



Preliminary Ignition Investigation Report

Ignition Database Index:	20240994
Electric Incident Investigation (EII) Number:	N/A
Incident Name:	Slate - 21 Jul 2024
PG&E Facility Ignition?	Yes
CPUC Reportable Ignition?	Yes
Date & Time of Incident:	July 20, 2024, at approximately 2123 hours
Street Address:	[REDACTED]
City:	Orleans
County:	Humboldt
Latitude/Longitude:	[REDACTED]
State Responsibility Area (SRA) / Local Responsibility Area (LRA) / Federal Responsibility Area (FRA)	State Responsibility Area (SRA)
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 1110
Circuit Protection Zone:	Hoopa 11103174
Nominal Voltage:	12kV
Pole SAP Equipment ID:	101011511
Subject to PRC 4292 Veg Pole Clearance:	No
PG&E Equipment associated with ignition:	Conductor – Primary (2-ACSR)
EPSS enabled at time of ignition?	Yes
Fault Type:	Line to Ground
Wire Down (Primary)?	Yes
Lead Agency/Agency Having Jurisdiction:	United States Forest Service
Fire Size:	0.26-9.99 acres
FAS Field Remarks:	“tree fell took conductors down there was a fire tag issued for repairs”

HAWC Summary:	“Resources responded to a vegetation fire off of Hwy 96 in Humboldt County. The fire is contained at 8.65 acres according to WildCAD. No outages or impact to assets were reported at the time of incident closure Notifications were made to the PSS and DCC. Closing barring any significant changes.”	
Injuries / Fatalities / Property Damage / Media Attention:	None	
Weather Conditions:	At 0000 hours on July 21, 2024 at a weather observation site approximately 2.4 miles south of the Incident Location: <ul style="list-style-type: none"> • Temperature: 62.9°F • Relative Humidity: 73% • Wind Speed: 4.6 mph out of the east • Wind Gust: 10.8 mph 	
Red Flag Warning (RFW) / High Wind Warning (HWW):	No / No	
911 Standby Relief Time:	N/A	
OIS #:	2522220	
ILIS #:	24-0090126	
FAS #:	T006454424	
TOTL #:	N/A	
Assigned Attorney:	N/A	
Ignition Investigator & Phone:	██████████ ██████████	██████████ ██████████

Executive Summary

On July 20, 2024, at 2359 hours, Line Recloser (LR) 3174 on the EPSS-enabled Hoopa 1101 12kV Overhead Distribution Circuit opened on a line-to-ground fault with Sensitive Ground Fault (SGF) targets, deenergizing 487 customers. On July 21, 2024, at 0010 hours, PG&E dispatched a troubleshooter to investigate the outage. At 0135 hours, the troubleshooter arrived at LR 3174 and began patrolling the area. At 0258 hours, due to low visibility at night and a lack of fault indicators on this section of the circuit, the troubleshooter asked the Distribution Control Center (“DCC”) to temporarily suspend the patrol. At 0818 hours, the troubleshooter returned to the circuit to continue patrolling for the location of the fault. At 1142 hours, the troubleshooter reported an active fire near [REDACTED] (“Incident Location”) in Orleans, California (Figure 1), where the troubleshooter observed the U.S. Forest Service (USFS) responding to the fire.¹ The troubleshooter observed a broken conductor on the ground and a tree (“Incident Tree”) leaning on the other phase of the two phases of 2-ACSR primary overhead conductors (“Incident Span”) spanning between load-side wood pole SAP ID 101011511 (“Incident Pole”)² and source-side wood pole SAP ID 101011510 (“Pole #2”) (Figure 2, Figure 3, Figure 4). The Incident Location was within HFTD Tier 2 and HFRA.

At 1139 hours, the troubleshooter opened overhead jumpers on pole SAP ID 101011524. At 1227 hours, the troubleshooter closed LR 3174, restoring service to 484 impacted customers (Figure 5, Figure 6). At 1255 hours, the troubleshooter created a corrective notification (EC 129257057) to repair the damaged conductors at the Incident Pole. At 1925 hours, a PG&E repair crew began work, and repairs were completed by July 22 at 0013 hours, restoring power to the remaining three impacted customers.

Although LR 3174 was an EPSS-enabled device with the Downed Conductor Detection (DCD) feature, due to a satellite repeater failure at LR 3174 that prevented both remote device operation and SCADA data collection, the DCD setting had been temporarily set to “Alarm Only” on DCD targets at the time of the incident. It is unclear whether the DCD alarm was raised on July 20, 2024; however, in light of the troubleshooter’s difficulty identifying the fault on the circuit at night, the inability to operate LR 3174 remotely, and the lack of SCADA data at LR 3174, it is unlikely that the DCD alarm would have resulted in a faster response time to the ignition.

On July 22, 2024, PG&E Vegetation Management (“VM”) patrolled the Incident Location and observed that the Incident Tree was a live black oak that was approximately 90 feet in height.³ The trunk of the tree broke approximately six feet above ground, and VM observed a large internal cavity at the location of the break (see Figure 3). VM determined that the tree was leaning toward and overhanging at least one phase of the Incident Span prior to failure. No prior work had been performed on the Incident Tree.

Based on incident photos, the post-ignition appearance of the internal cavity in the trunk of the Incident Tree suggests that decay was present within the trunk prior to the tree failure. The wood at fracture surfaces had lighter and darker-colored portions (see Figure 3), where the darker-colored portions are consistent with weathering that occurs when wood is exposed to oxygen and sunlight, suggesting that cracks in the trunk may have developed prior to the tree failure. However, the orientation of the fracture surface on the tree trunk

¹ The troubleshooter also reported to the DCC that a local homeowner had been responding to the fire prior to the arrival of USFS (NICE Recorder ID 2785410).

² Reported as five poles source-side of Overhead Distribution Transformer California Grid Coordinate (CGC) 115479670811 on pole SAP ID 101011516.

³ The 66-inch diameter at breast height (DBH) per the VM Incident Report has been determined to be unlikely based on incident photos.

suggests that obvious visual defects may have been limited to the side of the tree facing away from the inspector during routine VM inspections.

Notably, on September 22, 2021, VM performed an Enhanced Vegetation Management (EVM) inspection, which was a Basic Assessment (Level 2),⁴ at the Incident Tree. The inspector marked the tree for removal, noting signs of rot, tree lean, and an overhanging condition. However, the property owner refused the work, and the refusal was not resolved prior to the EVM program being discontinued at the end of 2022.⁵ Pending work from the program was transferred to the Tree Removal Inventory (TRI) program,⁶ where work was reprioritized by aggregating and ranking the risk of wildfire due to vegetation at the Circuit Protection Zone (CPZ) level. The incident CPZ, Hoopa 11013174, had a risk ranking of 597 and was not among the highest-ranked 242 CPZs included in the 2023-2024 TRI program scope of work.

Between the EVM inspection on September 22, 2021, and when the tree failed on July 20, 2024, there were three Routine VM inspections and two Second Patrol inspections, as well as a VMOM Proactive inspection of the CPZ from mid-April to early May of 2024. These six inspections were all Limited Visual Assessments (Level 1)⁷ and did not identify the defects identified under the Level 2 EVM inspection in September of 2021.

From July 22 to July 23, 2024, VM performed an Extent of Condition (XoC) and a Vegetation Management Operational Mitigation (VMOM) Reactive patrol to reassess healthy trees in the area with a lower tolerance for poor tree structure and future failure potential. The expanded patrols resulted in twelve additional trees that were listed for work including one Priority 1 tree and three Priority 2 trees.⁸

A review of other ignitions involving EVM-identified trees revealed a past incident with significant similarities to the subject incident of this report. PIIR index 20231006⁹ involved a tree trunk failure on September 5, 2023, where the tree had been marked by EVM on November 15, 2022, but was not worked due to an unresolved customer refusal. The investigation resulted in Corrective Action Program (CAP) issue no. 127516242, initiated on November 27, 2023, which was intended to address all open EVM refusals.¹⁰ However, the CAP was closed on December 7, 2023, without evaluating trees outside of that specific ignition. If the CAP had been adequately fulfilled, it is possible that the Incident Tree of the current report would have been identified for mitigation prior to its failure on July 20, 2024.

⁴ A Basic Assessment (Level 2) is a detailed visual inspection of a tree and surrounding site that requires a 360° inspection around the tree trunk. This includes inspecting the visible aboveground roots, trunk, and branches (TD-7102P-01).

⁵ A 60-day timeline was outlined in the former revision of TD-7201P-04, "Distribution Vegetation Refusal Procedure," 03/24/2015, Rev. 2. However, this document did not make specific reference to the EVM program, and the 60-day timeline was removed in the latest revision (Rev. 3).

⁶ Risk totals and rankings were determined using the WDRM V3 Weighted Vegetation Trunk Wildfire Risk Model.

⁷ A Limited Visual Assessment (Level 1) is a visual assessment of trees from a specified perspective (i.e., foot, vehicle, or aerial patrol) that is intended to identify conditions or obvious defects of concern (TD-7102P-01).

⁸ Project number OneVM-048631.

⁹ PIIR 20231006 involved a valley oak tree that broke at the trunk and fell into the Shingle Springs 2110 12kV Distribution Circuit in El Dorado County. The break point revealed a cavity and internal rot.

¹⁰ The recommended action in CAP #127516242 was to "[p]erform an Extent of Condition Patrol on open EVM Refusals working any priority 1 or 2 trees as needed. Any trees that will not likely hold for 18 months should be handed over to the next inspection cycle (Routine or 2nd Patrol) to work while the project is open for that cycle." Due date: January 9, 2023.

VM proposed to integrate EVM-identified trees into existing routine VM patrols; however, this could not be implemented due to incompatibility between the ESRI-based EVM platform and the Salesforce-based OneVM platform used during routine VM inspections. VM is currently exploring other options to incorporate legacy EVM inspection results into routine VM patrols.

No partial voltage alarms associated with this incident have been identified.

At the time of the incident, PG&E meteorology data from the nearest weather station, located 2.4 miles south of the Incident Location, recorded a temperature of 63°F, a relative humidity of 73%, sustained winds of 4.6 miles per hour (mph), and wind gusts up to 10.8 mph.

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

System Protection Analysis

The incident occurred on the Hoopa 1101 12kV circuit, and Enhanced Powerline Safety Settings (EPSS) were enabled on upstream LR 3174 (brand: Viper, type: Beckwith – Rev 7.3.1) at the time of the incident. LR 3174 opened automatically on a line-to-ground fault with SGF targets (15A with 18-second delay), impacting 487 customers. Distribution Protection Engineering analyzed the available data log for LR 3174 and found that abnormal ground current was detected as early as 2 hours and 27 minutes before LR 3174 responded. Additionally, upstream LR 3304 (brand: Nova, type: Form 6 – Rev 30) registered abnormal ground current as early as 2123 hours. Oscillography and sequence of events (SOE) data were unavailable for both LR 3174 and LR 3304.

At the time of the incident, although LR 3174 was DCD-capable, the DCD setting had been temporarily configured to “Alarm Only.” The DCD setting change was made in response to a satellite repeater failure at LR 3174 that prevented both remote device operation and SCADA data collection. It is unclear whether LR 3174 alarmed prior to tripping on SGF targets.¹¹ LR 3174 did not have recorded SCADA data from June 23 to August 15, 2024. A work order request¹² to repair the LR was submitted on July 23, 2024, and the satellite repeater at LR 3174 was replaced on August 15, 2024. Following repairs, the DCD setting at LR 3174 has been reverted to the trip setting.

Ignition Impact

The downed wire ignited an 8.7-acre fire near the Incident Pole. The fire was suppressed by USFS and a local homeowner whose property was nearby. The incident resulted in a sustained outage that affected 484 customers for a total duration of 12 hours and 28 minutes and 3 customers for a total duration of 24 hours and 14 minutes. There were no reports of damaged or destroyed structures, fatalities, or injuries as a result of the incident.

¹¹ Due to a 3500-line memory limit, the SOE data at LR 3174 from July 20, 2024, had already been overwritten by subsequent events logged on July 21 through July 24, 2024.

¹² Work Order Request REQ000003128099, Order #13549, with comment: “LR 3174 on Hoopa 1101 shows no SCADA after 7/15/24. Please investigate, thank you.”

Sequence of Events

July 20, 2024

- 2123 hours – LR 3304 begins registering abnormal ground current.
- 2132 hours – LR 3174 begins registering abnormal ground current.
- 2359 hours – LR 3174 opens on a line-to-ground fault, impacting service to 487 customers.

July 21, 2024

- 0010 hours – PG&E troubleshooter dispatched.
- 0135 hours – Troubleshooter arrives at LR 3174 and begins patrolling.
- 0258 hours – Troubleshooter suspends patrol.
- 0618 hours – Troubleshooter dispatched a second time.
- 0818 hours – Troubleshooter arrives on-site and continues patrolling.
- 1035 hours – Earliest recorded time of fire.¹³
- 1103 hours – First IRWIN dispatch time.
- 1139 hours – Troubleshooter opens overhead jumpers at pole SAP ID 101011524.¹⁴
- 1142 hours – Troubleshooter reports a treefall that broke a wire at pole SAP ID 101011511 and an active fire. Troubleshooter observes USFS and a homeowner fighting the fire.
- 1227 hours – Troubleshooter closes LR 3174, restoring power to 484 customers.
- 1255 hours – Troubleshooter creates EC 129257057 to repair damaged conductors at the Incident Pole.
- 1925 hours – PG&E repair crew begins work.

July 22, 2024

- 0013 hours – Repair crew completes repairs of the damaged conductors and closes overhead jumpers at pole SAP ID 101011524, restoring power to 3 customers.

Corrective Notification Associated with Ignition

One EC Notification was created in response to this incident for immediate replacement of the broken overhead conductors.

Type	Number	Description	Priority	Date Identified	Due Date
EC Notification	129257057	Repair broken/damaged conductor. Completed July 22, 2024.	A	July 21, 2024	N/A

Pending Work

There is currently no pending work at the Incident Location. Please note this may not include pending major program or project work.

¹³ Per Watch Duty, retroactively reported by HAWC at 1256 hours.

¹⁴ Overhead Distribution Transformer California Grid Coordinate (CGC) 115467970500.

Asset Info & Most Recent Inspections and Tests

Load Side Structure*	101011511	
Info / Inspection	Most Recent Date	Findings
Install Date:	1987	40-foot, Class 4, Penta-treated, Western Red Cedar pole
Inspection:	October 31, 2023	New pole barcode installed. Inspector noted damage to pole and guy anchor. No vegetation issues.
	August 22, 2020	-
Corrective History:	August 22, 2020	EC Notification No. 119658950 (priority E) created to trim and clear vegetation about the down guy and anchor. Completed August 27, 2024.
	March 7, 2017	EC Notification No. 112656971 (priority A) created to replace 100 feet of 2-ACSR conductor and broken crossarm. Completed March 7, 2017.
VM Inspection:	July 5, 2024	Span last inspected during a VMOM Reactive patrol. Next inspection scheduled for September 1, 2024, as part of the Hoopa 1101 Q4 second patrol.
EVM Inspection:	September 22, 2021	ArcGIS Field Maps: Inactive EVM Mobile Viewer Map V9. Veg Point ID: VP_AF104-C21_2712437_2021. Comment: "P2-P3; .2SP; 42¿ WOL; lean toward line 25 degrees; overhanging; sign of rot at base of stem;" [sic]. VM recommended abatement. Owner refused work.
Pole Intrusive Test:	April 14, 2020	Passed Pole top condition: fair / pole bottom condition: okay.
WSIP Inspection:	April 3, 2019	No compelling abnormal conditions for the pole, equipment, or associated spans.

*Incident Pole

Source Side Structure*	101011510	
Info / Inspection	Most Recent Date	Findings
Install Date:	1987	40-foot, Class 5, Penta-treated, Western Red Cedar pole
Inspection:	October 31, 2023	New pole barcode installed. EC notification created for replacement of high sign. No abnormal conditions at pole, conductors, or guys. No vegetation issues.
	August 26, 2020	-
Corrective History:	October 31, 2023	EC Notification No. 127388681 (priority F) created to replace broken high signs. Completed July 7, 2024.
	November 21, 2014	EC Notification No. 109683696 (priority F) created to remove an idle transformer. Completed August 4, 2020.
VM Inspection:	-	See Incident Pole.
EVM Inspection:	-	See Incident Pole.
Pole Intrusive Test:	April 14, 2020	Passed Pole top condition: fair / pole bottom condition: okay.

WSIP Inspection:	April 3, 2019	No compelling abnormal conditions for the pole, equipment, or associated spans.
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*Pole #2

Hazard Barrier Analysis:

Hazard	Vegetation Contact	Sub-Hazard	Fallen Tree
Target	Fallen tree in HFTD Tier 2 leading to 8.7-acre ignition.		
Barrier	Expected vs. Observed Performance	Why did the barrier not prevent the ignition event? (See ICF Codes)	Comments
Barriers that Negatively Affected the Ignition ¹⁵			
Distribution Vegetation Refusal Procedure (2015-2023) TD-7102P-04 Rev. 2	Expected Performance: Resolve customer/property owner refusals of identified VM work to maintain compliance on distribution lines in a timely manner Observed Performance: Barrier did not perform as expected	A3B1C2D3 – Work not performed in accordance to standard	The Incident Tree was not compliant with PRC 4293 and was marked by EVM for removal in 2021. While, at the time when the customer refused the prescribed work, PG&E's strategy was to complete the refusal process within 60 days; although presently PG&E's vegetation management interference strategy does not explicitly include a timeline for bringing customer refusals to closure, there is an internal target to resolve 90% of constraints within 60 days. ¹⁶
Barriers that Were Assessed as Opportunities			
Tree Risk Assessment - Basic Assessment (Level 2) TD-7102P-01 Rev. 2	Expected Performance: Identify conditions or obvious defects of concern Observed Performance: Barrier did not exist	N/A	Annual and Second Patrols (Level 1 inspections) did not identify defects at the Incident Tree that would have led to a Level 2 inspection. Based on incident photos, the defect would not have been visible from the patrol route (Level 1 inspection visibility limitation).
Lower Default Sensitive Ground Fault Thresholds TD-1470P-01	Expected Performance: Automatically turn off power faster than default SGF settings (LR 3174: 15A, 18-second delay) Observed Performance: Barrier did not exist	N/A	DPE Settings Change Request form submitted by local Distribution Engineer on September 20, 2024.

¹⁵ A control measure is defined to have had negatively affected an ignition event when its performance may have directly contributed to the ignition happening, increased potential for fire spread, or operated in a way to increase chances of an ignition. In other words, had the control measure performed as expected, the ignition event would have likely not occurred.

¹⁶ Per email correspondence dated October 7, 2024.

Fault Indicators Document 064048 Rev. 10	Expected Performance: Narrow down the location of the fault more easily during patrol Observed Performance: Barrier did not exist	N/A	In calls with DCC, the troubleshooter mentioned the lack of fault indicators made it very difficult to patrol the circuit in the middle of the night. Given that the fire was not discovered for approximately 10 to 11 hours after the LR opened, it is likely that the ignition impact would be smaller if the troubleshooter had been able to locate the fault more quickly.
Other Barriers Assessed			
Tree Removal Inventory (TRI) Program TD-7102P-01-Att06	Expected Performance: Perform work identified in high-risk CPZs prioritized by risk aggregated at the CPZ-level Observed Performance: Barrier performed as expected	A4B2C2D1 – Location not prioritized for program	The Incident Tree (Veg Point ID: VP_AF104-C21_2712437_2021) was identified for work on Sep 22, 2021, and the inspector identified signs of rot at base of stem. However, the owner refused work, and this refusal was not resolved before the EVM program was discontinued at the end of 2022. Remaining EVM work was re-prioritized by CPZ in the Tree Removal Inventory (TRI) Program. CPZ Hoopa 11013174 was ranked #597 and was not included in the 2023-2024 TRI scope of work.

Potential Next Steps / Associated CAP Items:

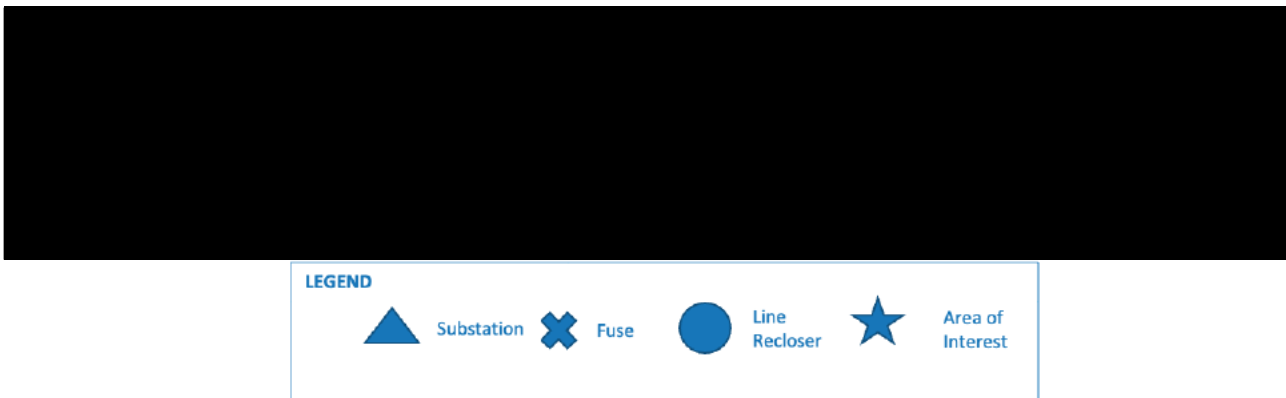
As a result of this investigation, lowered SGF settings were requested at LR 3174 on September 20, 2024.

After the ignition incident, VM XoC and VMOM Reactive patrols resulted in twelve additional trees that were listed for work under project number OneVM-048631, which includes one Priority 1 tree and three Priority 2 trees.

CAP no. 129699183 was submitted for trending and awareness to VM regarding the unresolved customer refusal of work identified by the EVM program at the Incident Tree in 2021.

VM will continue to explore and evaluate options to incorporate legacy EVM inspection results into routine patrols.

Single Line Diagram



Photos and Diagrams of Events

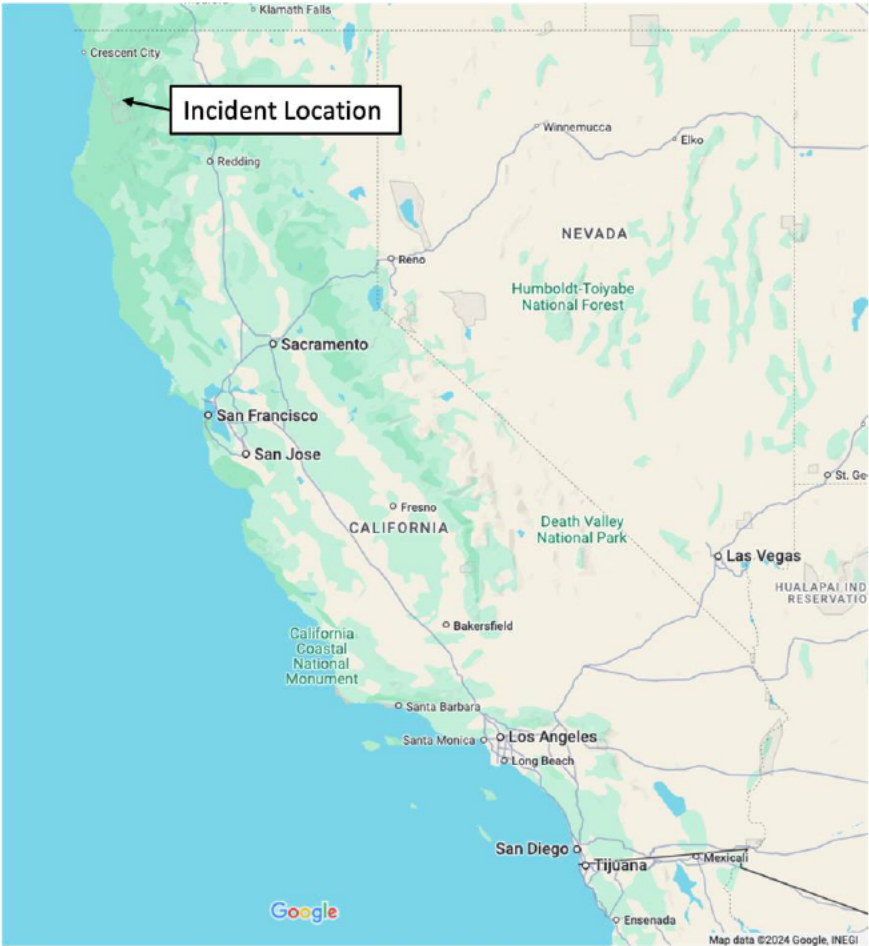


Figure 1. Map indicating Incident Location.

This report is preliminary and based on available information as of October 4, 2024; event data is subject to change based upon subsequently discovered information.

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Internal

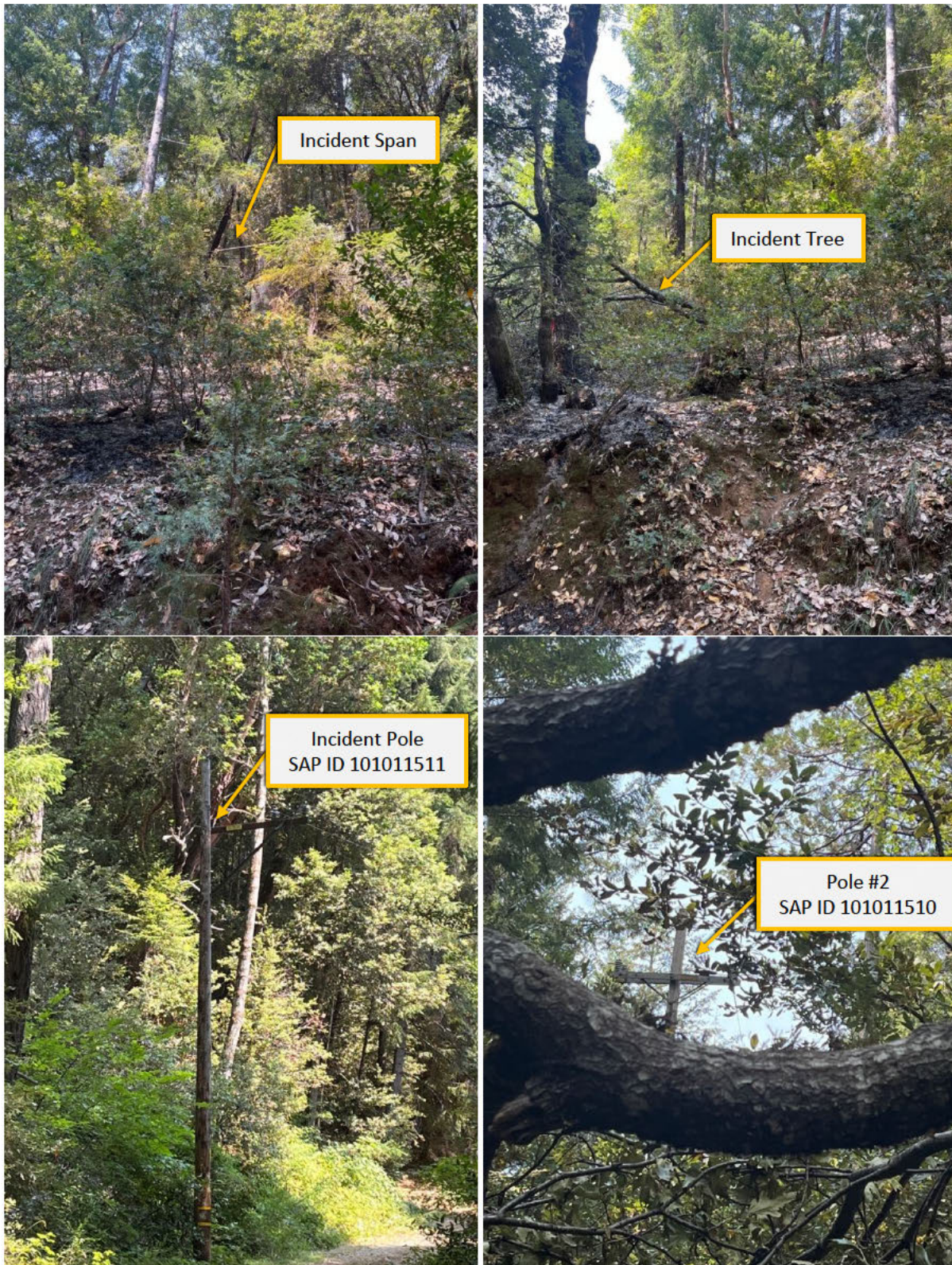


Figure 2. Incident photos of Incident Tree and poles on the Incident Span (taken July 21, 2024).



Figure 3. Photos of Incident Tree provided by Vegetation Management (taken July 22, 2024).

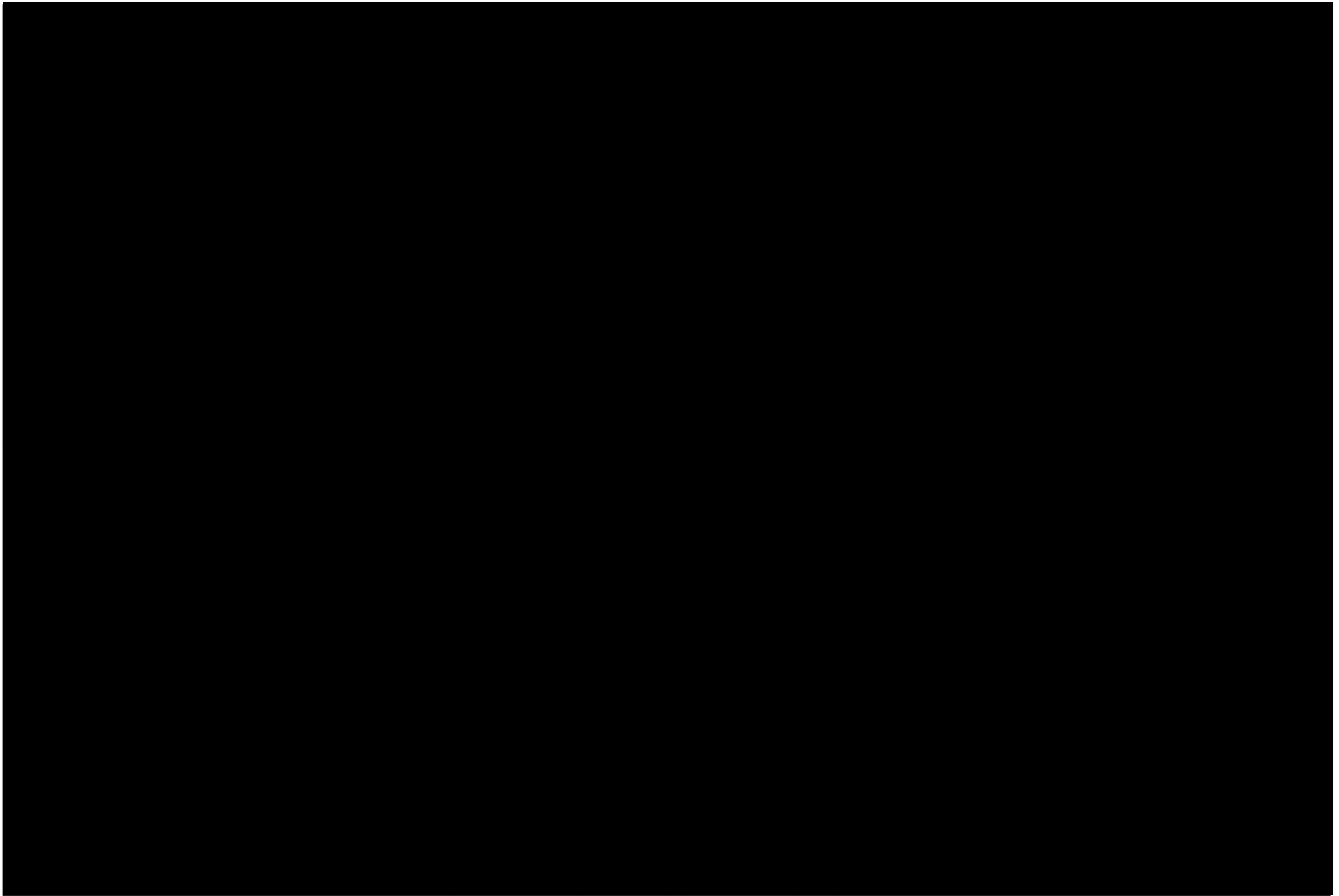


Figure 4. EDGIS map of area near Incident Pole.



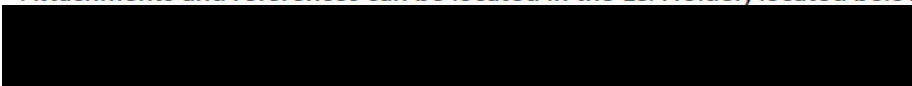
Figure 5. EDGIS map of with Incident Pole and upstream protective devices.



Figure 6. Map of poles near Incident Pole (via Google Earth Pro).

Attachments

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



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