



## Preliminary Ignition Investigation Report

|   |   |
|---|---|
| Ignition Database Index:  | 20241430  |
| Electric Incident Investigation (EII) Number:   | N/A   |
| Incident Name:  | Holly   |
| PG&E Facility Ignition?   | Yes   |
| CPUC Reportable Ignition?   | Yes   |
| Date & Time of Incident:  | October 3, 2024 @ 2250 hours  |
| Street Address:   | [REDACTED]  |
| City:   | Forestville   |
| County:   | Sonoma  |
| Latitude/Longitude:   | [REDACTED]  |
| State Responsibility Area (SRA) / Local Responsibility Area (LRA) / Federal Responsibility Area (FRA) | State Responsibility Area (SRA)   |
| PG&E Division:  | Sonoma  |
| High Fire Threat District (HFTD):   | Tier 3  |
| High Fire Risk Area (HFRA):   | Yes   |
| EPSS Buffer:  | No  |
| Fire Index Area (FIA):  | 180   |
| 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:  | Mirabel 1102  |
| Circuit Protection Zone:  | Mirabel 110238514   |
| Nominal Voltage:  | 12kV  |
| Pole SAP Equipment ID:  | 102300476   |
| Subject to PRC 4292 Veg Pole Clearance:   | No  |
| PG&E Equipment associated with ignition:  | Conductor – Primary (#6 Solid Cu)   |
| EPSS enabled at time of ignition?   | Yes   |
| Fault Type:   | Line-to-Ground  |
| Wire Down (Primary)?  | Yes   |
| Lead Agency/Agency Having Jurisdiction:   | Sonoma County Fire Department   |
| Fire Size:  | 3 meters –0.25 acres  |
| FAS Field Remarks:  | “tree fell mid span parted one span one phase of 6 CU arms and poles look ok. Open and tagged J’s 5 poles from EOL. decent small truck access but roads |

|   |   |
|---|---|
|   | are tight and switch backs are sharp. fire dep on site extinguished very small veg fire. spoke with on call all other customers have been restored"   |
| <b>HAWC Summary:</b>  | "Resources responded to a vegetation fire at [REDACTED]. The fire was extinguished by locals, no fire size was given. It was reported as a tree falling into the lines with vegetation fire starting. There was an outage on OIS# 2585286 affecting 1,243 customers on the Tier 3 EPSS enabled Mirabel 1102 circuit. The PSS was notified, no other notifications were made to rapid extinguishment." |
| <b>Injuries / Fatalities / Property Damage / Media Attention:</b> | None  |
| <b>Weather Conditions:</b>  | At 2250 on 10/3/2024 near the incident location<br>Temperature: 55.7°F<br>Relative Humidity: 86%,<br>Wind Speed: 1.2 mph out of the WSW<br>Wind Gust: 2.1 mph   |
| <b>Red Flag Warning (RFW) / High Wind Warning (HWW):</b>          | No/No   |
| <b>911 Standby Relief Time:</b>                                   | 28 minutes  |
| <b>OIS #:</b>   | 2585286   |
| <b>ILIS #:</b>  | 24-0119258  |
| <b>FAS #:</b>   | T006517342, T006517341  |
| <b>Assigned Attorney:</b>   | N/A   |
| <b>Ignition Investigator &amp; Phone:</b>                         | [REDACTED] (Exponent) [REDACTED]<br>[REDACTED] (PG&E) [REDACTED]  |

## Executive Summary

On October 3, 2024, at 2250 hours, Line Recloser (LR) 57840 on the EPSS enabled, two-phase overhead Mirabel 1102 12kV Distribution Circuit opened when a line-to-ground fault occurred, de-energizing approximately 1,243 customers. By 2257 hours, PG&E dispatched two troubleshooters (“Troubleshooter #1” and “Troubleshooter #2”) to LR 57840. At 2259 hours, Sonoma County Fire Department (“SCFD”) notified PG&E of a reported “tree in powerlines” starting a vegetation fire at [REDACTED], California (“Incident Location”, Figure 1 and Figure 2) and that fire engines were enroute.<sup>1</sup> At 2307 hours, PG&E Dispatch diverted Troubleshooter #2 to the Incident Location. At 2334 hours, Troubleshooter #1 arrived at LR 57840 and began patrolling the circuit protection zone Mirabel 110257840.

At 2326 hours, Troubleshooter #2 arrived at the Incident Location and observed SCFD *mopping-up*<sup>2</sup> a small (approximately 20-feet by 20-feet area) vegetation fire. Troubleshooter #2 also observed one phase of #6 solid copper primary overhead conductor on the ground between wood pole SAP ID 102300476 (“Pole #1”, load side) and wood pole SAP ID 102300477 (“Pole #2”, source side) (“Incident Span”) (see Figure 2 and Figure 3). Troubleshooter #2 did not observe damage to either pole or associated hardware. Troubleshooter #2 observed a tan oak tree (“Incident Tree”) freshly cut into sections and stacked on the side of the road,<sup>3</sup> presumably to open the road to traffic (Figure 6). Troubleshooter #2’s assessment was that the Incident Tree had fallen onto the conductors at mid span and into the adjacent road.

At 2345 hours, Troubleshooter #1 opened fuse cutout (FUCO) 2379 and by 0018 hours on October 4, 2024, patrolled between LR 57840 and FUCO 2379. By 0037 hours, Troubleshooter #2 had opened jumpers located at wood pole SAP ID 102300479 (two poles source side of Pole #2) and closed FUCO 2379<sup>4</sup>. At 0038 hours, the Distribution Control Center (DCC) closed LR 57840 restoring service to 1,239 customers. At 0100 hours, Troubleshooter #2 created corrective notification EC 129507996 to repair the Incident Span.

At 0703 hours on October 4, 2024, PG&E dispatched a repair crew to the Incident Location. By 1001 hours, one phase of #6 solid copper conductor had been repaired on the Incident Span. At 1025 hours, the repair crew closed the jumpers on pole SAP ID 102300479, restoring power to the remaining four customers.

On October 4, 2024, PG&E Vegetation Management (“VM”) patrolled the Incident Location and observed the remaining trunk of the Incident Tree. The trunk was broken approximately six feet above ground and located within approximately “62-feet horizontally” from the closest primary conductor, uphill, with a 25 degree lean downhill towards the Incident Span. The identified portions of the 85-foot-tall Incident Tree had been cut into sections and stacked on the side of the road.

VM observed the remaining portion of the standing trunk had hypoxylon (*Hypoxylone sp.*) fungal fruiting bodies and signs of wood rot at the base (Figure 7). The top portion of the Incident Tree was laying across the slope, beneath the conductors, and the failed tree top and branches were devoid of any live or dead leaves (Figure 8). On October 5, 2024, VM performed an Extent of Conditions (XoC) Patrol covering one span to the west, to the

---

<sup>1</sup> NICE call log recording ID 6636872 from 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> It is unclear if the tree was cut by SCFD or a local citizens group fire response team.

<sup>4</sup> Troubleshooter #1 report to DCC, NICE call log recording ID 2938986

end pole, and five spans to the east of Pole #1. VM did not identify any trees requiring mitigation that had not already been identified by prior patrols under the Routine Maintenance or Second Patrol programs. The Second Patrol inspection performed a month prior to the incident on August 29, 2024 did not identify the declining/dead Incident Tree.

No partial voltage alarms downstream of the Incident Location were recorded in the few hours prior to this outage.<sup>5</sup>

A weather station located 2.3 miles southwest of the Incident Location recorded a temperature of 55.7°F and a relative humidity of 86% with sustained winds of 1.2 mile per hour (mph) out of the west-southwest and wind gusts up to 2.1 mph 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.

### System Protection Analysis

EPSS was enabled for the Mirabel 1102 12kV circuit at the time of the incident. Protective devices upstream of the Incident Location, listed in order of closest proximity, include Fuse 2379,<sup>6</sup> Fuse 2103,<sup>7</sup> and LR 38514,<sup>8</sup> LR 332,<sup>9</sup> LR 57840,<sup>10</sup> and Circuit Breaker (CB) 1102.<sup>11</sup> At the time of the incident, the closest EPSS enabled protective device equipped with both Sensitive Ground Fault (SGF) and Downed Conductor Detection (“DCD”) capabilities was LR 57840.

The primary phase conductor falling to the ground, as a result of vegetation contact, triggered a line-to-ground high impedance fault. The fault caused LR 57840 to operate on DCD targets (Phase A: 82A, Phase B: 75A, Phase C: 51A, and Ground: 3A), clearing the fault in 1.39 seconds. In addition, upstream Fuses 3279 and 2103, LR 38514, and LR 332 (listed in order of closest proximity to fault location) 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 38514 to 5A with a five second time delay (setting at time of incident was 10A with a 10 second time delay), on LR 332 to 5A with a six second time delay (setting at time of incident was 10A with a 11 second time delay), and on LR 57840 to 5A with a seven second time delay (setting at

---

<sup>5</sup> Ignition Lookback Analysis Tool (ILAT) in Foundry and UIQ Transformer/meter checks accessed October 16, 2024 and downstream transformer/meter checks in UIQ.

<sup>6</sup> Part No.: 63; Link Type: 10E

<sup>7</sup> Part No.: 63; Link Type: 25E

<sup>8</sup> Brand: Nova, Type: Form 6 – Rev 30, No Downed Conductor Detection (“DCD”) capability. At the time of the incident EPSS settings were as follows: Phase Settings, 280A trip with 20 ms delay, Ground Settings: 100A trip with 20 ms delay, and SGF Settings: 10 A with 10 second delay.

<sup>9</sup> Brand: Nova, Type: Form 6-Rev 30, No DCD capability. At the time of the incident EPSS settings were as follows: Phase Settings, 400A trip with 57 ms delay, Ground Settings: 120A trip with 57 ms delay, and SGF Settings: 10 A with 11 second delay.

<sup>10</sup> Brand: Nova, Type: Beckwith – Rev 3.4, with DCD capability. At the time of the incident, EPSS settings were as follows: Phase Settings, 550A trip with 60 ms delay, Ground Settings: 160A trip with 60 ms delay, and SGF Settings: 10 A with 12 second delay.

<sup>11</sup> Brand: IPAC., Type: GE-F60/SEL 351, EPSS enabled with DCD enabled and Sensitive Ground Fault (“SGF”) capability.

time of incident was 10A with a 12 second time delay), and updating firmware on LR 57840 to Revision 9.1.<sup>12</sup> Per DPE, the proposed changes to the SGF settings would not have impacted the current incident. However, the firmware version update for LR 57840 may have detected and cleared the fault more quickly.

### Ignition Impact

The tree falling on the conductors caused one phase of #6 solid copper conductor to break and a vegetation fire of approximately 400 square-foot.<sup>13</sup> 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 1,239 customers for approximately two hours and four customers for approximately eleven and a half hours.

### Sequence of Events

October 3, 2024

- 2250 hours, LR 57840 opens de-energizing 1,243 customers: PG&E records First Night Light (FNL)
- 2254 hours; Troubleshooter #1 dispatched to outage location (LR 57840)
- 2257 hours, Troubleshooter #2 dispatched to outage location (LR 57840)
- 2259 hours, SCFD informed PG&E of reported “tree in powerlines” causing a vegetation fire at the Incident Location<sup>14</sup>
- 2307 hours, PG&E diverts Troubleshooter #2 to the Incident Location<sup>15</sup>
- 2326 hours, Troubleshooter #2 arrives at Incident Location
- 2334 hours, Troubleshooter #1 arrives at outage location (LR 57840) and begins patrolling circuit protection zone
- 2345 hours, Troubleshooter #1 opens FUCO 2379

October 4, 2024

- 0018 hours, Troubleshooter #1 finishes patrol between LR 57840 and FUCO 2379; No trouble found<sup>16</sup>
- 0037 hours, Troubleshooter #2 opens jumpers at Pole SAP ID 102300479 and closes FUCO 2379<sup>17</sup>
- 0038 hours, DCC closes LR 57840 returning service to 1239 customers
- 0043 hours, Troubleshooter #1 leaves Incident Location
- 0100 hours, Troubleshooter #2 creates correction notification EC 129630581 to repair the broken conductor
- 0104 hours, Troubleshooter #2 leaves Incident Location
- 0703 hours, Repair crew dispatched to Incident Location
- 0816 hours, Repair crew arrives at Incident Location
- 1001 hours, Repair crew reports work complete and ready to energize<sup>18</sup>

---

<sup>12</sup> Per DPE, the LR revision update changes the LR’s internal logic for identifying high impedance faults with the intent of quicker detection and clearance of the fault.

<sup>13</sup> Per discussion with Troubleshooter on October 4, 2024.

<sup>14</sup> 911 Response App

<sup>15</sup> NICE recording 6686272

<sup>16</sup> NICE recording 2938975

<sup>17</sup> NICE recording 2938986

<sup>18</sup> NICE recording 2939804

- 1002 hours, DCC disables EPSS on LR 38514, LR 332, LR 57840, LR 503000, and CB 1102
- 1004 hours, DCC gives repair crew ok to close jumpers
- 1025 hours, Repair crew closes open jumpers at SAP 102300479 returning service to the remaining four customers
- 1034 hours, DCC enables EPSS on LR 38514, LR 332, LR 57840, LR 503000, and CB 1102

### Corrective Notification Associated with Ignition

Corrective Notification EC 129630581 was created to repair one phase of #6 solid copper conductor within the Incident Span. This work was completed on October 4, 2024.

### Pending Work

| Type             | Number    | Description  | Priority | Date Identified | Due Date                      |
|------------------|-----------|--|----------|-----------------|-------------------------------|
| EC Notification  | 124117974 | <b>Pole #2:</b> Pole leaning/adjust; Tie wire, broken/damaged, replace; September 9, 2023 recommendation to replace pole | E        | July 19, 2022   | Original:<br>January 19, 2023 |
| COE Notification | N/A       |  |          |                 |                               |
| LC Notification  | N/A       |  |          |                 |                               |
| Veg Work Order   | None      |  |          |                 |                               |

Please note this may not include pending major program or project work at the incident location.

### Asset Info & Most Recent Inspections and Tests

| Load Side Structure* | SAP ID # 102300476 |  |
|----------------------|--------------------|--|
| Info / Inspection    | Most Recent Dates  | Findings   |
| Install Date:        | 1955               | Wood Pole, 40-feet high, Address: 942 Esther Drive   |
| Inspections:         | July 10, 2022      | GO165 Detailed Enhanced Inspection: Anchor is graded and needs to be dug and exposed more. Climbing space obstructed, bank where pole is eroding. Down guy above insulator is overgrown with vegetation and needs trimming. Notes EC tag # 122928554 is pending for similar conditions. No other abnormal or compelling conditions identified. |
|                      | July 17, 2021      | GO165 Detailed Enhanced Inspection: No abnormal or compelling conditions identified.   |
| Patrol:              | September 10, 2023 | No abnormal conditions identified.   |
| Corrective History:  | February 6, 2022   | EC # 122928554, Priority E. Climbing space obstructed by trees – needs trimmed around the pole. June 2022 FSR added “add bank where pole is eroding.” All tree work completed on June 21, 2024. Location: 942 Esther Drive.  |

|                             |                           |   |
|-----------------------------|---------------------------|---|
| <b>Load Side Structure*</b> | <b>SAP ID # 102300476</b> |   |
| <b>Info / Inspection</b>    | <b>Most Recent Dates</b>  | <b>Findings</b>   |
| Aerial Inspection Records   | N/A                       | N/A   |
| VM Inspection:              | August 29, 2024           | Did not identify any abnormal or compelling issues.   |
| EVM Inspection:             | None                      | The Incident Tree was not on an EVM inspection record in the last five years.   |
| Equipment Test:             | N/A                       | No equipment on pole.   |
| Pole Intrusive Test:        | September 6, 2017         | Distribution Pole Test and Treat – Intrusive Inspection Status: Pass. Notification # 204224737  |
| WSIP Inspection:            | March 24, 2019            | PR Notification 116279426; No compelling abnormal conditions for the Pole, equipment, and its associated spans. Notes improperly installed Chance Clamps – no recommended action. |

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

|                               |                                  |  |
|-------------------------------|----------------------------------|--|
| <b>Source Side Structure*</b> | <b>Pole #2 SAP ID: 102300477</b> |  |
| <b>Info / Inspection</b>      | <b>Most Recent Date</b>          | <b>Findings</b>  |
| Install Date:                 | 1955                             | Wood pole, 40 feet tall; Address 978 Esther Drive  |
| Inspection:                   | July 19, 2022                    | GO165 Detailed Enhanced Inspection: Pole leaning/ adjust; Tie wire, broken/damaged, replace; Third party utility infraction at this location: Inadequate conductor clearance, and conductor unattached or idle. No other abnormal conditions identified. EC # 124117974 created, currently pending |
|                               | June 17, 2021                    | GO165 Detailed Enhanced Inspection: No abnormal conditions identified.   |
| Patrol:                       | September 10, 2023               | No abnormal conditions identified.   |
| Corrective History:           | July 19, 2022                    | Pending EC 124117974 – See above.  |
|                               | April 29, 2014                   | EC 107978358, Priority A. Replaced 100-feet of #6 solid copper downed by tree, 2 spans (including Incident Span).  |
| Aerial Inspection Records:    | N/A                              | N/A  |
| VM Inspection:                | August 29, 2024                  | Did not identify any abnormal or compelling issues.  |
| EVM Inspection:               | None                             | The Incident Tree was not on an EVM inspection record in the last five years.  |
| Equipment Test:               | N/A                              | N/A  |
| Pole Intrusive Test:          | September 6, 2017                | Distribution Pole Test and Treat – Intrusive Inspection Status: Pass.  |



|                               |                           |   |
|-------------------------------|---------------------------|---|
| <b>Source Side Structure*</b> | Pole #2 SAP ID: 102300477 |   |
| <b>Info / Inspection</b>      | <b>Most Recent Date</b>   | <b>Findings</b>   |
| WSIP Inspection:              | March 24, 2019            | PR Notification 116268937; No compelling abnormal conditions for the Pole, equipment, and its associated spans. |

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

### Hazard Barrier Analysis

| Hazard   | Vegetation Contact  | Sub-Hazard  | Fallen Tree   |
|--|---|---|---|
|  | Tree falling onto and breaking one phase of conductor and causing a 400 square-foot 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 -<br>Downed Conductor Detection<br><br>Document:<br>TD-2700P-26 | Expected Performance:<br>Automatically turn off power when a high impedance fault/downed conductor is detected to reduce the risk of ignition in HFRA's.<br><br>Observed Performance:<br>Barrier performed as expected. | A1B2C2D3 – Device tripping time is limited          | LR3274 operated on DCD target clearing the fault in 1.39 seconds thus limiting the ignition impact.   |
| Other Barriers Evaluated   |   |   |   |
| Distribution Second Vegetation Patrol<br><br>Document:<br>TD-7102S                                 | Expected Performance:<br>Identify declining/dead vegetation that may fall into or contact PG&E assets.<br><br>Observed Performance:<br>Unknown  |   | Dead tree with no leaves was not identified during August 29, 2024 Second Vegetation Patrol. Tree fell into conductors.                                   |
| Barriers that were Assessed as Opportunities   |   |   |   |
| Enhanced Powerline Safety Settings -<br>Downed Conductor Detection                                 | Expected Performance:<br>Automatically turn off power when a high impedance fault/downed conductor is detected to   | N/A   | The first two upstream LR's, LR 38514 and LR 332, did not have DCD capabilities. Replacement with DCD capable devices would limit the number of customers |

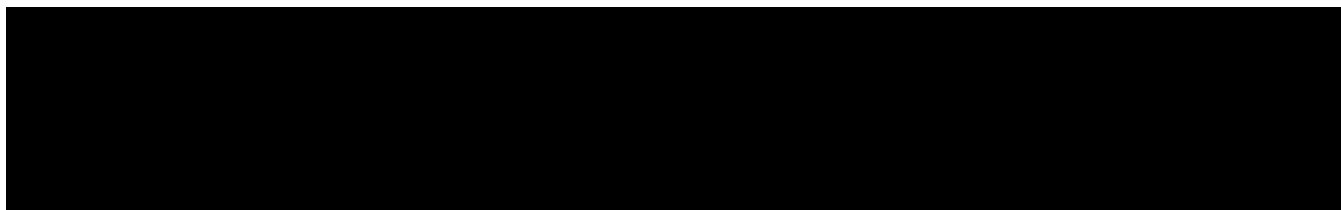


| Hazard  | Vegetation Contact   | Sub-Hazard  | Fallen Tree   |
|---|--|---|---|
|   | Tree falling onto and breaking one phase of conductor and causing a 400 square-foot fire.  |   |   |
| Barrier   | Expected vs. Observed Performance  | Why did the barrier not prevent the ignition event? | Comments  |
| Document:<br>TD-2700P-26  | reduce the risk of ignition in HFRA's.<br><br>Observed Performance:<br>Barrier did not exist.  |   | affected and may have further reduced ignition potential and impact.  |
| Tree Risk Assessment - Basic Assessment (Level 2)<br><br>Document:<br>TD-1470P-01 | Expected Performance:<br>Identify vegetation conditions or obvious defects of concern.<br><br>Observed Performance:<br>Barrier did not exist | N/A   | A Level 2 inspection likely would have identified the hypoxylon fungus, an indicator of declining tree health. Annual and second patrols (Level 1 inspections) likely would not have identified this condition. |

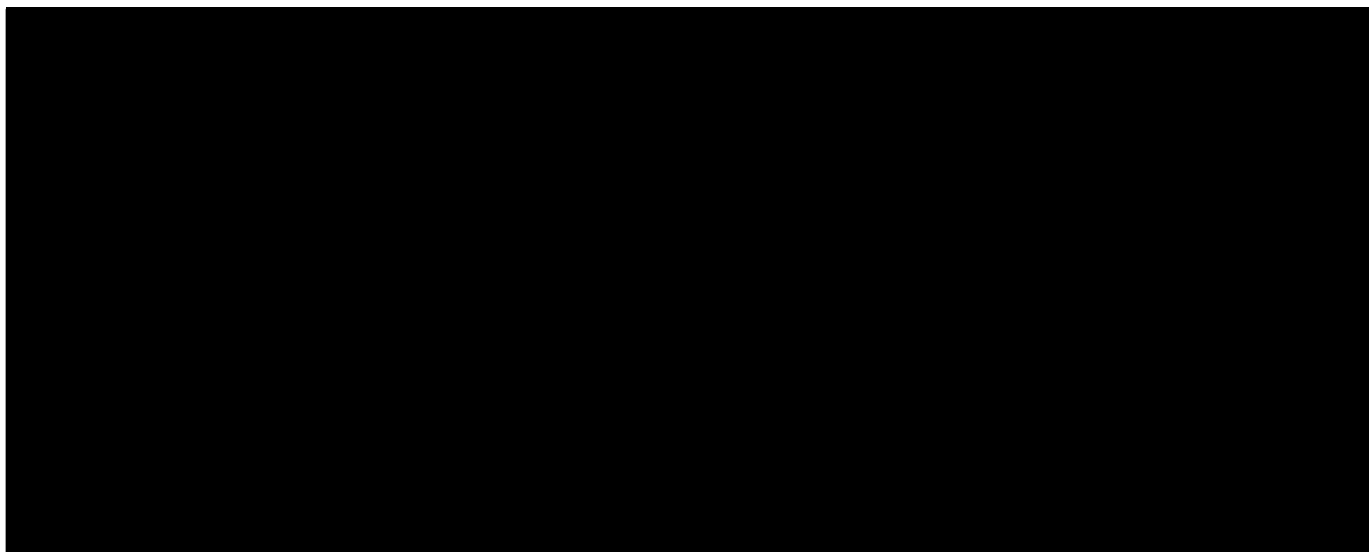
#### Potential Next Steps / Associated CAP Items:

- To reduce future wildfire risk, implement DPE proposed improvements to EPSS on Mirabel 1102 as follows:
  - Update firmware on LR 57840 to Revision 9.1, and
  - Lower SGF settings on LR 38514, LR 332, and on LR 57840.

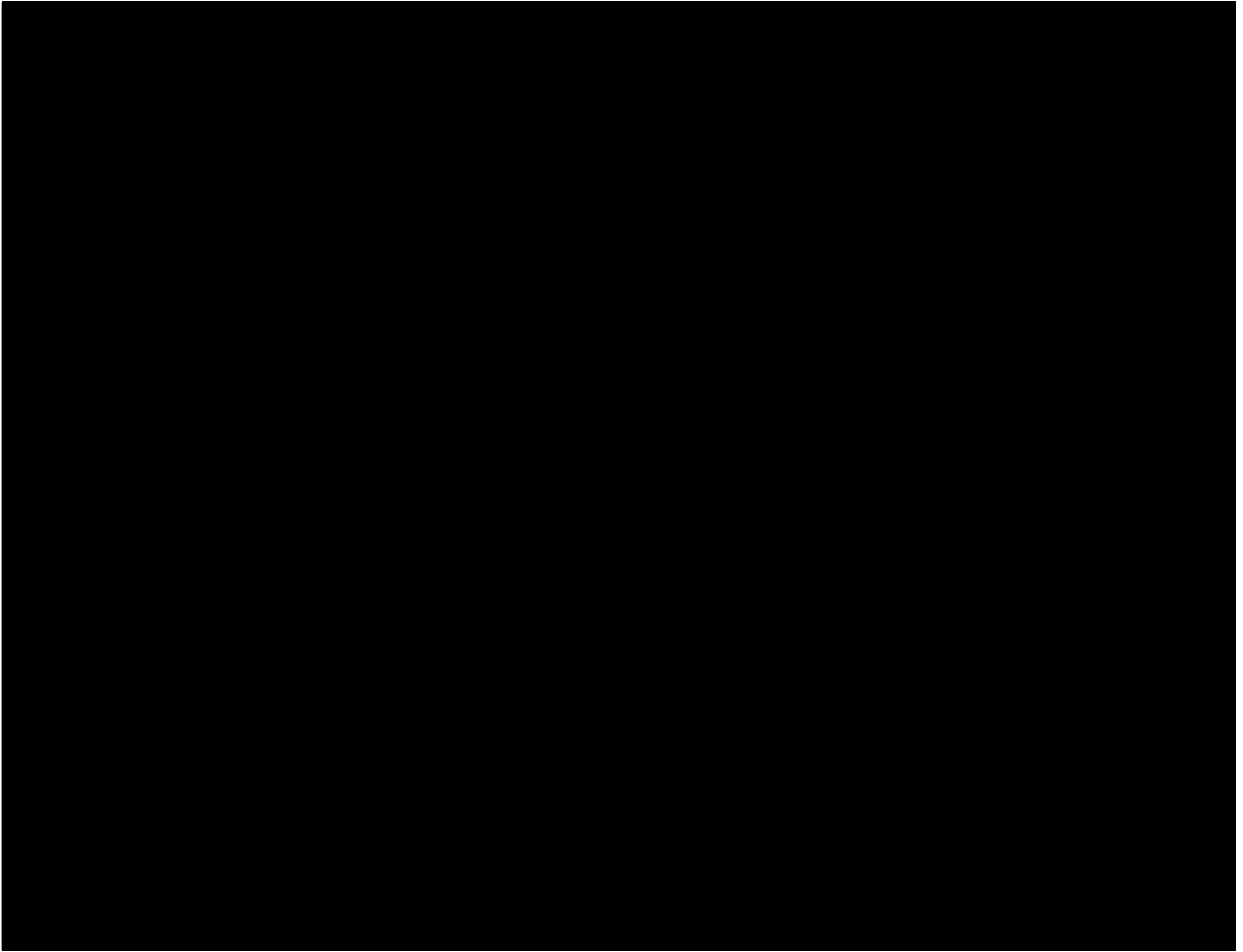
#### Single Line Diagram



## Photos and Diagrams of Events



*Figure 1: Aerial view of showing the Ignition/Incident Location (indicated with red "X") and the location of the closest upstream protective devices (marked with yellow pins). Source: Google Earth, image undated.*



*Figure 2 View of circuit layout in vicinity of Ignition/Incident Location (indicated with res "X"). Source: EDGIS.*

Notification #: 122928554



*Figure 3 View of Pole #1 at most recent (February 6, 2022) GO165 inspection. Source: EC # 122928554*





*Figure 4 Overview (top) and close-up (bottom) of small area of burned vegetation approximately 50-feet source side of Incident Pole (see Figure 2). Source: VM Incident report and associated photographs, 10/4/2024.*



Figure 5 Photographs of top of Pole #1 showing broken conductor (indicated with arrows). Source: Troubleshooter, taken on October 4, 2024.





Figure 6 Remnants of Incident Tree on side of road (indicated with arrows). Source: Troubleshooter, taken on October 4, 2024.





*Figure 7 View of remaining six-foot height of trunk of failed tree (top, left) and close-up of trunk failure location showing hypoxylon and wood rot (top, right and bottom). Source: VM Incident report and associated photographs, 10/4/2024.*



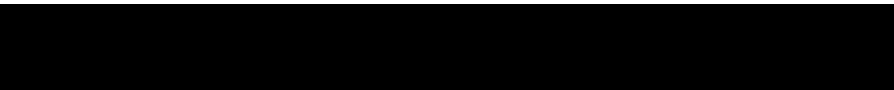
### #7 Subject tree top under lines



*Figure 8 Top of failed tree showing trunk and branches devoid of any live or dead leaves. Source: VM Incident report and associated photographs, 10/4/2024.*

### Attachments

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



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