



## Preliminary Ignition Investigation Report

Ignition Database Index:	20241408
Electric Incident Investigation (EII) Number:	N/A
Incident Name:	Owl
PG&E Facility Ignition?	Yes
CPUC Reportable Ignition?	Yes
Date & Time of Incident:	September 28, 2024 @ 1527 hours
Street Address:	Owl Mine Road and Highway 96, near Owl Gulch
City:	Orleans
County:	Humboldt
Latitude/Longitude:	41.29546, -123.57196
State Responsibility Area (SRA) / Local Responsibility Area (LRA) / Federal Responsibility Area (FRA)	Federal Responsibility Area (FRA)
PG&E Division:	Humboldt
High Fire Threat District (HFTD):	Tier 2
High Fire Risk Area (HFRA):	Yes
EPSS Buffer:	No
Fire Index Area (FIA):	112
Fire Potential Index (FPI) Rating: FIA	R3
Fire Potential Index (FPI) Rating: Circuit	R3
Was there a PSPS event at the time of ignition?	No
Suspected Initiating Event:	Vegetation
Failure Driver:	Contact from Object
Failure Sub-driver:	Contact - Vegetation
Circuit:	Hoopa 1101
Circuit Protection Zone:	Hoopa 11013174
Nominal Voltage:	12kV
Pole SAP Equipment ID:	103983301
Subject to PRC 4292 Veg Pole Clearance:	No
PG&E Equipment associated with ignition:	Conductor – Primary (4-ACSR)
EPSS enabled at time of ignition?	Yes
Fault Type:	Line-to-Ground
Wire Down (Primary)?	Yes
Lead Agency/Agency Having Jurisdiction:	CAL FIRE
Fire Size:	0.26-9.99 acres
FAS Field Remarks:	"wires only poles good"

<b>HAWC Summary:</b>	<p>“Outage and 9-1-1 Stand by at the request of USFS for reports of wires down. In the UPTR indication was made that there was possibly a vegetation fire associated with the incident. EPSS notification and call to DCC was made along with PSS engagement. No additional updates were received over night, no confirmation there was in fact a vegetation fire. OIS# 2580222 impacting 487 customers. Closing barring any changes due to no confirmation of fire or updates.”</p>	
<b>Injuries / Fatalities / Property Damage / Media Attention:</b>	None	
<b>Weather Conditions:</b>	<p>At 1541 hours on 9/28/2024 near the incident location  Temperature: 84.7°F  Relative Humidity: 39%  Wind Speed: 2.9 mph  Wind Gust: 8.0 mph out of the SSW</p>	
<b>Red Flag Warning (RFW) / High Wind Warning (HWW):</b>	No/No	
<b>911 Standby Relief Time:</b>	40	
<b>OIS #:</b>	22580220, 2580221, 2580222, TR7723193	
<b>ILIS #:</b>	24-0116940	
<b>FAS #:</b>	T006512508; The following associated FAS #'s were cancelled: T006512461, T006512462, T006512463, T006512488, T006512505, and T006512351	
<b>Assigned Attorney:</b>	N/A	
<b>Ignition Investigator &amp; Phone:</b>	<div>██████████ (Exponent)</div> <div>██████████ (PG&amp;E)</div>	<div>██████████</div> <div>██████████</div>

## Executive Summary

On September 28, 2024, at 1527 hours, two SmartMeters™ report offline on the EPSS enabled, two-phase primary overhead Hoopa 1101 12kV Distribution Circuit (Hoopa 1101). At approximately 1531 hours, Line Recloser (LR) 3174 on Hoopa 1101 opened when a line-to-ground fault occurred, deenergizing approximately 487 customers. At 1542 hours, PG&E dispatched a troubleshooter (“Troubleshooter #1”) and at 1622 hours dispatched another troubleshooter (“Troubleshooter #2”) to LR 3174. At 1636 hours, the U.S. Forest Service (“USFS”) notified PG&E of power lines down and a vegetation fire in the Owl Mine Road area off of Highway 96 in the city of Orleans, California (“Incident Location”, Figure 1 and Figure 2)<sup>1</sup>; USFS fire engines were reportedly enroute to the Incident Location. At 1640 hours, PG&E dispatch diverted Troubleshooter #1 to the Incident Location, and at 1655 hours, Troubleshooter #2 arrived at LR 3174 and began patrolling the Hoopa 11013174 circuit protection zone.

At 1720 hours, Troubleshooter #1 opened Fuse Cutout (FUCO) 3283 (Figure 2), isolating the Incident Location from the rest of the circuit. By 1730 hours, Troubleshooter #1 observed USFS fighting the fire and had blocked the road preventing access to the Incident location. By 2034 hours, USFS had contained the fire at 0.5-acres and was *mopping-up*.<sup>2,3</sup> At 2254 hours, the restoration supervisor informed the Distribution Control Center (DCC) that USFS would not be allowing PG&E to access to the Incident Location until the next morning (September 29, 2024).

By 1145 hours on September 29, 2024, Troubleshooter #1 had access to the Incident Location and PG&E restoration personnel had completed a helicopter patrol from LR 3174 to FUCO 3283. Troubleshooter #1 observed two phases of 4-ACSR primary overhead conductor on the ground between wood pole SAP ID 103983301 (“Pole #1”, load side) and wood pole SAP ID 104086952 (“Pole #2”, source side) (“Incident Span”) (see Figure 3 and Figure 4). Troubleshooter #1 walked the span and did not see anything laying across the wire that may have caused the wires to break and fall to the ground; however, Troubleshooter #1 observed several cut trees and tree remnants in the area scattered around, potentially attributable to a combination of USFS firefighting and clean-up efforts<sup>4</sup> and tree cutting efforts in the area approximately three weeks prior to this ignition.<sup>5,6</sup> While not observing any confirming evidence, Troubleshooter #1 speculated the ignition was likely caused by a vegetation strike, given the heavily wooded location, lack of other apparent cause(s) of the

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<sup>1</sup> NICE recording ID 6636872; call from U.S. Forest Service to PG&E.

<sup>2</sup> *Mopping-up* describes the hard physical labor process of extinguishing or removing burning material near control lines down to the mineral soil, felling fire damaged trees, and cooling ash pits to make a fireline less likely to escape or to reduce residual smoke. This is followed up by ‘cold-trailing’ with the back of one’s hand along the ground near the fireline to make sure no heat remains. (Reference: <https://www.fs.usda.gov/detail/r6/fire-aviation/?cid=fseprd805815>]; accessed 10/24/2024)

<sup>3</sup> NICE recording ID 2971760

<sup>4</sup> Discussion with Troubleshooter on October 10, 2024.

<sup>5</sup> Troubleshooter #1 spoke with a property owner in the area who informed him tree crews were in the area about three weeks prior to the ignition, trimming and cutting trees. (Reference: Discussion with Troubleshooter on October 10, 2024.)

<sup>6</sup> VM records indicate CEMA tree trimming, and removal was performed in the incident area two days and approximately three weeks prior to the ignition. (Reference: One VM Discussion with EII on October 16, 2024)

broken wires, and the overheard remarks from USFS personnel that they “took a tree.”<sup>7,8</sup> The helicopter patrol did not identify any additional abnormalities.

At 1202 hours, DCC closed LR 3174 returning service to 482 customers. At 1243 hours, PG&E dispatched a repair crew to the Incident Location. By 1813 hours, both phases of 4-ASCR conductor had been replaced in the Incident Span. At 1818 hours, the repair crew closed FUCO 3283, restoring power to the remaining five customers.

On October 3, 2024, PG&E Vegetation Management (“VM”) patrolled the Incident Location and observed a 100-foot-tall Douglas fir (*Pseudotsuga menziesii*) north of the right of way that had uprooted and failed downhill to the southwest (Figure 6). VM did not identify any branches showing indications of direct contact, however noted there was a splice observed directly above the fall path of the tree. VM speculated the uprooted Douglas fir may be the Incident Tree.<sup>9</sup> However, likely due to post ignition firefighting and possible material retention activities performed by USFS, VM was unable to conclusively identify the location and species of the Incident Tree.<sup>10</sup> Also on October 3, 2024, VM performed an Extent of Conditions (XoC) Patrol covering five distribution spans in all (three) directions from the Incident Span. No immediate additional hazards were identified.

Based on information available as of the date of this report, this ignition was likely caused by a tree, or portion thereof, falling onto the conductors causing them to fall to the ground and ignite ground vegetation. However, specifics of the Incident Tree (location, species, condition at time of incident, inspection history, etc.) are currently unknown. Additional information may be available upon receipt of the USFS investigation report. Upon receipt and review of the USFS report, this record of events will be revised, as needed.

No partial voltage alarms downstream of the Incident Location were recorded in the few hours prior to this outage.<sup>11</sup>

A weather station located 6.6 miles southwest of the Incident Location recorded a temperature of 84.7°F and a relative humidity of 39% with sustained winds of 2.9 miles per hour (mph) and wind gusts up to 8.0 mph out of the south-southwest at the time of the incident. Meteorology indicated the Fire Potential Index (FPI) rating was R3.

This information is preliminary, and all times, customer numbers and measurements mentioned in this report are approximate.

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<sup>7</sup> Troubleshooter #1 spoke with a USFS investigator regarding the cause of the ignition; the investigator did not offer any specific information regarding the cause. While Troubleshooter #1 overheard another USFS investigator mention they took a tree, he did not observe USFS investigators or firefighters taking a tree or any other materials (Reference: Discussion with Troubleshooter on October 10, 2024.)

<sup>8</sup> PG&E requested a copy of the USFS incident report and a list and photographs of any retained materials on October 10, 2024. As of the date of the report, this information has not been received.

<sup>9</sup> VM noted that trees in the area consisted of Douglas firs and Pacific madrones, some of which were burnt at the base as well as others removed above the base. Mid-canopies of the Douglas firs and Pacific madrones in the area exhibited signs of scorching mid-span and more on the northern side of the lines. The report does not provide evidence to conclude the uprooted Douglas fir caused the wire down incident. Tree trimming and removal was performed within the Incident Span two-days and approximately three weeks prior to the incident, some of the tree remnants in the scar area may be related to these efforts.

<sup>10</sup> Within the burn scar area, a section of a freshly cut (post ignition) madrone tree appeared to be missing; there were three flags and part of a broken insulator in the space between the intact trunk and upper portion of the tree (Figure 7). It is speculated, this may be the area where USFS removed material for retention.

<sup>11</sup> Ignition Lookback Analysis Tool (ILAT) in Foundry accessed October 16 2024.

## System Protection Analysis

EPSS was enabled for the Hoopa 1101 12kV circuit at the time of the incident. Protective devices upstream of the Incident Location, listed in order of closest proximity, include Fuse 3283,<sup>12</sup> LR 3174,<sup>13</sup> LR 3304,<sup>14</sup> LR 405280,<sup>15</sup> and Circuit Breaker (CB) 1101/2.<sup>16</sup> At the time of the incident, protective device LR 3174 was the closest EPSS enabled device equipped with both Sensitive Ground Fault (SGF) capabilities and Downed Conductor Detection (DCD) capabilities.

The two phases of primary phase conductor falling to the ground, likely as a result of vegetation contact, triggered a line-to-ground high impedance fault. The fault (Phase A: 13A, Phase B: 35A, Phase C: 30A, and Ground: 7.8 A) caused LR 3174 to operate on DCD targets, responding in 1.54 seconds and clearing the fault after 1.59 seconds. Upstream Fuse 3283 did not operate because fault conditions were below minimum thresholds for operation. Distribution Protection Engineering's ("DPE") assessment is that the EPSS protective devices operated as expected given the system configuration at the time of the incident.

Following this ignition event, DPE evaluated EPSS settings and identified the following opportunities for improvement: Lowering the SGF settings on LR 3174 to 5A with a six second time delay (setting at time of incident was 15A with a 15 second time delay), lowering the SGF settings on LR 3290 (located downstream of the Incident Location) to 5A with a five second time delay (setting at time of incident was 15A with a second time delay) and updating firmware on LR 3174 to Revision 9.1.<sup>17</sup> Per DPE, the proposed changes to the SGF settings would not have impacted the current incident. However, the firmware version update for LR 3174 may have detected and cleared the fault more quickly.

## Ignition Impact

The vegetation falling on the conductors caused two phases of 4-ACSR conductor to break and a vegetation fire of approximately 0.5-acre. There was no fire related damage to other PG&E or third-party assets, no individuals were injured, and there was no reported media exposure. The outage associated with this event affected 482 customers for approximately twenty and a half hours and fourteen customers for approximately twenty-seven hours.

## Sequence of Events

September 28, 2024

- 1527 hours, two SmartMeters™ on Hoopa 1101 report offline

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<sup>12</sup> Part No.: 75; Link Type: 8 ELF

<sup>13</sup> Brand: Viper, Type: Beckwith – Rev 7.3.1, DCD capable. At the time of the incident EPSS settings were as follows: Phase Settings, 100A trip with 30 ms delay, Ground Settings: 100A trip with 10 ms delay, and SGF Settings: 15A with 15 second delay.

<sup>14</sup> Brand: Nova, Type: Form 6-Rev 30, No DCD capability. At the time of the incident EPSS settings were as follows: Phase Settings, 140A trip with 77 ms delay, Ground Settings: 80A trip with 77 ms delay, and SGF Settings: 15A with 24 second delay.

<sup>15</sup> Brand: Nova, Type: Beckwith – Rev 3.4. At the time of the incident, LR 405280 was in switch mode and was not EPSS enabled.

<sup>16</sup> Brand: IPAC., Type: GE-F60/SEL 351, EPSS enabled with DCD enabled and Sensitive Ground Fault ("SGF") capability.

<sup>17</sup> Per DPE, the Revision update changes the LR's internal logic for identifying high impedance faults with the intent of quicker detection and clearance of the fault.

- 1531 hours, LR 3174 opens, deenergizing approximately 487 customers; PG&E records First No Light (FNL)
- 1542 hours; Troubleshooter #1 dispatched to LR 3274
- 1622 hours, Troubleshooter #2 dispatched to LR 3274
- 1636 hours, USFS notifies PG&E emergency of powerlines down and a vegetation fire in the Owl Mine area off Highway 96 in the city of Orleans; firefighters enroute<sup>18</sup>
- 1640 hours, PG&E dispatch directs Troubleshooter #1 to Incident Location<sup>19</sup>
- 1655 hours, Troubleshooter #2 arrives to LR 3274 and begins patrol
- 1720 hours, Troubleshooter #1 opens FUCO 3283<sup>20</sup>
- 1730 hours, Troubleshooter #1 reports to DCC that USFS presently fighting fire and blocking the road, preventing access to Incident Location<sup>21</sup>
- 2034 hours, Troubleshooter #1 reports to DCC that USFS has contained the fire at ½-acre and is presently mopping up<sup>22</sup>
- 2254 hours, Supervisor reports to DCC that USFS will not allow access due to fire activity; Helicopter patrol will proceed tomorrow morning<sup>23</sup>
- 2303 hours, Troubleshooter #2 leaves Incident Location for the night

September 29, 2024

- 1145 hours, Troubleshooter #1 reports to DCC two wires down one span, five poles load side of FUCO 3283; Helicopter patrol from LR 3174 to FUCO 3283 complete<sup>24</sup>
- 1202 hours, DCC closes LR 3174 returning service to 482 customers
- 1243 hours, Repair crew dispatched to Incident Location
- 1301 hours, Repair crew reports to DCC they are obtaining materials and likely will not arrive on site until 1430 hours.<sup>25</sup>
- 1813 hours, Repair crew reports all work complete<sup>26</sup>
- 1818 hours, DCC disables EPSS on protection devices between FUCO 3283 back to CB 1101/2
- 1821 hours, Repair crew closes FUCO 3283 returning service to the remaining five customers
- 1835 hours, DCC enables EPSS on protection devices between FUCO 3283 back to CB 1101/2

### Corrective Notification Associated with Ignition

Corrective Notification EC 129603627 was created to replace both phases of 4-ACSR conductor within the Incident Span. This work was completed on September 29, 2024.

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<sup>18</sup> NICE recording 6636872

<sup>19</sup> NICE recording 6636887

<sup>20</sup> NICE recording 2971624

<sup>21</sup> NICE recording 2971624

<sup>22</sup> NICE recording 2971760

<sup>23</sup> NICE recording 5441662

<sup>24</sup> NICE recording 2972754

<sup>25</sup> NICE recording 6640728

<sup>26</sup> ILIS 24-0016940

## Pending Work

Type	Number	Description	Priority	Date Identified	Due Date
EC Notification	N/A				
COE Notification	N/A				
LC Notification	N/A				
Veg Work Order	N/A				

Please note this may not include pending major program or project work at the Incident Location.

## Asset Info & Most Recent Inspections and Tests

<b>Load Side Structure*</b>	<b>SAP ID # 103983301**</b>	
<b>Info / Inspection</b>	<b>Most Recent Dates</b>	<b>Findings</b>
Install Date:	2013	Wood Pole, 35-feet high
Inspections:	July 26, 2023	GO165 Detailed Enhanced Inspection: Anchor is graded and needs to be dug and exposed more. No other abnormal or compelling conditions identified.
	July 16, 2021	GO165 Detailed Enhanced Inspection: No abnormal or compelling conditions identified.
Patrol:	N/A	
Corrective History:	March 4, 2024	EC # 128236280, Priority A. Repaired 60-feet of 4-ACSR in both phases. Adjusted anchor and replaced visibility strip. Work completed March 4, 2024.
	July 26, 2023	EC # 126681212: Anchor is graded and needs to be dug and exposed. Tag cancelled as all work completed on storm A-tag # 128236280 on March 4, 2024.
Aerial Inspection Records	N/A	N/A
VM Inspection:	N/A	Details of the Incident Tree are unknown.
EVM Inspection:	N/A	Details of the Incident Tree are unknown.
Equipment Test:	N/A	No equipment on pole.
Pole Intrusive Test:	April 7, 2020	Distribution Pole Test and Treat – Intrusive Inspection Status: Pass.
WSIP Inspection:	None	

\*Please note this may not include pending major program or project work at the Incident Location.

\*\*Ancestor Pole 100961929

<b>Source Side Structure*</b>	<b>Pole #2 SAP ID: 104086952**</b>	
<b>Info / Inspection</b>	<b>Most Recent Date</b>	<b>Findings</b>
Install Date:	2017	Wood pole, 45 feet tall



<b>Source Side Structure*</b>	<b>Pole #2 SAP ID: 104086952**</b>	
<b>Info / Inspection</b>	<b>Most Recent Date</b>	<b>Findings</b>
Inspection:	October 31, 2023	GO165 Detailed Enhanced Inspection: No abnormal conditions identified.
	August 24, 2020	GO165 Detailed Enhanced Inspection: No abnormal conditions identified.
Patrol:	N/A	
Corrective History:	August 3, 2023	EC 1126741549, Priority E: Need trail established and veg/poison oak cleared to and around structure and anchors for inspection. Cancelled – location inspected 10/31/0223.
	August 9, 2016	EC 111886753, Priority F: Install anchor (guy currently held by tree) and install HV signs. Work completed on November 19, 2023.
Aerial Inspection Records:	N/A	N/A
VM Inspection:	N/A	
EVM Inspection:	N/A	
Equipment Test:	N/A	N/A
Pole Intrusive Test:	None	
WSIP Inspection:		None

\*Please note this may not include pending major program or project work at the Incident Location.

\*\*Ancestor Pole 100961920

### Hazard Barrier Analysis

Hazard	Vegetation Contact	Sub-Hazard	Fallen Vegetation
	Vegetation falling onto and breaking two phases of 4-ACSR conductor causing a high impedance fault resulting in a 0.5-acre fire.		
Barrier	Expected vs. Observed Performance	Why did the barrier not prevent the ignition event?	Comments
Barriers that Positively Affected Ignition			
Enhanced Powerline Safety Settings - Downed Conductor Detection  Document: TD-2700P-26	Expected Performance: Automatically turn off power when a high impedance fault/downed conductor is detected to reduce the risk of ignition in HFRA's.  Observed Performance: Barrier performed as expected	A1B2C2D3 –Device tripping time is limited	LR 3174 operated on DCD target responding to the fault in 1.54 seconds and clearing the fault in 1.59 seconds thus limiting ignition impact

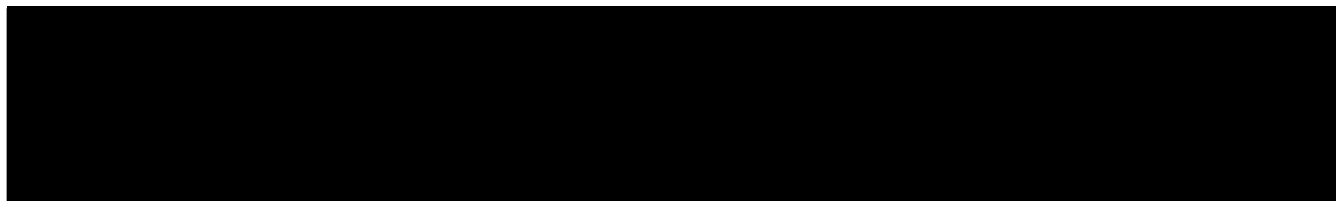


Hazard	Vegetation Contact	Sub-Hazard	Fallen Vegetation
	Vegetation falling onto and breaking two phases of 4-ACSR conductor causing a high impedance fault resulting in a 0.5-acre fire.		
Barrier	Expected vs. Observed Performance	Why did the barrier not prevent the ignition event?	Comments
Barriers that were Assessed as Opportunities			
Enhanced Powerline Safety Settings - Downed Conductor Detection  Document: TD-2700P-26	Expected Performance: Automatically turn off power when a high impedance fault/downed conductor is detected to reduce the risk of ignition in HFRA's.  Observed Performance: Barrier performed as expected	N/A	Updated LR firmware may have identified and cleared the fault more quickly.

#### Potential Next Steps / Associated CAP Items:

- Upon receipt, assess USFS incident investigation report and any returned materials removed from Incident Location for causative factors associated with this ignition and revise this record of events as needed.
- To reduce future wildfire risk, implement DPE proposed improvements to EPSS on Hoopa 1101 as follows:
  - Update firmware on LR 3174 to Revision 9.1, and
  - Lower SGF settings on LR 3174 and downstream LR 3290.

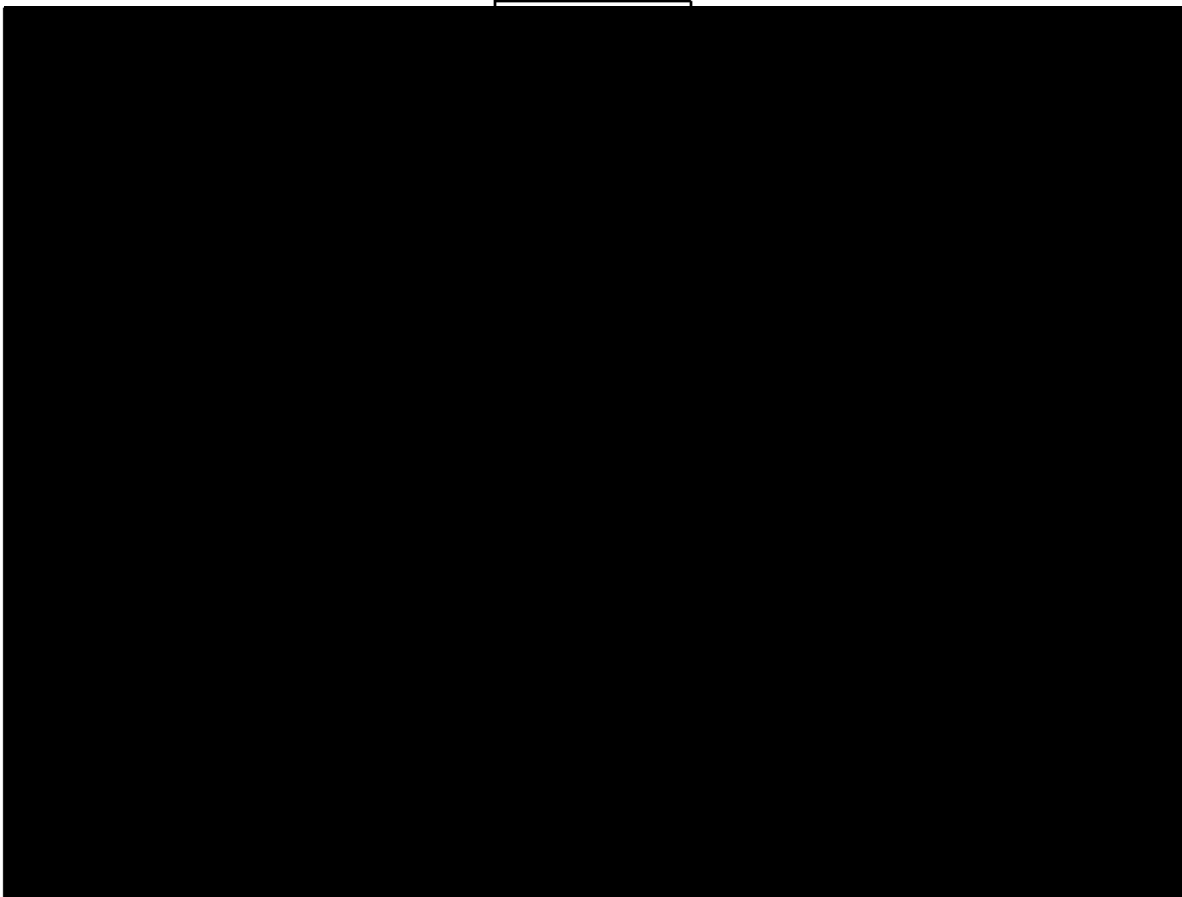
#### Single Line Diagram



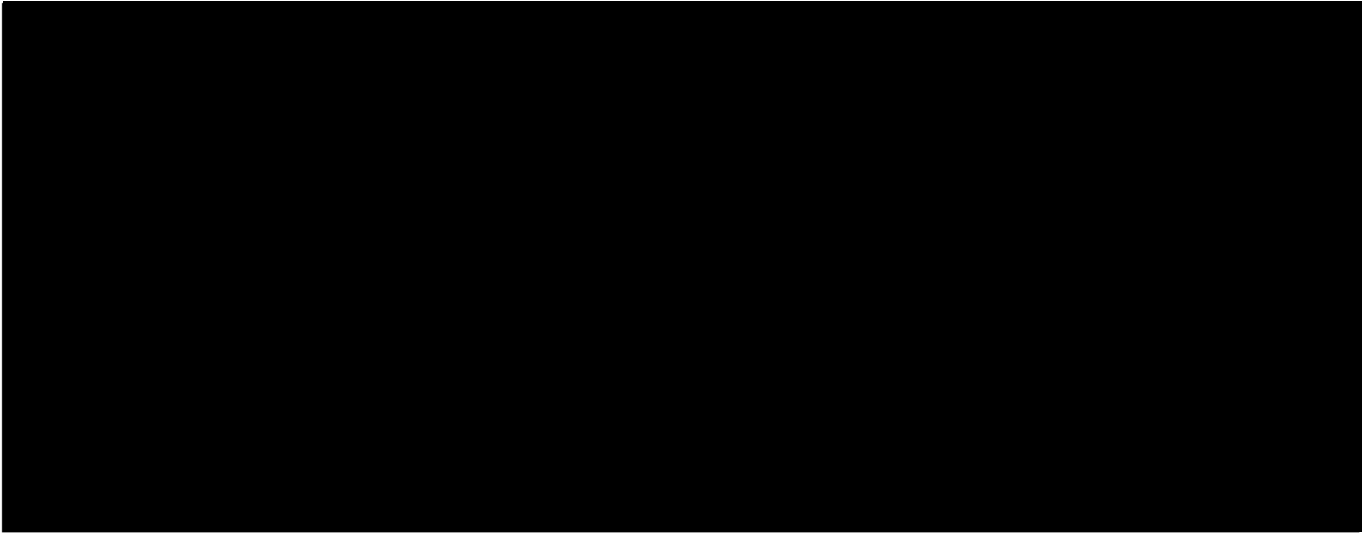
Incident Location:  
Pole SAP ID # 103983301



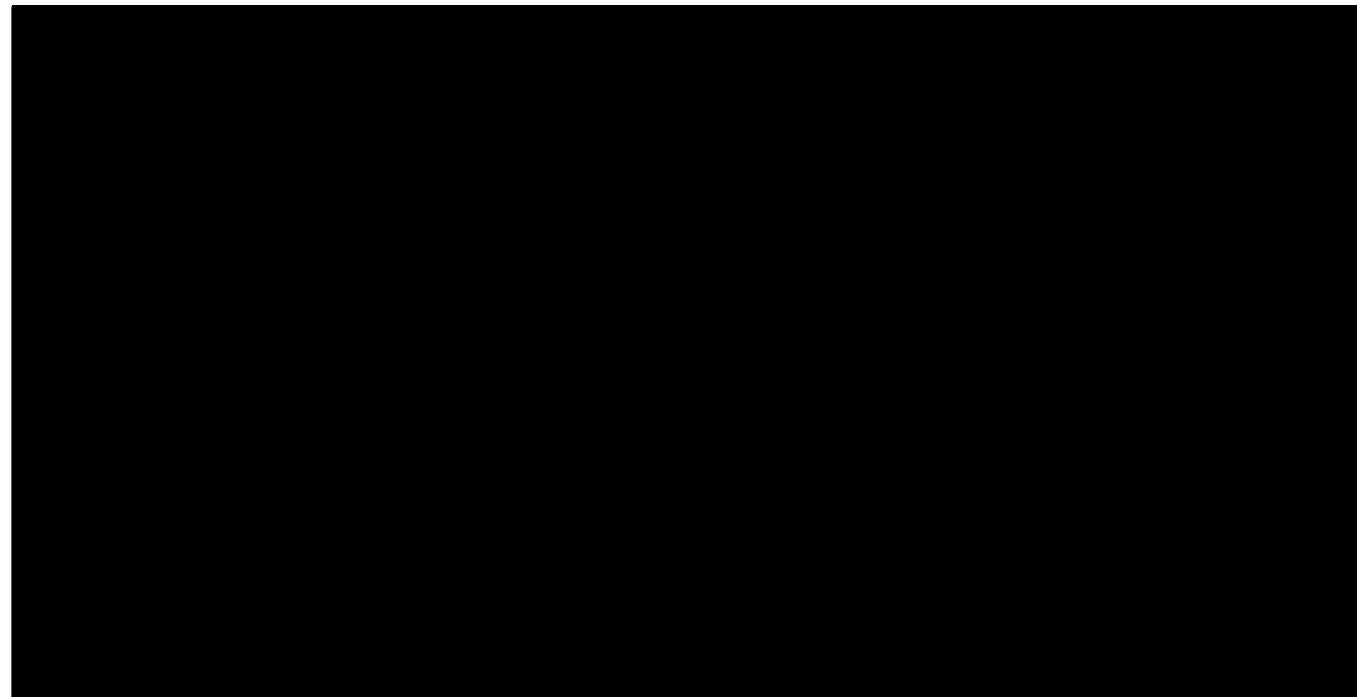
## Photos and Diagrams of Events



*Figure 1: Aerial view showing the Incident Location (indicated with red "X", the ignition occurred at the Incident Location), and the location of the closest upstream protective devices (marked with yellow pins). Close-up of area within dashed rectangles showing the incident poles and spans is shown in Figure 2. Source: Google Earth, image.*



*Figure 2: Aerial view showing the Incident Location (indicated with red "X"), and the location of the upstream FUCO 3283 opened by Troubleshooter #1. Source: Google Earth, image undated.*



*Figure 3 Circuit layout in vicinity of Incident Location. Source: EDGIS.*

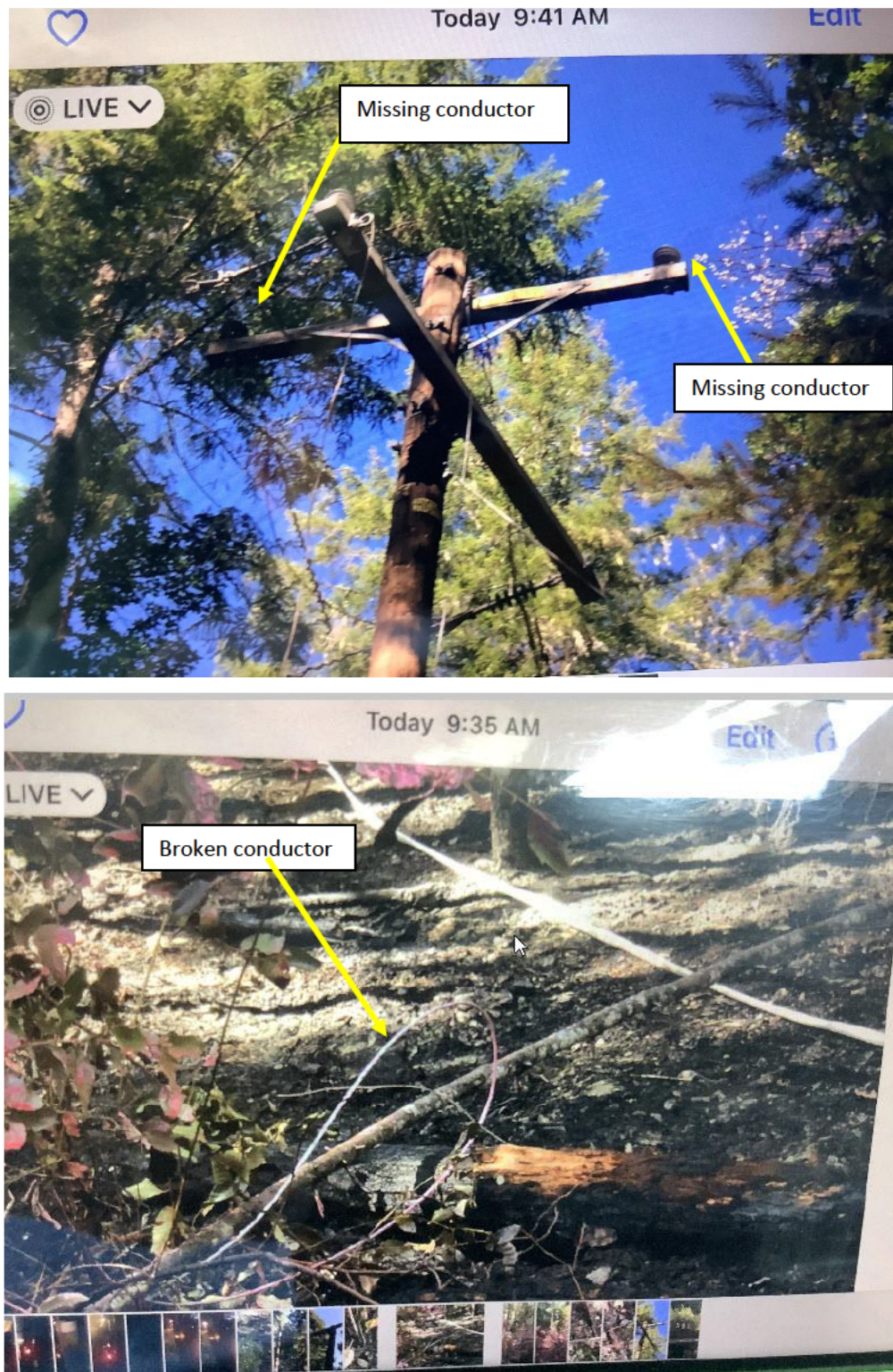


Figure 4 Photographs of top of Incident Pole showing missing conductors and missing insulator. Source: Troubleshooter, taken on September 29, 2024.





*Figure 5 Cut trees within burn scar. Note the fire retardant (pink discoloration) on some of the trees indicating they were cut prior to the ignition. Source: VM Incident Investigation Report (attached photograph).*





*Figure 6 Uprooted Douglas-fir, located on north side of the right of way, that failed downhill, to the southwest. Source: VM Incident Investigation Report (attached photograph).*



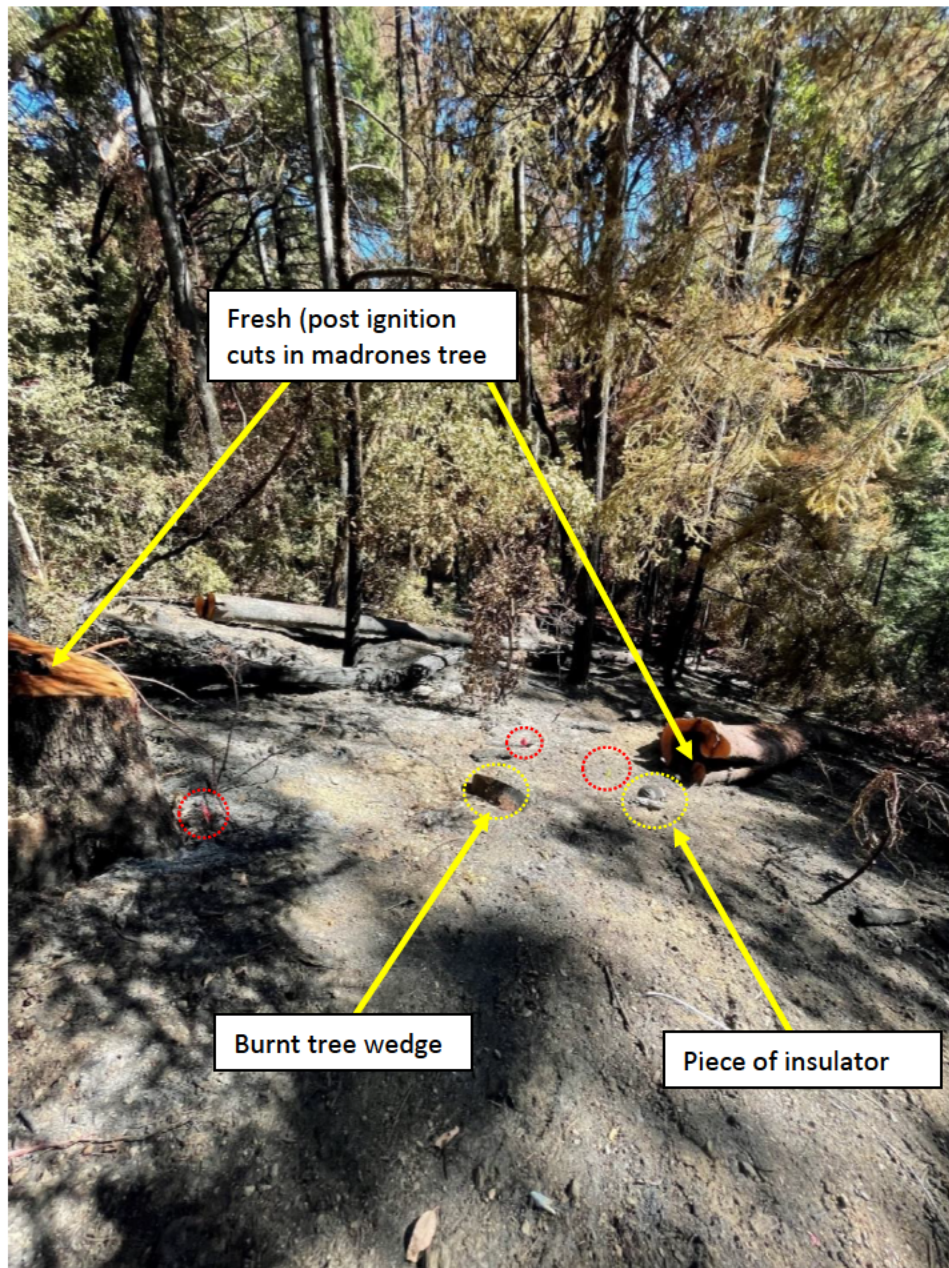


Figure 7 View of cut madrone (*Arbutus menziesii*) tree, with apparent section missing, and surrounding burnt vegetation. Note the investigation flags (two red and one yellow, indicated by red circles, placed by others) between the madrone tree sections. A piece of insulator and burnt wedge are present on the ground. Source: VM Incident Investigation Report (attached photograph).

### Attachments

Attachments and references can be located in the ESA folder, located below:



-----END of REPORT-----