk Model.<sup>187</sup>

The CAL FIRE Report noted the following regarding the risk of the area adjacent to Bucks Creek 1101:

It is common and historic knowledge that the Highway 70 corridor is known for extreme fire danger and poor access. Several large and devastating fires including the Camp Fire, (a PG&E caused fire) have ignited over the last several years in that geographical area. It is also common knowledge that the month of July in Butte County and surrounding areas is peak fire season, yet no sense of urgency was demonstrated by PG&E to determine the cause of the fault in a fire prone area during a severe time of year.<sup>188</sup>

Had PG&E responded to the alarm in a reasonably prompt manner, considering the extreme fire danger, poor access, and history of previous wildfires, the Dixie Fire could have been prevented. PG&E missed two potential opportunities to respond in time to prevent the fire. First, PG&E had a 2.5-hour period in which to respond to the alarm and access the fuses before the bridge work obstructed access. Second, the bridge work finished at 1520 hours, but the Dixie Troubleman did not return to the bridge until 1630 hours.<sup>189</sup> Assigning higher priority to trouble on the Bucks Creek 1101 circuit, based on the well-established high wildfire risk associated with the circuit, would have likely resulted in access to the fuses as soon as the road was passable, or other action (e.g., de-energizing the circuit) consistent with a higher priority response.

## **7. Analysis of Overall Risk**

PG&E should reasonably consider the hazard levels identified for a circuit in responding to outages or other types of trouble on the circuit. PG&E ranked the Bucks Creek 1101 circuit 11

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<sup>182</sup> Response to Data Request Dixie Fire-SED-004, Question 49, page 1.

<sup>183</sup> Response to Data Request Dixie Fire-SED-004, Question 49, page 1.

<sup>184</sup> Response to Data Request Dixie Fire-SED-004, Question 49, page 1.

<sup>185</sup> Response to Data Request Dixie Fire-SED-004, Question 49, page 1.

<sup>186</sup> PG&E *2021 Revised Wildfire Mitigation Plan – Revised* (June 3, 2021), page 161.

<sup>187</sup> Response to Data Request Dixie Fire-SED-004, Question 49, page 1.

<sup>188</sup> CAL FIRE Investigation Report, page 45.

<sup>189</sup> 20-Day report, Page 3.



out of 3535 circuits in its Equipment Risk Model for wildfire risk.<sup>190</sup> While SED understands that this model is not used to inform operations decision-making, the model suggests that the Bucks Creek 1101 is in the top one percent of the most hazardous circuits for wildfires. PG&E's response to outages on this circuit should account for this risk. The circuit is also located in a Tier 2 HFTD. Further, as noted by CAL FIRE, the Highway 70 corridor (where the Dixie Fire started) is an area of extreme fire danger and July was fire season.<sup>191</sup>

PG&E's procedures for responding to outages or other types of trouble on a circuit do not account for known risks. As a result, PG&E personnel failed to prioritize the response to the alarm effectively and appropriately given the extreme wildfire risk associated with the circuit, missing two chances to respond to the Cresta Dam outage in time to eliminate the fire risk. Therefore, SED finds PG&E in violation of PU Code Section 451 for failing to provide electric service as necessary to promote public safety.

## **8. Bucks Creek 1101 Circuit - Analysis of Current Data and System Data**

SED investigated and analyzed the current and system protection design of Bucks Creek 1101. SED finds no violations of GO 95 or the PU Code related to this portion of SED's investigation. Refer to the Technical Addendum for more information and analysis. A summary of the conclusions from the Technical Addendum follows:

- Current data provided by PG&E points to the tree hitting the power lines, causing a phase-to-phase fault at 0648 hours.
- Fuses at Fuse 17733 operated before Recloser 1101/2, which cleared the phase-to-phase fault by shutting power off to two out of three phases of the circuit beyond the fuses.
- After the fuses operated, the tree was still in contact with the third conductor, Phase A (far left conductor on Figure 5 on page 10), which remained energized.
- The contact caused a high-impedance fault, which eventually started a fire along the tree, as shown in Figure 3 on page Figure 3.
- If the recloser settings were set more sensitively than the fuses, the recloser would have triggered, turned off power to all three phases, which would have prevented the fire. At the time of this fire, however, fuses were typically designed to be more sensitive than a recloser, so this was not common practice.<sup>192</sup>

## **9. Additional Items Investigated**

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<sup>190</sup> PG&E Response to Data Request Dixie Fire-SED-004, Question 49, page 1.

<sup>191</sup> CAL FIRE Investigation Report, page 45.

<sup>192</sup> Since the start of the Dixie Fire, PG&E has implemented Enhanced Powerline Safety Settings (EPSS), which implements settings for reclosers that are more sensitive than fuses.

SED investigated two additional items: a helicopter flight performed by PG&E to look for smoke near Cresta Dam on July 13, 2021, and a report of a drone in the vicinity of the fire. No violations of GO 95 were identified related to either item.

### **Investigation of Helicopter Flight**

At approximately 1500 hours, a Senior Power Generation Inspector at the Bucks Creek Powerhouse parking lot thought he smelled and saw smoke southeast of the powerhouse.<sup>193</sup> Cresta Dam and the Incident Location are roughly southwest of Bucks Creek Powerhouse.<sup>194</sup> The inspector called the Rock Creek Switching Center to alert the Operator that he smelled smoke.<sup>195</sup> The Operator recruited a helicopter to fly over the area around Bucks Creek 1101.<sup>196</sup> The Operator also alerted an electrician at the Rock Creek Switching Center, who circled the facility and did not smell smoke or see any sign of fire.<sup>197</sup> The helicopter performed a fly-over of the area.<sup>198</sup> The pilot reported that he did not see a fire or any indication of a fire.<sup>199</sup> The flight path passed over a portion of Bucks Creek 1101 circuit, but the fly-over was focused near the Bucks Creek Powerhouse and Rock Creek Powerhouse (Figure 30).<sup>200</sup> The closest point to Pole 100403909 from the flight path was approximately one mile, but the flight path and Pole 100403909 were on opposite sides of a mountain ridge.<sup>201</sup> PG&E is not aware if any of the information related to the suspected fire was conveyed to a Distribution Operator at the NDCC or the Dixie Troubleman.<sup>202</sup>

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<sup>193</sup> Document 1479, *PG&E Further Response re Dixie Fire 092421* (Doc. 1479), page 10.

<sup>194</sup> Doc. 1479, page 10.

<sup>195</sup> Doc. 1479, page 10.

<sup>196</sup> Doc. 1479, page 10.

<sup>197</sup> Doc. 1479, page 10.

<sup>198</sup> PG&E Response to Data Request Dixie Fire-SED-005, Question 18 (February 28, 2022), page 1.

<sup>199</sup> Response to Data Request Dixie Fire-SED-005, Question 18, page 1.

<sup>200</sup> PG&E “KMZ Map of Helicopter Flight” (PGE-DIXIE-CPUC-000017677) (July 13, 2021).

<sup>201</sup> PGE-DIXIE-CPUC-000017677

<sup>202</sup> PG&E Response to Data Request Dixie Fire-SED-005, Question 20 (February 28, 2022), page 1.

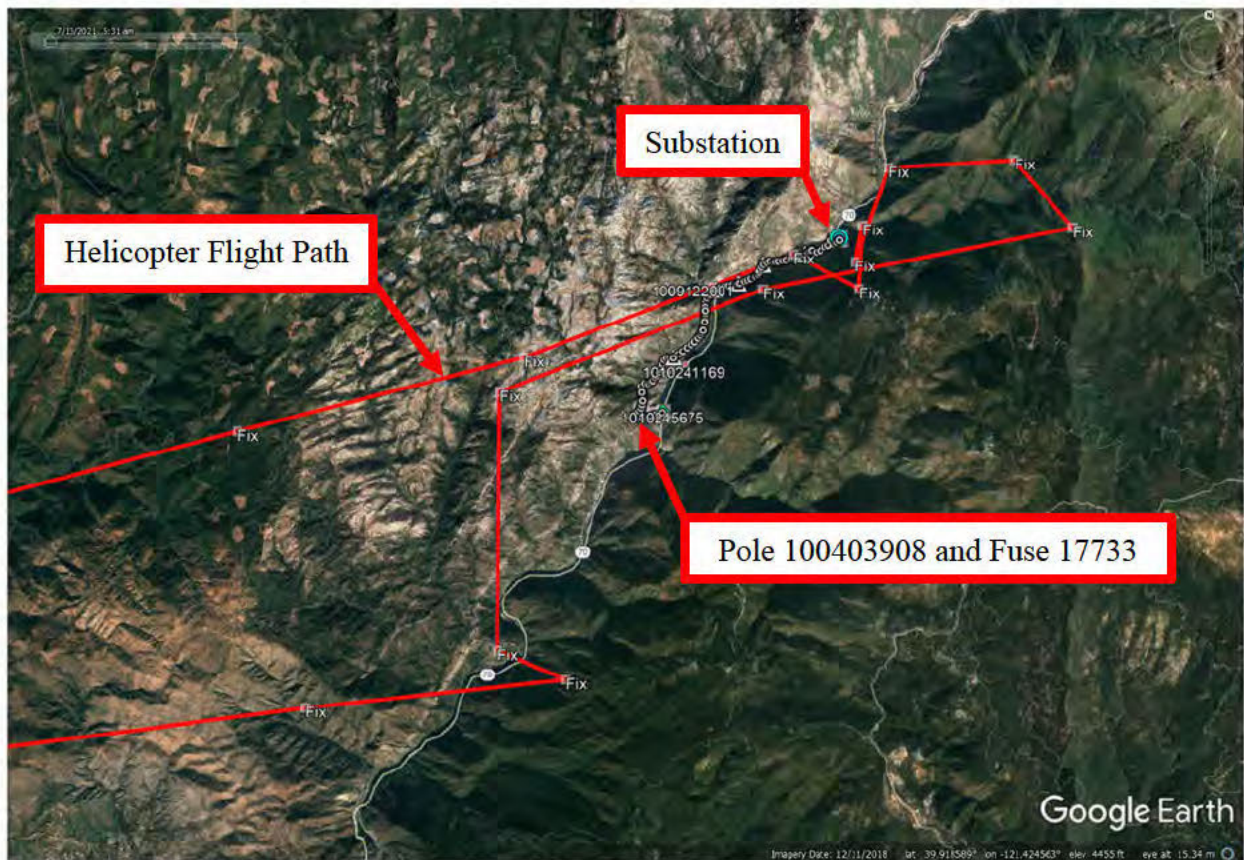


Figure 30: The red lines show the helicopters flight path in the area surrounding Bucks Creek 1101 Circuit. For a closer view of the circuit, see Figure 1.

### Analysis of Helicopter Flight

The helicopter was close enough to the Pole 100403908 and Fuse 17733 that any visible smoke from the Dixie Fire at that time could have been visible from the helicopter. However, per PG&E procedures, the helicopter pilot could not have safely conducted a patrol of the Bucks Creek 1101 circuit without a patrolman in the helicopter.<sup>203</sup> There is no indication that a patrolman was in the helicopter to help with a patrol. No violations of GO 95 are identified regarding the helicopter flight.

### Drone Investigation

A drone was reportedly in the vicinity of the Incident Location after the fire started.<sup>204</sup> PG&E records indicated that PG&E contractors operated drones on the morning of July 13, 2021 in

<sup>203</sup> PG&E Helicopter Operation Field Manual (November 11, 2019), page 19.

<sup>204</sup> Natalia Gurevich, *Authorities investigate drone interference with initial critical efforts to control Dixie Fire*, Audacy (last modified August 12, 2021), available at

Plumas County, but PG&E records indicate that the closest authorized drone flights were 20 miles away from the Incident Location.<sup>205</sup>

### **Drone Analysis**

Based on evidence that the drone was not associated with PG&E operations, no violations of GO 95 are identified regarding a drone flight.

### **Conclusion**

SED finds no violation of GO 95 related to the drone or helicopter flight.

## **IV. Conclusion**

### **A. Violations**

Based on the evidence reviewed, SED's investigation found six violations of GO 95 and one violation of PU Code Section 451 by PG&E:

1. PG&E's failure to complete Electric Overhead Tag 109671451 within the required one-year deadline is a violation of **GO 95, Rule 18.B.**
2. PG&E's failure to maintain records that show the correct date of inspection for its 2020 vegetation management routine inspection is a violation of **GO 95, Rule 18.B.**
3. PG&E's failure to maintain a complete set of records from its 2019 vegetation management routine inspection is a violation of **GO 95, Rule 18.B.**
4. PG&E's failure to update Appendix A from its vegetation procedures to appropriately reflect the MDRs required by GO 95, Rule 35 is violation of **GO 95, Rule 31.1.**
5. PG&E's failure to identify the tree on the line which was reasonably visible from Cresta Dam is a violation of **GO 95, Rule 31.1.**
6. PG&E's failure to maintain its 12 kV overhead conductors safely and properly is a violation of **GO 95, Rule 31.1.** PG&E did not identify a hazardous tree condition and take the appropriate steps to prevent the Subject Tree from striking the overhead conductors.
7. PG&E's failure to adequately consider the hazard of Bucks Creek 1101 circuit in its response to the outage at Cresta Dam is a violation of **PU Code Section 451.**

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<https://www.audacy.com/kcbsradio/news/weather/drone-interfered-with-critical-efforts-to-control-dixie-fire> (August 12, 2021 News Item).

<sup>205</sup> PG&E. "Response to Data Request Dixie Fire-SED-001, Question 2," Page 1. May 25, 2022; *see also* August 12, 2021 News Item, quoted Butte County District Attorney Mike Ramsey as stating that the drone was not likely to be PG&E's.



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