CALIFORNIA PUBLIC UTILITIES COMMISSION
Safety and Enforcement Division
Electric Safety and Reliability Branch

Incident Investigation Report

Report Date: April 29, 2019

Incident Number: E20171010-02

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

Date and Time of the Incident: October 8, 2017, 2234 hours

Location of the Incident: 8555 Sonoma Highway (CA-12)
Kenwood, CA 95452
County: Sonoma

Fatality / Injury: One fatality

Property Damage: $179 million (PG&E restoration costs in Sonoma Division)

Utility Facilities involved: Dunbar-1101, 12 kV Circuit

Violation: Yes

I. Summary

On October 8, 2017, at approximately 2234 hours, a Eucalyptus tree fell and contacted overhead conductors of PG&E's Dunbar-1101 12 kV circuit near 8555 Sonoma Highway in the city of Kenwood in Sonoma County. When the tree severed PG&E's insulated conductors, the Adobe Fire started on the Chateau St. Jean Winery property.

The Adobe Fire was combined with several other fires, which CAL FIRE called collectively the Nuns[1] Fire. The Nuns Fire burned a total of 56,556 acres, destroyed 1,355 buildings, and damaged 172 buildings. Three fatalities occurred as a result of the Nuns Fire, with one of those fatalities occurring within the perimeter of the Adobe fire.

[1] The Nuns Fire included the Nuns, Oakmont/Pythian, Norrbom, Adobe, Pressley and Partrick fires. SED investigated each of these incidents except the Pressley fire, which was a spot fire that ignited from an ember that originated from the Adobe Fire

Based on SED's review, SED found that PG&E violated the Commission's General Order (GO) 95; specifically, there are three violations of Rule 31.1 as listed below:

GO Rule	Violations
GO 95, Rule 31.1	Work order completed late
GO 95, Rule 31.1	Hazardous tree not identified and abated
GO 95, Rule 31.1	Records of 2015 CEMA inspection not retained

A. Rules Violated

General Order 95, Rule 31.1 - Design, Construction and Maintenance

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

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

A supply or communications company is in compliance with this rule if it designs, constructs, and maintains a facility in accordance with the particulars specified in General Order 95, except that if an intended use or known local conditions require a higher standard than the particulars specified in General Order 95 to enable the furnishing of safe, proper, and adequate service, the company shall follow the higher standard.

For all particulars not specified in General Order 95, a supply or communications company is in compliance with this rule if it designs, constructs and maintains a facility in accordance with accepted good practice for the intended use and known local conditions."

B. Witnesses

No.	Name	Title
1	Raymond Cho	CPUC Lead Investigator
2	Wilson Tsai	CPUC Investigator
3	Gary Uboldi	Fire Captain, California Department of Forestry and Fire Protection (CAL FIRE)
4	Jay Singh	PG&E Director
5	[redacted]	PG&E Supervisor
6	Maria Deluca	PG&E Claims Investigator
7	[redacted]	PG&E Vegetation Management Supervisor

C. Evidence

No.	Source	Description
1	PG&E	Initial Online Incident Report 10/10/17
2	CPUC	Field visit report and Photos, 10/17/18
3	PG&E	20-day Incident Report, 11/6/17
4	CPUC	Data Request #1, 11/21/17
5	PG&E	Data Request Response #1, 12/29/17 through 6/29/18
6	CAL FIRE	Investigation Report and Attachments, 5/22/18
7	CPUC	PG&E Evidence Inspection, 6/11/18
8	CPUC	Data Request #2,7/19/18
9	PG&E	Data Request Response #2, 8/3/18 through 9/21/18
10	CPUC	Data Request #3, 8/16/18
11	PG&E	Data Request Response #3, 8/31/18 through 9/21/18
12	CPUC	CAL FIRE Evidence Viewing Photos, 10/12/18
13	CPUC	Data Request #4, 10/19/18
14	PG&E	Data Request Response #4, 11/15/18 through 12/14/18
15	CPUC	Data Request #5, 1/3/19
16	PG&E	Data Request Response #5, 1/25/19 through 2/6/19
17	CPUC	Data Request #6, 2/8/19
18	PG&E	Data Request Response #6, 2/15/19 through 3/15/19
19	CPUC	Data Request #7, 2/25/19
20	PG&E	Data Request #7 Response, 3/18/19

II. Background

On January 17, 2014, Governor Edmund G. Brown Jr. proclaimed a State of Emergency and directed state officials to take actions to mitigate conditions that could result from the drought and cause a fire. On February 18, 2014, in response to the proclamation, SED issued a letter to PG&E directing PG&E to take all practicable measures to reduce the likelihood of fires caused by utility facilities, including, increasing inspections, taking corrective actions and modifying protective schemes. On June 12, 2014, the California Public Utilities Commission (CPUC) issued Resolution ESRB-4 directing all Investor Owned Electric Utilities (IOU) to take remedial measures to reduce the likelihood of fires started by or threatening utility facilities. On October 30, 2015, Governor Edmund G. Brown Jr. declared a Tree Mortality State of Emergency due to tree mortality caused by the state's prolonged drought and bark beetle infestations.

On October 8, 2017 at approximately 2234 hours, a 109-foot Eucalyptus tree fell and contacted overhead conductors of PG&E's Dunbar-1101 12 kV circuit located on the subject property. The subject tree severed the insulated 12 kV conductors and, as a result, a fire called the Adobe Fire started. One fatality occurred within the perimeter of the Adobe Fire.

The Adobe Fire contributed to power interruptions to 3,072 customers on the Dunbar 1101 circuit for a maximum outage duration of 23,705 minutes. PG&E reported an estimated $179 million in restoration costs for its own facilities in the Sonoma Division.

Weather station KENWW, located approximately one mile southeast from the incident location, recorded a peak wind speed and gust of 17.1 miles per hour (mph) and 45.7 mph, respectively. The ambient condition around the time of ignition was approximately 73 degrees Fahrenheit with a 12 percent relative humidity.[2]

[2] Weather conditions per MesoWest (www.mesowest.utah.edu)

Figure 1. Red marker: approximate ignition point/location (38.4283590, -122.5489570) near Chateau St. John Winery. (Source: Google Maps)

III. SED Review and Analysis

A. PG&E's Distribution Facilities Inspection Program

General Order 165 requires biennial patrol inspections and detailed inspections at five-year intervals for rural areas, such as the incident location. Rural areas are defined by GO 165 as "those areas with a population of less than 1,000 persons per square mile".

GO 165 defines a patrol inspection as a "simple visual inspection" meant to identify "obvious" problems and hazards and may be carried out in the course of other company business. GO 165 defines a detailed inspection as one where facilities are "carefully examined" to gather and record conditions of overhead facilities.

For the incident area, SED reviewed PG&E's 2012 and 2016 distribution patrol inspection and PG&E's 2009 and 2014 detailed inspection documentation. No conditions or issues were documented during the course of PG&E's patrol inspections of the subject area for those two years.

Based on PG&E's detailed inspection records, SED noted a total of four work orders; three were related to vegetation contact with an anchor guy above the insulator and one

was related to a cross-arm replacement. Vegetation contact with the anchor guy wire above the insulator creates a fire safety risk. If the guy wire were to somehow become energized, it would behave like any other energized conductor and could arc with the vegetation resulting in a fire.

As a result of the 2014 detailed inspection, the three vegetation work orders (#108554731, #108554733, #108554734) were identified and categorized as priority F (five years from date identified) on July 3, 2014 with required completion by July 3, 2019. All three vegetation related work orders were not completed prior to the fire but they were also not yet due. One of the PG&E work orders (#108554733) was cancelled after the fire on December 4, 2017 since the work was completed as part of pole replacement work order #113743733. According to work order #113743733, PG&E found the damaged pole on October 18, 2017, ten days after the fire ensued and completed the pole replacement on October 21, 2017.

From the 2009 detailed inspection[3], a cross-arm replacement work order (#103891848) identified on June 2, 2009, was categorized as priority G, which was the previously used PG&E classification prior to 2010 described as work to maintain compliance without the ability to defer or change the due date. The original due date for this cross-arm work was December 31, 2009 and the work was completed 15 days late on January 15, 2010. Based on SED's reading of the notes for the cross-arm work order[4], the work may have been delayed due to coordination with the customer.

Based on the inspection records reviewed, SED found PG&E in violation of GO 95, Rule 31.1 for completing work order #103891848 15 days late. The violation found is not the cause of the ignition of the subject fire but is nevertheless a violation of the Commission GO.

B. PG&E's Vegetation Management Program

The GO 95 rules applicable to Vegetation Management (VM) include:

1. Rule 31.1 – Design Construction and Maintenance.
2. Rule 35 – Vegetation Management.
3. Rule 37 – Minimum Clearances of Wires above Railroads, Thoroughfares, Buildings, Etc., Table 1 – Cases 13 and 14.

In order to comply with the applicable GO 95 rules, PG&E's Distribution Vegetation Management Standard[5] (DVMS) outlines the general strategy used to identify:

1. Conductor radial clearance issues;
2. Trees that will encroach PG&E's minimum distance requirements; and

[3] Bates PGE-CPUC_00007970_CONFIDENTIAL.

[4] Bates PGE-CPUC_00020174_CONFIDENTIAL.

[5] Bates PGE-CPUC_00005827_CONFIDENTIAL. Utility Standard TD-7102S, Published on 9/4/15. Rev 1.

3. Hazard trees that have the potential to strike conductors.

In order to implement their strategy, PG&E's DVMS prescribes annual vegetation patrols and completion of identified tree work for all primary and secondary distribution facilities.

i. Routine VM Inspections

PG&E's VM contractors, specifically Pre-Inspection[6] (PI) personnel, work with VM Vegetation Program Managers (VPM) to create an annual plan for routine patrols that lead to vegetation work. Vegetation work prescribed by the PI personnel is completed by Tree Contractor (TC) personnel. PG&E also uses a combination of LiDAR[7] and spectral imagery to allow VM personnel to identify hazardous trees in high fire threat areas. Trees identified using these technologies are then inspected from the ground and addressed as necessary. However, PG&E did not use LiDAR or spectral imagery for the incident area in the last five years[8]. Also, PG&E allows the use of aerial patrols in place of ground patrols.

For the incident area, PG&E used two VM contractors as part of its vegetation management. Western Environmental Consultants, Inc. (WECI) conducted the vegetation PI to inspect and identify tree work and The Davey Tree Expert Company (Davey Tree) performed the vegetation work that included trimming or removal. Davey Tree is the primary contractor in this area and is allowed to subcontract their type of work to other companies. In this area, some work was subcontracted to The Original Mowbrays Tree Service, Inc. (Mowbrays).

Vegetation PIs are performed by a Consulting Utility Forester (CUF), an individual qualified by PG&E, who inspects all vegetation that have the potential to grow into or fall into the distribution primary conductors before the next inspection and identify vegetation that is currently causing strain/abrasion of secondary conductors.

PG&E's PI contract specification[9] requires a CUF to have at least two years' experience in line clearance tree pruning work, or equivalent experience as determined by PG&E. The PI contract specification also notes that PG&E desires that a CUF have an associate's degree in forestry, arboriculture or a related field, however, an associate's degree is not a requirement. The CUF should be "familiar with the Contractor's work practices, proper arboricultural techniques and practices, proper integrated pest

[6] PG&E uses the term "Pre-Inspection" to describe routine vegetation management inspections.

[7] LiDAR (an acronym of Light Detection And Ranging) is a surveying technology that measures distance by illuminating a target with a laser light. (Source: Wikipedia.)

[8] Bates PGE-CPUC_DR-112117_Common_Q14.

[9] Bates PGE-CPUC_DR-071918_General_Q04. PG&E Pre-Inspection contract specification. Section 3.2.

management practices, PG&E's Tree Pruning Specification, PG&E's Pre-Inspection Specification and requirements, and all applicable legal and regulatory requirements."[10]

SED reviewed PG&E's VM documentation for the previous five years leading up to this incident and searched for Eucalyptus trees similar to the subject tree. SED focused on documented routine inspections with accompanying vegetation work orders.

PG&E performed routine VM activities, PI and vegetation trim or removal, on the subject circuit in 2012, 2014, 2015, 2016 and July 11, 2017.

In PG&E's VM inspection document dated December 14, 2012, the PG&E contracted inspector identified a Eucalyptus tree (designated Tree Number 3) for a 14-foot trim in 2011. The tree was 20 feet tall and 3 feet in Diameter at Breast Height (DBH). DBH is the diameter of the tree's trunk at approximately 4.5 feet up from the ground. The Eucalyptus tree was trimmed on December 28, 2011. PG&E did not identify any other Eucalyptus trees for trim or removal in the following years leading up to the Adobe fire.

Of the VM work orders reviewed, SED identified four Live Oak trees trimmed in March 2015 and one palm tree removed in June 2016. The subject 109 feet high, Eucalyptus tree that fell into the PG&E conductors was not identified for removal or trim by PG&E or PG&E contractors during vegetation management inspections from December 2012 through July 11, 2017.

ii. Enhanced Vegetation Inspections

In addition to routine VM, PG&E contracted WECI to perform Catastrophic Event Memorandum Account (CEMA) related inspections at the incident location on the dates below:

1. September 1, 2014
2. 2015 – PG&E was unable to locate maps for this inspection.[11]
3. August 29 and November 1, 2016
4. January 17, 2017[12]

CEMA is an account used to recover the costs associated with the restoration of service and facilities affected by catastrophic events that have been declared disasters or states of emergency by federal or state authorities. PG&E will file an application to recover the CEMA balance through rates. The amount to be recovered are the reasonable costs incurred, which are determined after CPUC review and audit of the recorded CEMA balance.

---

[10] Bates PGE-CPUC_DR-071918_General_Q04. PG&E Pre-Inspection contract specification. Section 3.2.

[11] Bates PGE-CPUC_DR-112117_Common_Q10_part3.

[12] Bates PGE-CPUC_00009901_CONFIDENTIAL.

PG&E performed enhanced VM inspections, related to CEMA, on the subject circuit in 2014, 2015, 2016 and January 17, 2017. SED reviewed PG&E's VM documentation for the 2014, 2016, and 2017 enhanced vegetation inspections but was unable to review the 2015 documentation because PG&E was unable to locate maps for this inspection. SED searched for Eucalyptus trees similar to the subject tree. SED focused on documented inspections with accompanying vegetation work orders.

The subject Eucalyptus tree that fell into the PG&E conductors was 109 feet high and was not identified for removal or trim by PG&E or PG&E contractors during the enhanced VM inspections from 2014 through January 17, 2017 for which documentation exists.

iii. PG&E VM Quality Control (VMQC) and VM Quality Assurance (VMQA)

PG&E's VMQA program audits PG&E facilities for any compliance violations, e.g., GO 95 or Public Resource Code (PRC) Section 4293, while PG&E's VMQC program audits PI and TC personnel for any vegetation work that is missed or not performed correctly. VMQA audits are required to be performed by PG&E's VMQA standard[13], annually at a minimum. PG&E does not require routine VMQC audits and PG&E describes the VMQC audit locations as "computer-generated" and "randomized"[14].

In the last five years, VMQC audits were performed by PG&E contractor California Forestry & Vegetation Management. However, PG&E did not identify any VMQC audits for the Adobe incident location.[15]

Therefore, SED reviewed PG&E's VMQA audit reports from 2012 through 2017 and focused on the Dunbar-1101 circuit. The VMQA audits verified compliance in PG&E's North Coast Division, which includes the incident location. California Forestry & Vegetation Management or Western Environment Consultants Incorporated performed the audits as directed by PG&E. VMQA audits sort vegetation non-compliances into five categories:

1. Contact with conductor.
2. Within four feet of conductor.
3. Trees that have the potential of being non-compliant within 90 days of auditor observation.
4. Trees that may not hold compliance with GO 95, Rule 35 or PRC §4293 before the next fire season.

[13] Bates PGE-CPUC_00006027_CONFIDENTIAL.

[14] Bates PGE-CPUC_00005827. Pages 9-10.

[15] Bates PGE-CPUC_DR-112117_Common_Q16_amend01.

5. Trees that present a potential threat to the conductors called Facility Protect Trees (FPT).

In PG&E's 2014 Audit #7N DS2-14S[16], auditors identified three Valley Oak trees that were within four feet of the conductor but greater than 18 inches away. The report also notes that 38% of the non-compliant trees identified were linked to one inspector that included the three Valley Oak trees. The subject tree was not identified in the VMQA audits SED reviewed.

iv. Vegetation Analysis by CAL FIRE

CAL FIRE contracted a Certified Arborist, Mark Porter, to evaluate the subject Eucalyptus tree failure. In Mr. Porter's "Evaluation of Tree Failure" report[17] the subject tree was described as a re-growth from a once mature Eucalyptus that was cut down to a stump. "The stump had decayed over time and was utterly hollow at the time of inspection. The epicormic shoot approximately 109 feet high, was weakly attached to a rotting stump."[18] Epicormics are defined as shoots or branches "growing from a previously dormant bud on the trunk or a limb of a tree."[19] In this case a dormant bud sprouted a tree from the dead Eucalyptus stump. The report also identified that "the epicormics shoot developed with a one-sided buttress root." Buttress roots are the roots at the trunk base that help support the tree and equalize mechanical stress. The report further explains that the roots did not fully develop for stability which created an "unequaled mechanical stress".

[16] Bates PGE-CPUC_00006960_CONFIDENTIAL.

[17] Evaluation of Tree Failure, 8555 Sonoma Highway, Kenwood, CA. Author: Mark Porter, ISA Certified Arborist # WE465. Dated October 12, 2017.

[18] Id. Page 3.

[19] Oxford Dictionary. www.en.oxforddictionaries.com.

Figure 2. Left. Base of Eucalyptus epicormic shoot separated from dead stump (photo facing south). **Right.** Base of Eucalyptus epicormic shoot and dead stump (photo facing north).

v. Applicable PG&E Vegetation Management Standards and Procedures

PG&E's Distribution Routine Patrol Procedure[20] describes various factors when patrolling or pre-inspecting trees for vegetation work. Under section 2.6 *"Hazard Trees/Facility Protection Trees"*[21] *the document describes trees that should be identified as such. "(T)rees or portions of trees that are dead, show signs of disease, decay or ground or root disturbance, AND may fall into or otherwise impact primary or secondary conductors, THEN PRESCRIBE work to make tree Facility Safe per Facility Protect and work Difficulty Classification Procedure*."[22]

[20] PG&E Distribution Patrol Procedure. Utility Procedure TD-7102P-01. Rev: 1. Published 10/27/15.

[21] PG&E Distribution Patrol Procedure. Utility Procedure TD-7102P-01. Rev: 1. Published 10/27/15. Page 8.

[22] PG&E Distribution Patrol Procedure. Utility Procedure TD-7102P-01. Rev: 1. Published 10/27/15. Page 8.

PG&E's Vegetation Management Hazard Tree Rating and Scoring Procedure[23] aids inspectors in prescribing work for potentially hazardous trees. The procedure indicates a Blue Gum (species of subject Eucalyptus) as a tree with a "Very High" failure potential.

In summary, based on the VM records reviewed and evidence provided by Mr. Porter, SED found the following violations of GO 95 by PG&E:

- GO 95, Rule 31.1, for failing to maintain its 12 kV overhead conductors safely and properly. PG&E did not identify a hazardous tree condition during the last vegetation inspection on July 11, 2017.
- GO 95, Rule 31.1, for failing to maintain VM inspection records related to a 2015 enhanced VM inspection. This violation did not directly cause the subject fire but is nevertheless a violation of a Commission GO. PG&E notified SED of the lost record on March 30, 2018.

C. PG&E's Infrastructure Condition

SED investigated compliance with GO 95 construction standards and GO 95, Rule 31.1 during their review of PG&E's physical infrastructure.

On October 17, 2017 at 0900 hours, SED staff, Raymond Cho and Wilson Tsai, met with Gary Uboldi, [redacted] and [redacted] near the front of Chateau St. John Winery. SED staff proceeded toward the rear of the property to take photos and document PG&E facilities around the incident location. In total, SED documented seven PG&E poles and the various facilities attached to the poles. The first pole documented was four spans downstream of the incident span and the final pole documented was one span upstream from the incident span.

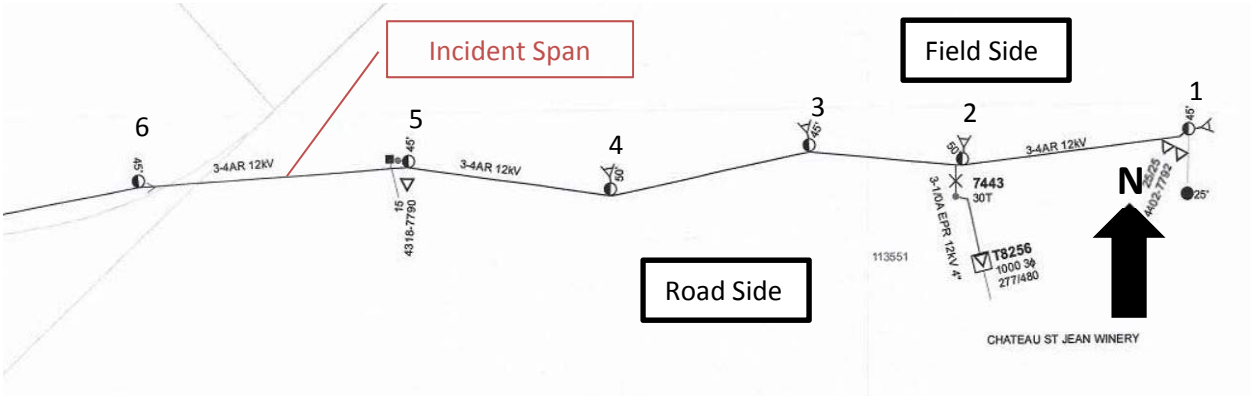


Figure 3. Schematic of pole locations (1-6) and incident span between Pole #5 and #6. Private road and subject conductors located south of the pole line. (Source: PG&E with added notes)

[23] PG&E Vegetation Management Hazard Tree Rating and Scoring Procedure. Utility Procedure: TD-7102P-07. Publication Date: 10/13/2014. Appendix A, Page 11.

SED staff did not find any visual damage on Pole #1. Attached near the top of Pole #2 were fuses in the open position. Pole #3 did not exhibit any visual damage to facilities. On Pole #4, the field side conductor separated from the insulator and was hanging in a nearby tree. The incident span was still attached to Pole #5. At Pole #5, the road side phase was detached from the insulator and resting directly on the cross arm. The electric supply and communication conductors going west were on the ground. The subject Eucalyptus tree fell into the incident span between Poles #5 and #6. SED staff proceeded to Pole #6 and found it leaning in a tree and burnt through at ground level. The pole could no longer stand on its own without the steel reinforcement and nearby tree's support. All the conductors on the ground were marked as evidence by CAL FIRE and PG&E investigators. PG&E retained the base of the subject Eucalyptus tree as evidence. At Pole #7 (not included in Figure 6), the three primary level conductors were cut by PG&E and provided to CAL FIRE as evidence.

CAL FIRE requested that PG&E cut and remove the pole top of Pole #6 including the cross-arm that supported PG&E primary conductors for evidence retention.

The subject conductors were insulated, size 4 American Wire Gauge (AWG), Aluminum Conductor, Steel Reinforced (ACSR) and were part of PG&E's Dunbar-1101 12 kV circuit. The three subject conductors spanned approximately 265 feet between poles and were installed in 1966. Figure 4 below shows the two subject poles supporting the incident span.

Figure 4. Left: Subject Pole #6 (Coordinates: 38.4283590, -122.5489570). Photo taken from southeast side of pole. **Right:** Subject Pole #5 (Coordinates: 38.4284454, -122.5480649). Photo taken from the southwest side of failed pole.

Pole #6 failed at the ground level with two spans of three phase conductors attached above and running in two opposing directions. Pole #6 also had an anchor guy attached to counter the imbalanced load caused by the spans in two different directions. PG&E had previously installed structural steel reinforcement at the ground level for Pole #6 in February 2002[24]. This subject pole passed the last intrusive inspection on April 11, 2017[25].

Pole #5 did not fail and had an "alley arm" construction with all three primary insulators set on one side of the pole. Also attached to Pole #5 was one 15 KVA transformer with three secondary conductors directly below. The two insulators that were attached to the top of the transformer were pulled out due to the lateral force on the conductors from the subject tree. PG&E also installed structural steel reinforcement at the ground level for Pole #5 in February 2002[26]. This subject pole required replacement after the last intrusive inspection on April 11, 2017[27].

According to PG&E Pole Detail Reports[28] for the subject poles, the poles were replaced sometime after the fire but before the visual inspection.

Based on the infrastructure SED reviewed, SED did not identify a violation at the physical incident location.

D. PG&E Equipment Operations and Maintenance

SED investigated compliance with GO 95, Rule 31.1 during their review of PG&E distribution equipment operations and maintenance records.

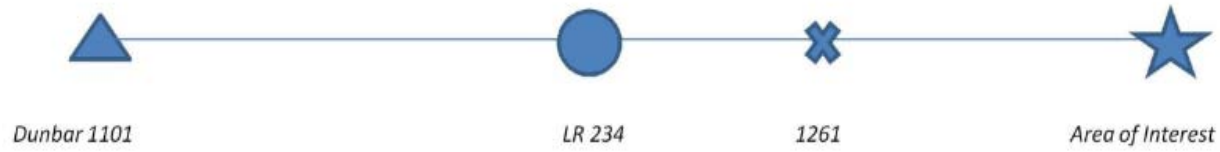


Figure 5. Diagram showing protective devices upstream of incident span/Area of Interest. Dunbar-1101 is the Circuit Breaker and source of the Dunbar-1101 circuit. Not drawn to scale. (Source: PG&E)

[24] Bates PGE-CPUC_00006161_CONFIDENTIAL.

[25] Id.

[26] Bates PGE-CPUC_00006174_CONFIDENTIAL.

[27] Id.

[28] Bates PGE-CPUC_00006161_CONFIDENTIAL and PGE-CPUC_00006174_CONFIDENTIAL.

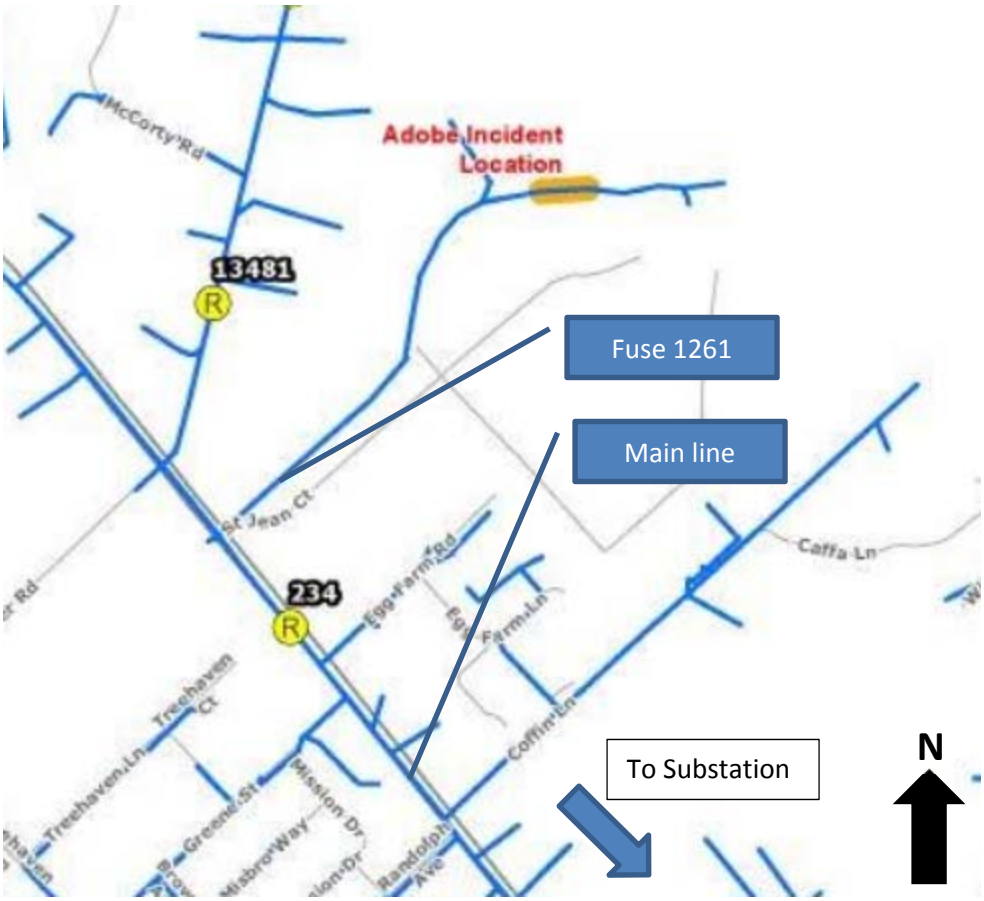


Figure 6. Map showing the approximate locations of protection devices upstream of incident span/Area of Interest. Not drawn to scale. (Source: PG&E)[29]

The incident span was protected by upstream fuse 1261, Line Recloser 234 (LR-234, manufactured by Cooper Power Systems, type F4C), and finally the Dunbar-1101 Circuit Breaker (CB-1101). Fuse 1261, located at the branch from the main line near Highway 12, consists of three 65T fuses, in line with each of the conductors.

i. Event Timeline

While the circuit was energized, LR-234 and CB-1101 had data recording capability prior to and for a limited duration of the fire. SED reviewed the Supervisory Control and Data Acquisition (SCADA) load and event data[30] recorded at LR-234 and CB-1101 for October 8, 2017 until PG&E staff remotely opened CB-1101. The data received from LR-234 did not record at consistent time intervals, for example, time intervals ranged from one minute up to 11 minutes. Also, PG&E provided raw and "time corrected" data

[29] Bates number PGE-CPUC_00023051_CONFIDENTIAL Adobe. PGE-CPUC_00017477_CircuitMap_AU114-M_24x36_500_CONFIDENTIAL. PGE-CPUC_00017356_CircuitMap_AT114-p_24x36_500_CONFIDENTIAL.

[30] Bates PGE-CPUC_00007875 and PGE-CPUC_00007876.

from LR-234 due to the internal clock reset after extended power loss. For example, the raw data included timestamps from January 1, 1960 even though the equipment was installed after that date. SED also reviewed records from ten smart meter locations on the branch circuit downstream of fuse 1261.

October 8, 2017
2022 hours – Smart meter 9637363405 failed to report data for the rest of the day.

2149 hours – LR-234 records an above minimum to trip open alarm.

2232 – 2234 hours

- SCADA at LR-234 registered a B phase load reduction from 149 Amps at 2233 hours to 109 Amps at 2234 hours. Another significant load reduction on the C phase was recorded at LR-234 from 101 Amps at 2332 hours to 82 Amps at 2333 hours. Two phases experienced a loss of load and a responding PG&E troubleman found two fuses opened at fuse #1261.
- At approximately 2234 hours, SCADA at CB-1101 recorded zero load for phases B and C while phase A read 222.7 Amps.
- *2234 hours* – LR-234 registers a power failure alarm and two separate alarms for a load above the minimum to trip open setting.

2234 hours – Approximate ignition time of Adobe fire.

2235 hours – LR-234 registers two more above minimum to trip open alarms.

The load reduction event recorded at 2234 hours is consistent between both devices, LR-234 and CB-1101 (Figure 6). At 2233 hours, CB-1101 also registered phase B and C reductions while phase A tries to compensate for the load loss noted by the increase in load to 222.7 Amps shortly at 2234 hours. At 2235 hours, Phase A reduces to 145.3 Amps.

2236 hours - One smart meter (Service Point ID 3680315905) between the incident location and fuse 1261 recorded a power failure.

2237 hours – LR-234 records an above minimum to trip open alarm.

2302 hours – First 911 call regarding a fire at the Adobe incident location.[31]

2308 – 2336 hours

- LR-234 registers seven alarms referencing above minimum to trip open detection during this time span.

[31] Bates Adobe Supplement 12-31.

- *2308 hours* – A customer's transfer switch (Entelli-Switch 250, Serial #2530419) recorded three under voltage failure events and three service restored events within 29 seconds.[32]

- At 2313 hours, the load data from LR-234 showed a potential ground fault of 72 Amps and CB-1101 SCADA equipment also recorded a phase C fault of 323 Amps. The minimum ground fault setting to trip open LR-234 was set to 90 Amps so the increased load of 72 Amps was not large enough to trip the LR to the open position. Therefore, the LR was in the closed position and energized with 13 alarm events from 2149 hours until about 2314 hours.

- *2314 hours* – The event log for LR-234 indicated that the LR opened once and closed back in less than a minute.

The three outage events and service restored events recorded on the customer's transfer switch signify three open and close operations by upstream protective devices. The SCADA data from LR-234 only recorded one operation and was set to operate three times before locking in the open position, however, the LR did not lockout in the open position until a remote command was sent by PG&E distribution operators.

Additionally, the following service points between the incident location and fuse 1261 experienced power losses and restorations described below:

- <u>Service Point ID 3680318000</u>
  - 2308 hours – instance of power failure
  - 2318 hours – instance of power down
  - Between 2308 and 2327 hours, this meter communicated eight power restorations, four power failures, and seven power downs.

- <u>Service Point ID 3680319005</u>
  - 2309 and 2312 hours – communicated power restorations

- <u>Service Point ID 3680320005</u>
  - 2309 hours – power restoration
  - 2312 hours – power failure
  - Between 2312 and 2323 hours, this meter communicated eight power restorations.

- <u>Service Point ID 3680321110</u>
  - Between 2309 and 2327 hours, this meter communicated nine power restorations.

- <u>Service Point ID 3680338805</u>
  - 2313 and 2336 hours – experienced two power failures

[32] CAL FIRE Fire Investigation Report 17CALNU010050. Attachment 18 – Photograph Log #2.

- 2320 hours – instance of power restoration

… Service Point ID 3680343005
- 2313, 2314, and 2336 hours – experience a total of three power failures
- 2322 hours – instance of power restoration

… Service Point ID 3680337805
- 2318 hours – instance of power restoration

In summary, between 2308 hours and 2336 hours, the above smart meters recorded 17 power failures and 31 power restorations.

2335 hours – PG&E remotely disables reclosing for LR-234 because of reports of fire downstream of LR. SCADA records at LR-234 indicated two more "ALARM" events until 2335 hours.

2336 hours – PG&E remotely opens LR-234 because of reports of fire downstream of LR.

2339 hours - LR-234 registered two alarms for power issues as a result of the open operation.

At 2358 hours, Dunbar substation CB-1101 registered a high load of 597.22 amps which exceeded the set limits of 570 and 590 amps and triggered an alarm and opened the circuit breaker. At 2358 hours, the circuit breaker closed in less than a minute from when it opened. At this point, LR-234 was still in the open position so this fault may have occurred somewhere between LR-234 and CB-1101.

October 9, 2017
0000 hours - PG&E Control Center operator remotely disabled reclosing for CB-1101 and remotely opened the device.

0110 hours - PG&E troubleman reported two of three fuses open at fuse 1261. He also reported that he opened the last fuse and tagged it "Man on Line" and in need of further patrol.

0135 hours - all three phases read zero load by the SCADA equipment on the Dunbar-1101 CB.

End of Timeline

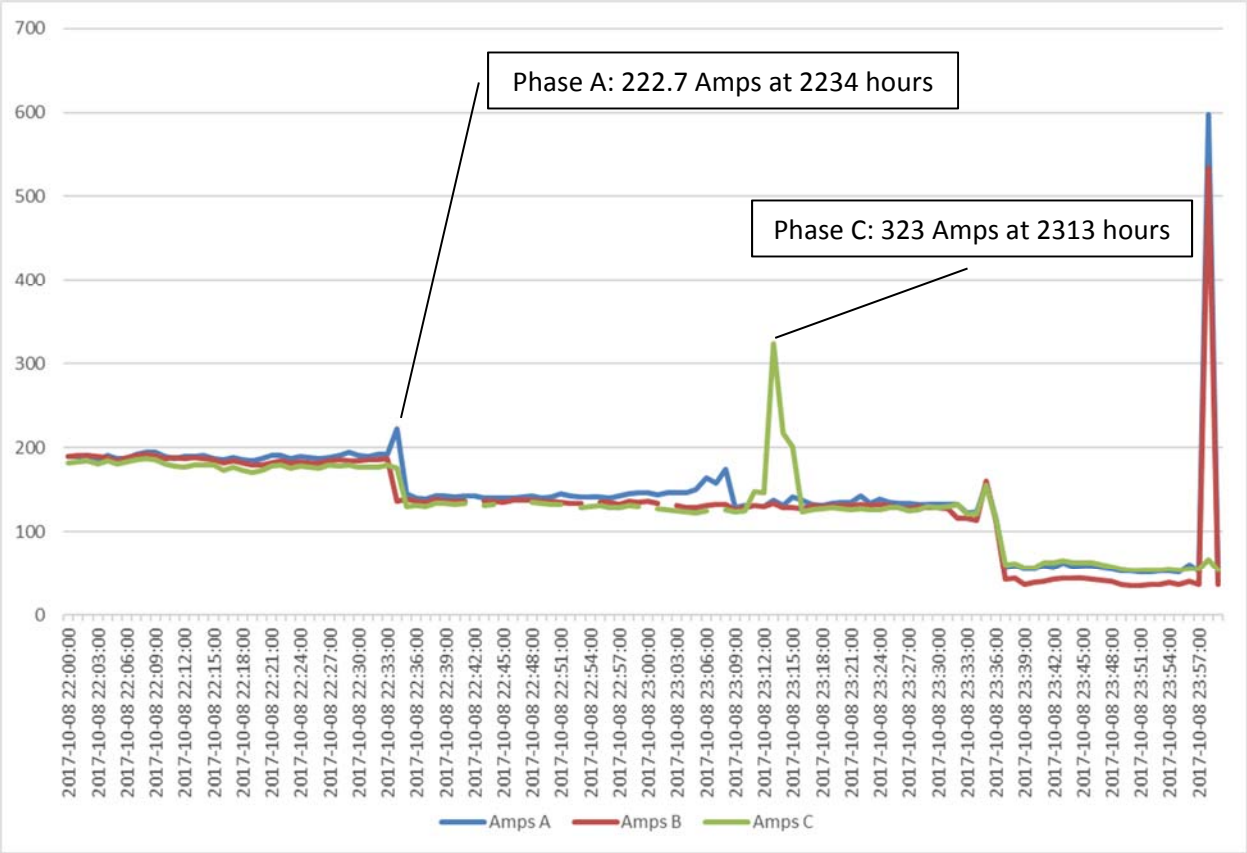


Figure 7. SCADA plot of load data recorded at Dunbar-1101 CB on October 8, 2017, from 2200 hours to 2359 hours. Highlight of load reduction event at 2233 to 2235 hours.

On October 8, 2017, at 2234 hours, SED staff believes the load reduction to be linked to the operation of two fuses that are part of fuse 1261. The subject Eucalyptus tree falling into the overhead lines likely caused a ground fault condition and ultimately the fire.

After SED staff reviewed equipment testing records for LR-234 and the Dunbar 1101 CB, they did not identify issues with the records.

Based on the SCADA records and smart meter data reviewed, SED did not identify a violation.

E. Other Field Observations and Review of Physical Evidence

On the morning of October 17, 2017, SED staff, Wilson Tsai and Raymond Cho, met with CAL FIRE investigator, Gary Uboldi, at the incident location. SED staff field investigated the Adobe site and documented seven poles during their visit.

Figure 8. Subject Eucalyptus tree laying across the road and subject conductor spans. The tree was rooted in the top left corner of the image. (October 17, 2017)

On June 11, 2018, SED staff visited PG&E's evidence storage location in Oakland, California. SED identified the base of the Eucalyptus tree and photographed the unbalanced root system mentioned in Mr. Porter's report.

Figure 9. Subject Eucalyptus tree base with unbalanced root system. (June 11, 2018)

On October 12, 2018, SED staff, Wilson Tsai and Raymond Cho, met with CAL FIRE investigators in Santa Rosa to review evidence from the evidence site retained by CAL FIRE. Of the evidence reviewed and photographed, SED staff found multiple damaged electric facilities and hardware including a fulgarite-like mass, failed insulator tie wires and damaged conductors. Fulgarites[33] are naturally occurring masses of fused soil and/or other debris that can form when lightning discharges into the ground. In this case, a fulgurite-like mass was formed when conductors fell to the ground and discharged enough energy to fuse some of the ground material together.

Figure 10. Fulgarite-like mass found in the Adobe incident area.

SED staff did not unwind the multiple bundles of conductor wire but reviewed the failure points. The Eucalyptus tree and fire damaged the insulating rubber material around the conductors. SED found evidence of arcing exhibited by molten metal attached to failed pieces of conductor.

[33] https://en.wikipedia.org/wiki/Fulgurite.

Figure 11. Failed pieces of conductor strands and evidence of arcing.

IV. CAL FIRE Investigation

CAL FIRE's investigation report determined that the subject Eucalyptus tree failed and fell into the three 12 kV conductors. The report notes that *"(t)he electrical conductors broke and fell to the ground and onto surrounding vegetation. Several of the conductors remained energized and arced causing a vegetation fire…"*[34]. The CAL FIRE investigator identified the grounded, energized conductors as the source of ignition.

Mr. Porter determined that the tree failure was caused by a weak connection of the epicormic shoot, the height of the epicormic, decay in the stump, a one-sided root system, and unbalanced tree base[35].

Mr. Steuterman referred to the Eucalyptus trees near the span as "new trees sprouted from the old stumps and have reached an average height of approximately 100 ft."[36] Forester Steuterman also noted that "(t)here is no evidence of any other management

[34] CAL FIRE Fire Investigation Report 17CALNU010050. Page 33.

[35] CAL FIRE Fire Investigation Report 17CALNU010050. Attachment 33 – Arborist Report.

[36] CAL FIRE Fire Investigation Report 17CALNU010050. Attachment 43 – CAL FIRE Forester Report.

action (pruning, limbing, herbicide application, etc.) since the removal of the original parent trees"[37].
CAL FIRE found PG&E in violation of California Penal Code (PC) §192. (b), California Public Resources Code (PRC) §4421 and §4435, and California Health & Safety Code (HSC) §13001.

PC §192. (b) states in part:

"Manslaughter is the unlawful killing of a human being without malice.

(b) Involuntary—in the commission of an unlawful act, not amounting to a felony; or in the commission of a lawful act which might produce death, in an unlawful manner, or without due caution and circumspection. This subdivision shall not apply to acts committed in the driving of a vehicle."

PRC §4421 states:

"*A person shall not set fire or cause fire to be set to any forest, brush, or other flammable material which is on any land that is not his own, or under his legal control, without the permission of the owner, lessee, or agent of the owner or lessee of the land*."

PRC §4435 states:

"*If any fire originates from the operation or use of any engine, machine, barbecue, incinerator, railroad rolling stock, chimney, or any other device which may kindle a fire, the occurrence of the fire is prima facie evidence of negligence in the maintenance, operation, or use of such engine, machine, barbecue incinerator, railroad rolling stock, chimney, or other device. If such fire escapes from the place where it originated and it can be determined which person's negligence caused such fire, such person is guilty of a misdemeanor*."

HSC §13001 states:

"*Every person is guilty of a misdemeanor who, through careless or negligent action, throws or places any lighted cigarette, cigar, ashes, or other flaming or glowing substance, or any substance or thing which may cause a fire, in any place where it may directly or indirectly start a fire, or who uses or operates a welding torch, tar pot or any other device which may cause a fire, who does not clear the inflammable material surrounding the operation or take such other reasonable precautions necessary to insure against the starting and spreading of fire*."

Both Mr. Porter and Mr. Steuterman, who are trained and qualified professionals in a vegetation management related field, found that the failure of the imbalanced Eucalyptus tree caused the fire. VM professionals inspecting and working for PG&E

[37] Id.

should have reasonably been able to identify and mitigate the hazardous tree prior to the fire.

V. Conclusion

Based on the evidence reviewed, SED found three violations of GO 95 by PG&E:

- GO 95, Rule 31.1, for PG&E's failure to maintain its 12 kV overhead conductors safely and properly. PG&E did not identify a hazardous tree condition and take the appropriate steps to prevent the subject Eucalyptus tree from striking the overhead conductors. SED found that PG&E did not document the subject Eucalyptus tree for trim or removal.

- GO 95, Rule 31.1, for PG&E's failure to maintain VM inspection records related to a 2015 CEMA inspection[38] according to best practices. PG&E could not locate records related to this inspection and notified SED of the lost record on March 30, 2018.

- GO 95, Rule 31.1 for PG&E completing work order #103891848[39] 15 days late.

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

VI. Attachments

Attachment A – CAL FIRE Investigation Report – Case No. 17CALNU010050

Attachment B – CAL FIRE Arborist Report by Mark Porter

Attachment C – CAL FIRE Forester Report by Jeremiah Steuterman

Attachment D – PG&E Work Order #103891848

Attachment E – PG&E Data Request Response (In Response to Data Request #1, Question 10)

[38] Bates PGE-CPUC_DR-112117_Common_Q10_part3.

[39] Bates PGE-CPUC_00020174_CONFIDENTIAL.

ATTACHMENT A

CAL FIRE Investigation Report

Case Number 17CALNU010050

CAL FIRE

CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION
SONOMA-LAKE NAPA UNIT
1199 Big Tree Road
St. Helena, CA 94574

INVESTIGATION REPORT

CASE NUMBER:	17CALNU010050
CASE NAME:	Adobe
DATE:	October 8, 2017
INCIDENT TYPE:	Wildland Fire
INCIDENT INVESTIGATOR(S):	Gary UBOLDI, Fire Captain – LNU
	Mike THOMPSON, Battalion Chief – CNR

1 - VIOLATION(S):

CALIFORNIA PENAL CODE 192. (b)

Manslaughter is the unlawful killing of a human being without malice.

(b) Involuntary—in the commission of an unlawful act, not amounting to a felony; or in the commission of a lawful act which might produce death, in an unlawful manner, or without due caution and circumspection. This subdivision shall not apply to acts committed in the driving of a vehicle.

PUBLIC RESOURCES CODE §4421.

A person shall not set fire or cause fire to be set to any forest, brush, or other flammable material which is on any land that is not his own, or under his legal control, without the permission of the owner, lessee, or agent of the owner or lessee of the land.

PUBLIC RESOURCES CODE §4435.

If any fire originates from the operation or use of any engine, machine, barbecue, incinerator, railroad rolling stock, chimney, or any other device which may kindle a fire, the occurrence of the fire is prima facie evidence of negligence in the maintenance, operation, or use of such engine, machine, barbecue, incinerator, railroad rolling stock, chimney, or other device. If such fire escapes from the place where it originated and it can be determined which person's negligence caused such fire, such person is guilty of a misdemeanor.

HEALTH AND SAFETY CODE §13001.

Every person is guilty of a misdemeanor who, through careless or negligent action, throws or places any lighted cigarette, cigar, ashes, or other flaming or glowing substance, or any substance or thing which may cause a fire, in any place where it may directly or indirectly start a fire, or who uses or operates a welding torch, tar pot or any other device which may cause a fire, who does not clear the inflammable material surrounding the operation or take such other reasonable precautions necessary to insure against the starting and spreading of fire.

2 - SUMMARY:

On October 8, 2017 at approximately 11:08 PM. a eucalyptus tree located at the address of 8555 Sonoma Highway in the community of Kenwood, fell across electrical conductor lines owned by Pacific Gas and Electric Company. A vegetation fire occurred on the property shortly after the tree fell in to the conductor wires. Initial witnesses who arrived at scene of the fire described the fire originating from the west side of a secondary access road on the west side of the main building.

The resulting vegetation fire spread out of control and was named the Adobe fire. On October 9, 2017 at 5:25 AM the Incident Commanders for the Adobe and Nuns Fire combined the two fires and called them the Central LNU Complex.

A total of six fires were added later to the Central LNU Complex (Nuns, Adobe, Norbom, Presley, Partrick, and Oakmont). A total of 56,556 acres and 1355 building were destroyed, and 172 buildings were damaged in the Central LNU Complex. One fatality occurred as a result to the Adobe Fire in the community of Bennett Valley.

3 - SUSPECT:

S-1 Pacific Gas and Electric Company
77 Beale Street 24th floor
San Francisco, CA 94105

Owner and operator of the powerlines located in the fire origin.

4 - WITNESS(ES):

W-1 Shawn RAMSAY

Vineyard Manager, Treasury Wine Estates

[redacted]

DOB: [redacted]

DL: [redacted]

Cell Phone: [redacted]

First company employee and person at scene of the fire. Can speak to observations at the incident.

W-2 Daniel HERNANDEZ

Security Officer, Allied Security Company

[redacted]

SEX: [redacted] HAIR: [redacted] EYES: [redacted]

HT: [redacted] WT: [redacted] DOB: [redacted]

DL: [redacted]

Home Phone: [redacted]

Second person at scene. Can speak to observations at the incident.

W-3 Robert UBOLDI

Assistant Fire Chief, Kenwood Fire Protection District

9045 Sonoma Highway

Kenwood, CA. 95452

Station Phone: (707) 833-2042

Third person at scene, first fire personnel at scene. Can speak to observations at the incident.

W-4 Travis PAOLINI
Fire Fighter (company officer), Kenwood Fire Protection District
9045 Sonoma Highway
Kenwood, CA. 95452
Station Phone: (707) 833-2042
Fourth person at scene, second fire personnel at scene. Can speak to observations at the incident.

W-5 Zach MILLER
Fire Fighter (driver/operator), Kenwood Fire Protection District
9045 Sonoma Highway
Kenwood, CA. 95452
Station Phone: (707) 833-2042
Fifth person at scene, third fire personnel at scene. Can speak to observations at the incident.

W-7 Mike THOMPSON
Battalion Chief, CALFIRE, North Region
6105 Airport Road
Reading, CA. 96002
Phone: (530) 226-3477
Sixth person at scene. Can speak to observations at the incident.

W-8 Daren BELLACH
Fire Chief, Kenwood Fire Protection District
9045 Sonoma Highway
Kenwood, CA. 95452
Station Phone: (707) 833-2042
Assisted in collection and transportation of evidence from 8555 Sonoma Highway Kenwood, CA.

W-9 James NOLT

Electrical, Mechanical, Corrosion Engineer, JHNOLT Associates

[redacted]

Phone: [redacted]

Can speak to observations at the incident.

W-10 Mark PORTER

Arborist, Mark's Tree Service and Consulting

[redacted]

Phone: [redacted]

Can speak to observations at the incident.

W-11 Russell WEST

Fire Captain Specialist, CAL FIRE, LNU

2210 West College Ave.

Santa Rosa, CA. 95401

Phone: (707) 967-1400

Can speak to observations at the Pressley Incident (17CALNU010050).

V-1 Daniel Martin Southard

Residence

[redacted]

Refer to Adobe Fire 17CALNU010050 Damage Inspection Report (Attachment #35.3) for a list of victims effected by property loss from the fire.

OTHER(S):

RP-1 Debbie COOPER

Resident

[redacted]

SEX: [redacted]

Phone: [redacted]

First resident to call 911 dispatch from the area. Can speak to observations near the incident.

5 – EVIDENCE:

On October 17, 2017 while collecting evidence with PG&E, I cut three pieces of wire with a side cutter plyer. The three cuts I made were to the wires attached to the top of power pole #GT41422 (see photograph IMG._0598.jpg for general location of cuts). These three cuts were necessary to separate evidence items # 2.1,3.1,4.1 from evidence items # 2.2, 3.2, & 4.2. Prior to cutting, I inspected all three wires for damage. All three wires appeared to be undamaged prior to cutting.

Evidence was collected by me. Prior to transport the evidence was secured and covered with a tarp by me in a KFPD pickup, Rescue 3141. Evidence was transported by KFPD, Chief Daren BELLACH while under my supervision of from 8555 Sonoma Highway Kenwood CA to the CAL FIRE Santa Rosa Station / Prevention office and evidence storage locker located at 2210 West College Ave. Santa Rosa CA. I remained behind the vehicle carrying the evidence during the whole trip to the evidence locker from the scene. I did not lose sight of the vehicle during the trip.

Evidence

At the scene, evidence item numbers were assigned to reference points and to evidence items to assist with Light Detection and Ranging (LIDAR) team. Not all the evidence tents were collected as evidence, as they were marking reference points and not evidence items. All evidence items pertinent to the investigation were collected by me and documented.

I received a large volume of data which was provided to me from PG&E. I reviewed all of the data and kept pertinent portions of the data in the report. The remainder of the unused data has been saved and securely stored at CAL FIRE Santa Rosa Station / Prevention office, evidence storage locker located at [redacted]

The PG&E electrical meter which was collect by PG&E under my supervision was released back to PG&E. (see photograph IMG_0939.JPG).
I recorded the electrical meter numbers as follow.
PG&E 1003746174
KZG10037461740708
35 936 460
Plastic seal # 10018567 (clear / blue in color)

See attached CAL FIRE LE-75e for list of evidence items.

Photographs

IMG_0592.JPG thru IMG_939.JPG Three hundred forty seven photographs were taken by me between the dates of October 9, 2017 and October 17, 2017.
IMG_8559.JPG thru IMG_8608.JPG Forty six photographs were taken by me on October 24, 2017.
IMG_0314.JPG,0316.JPG thru IMG_0320.JPG Six photographs were taken with my state issued cellular phone on October 10, 2017.

Audio Recordings

171010_0021.MP3 File (Interview between HERNADEZ and myself)
00:19:26 in duration, on October 10, 2017.

6 – PHYSICAL CONDITION OR CONDITIONS:

Santa Rosa Remote Area Weather Station (RAWS)

Date:	Sunday, October 08, 2017
Time:	11:00 PM
Temperature:	70 degrees Fahrenheit
Dew Point:	13 degrees Fahrenheit
Relative Humidity:	11 percent
Wind Speed:	24 miles per hour, gusts to 22 miles per hour.
Wind Direction:	North
Fuel Temperature:	69 degrees Fahrenheit
Instrument Used:	Remote Area Weather Station (RAWS)
GPS Coordinates:	38° 28' 43" 122° 42' 43"
Elevation:	576 feet above sea level

9.5 miles west of GOA of fire (See attached for reference map).

Kenwood Fire Department Weather Station (KCAKENW02)

Date:	Sunday, October 08, 2017
Time:	11:08 PM
Temperature:	71.6 degrees Fahrenheit
Dew Point:	23 degrees Fahrenheit
Relative Humidity:	16 percent
Wind Speed:	16 miles per hour, gusts to 24 miles per hour.
Wind Direction:	North / Northeast
Instrument Used:	Automated Weather Station
GPS Coordinates:	38° 25.099' 122° 33.049'
Elevation:	424 feet above sea level

.73 miles south of GOA of the fire (see attached for reference map). The weather station KCAKENWO2 is less than one mile from the GOA. This weather station is the best representation of the weather conditions which occurred at the GOA due to elevation and proximity.

7 – VEHICLE(S)/EQUIPMENT:

Electrical powerlines connected from electrical power pole # GT140648 located at Goff Road in Kenwood, CA. 95452 to the Pacific Gas and Electric, meter located at Chateau Saint Jean Winery. 8555 Sonoma Highway Kenwood, CA. 95452

8 – PROPERTY:

Business name: Chateau Saint Jean Winery

Owner: Treasury Wine Estates.

Address: 8555 Sonoma Highway
Kenwood, California
Sonoma County

Latitude: 38° 31.7330

Longitude: -122° 45.8780

Elevation: 210 FT.

APN# 050-150-006-000

Property located northwest side of Sonoma Highway (State Highway 12), east of Adobe Canyon Road in the community of Kenwood, California.

(See attached overview site map)

9 – NARRATIVE:

On October 8, 2017 at approximately 11:08 PM, a vegetation fire occurred at the address of 8555 Sonoma Highway in the community of Kenwood, located in Sonoma County, California. The area at the time of the fire was issued a red flag wind warning by the United States National Weather Service. I responded in uniform in my marked department vehicle to the incident at 8555 Sonoma Highway in the community of Kenwood.

I arrived at scene on October 9, 2017 at approximately 7:00 AM. I met with Kenwood Fire Protection District (KFPD), Assistant Chief Robert UBOLDI. R. UBOLDI told me the following in summary. R. UBOLDI told me he was the first he knew of to arrive at scene. R. UBOLDI told me he arrived at scene and saw fire on the west side of the main winery building. He told me the fire was spreading in a southwest direction towards Sonoma Highway and the community of Kenwood. He pointed and told me where he saw the perimeter of the fire when he arrived. I marked the two locations with white and blue striped survey flagging (see photographs IMG_0601.JPG & IMG_0605.JPG). R. UBOLDI told me KFPD, Engine 3182 arrived at scene shortly after him and attempted to make a hose lay across the front of the lawn on the south west corner of the building.

After meeting with R. UBOLDI I met with KFPD, Fire Fighters Zack MILLER and Travis PAOLINI who were on Engine 3182. MILLER told me the following in summary. MILLER told me when they arrived at scene the fire was spreading to the west up the hill away from the winery. MILLER told me he and PAOLINI stretched a hose line to the southwest corner of the winery building to protect it from the fire (see photograph IMG_0614.JPG). MILLER told me as they were fighting the fire he could see the fire crowning in the trees on the slope west of the building. MILLER described the fire conditions to be extreme. PAOLINI recollection of the events mirrored MILLER's description of events during a separate interview. PAOLINI told me after extinguishing the fire which was threating the building, he and MILLER moved the engine to the rear of the winery building and deployed another hose line to protect the west side of the

building. PAOLINI told me they extinguished several spots along the building, in the area of the dumpster and roof gutters (see photograph IMG_0716JPG.). (See CAL FIRE LE-78 Witness Statement PAOLINI).

After interviewing R. UBOLDI, MILLER, and PAOLINI, I began to survey the scene and looking for macro fire pattern indicators. I walked in a clockwise direction starting from where R. UBOLDI told me he had first seen the fire along the west fence line. From the fence line, I walked north across the slope to the base of a reservoir located near the rear of the winery building observing protection type fire pattern indicators which showed the advancing fire pattern indicator vector was from the secondary access road / southwestern corner of the main building.

While standing near the base of the reservoir, I could see and hear a large trailer mounted diesel powered generator, which appeared to be running. The generator was located between the main winery building and the reservoir (see photographs IMG_0727.JPG & IMG_0736.JPG). I called Treasury Wine Estate Equipment Mechanic Gregory AMANTITE. I asked AMANTITE if the generator was connected to the main power supply. AMANTITE told me yes, via an automatic transfer switch which would isolate the power to the facility and would not back feed in to the powerlines which supplied the facility.

From the reservoir, I walked east back toward the winery. When I arrived at the corner of the winery building, I turned and walked southwest down a paved access road to the front of the winery building and on to the lawn. I observed backing type fire pattern indicators along the west side of the paved roadway. The backing fire pattern indicators showed the backing fire pattern indicator vector was from the west side of the secondary access road, south of my location. When I reached the lawn, in front of the building, I saw a set of tire tracks on the lawn starting from the access road. The tire tracks extended from the access road north on to the lawn towards the main winery

building. The tire tracks ended several feet from the steps of the stairway leading up to a patio area from the edge of the lawn (See photograph IMG_0763.JPG).

I continued my survey back down to my vehicle which was parked in front of the lawn. I saw a large eucalyptus tree approximately one hundred feet tall laying across the secondary access road. Underneath the eucalyptus tree, I could see what appeared to be several electrical conductors laying on the roadway of the secondary access road (See photograph IMG_0628.JPG). South of the tree which was across the road I observed protection and staining types of advancing fire pattern indicators, which indicated to me the fire originated from the north.

I retrieved a roll of "Fire Line do not cross" barricade tape from my vehicle and began securing what I believed to be the area surrounding the GOA. I determined this area from the macro fire pattern indicators I saw on my first rotation around the heel of the fire. While I was securing the area, I checked the macro fire pattern indicators from the opposite direction.

After securing the area around the heel of the fire, I met with CALFIRE Battalion Chief Mike THOMPSON. THOMPSON responded to assist me with my investigation. I briefed THOMPSON on what I had found and we began looking for and identifying macro and micro fire pattern indicators. We began working the area west of the heel of the fire, towards the highway, we worked our way east back towards the winery building. We found several advancing indicators and lateral fire pattern indicators. We followed the sooting, staining and angle of char fire pattern indicators back to a power pole along the secondary access road.

At 8:28 AM on October 10, 2017, two individuals who work for PG&E approached the scene. The first individual was James WEBB (employee ID# JVW7) and the second individual was Jarod CONWAY (employee ID# JKCK).

I told WEBB what AMANTITE had told me about the onsite generator which was still running and requested WEBB to isolate and make safe the section of PG&E powerlines from power pole # GT40648 (evidence tent 19) to the electrical meter at 8555 Sonoma Highway, WEBB agreed. WEBB walked with me up the access road to check for additional life safety hazards after disconnecting the powerlines at power pole # GT40648.

As WEBB and I approached power pole # 120101124 (evidence tent 9) WEBB pointed to evidence item # 11 and told me it was originally attached to the top of the equipment located on top of power pole #120101124 (evidence tent 9). WEBB told me it was one of two missing bushings. WEBB pointed to the ground and showed me a v-pattern on the road surface of the access road (see photograph IMG_0858.JPG). The v-pattern looked to me to be an oil stain on the pavement. WEBB told me the material which formed the v-pattern was oil originally from inside the transformer located on power pole #120101124 (evidence tent 9). WEBB showed me the gasket (evidence item #11) which was hanging in a palm tree (see photograph IMG_0660.JPG). WEBB found the second transformer bushing (evidence item # 6) (see photograph IMG_0655.JPG). WEBB also told me the eucalyptus tree, (evidence item # 5) was what had knocked down the power lines and caused the transformer and conductors to fail. (See attachment 45 Outage Report PGE-CF_00136055 for notes written by PG&E discussing the incident.)

After WEBB told us the powerlines were safe to work around THOMPSON and I began looking for fire pattern indicators. I began my search from the area near power pole #GT140648 (evidence item 19). I saw protection type advancing fire indicators leading from the northeast to the southwest along the drainage. I continued up the drainage, following the advancing fire pattern indicators. I walked north, across the drainage until I located lateral fire pattern indicators mid slope on the hill.

After locating the lateral fire pattern indicators, I began looking for indicators down slope back towards the drainage and winery. I followed the lateral indicators to the

drainage west of power pole #120101124 (evidence item 9). The fire pattern indicators began to transition from lateral to advancing as I crossed the drainage, walking towards the secondary access road. I saw the fire pattern indicators directing me towards power pole #120101124 (evidence item 9). As I passed power pole #120101124 (evidence item 9) to the northeast I saw the fire pattern indicators transition from advancing to backing.

The fire pattern indicators located northeast of power pole #120101124 (evidence item 9), and between the drainage and the access road were a mix of lateral and backing fire pattern indicators. I saw several narrow advancing fire pattern indicator clusters. I attributed this phenomenon to false fire pattern indicators. These indicators consisted of isolated backing type fire pattern indicators transitioning to an advancing fire due to wind and fuel alignment which did not reflect the totality of the overall direction of the fire spread.

From the sooting, staining, and protection, micro fire pattern indicators I observed northeast power pole #120101124 (evidence item 9). I ruled out the possibility of the fire originating northeast of power pole #120101124 (evidence item 9), I returned to the base of power pole #120101124 (evidence item 9). I began to look for signs of micro fire pattern indicators. I began my focused search around the base of power pole #120101124 (evidence item 9). I worked my way outwards in a rotation. I saw several advancing and lateral fire pattern indicators directing me towards an area between power pole # 120101124 (evidence item 9) and the edge of the access road. The area in question was approximately twelve feet long paralleling the access road edge. From the road edge west this area extended approximately five to six feet. I determined this area to be my GOA. (See attachment 9.2 GPS Evidence Collection, for a map detailing locations of advancing, lateral, and backing fire pattern indicators)

I did a grid search of the GOA. I marked out search lanes with survey string perpendicular to the secondary access road and power pole # 120101124 (evidence

item 9). I began searching from the edge of the secondary access road towards power pole # 120101124 (evidence item 9). On each search lane, I performed the following tasks in this order from one end to the opposite end of each search lane.

- Visual inspection of the undisturbed lane for fire pattern indicators and possible evidence items (with and without a magnification glass).
- Removal of loose material from the search lane, with a comb and tweezers, placing all disturbed materials in to previously searched areas.
- Application of a magnet just above the surface to collect metallic items.
- Prior to moving to the next search lane, I identified any burn pattern indicators, evidence items and points of interest with pin flags.

I determined the location of my GOA by observing protection, cupping, sooting, and spalling types of advancing and lateral fire pattern indicators (see photograph IMG.696JPG). Within the GOA, I found a minimum of three plausible and reliable ignition sources within the GOA. These three ignition sources had correlating micro fire pattern indicators directing me to them as potentially responsible ignition sources for the fire. I saw the area of the GOA experienced low intensity heat with several isolated pockets of extreme heat located near the plausible ignition sources. The three ignition sources were three portions of a single electrical conductor. (marked by evidence tents E-7, E-20, E-22) (see photograph IMG_0876.JPG).

I began to investigate the eucalyptus tree (evidence item #5). The tree was laying across the secondary access road to the south. I started to investigate the stump from where the tree appeared to have originated. I saw a portion of the tree was still attached to the stump. The wood attaching the tree to the stump appeared to have acted like a hinge and remained connected to the stump after it had fallen (see photograph IMG_0801.JPG).

The eucalyptus tree, evidence item #5, had a mark / ridge protruding from the trunk on the same side as the stump. The mark / ridge on the trunk correlated with where I

believe the tree originally connected with the top of the stump prior to falling. I attached a large galvanized, ten-inch-long nail into the area of the mark / ridge of the trunk of the tree (see photograph IMG_803JPG). I attached my tape measure to this galvanized nail stretched my tape measure along the trunk of the tree until I reached the tip of the tree. I made every effort to keep the tape straight while weaving it around the tree limbs. I recorded at the length of the tree to be approximately 110 feet long (see photograph IMG_0782.JPG & IMG_0783.JPG). I saw the tree had notable fire damage on the underside of the trunk just south of where it intersected the creek which parallels the secondary access road. The tree appeared to have landed on a dead log which was on the ground prior to the fire, on the south bank of the creek. The damage to the tree looked to be a result of the tree contacting the dead log which burned as a result the fire.

While inspecting the tree, I found several advancing fire pattern indicators along the north / northeast side of the tree trunk. With the totality of the advancing fire indicators observed. I concluded the tree had fallen to the ground prior to experiencing flames from the advancing fire north of its location.

I located and identified each electrical conductors which were attached to the six effected electrical power poles. I attached white colored electrical tape to what would have been the western most wire, green colored electrical tape to what would have been the middle or top electrical wire and red colored electrical tape to what would have been the eastern most wire. I attached blue colored tape to the phone/data line which would have been attached to the electrical pole under the electrical conductors on the pole.

On October 10, 2017, I located a male adult driving a small Sport utility vehicle. The individual identified himself as a security guard by the name of Daniel HERNANDEZ with Allied Security. Allied Security is contracted by Chateau St. Jean Winery for onsite security. I asked HERNANDEZ if he was at the site at the time of the fire. HERNANDEZ

told me yes. I asked HERNANDEZ if I could record our interview with my digital audio recorder. HERNANDEZ said that was fine. HERNANDEZ told me the following in summary.

HERNANDEZ told me he was checking the interior front portion of the building near the tasting room when the electricity went out. I asked HERNANDEZ if he had heard any noises prior to or during the power failure. HERNANDEZ said no, but he said he had experienced some hearing loss from his time working in the air force. HERNANDEZ told me he turned on his flash light and proceeded to exit the building out the front entrance where his vehicle was parked.

HERNANDEZ told me when he got back to his vehicle he could see smoke coming from the exterior of the southwest corner of the building. HERNANDEZ told me he could not see fire, only smoke and a bright white flashing light. HERNANDEZ told me the bright white light appeared to be coming from the ground near the access road along the side of the building. HERNANDEZ told me he drove his vehicle out of the parking lot and down the access road and then drove up on to the front lawn in front of the building to get a closer look (See attached photograph IMG_0763.JPG).

I marked where HERNANDEZ parked his vehicle with evidence tent #28. HERNANDEZ told me the smoke was shifting back and forth in different directions which made it difficult for him to breath so he drove away. HERNANDEZ told me he met up with Shawn RAMSEY the Vineyard Manager and assisted with evacuating the remainder of the employees who were on the vineyard and property.

On October 10, 2018 at 11:50 AM, two CAL FIRE type three fire engines with a total of six personnel made an unauthorized entry in to the incident scene (see photograph IMG_0757.JPG). The two engines made entry by breaking a minimum of four horizontal sections of Yellow, "FIRELINE DO NOT CROSS" barricade tape and opening a closed chain link gate (see photograph IMG_0778.JPG). Prior to this point in the incident I had

not seen any fire resources driving on the road due to a burned vehicle blocking the main entry.

I immediately instructed both engine company officers to stop their apparatus and remain in the vehicles. Prior to me being able to stop both engines they had driven over three conductor wires and one communication wire (evidence items 1, 2, 3, & 4). I instructed both engine company officers to write me a narrative of what had just happened and I contacted their immediate division supervisor. I inspected the tire tracks from the engines and found that neither fire engine had done any damage to the scene (see attached CAL FIRE LE 71Supplementary Reports).

On October 11, 2017, CAL FIRE Forestry Assistant Jeremiah STEUTERMAN arrived at scene as requested. I briefed STEUTERMAN on the general layout of the scene and safety issues and concerns. I walked STEUTERMAN over to the grove of trees to be evaluated. I described to STEUTERMAN on how I originally found the scene and its condition. STEUTERMAN began his evaluation of the grove of trees. I continued to evaluate the scene while STEUTERMAN conducted his evaluation (see attachment 49 CAL FIRE Forester STEUTERMAN Report)

On October 12, 2017, Arborist Mark PORTER arrived at scene as requested. I briefed PORTER on the general layout of the scene and safety issues and concerns. I walked PORTER over to the tree to be evaluated (evidence item #5). I described to PORTER on how I originally found the tree and its condition. PORTER began his evaluation of the evidence item #5. I assisted PORTER with collecting measurements for his evaluation. PORTER collected a wood sample from the tree stump (evidence item #17). PORTER placed the wood samples in to a clean paper envelope which I held open. After the items were in the envelope, I sealed and marked the envelope with my name, badge number, date and time. I secured the envelope in my pistol safe in my locked department vehicle (See attachment 33 Arborist Report PORTER).

I met with RAMSEY the Vineyard Manager from Treasury Wine Estates on October 13, 2017. Treasury Wine Estates is the parent company of Chateau Saint Jean Winery and owner of the property. RAMSEY told me the following in summary. RAMSEY told me he was out driving around on the night of October 8, 2017. As he was drove up to the winery at approximately 11:30 PM, he could see a glow from the north side of the winery. RAMSEY told me he drove over to the glow to investigate it. When RAMSEY drove up the secondary access road he saw a large eucalyptus tree which had fallen across the road and had taken down the power and phone lines. RAMSEY showed me his location and point of view while I took a picture with my camera from the approximate direction and location (see photograph IMG_0772.JPG). RAMSEY told me he stopped his truck and didn't get out because he saw the power lines were down on the ground and didn't want to get injured. RAMSEY showed me where he stopped and his tire tracks on the roadway. I marked RAMSEY's tire tracks with evidence tent # 25 and orange spray paint. (see photograph IMG_0773.JPG)

RAMSEY told me the fire was located near the three palm trees near (evidence tent #11) RAMSEY told me the fire was on both sides of the secondary access road, but had not burned to the eucalyptus tree (evidence tent #5). I asked RAMSEY if he saw anyone else in the area. RAMSEY told me no. RAMSEY told me after seeing the fire he contacted and evacuated the remaining Treasury Wine Estates employees who were in the vineyard and the property. RAMSEY told me the fire engines arrived ten to twelve minutes after calling 911 on his cellular phone.
(see attached CAL FIRE LE 78 Witness Statement)

On October 12, 2017, USFS Special Agent Alex LOMVARDIAS and Sean WEST arrived at scene with their Light Detection and Ranging (LIDAR) equipment which I had requested. I briefed LOMVARDIAS and WEST on what I wanted them to scan. LOMVARDIAS and WEST were on scene for a total of two days conducting their operation (See attachment 26 Supplemental report SA LOMVARDIAS).

On October 14, 2017, Electrical Engineer James NOLT from JH Nolt Associates arrived at scene whom I had requested. I briefed NOLT on the general layout of the scene and safety issues and concerns. I walked with NOLT through the scene explaining to him what I had found when I arrived and what had been disturbed by the PG&E crew and myself to mitigate safety issues. I assisted NOLT with collecting photographs for his evaluation.

After NOLT arrived, a bucket truck that I requested, arrived at scene. We were able to setup the bucket truck on the secondary access road without disturbing any evidence. I had NOLT use the bucket truck first to continue his evaluation of the conductors and hardware. (See attachment 32 Electrical Engineer NOLT Report)
After NOLT was finished, I used the bucket truck to examine and photograph the top of electrical pole #120101124 (evidence tent #9). Digital photos IMG_0889.JPG through IMG.0926JPG were taken when I was in the bucket truck. When I could get a closer look at the equipment atop of electrical pole #120101124 I saw the cross arm was distorted and appeared to be loose (see photograph IMG_0923.JPG). Only one of the two wires were resting on the top of the cross arm. Both wires were not physically connected to the insulators mounted on the cross arm (see photograph IMG_0889.JPG). The hardware attaching the cross arm also showed damage. When I inspected the transformer, I saw the top consisted of two openings. The surface was coated in an unknown type oil substance which had collected ash from the previous days. The two holes on the transformer appeared to be bent and distorted (see photographs IMG_0895.JPG).

During my inspection of the of the top of electrical pole #120101124, I made every effort to avoid contact with the power pole and equipment. However, I did need to touch the outside edge of the wooden cross arm. I did this to avoid contacting the bucket truck to the electrical pole during an unexpected gust of wind.

Prior to collecting evidence on October 17, 2017, I cut and removed a section of the eucalyptus tree (evidence item # 5). I wanted to confirm fire pattern indicator under the eucalyptus tree trunk were consistent with the surrounding fire pattern indicators in the area. I took digital photographs prior to cutting the effected section of tree (see photographs IMG_0927.JPG, IMG_0930.JPG) I chose a section of the tree where it had made direct contact with the ground. I located this area near the edge of the pavement on the west side of the secondary access road where the tree had intersected the roadway.

I made several cuts to remove branches from the tree trunk. As I cut each branch I laid it directly on the ground in relation to their original elevated location. Once the branches were clear of the tree trunk I made two cuts to the main tree trunk. Each section of the trunk dropped directly on to the ground. I lifted the effected middle section of the tree trunk directly upwards without adversely disturbing the area directly under the trunk. I moved the middle section of the trunk to the side of the tree attempting to keep it in line with the saw cuts (see photograph IMG_0932.JPG). I could see where the tree trunk had come in direct contact with the ground showed advancing fire indicators from the northeast direction. The advancing fire pattern under the tree indicated to me the eucalyptus tree (evidence item # 5) had fallen prior to the fire progression from the northeast to this location. I placed my leather glove down on the ground and used the pointer finger of my empty glove to indicate the area in question while taking a photograph. (see photograph IMG_0933.JPG).

On October 24, 2017, PG&E restored electrical service to the property of 8555 Sonoma Highway Kenwood, CA. At approximately 2:00 PM that same day I returned to 8555 Sonoma Highway. With the approval of the property representative, I retrieved electronically stored data within the memory of the electrical service transfer switch. I identified the equipment as a General Electric, Zenith Automatic Transfer Switch. Model: Entelli-Switch 250. Serial # 2530419.

Prior to accessing or operating the transfer switch controller, I read and reviewed the users operating manual (See attachment 14 Generator transfer switch operating manual). As I scrolled through each screen page on the controller, I took a picture of each display screen. Per the operating manual for the transfer switch (S1) represents the PG&E electrical service supplying the facility. (S2) represents the backup diesel powered generator supplying the facility. The transfer switch recorded a total of sixteen events within its memory.

The following were the events are as listed.

Event 1 January 18, 2017 at 5:58:33 PM
S1 restored (PG&E electrical service restored)

Event 2 January 18, 2017 at 5:58:55 PM
S1 UV fail (Failure of PG&E electrical service, under voltage fail)

Event 3 March 29, 2017 at 9:39:48 AM
S1 UV fail (Failure of PG&E electrical service, under voltage fail)

Event 4 March 29, 2017 at 9:39:49 AM
S1 restored (PG&E electrical service restored)

Event 5 May 30, 2017 at 10:39:27 AM
S1 UV fail (Failure of PG&E electrical service, under voltage fail)

Event 6 May 30, 2017 at 10:39:28 AM
S1 restored (PG&E electrical service restored)

Event 7 July 10, 2017 at 7:48:30 AM
S2 Stop (Facility diesel generator shut down)

Event 8 July 29, 2017 at 11:27:23 PM
S1 UV fail (Failure of PG&E electrical service, under voltage fail)

Event 9 July 29, 2017 11:27:24 PM
S1 restored (PG&E electrical service restored)

The following events occurred during and after the time of the fire on October 8, 2017

Event 10 October 8, 2017 at 11:08:05 PM
S1 UV fail (Failure of PG&E electrical service, under voltage fail)

Event 11 October 8, 2017 at 11:08:06 PM
S1 restored (PG&E electrical service restored)

Event 12 October 8, 2017 at 11:08:17 PM
S1 UV fail (Failure of PG&E electrical service, under voltage fail)

Event 13 October 8, 2017 at 11:08:18 PM
S1 restored (PG&E electrical service restored)

Event 14 October 8, 2017 at 11:08:33 PM
S1 UV fail (Failure of PG&E electrical service, under voltage fail)

Event 15 October 8, 2017 at 11:08:34 PM
S1 restored (PG&E electrical service restored)

Event 16 October 24, 2017 at 11:37:10 AM
S2 Stop

In a document that was provided to me by PG&E titled "Vegetation Management Work Request" numbered SRNC1005704, shows communications between PG&E and their inspection contractor Western Environmental Consultants Inc. (WECI).
(See attachment 34 Tree Work Request PGE-CF-00025462)

WECI identified the need for tree work on a March 27, 2015 inspection at 8555 Sonoma Highway Kenwood, CA. The work request identifies the species of tree at the location as eucalyptus. WECI identified two locations on the property within the immediate vicinity of the GOA.

The first location is listed as number 23. The physical description was listed as the, "second span along road to chateau delivery area". GPS coordinates 38.428445 - 122.54760 were listed for this location in the location comments. In the tree comments section the abbreviation ".8SP BHD ROSES. NP.FLG" were typed. (See photograph IMG_0717.JPG). In the photograph, on the left-hand side of the road above the concrete retaining wall, are the roses being referenced in the location 23 work request from WECI. This location also corresponds with the listed GPS location.

The second location for the work request was listed as number 24. The physical description was the, "third span along the road to the chateau delivery area". No GPS coordinates were listed for this location in the location comments. In the tree comments section the abbreviation "1S. NP.FLG. IN CRK" were typed.

Fire cause exclusion

I excluded the following causes for the fire at 8555 Sonoma Highway on October 8, 2017 except for electrical.

Lightning, I excluded lightning as a cause for the fire. I did not see any evidence of a lightning strike which could have occurred in the area. I inspected the surrounding trees and structures and found no evidence of a lightning strike. Witnesses and myself who were in the area prior to the fire and did not see lightning or hear thunder. I researched recorded weather data from National Interagency Fire Center (NIFC) and found no recorded lightning strike for this area between the dates of September 24, 2017 and October 8, 2017 (See attachment 16).

I did find evidence of fulgurites in the GOA. I excluded the creation of the fulgurites by lightning. The totality of the evidence did not support lightning as a cause due to the absence of damage which would be consistent with a lightning strike.

Campfires, I excluded campfires as a cause for the fire. I inspected the area surrounding the GOA and property. I did not see a campfire or evidence which would lead me to believe a campfire was or had been used in the area of the property or GOA. The property was being monitored by a hired private security guard (HERNADEZ), and employees would have seen a campfire if it was present due to the location of the GOA.

Fireworks, I excluded campfires as a cause for the fire. I did not see evidence of fireworks in the location the property or GOA. Witnesses also did not see or hear fireworks being used in or around the property or GOA prior to the fire.

Debris burning, I excluded debris burning as a cause for the fire. I did not see any recent debris burning piles in the area. I did find a location to the southwest which was landscaping debris dumping area behind what appeared to have been the remains of a storage building. This area would have not been suitable or safe to conduct a debris burn. The fire pattern indicators I saw during my investigation did not indicate a fire had

pattern from this location. During the time of the fire there were no debris burn permits issued for this property by CAL FIRE, KFPD, or the Bay Area Air Quality Management District.

Vehicle, I excluded vehicle use as a cause for the fire. I did not see evidence of vehicle use in the area or off the road near the GOA. The location of GOA would not have been a typical location to experience a vehicle malfunction which would have resulted in a vegetation fire. The location of the GOA was on a flat section of a twisty, single lane paved road. A driver driving in this area would have been typically traveling at a low speed (5 to 10 MPH). The section of road was not an area where and individual would have been accelerating to go up the hill or down shifting to control their vehicle speed. Additionally, this location was a secondary access road seldom used by the public or employees.

Cigarettes, I excluded smoking as a cause for the fire. I did not see cigarettes, cigarette filters or remains of either in the area of the GOA. The weather conditions recorded at the time of the fire could support the possibility of cigarettes as an ignition source but, due to the low intensity of the burn in the GOA, I believe we would have located the remains of a cigarette or some other type smoking device within the GOA. Additionally, due to the time of day and the fact the winery was closed for business limits the possibility of someone (employee or customer) would accidentally start a fire with a cigarette. The GOA and surrounding area was not a common or designated area for smoking by employees. Per my interviews none of the witnesses smoked.

Arson, I excluded arson as a cause for the fire. I did not see evidence of an arson device in the area of the GOA or the property. Due to the front entry gate being closed, and the presence of a security guard, several company employees on the property, it would be very difficult for an individual to enter and exit the property without being seen or contacted. The property owners do not have any record or recollection of any individuals who would be motivated or have made statements, current or in the past to

commit arson to the facility or company property. The distance from the locked gate at the entrance of the property to the GOA is approximately 1,318 feet.

Children playing with fire, I excluded children playing with fire as a cause for the fire. I saw no evidence of forts or toys near the area of the GOA. The location of the GOA did not have any landmarks or geographical features which would had attracted children. I inspected adjacent properties and found no evidence of children. Due to the time of day of the fire starting, I concluded that it was highly unlikely a child or children were in the area of the GOA. The nearest known child lives over a half mile away and would have likely been discovered by an employee or the security guard if they were present.

Equipment use, I excluded equipment use as a cause of the fire. I did not see any evidence of recent equipment use in the area of the GOA. RAMSEY told me during our interview he had not seen or heard of the employees working in this area prior to the fire. I did not see signs of recent "hot" work or landscaping work in the area of the GOA.

Opinion and conclusion:

I determined the cause of the Adobe fire on October 8, 2017 to be caused by electrical power line. At approximately 11:08 PM on October 8, 2017, a eucalyptus tree (evidence item # E-5) fell south, across the secondary access road at the address of 8555 Sonoma Highway. The eucalyptus tree struck suspended electrical conductors which were attached between power pole #120101124 (evidence item 9) and power pole #GT41422 (evidence item 18). The electrical conductors broke and fell to the ground and onto surrounding vegetation. Several of the conductors remained energized and arced causing a vegetation fire near evidence tents # 21, 7, 15, 20, 22, and 10. I saw that the electrical conductor wire which I marked with white electrical tape appeared to remain energized after falling to the ground and onto vegetation. Under each section of the white wire I found several fulgurites and spalded of rocks (see photograph IMG_0842.JPG). Additionally, evidence of the reenergization of the powerlines was recorded within the data memory of the electrical transfer switch. Event 10 show the

time when the tree contacted the powerlines and events 11, through 16 show PG&E's equipment was attempting to re-energize the system after a failure occurred.

In a document which was provided to me from PG&E, called a Supervisory Control and Data Acquisition (SCADA) Event Log showed an electrical power outage. This outage occurred on October 8, 2017 at 23:08 (11:08 PM) on the DUNBAR 1101 circuit, to fuse 1261. The location of this device is stated as 500 N/HWY 12 S/ADOBE CANY. The SCADA Event Log with the generator transfer switch data, fire pattern indicators, and witness accounts indicates the fire originated from the base of power pole # 120101124 (evidence tent 9) from the electrical conductor (white) evidence item #2 at approximately 11:08 PM on October 8, 2017.

The resulting fire in its initial stage near power pole # 120101124 (evidence tent 9) was witnesses by RAMSEY and HERNANDEZ. Later, the fire progression was witnessed by R. UBOLDI, MILLER and PAIOLNI.
The fire spread rapidly in two directions the primary towards Sonoma Highway and the community of Kenwood, and in a secondary direction towards the County of Napa later during the incident.

On October 9, 2017 at 5:25 AM the Incident Commanders for the Adobe and Nuns Fires combined the two fires and called them the Central LNU Complex. A total of six fires were added to the Central LNU Complex (Nuns, Adobe, Norbom, Presley, Partrick, and Oakmont). A total of 56,556 acres were burned. 1355 building were destroyed, 172 building were damaged within the Central LNU Complex. One fatality occurred within the perimeter of the Adobe Fire.

5/22/2018

Signature Date

Gary UBOLDI, Badge 2814

Fire Captain

10 – ATTACHMENTS:

1 - Overview map.
2 - Overview map.
3 - Overview map.
4 - Overview map.
5 - SRA-LRA line map.
6 - Power lines.
7 - Santa Rosa RAWS Location.
8 - KFPD Weather Station Location.
9.1 - Evidence Collection GPS Log.
9.2 - GPS Evidence Collection
10 - Sketch of tree, E-5.
11 - Tire tracks measurements from HERNANDEZ.
12 - CAL FIRE LE92 for PG&E.
13 - CAL FIRE LE92 for Treasury Wine Estates.
14 - Generator transfer switch instructions.
15 - Incident timeline.
16 - NIFC Lightning viewer map.
17 - Photograph Log #1. (scene photos)
18 - Photograph Log #2. (transfer switch photos)
19 - IMG_0595A wire color coding.
20 - CAL FIRE LE92 for Frontier Communication.
21 - Scene security log & ICS 214.
22 - KFPD weather station log.
23 - Santa Rosa RAWS log.
24 - PG&E SCADA event log.
25 - REDCOM Event Log.
26 - SUPPLEMENTAL REPORT_SA LOMVARDIAS.
27 - CAL FIRE LE71 E-4362, E-4364, & Div DD.

28 - Notes from HERNANDEZ interview.
29 - CAL FIRE LE78 Witness statement PAOLINI.
30 - CAL FIRE LE78 Witness Statement RAMSAY.
31 - 1st RP location
32 - Electrical Engineer Report NOLT
33 - Arborist Report PORTER
34 - Tree Work Request PGE-CF_00025462
35.1 - Damage Inspection Report (DINS) Adobe Grid Index
35.2 - Damage Inspection Report (DINS) Adobe Map Grid Series
35.3 - Damage Inspection Report (DINS) Report list Adobe
36 - PG&E Evidence Collection Log 12 26 17
37.1 - CAL FIRE FC34 Dispatch Report – Adobe Fire
37.2 - CAL FIRE FC34 Dispatch Report – Nuns Fire
38 - CAL FIRE LE75e Evidence Collection Log
39 - CAL FIRE LE71 Explanation of discrepancy
40 - CAL FIRE LE71 Explanation of missing evidence
41 - Fire merge map of Adobe, Oakmont, & Nuns
42.1 - CAL FIRE LE71 FC. WEST 17CALNU010050 (Pressley Fire)
42.2 - Photograph Log 17CALNU010050 (Pressley Fire)
43 - CAL FIRE Forester Jeremiah STEUTERMAN report
44 - Site Reference Map
45 - Outage Report PGE-CF_00136055
46 - CAL FIRE LE71 ZIMMERMAKER

ATTACHMENT B

CAL FIRE Arborist Report by Mark Porter

Mark Porter, Mark's Tree Service and Consulting
ISA Certified Arborist # WE465

member

AMERICAN SOCIETY of CONSULTING ARBORISTS

Evaluation of Tree Failure
8555 Sonoma Highway
Kenwood, CA

Prepared for Cal Fire Investigator Gary Uboldi

October 12, 2017

Table of Contents

Summary

The Nuns fire burned 56,556 acres. This particular incident associated with this report was initially called the Adobe Fire. It occurred on October 8, 2017. A tree failure occurred at 8555 Sonoma Highway in Kenwood, CA near the fire. On October 11, 2017, I met with Cal Fire Investigating Officer Gary Uboldi to assist him in with a tree failure investigation and report the result of my inspection. I made some notes and took some photographs. It appeared as if most of the large trees on the site were Eucalyptus.

The subject tree is a blue gum (*Eucalyptus globulus).* The subject tree was once a mature Eucalyptus. It was cut down to a stump, and sucker like re-growth (epicormic) grew out of the side of a hollow rotting stump. The stump had decayed over time and was utterly hollow at the time of inspection. The epicormic shoot approximately 109 feet high, was weakly attached to a rotting stump. The area experienced high winds and the poorly connected epicormic shoot fell. I observed electrical wires on the ground near the downed tree part. Several trees were burned in the area.

My opinion of the tree failure occurred because of the following:

- the weak connection of the epicormic shoot.
- The height of the epicormic shoot.
- the pressure on the weak connection created by the strong winds.
- the advanced decay in the large stump.
- the decay of the stump prevented a core of branch wood from the epicormic shoot to be overlapped by trunk wood.
- the epicormic shoot developed a one-sided **buttress root** hence contributing to an unbalanced base.
- the one-sided buttress root on the stump side was in close proximity to advanced stump decay preventing full development for stability or unequaled mechanical stress.

It is my opinion this failure was preventable had a qualified arborist inspected the tree and the site conditions.

Introduction

Background

On October 8, 2017, at 10:00 PM the Adobe Fire (or Central LNU Complex) occurred. The Adobe fire is now a part of the Nuns Fire. It is my understanding the Nuns fire burned 56,556 acres (APPENDIX I Cal Fire Incident Report). It was reported to me a tree failure occurred on or around this date, at 8555 Sonoma Highway in Kenwood, California (see- Appendix II Site Overview)

October 11, 2017, I met with Cal Fire Investigating Officer Gary Uboldi at this site. The tree part that fell is a weakly attached section of tree trunk called an **epicormic shoot**[1] (similar to a large sucker) growing from a blue gum eucalyptus stump. It was reported to be windy and the approximate 109-foot tall epicormic shoot detached and collapsed (see - Appendix III Photo 1 Subject Tree).

The stump connected to the failed epicormic shoot was once part of a mature blue gum tree. It was cut down be many years ago evident by the condition of wood missing in the center of the stump. The stump is nearly entirely rotten from decay. It is impossible to count the annual rings to determine the age of the tree since the **heartwood** of the stump is so severely decayed.

I observed a broken power line on the ground near the tree failure.

Assignment

I was asked to:

1. Visit the site where the tree failed.

2. Provide my professional opinion of the circumstances or conditions that led to the failure of the Eucalyptus trunk.

3. Document my observations and in a report.

Purpose and Use of Report

To assist Cal Fire with their investigation of the tree fallen tree.

Observations

A mature eucalyptus tree once grew where the failure took place. Sucker like growth eventually transformed into another trunk at the side of the old stump. The new or replacement trunk (epicormic shoot) failed at the connection of the trunk of an old rotting stump. Heart rot has consumed the center of the stump. The vascular system was still intact supported by a thin shell wall surrounding the hollow rotten stump.

The failed trunk measured approximately 109 feet long. The portion of trunk (epicormic shoot) that separated from the original stump had an estimated diameter of 16 inches. The original rotting stump is approximately 26 inches in diameter with an estimated average of 7-8 inches of

[1] *Words in bold that are not part of section headings are defined in the Glossary*

wood remaining and surrounding the rotting hollow stump (see - Appendix III Photo 1 Subject Tree). The rot extends to the bare soil below the stump.

East and west of the tree that fell are several hollow gum tree stumps. I believe it is probable that all the stumps were once large statured eucalyptus trees with massive trunks. At some unknown point in time, the trees were cut down, and stump sprouts grew on the outside of the stumps. Some of the stumps just died, and no shoots grew. Like the subject tree, the center of the neighboring stumps has rotted away over a period of several years. The trees were once part of a windrow planted slightly north of a paved road on the north side of the property. North of the property is a mixed conifer-hardwood forest. The forested area burned and several of the stumps were smoldering during my inspection. I observed broken wires under the tree part that fell.

The rotting trunks are blue gum trees (*Eucalyptus globulus*).

Species Information

The subject tree a blue gum, "*Eucalyptus globulus*" (see Photo 4) is common to California. A page from a Californian's Guide to the Trees Among Us report Eucalyptus are the most widespread of all California cultivated trees. Eucalyptus was introduced to California from Australia in the 1850s. By the early 1900s blue gum (*Eucalyptus globulus*) was being extensively planted for lumber, pilings and post, fuel wood, medicinal products, tannin, oil, windbreaks, and as street and park trees (Dr. Matt Ritter). "*As California's forestry and fuel economy evolved, the inferior quality of young blue gum wood was discovered, most of the plantations remain uncut, and parts of the state are now burdened with the ecological legacy of this vast unharvested crop. Either prized as aesthetically pleasing heritage trees and monarch butterfly habitat or demonized as America's largest weed*".

My personal experience working with this particular species is the same shared by many of local arborist I know. Some blue gum trees are a higher risk tree than many others in the California landscape if planted close to structures or people. When large blue gum trees fail, they have a reputation for causing a lot of damage, injuring, and killing people. In the nearby hills of the Napa Valley, the back roads from the 101 freeway to the Russian River, there are long rows of towering blue gum trees that dot the grassy hillsides close to or sharing the land with native oaks. Windrow trees that serve a purpose to protect crops cause little concern if they fail on a hillside away from structures or infrastructure.

Of the 700 or so species of eucalyptus that grow almost exclusively in Australia, more than 300 different species of eucalyptus have been growing in California. Blue gum, like the subject tree, is being discontinued by cities and counties all over the state for a long time.[2] Failures are typically more significant with mature blue gum than many landscape species due to their size and weight[3]. Decay is frequently associated with failures. Of the reports in the California Tree Failure Report database decay was a factor in 23% of trunk failures. Often decay is hidden in the

[2] *The State of Urban Forestry in California: Results of the 1988 California Urban Forest Survey.*

[3] *Personal observations*

roots or trunk. This particular tree and associated neighboring eucalyptus exhibited visible decay.

Discussion

In botany, ***adventitious*** refers to structures that develop in an unusual place.
Adventitious roots, buds, and shoots are widespread in vascular plants. Adventitious buds are often formed after the stem is wounded or pruned. The adventitious buds help to replace lost branches. Adventitious can refer to roots also.

Strong branch attachments form when branch and trunk wood develop together over time. Adventitious branches such as **epicormic shoots** or waterspouts are weaker because, in the short term, less wood has formed to hold the branch in place compared with a normal branch of the same diameter (ISA Tree Risk Assessment Manual). Since epicormic shoot arises at or below the ground this failure is considered a trunk failure (Roth, Mann[4]).

Epicormic buds lie dormant beneath the bark, their growth suppressed by hormones from active shoots higher up the plant. Under certain conditions, they develop into active shoots, such as when damage occurs to higher parts of the plant, or when light levels increase following removal of nearby plants.

In the case of the blue gum trees at this site, when the trunk was cut off epicormic growth was stimulated below the final removal cut. It is common knowledge amongst arborist that epicormic shoots are a common cause of failure. Especially on trees that have been topped and grow back rapidly. The situation is worse when decay is present which tends to make holding wood depth even less available. A long core of wood attaching to the original trunk lacks here.

Conditions of Concern
The **heartwood rot** in the stump, weakly attached epicormic shoot, the height of the defective part.

The Mode of Failure: There are three primary modes or classification of failure[5]

1. branches
2. trunk
3. root

Technically, the part that failed is an epicormic shoot. Because it connects to the stump at ground level, I will refer to this as a trunk failure. It has more characteristics of a trunk with branching. The growth is similar to what occurs in **coppicing** where trees are felled purposely to force epicormic growth for fuelwood and other purposes.

---

[4] *Personal conversation*
[5] *California Tree Failure Report Program*

It is not uncommon to find decay in old blue gum trees. Colorful fruiting structures are sometimes present (**conks or brackets**) and serve as visual indicators than an inspector can use to gain more information. When a stump has been cut off and one walks by, it is easy to see a problem is present when the heartwood is missing. If the wood is sound and solid a conk or bracket would indicate a possible hidden problem.

The California Tree Failure Report Program (CTFRP) was established in 1987 to collect quantitative information on the mechanical failure of urban trees (trunk breaks, branch breaks, and uprootings). The information is used to develop "failure profiles" for genera and species to more accurately assess failure probability. Over 200 tree care professionals in California are cooperating with this effort by inspecting fallen trees and reporting failure details.

Researchers of the CTFRP produced a structural failure profile for Eucalyptus globulus published in Western Arborist in 2014. There were 43 trunk failure reports in the CTFRP database. Of all the reported trunk failures 51% occurred at ground level. Codominant stems with poor attachments and were cited as the most common defect. Most trunk failures (47%) occurred at wind speeds between 5-24 MPH. Trunk failures at high wind speeds >25 MPH were 37%. A link at CTFRP homepage (http://ucanr.edu/sites/treefail/) will direct the reader to the full species profile report. The data collected does not include thousands of tree failures that go un-reported. The data is only limited by the number of failures reported. Regardless, the data is helpful.

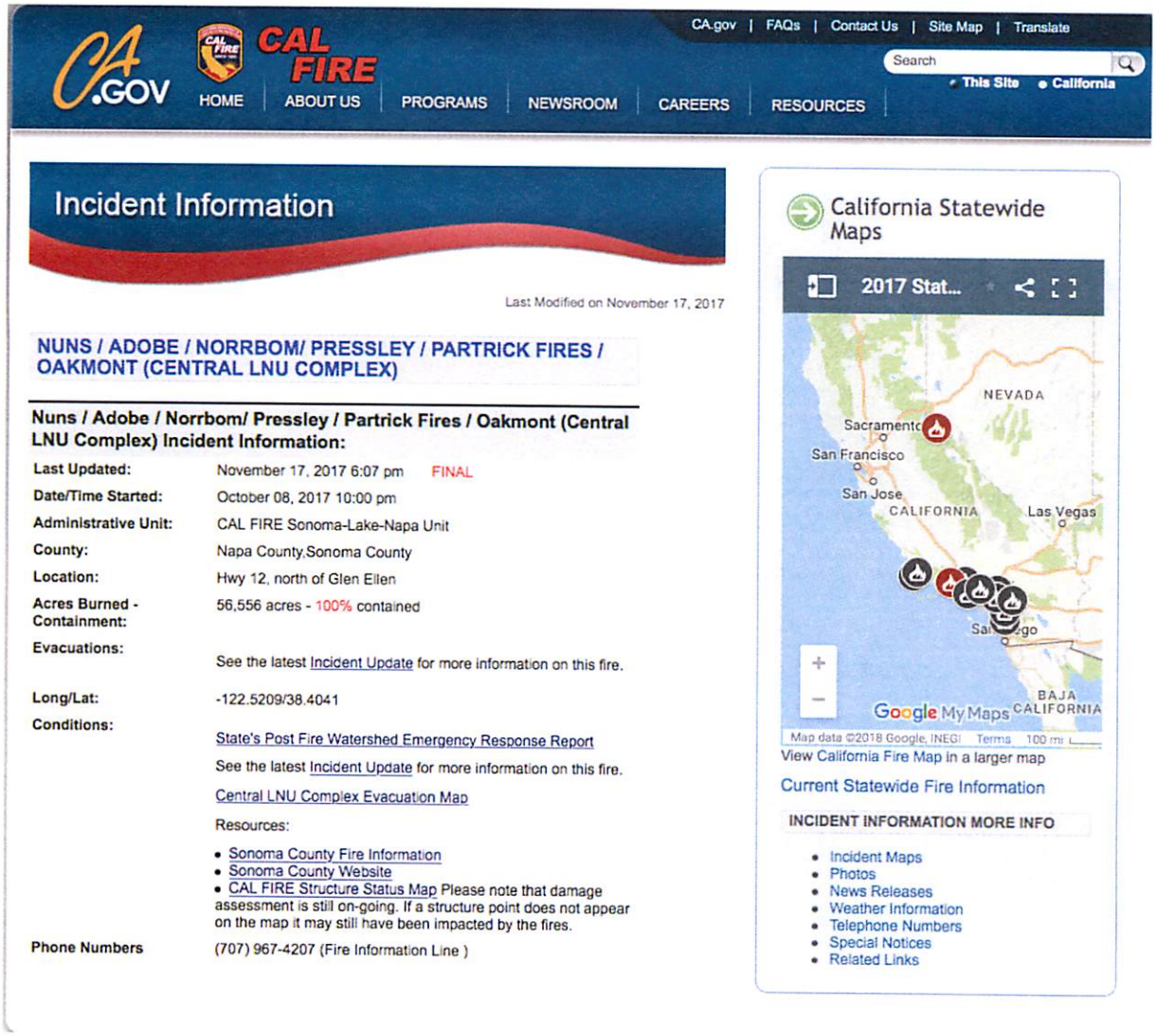
Conclusion

The cause of failure is as follows:

- the weak connection of the tall epicormic shoot.
- the pressure on the weak connection created by the strong winds.
- the advanced decay in the large stump.
- the decay of the stump prevented a core of branch wood from the epicormic shoot to be overlapped by trunk wood.
- the epicormic shoot developed with a one-sided **buttress root**.
- the one-sided buttress root on the stump side near advanced stump decay preventing full development for stability or unequaled mechanical stress.

The failure was preventable had a qualified arborist inspect the tree and assess for risk.

Appendix I Incident Report



CA.gov | FAQs | Contact Us | Site Map | Translate

Search

This Site California

CA.GOV CAL FIRE

HOME | ABOUT US | PROGRAMS | NEWSROOM | CAREERS | RESOURCES

Incident Information

Last Modified on November 17, 2017

NUNS / ADOBE / NORRBOM/ PRESSLEY / PARTRICK FIRES / OAKMONT (CENTRAL LNU COMPLEX)

Nuns / Adobe / Norrbom/ Pressley / Partrick Fires / Oakmont (Central LNU Complex) Incident Information:

Last Updated:	November 17, 2017 6:07 pm FINAL
Date/Time Started:	October 08, 2017 10:00 pm
Administrative Unit:	CAL FIRE Sonoma-Lake-Napa Unit
County:	Napa County,Sonoma County
Location:	Hwy 12, north of Glen Ellen
Acres Burned - Containment:	56,556 acres - 100% contained
Evacuations:	See the latest Incident Update for more information on this fire.
Long/Lat:	-122.5209/38.4041
Conditions:	State's Post Fire Watershed Emergency Response Report See the latest Incident Update for more information on this fire. Central LNU Complex Evacuation Map Resources: • Sonoma County Fire Information • Sonoma County Website • CAL FIRE Structure Status Map Please note that damage assessment is still on-going. If a structure point does not appear on the map it may still have been impacted by the fires.
Phone Numbers	(707) 967-4207 (Fire Information Line)

California Statewide Maps

View California Fire Map in a larger map

Current Statewide Fire Information

INCIDENT INFORMATION MORE INFO

- Incident Maps
- Photos
- News Releases
- Weather Information
- Telephone Numbers
- Special Notices
- Related Links

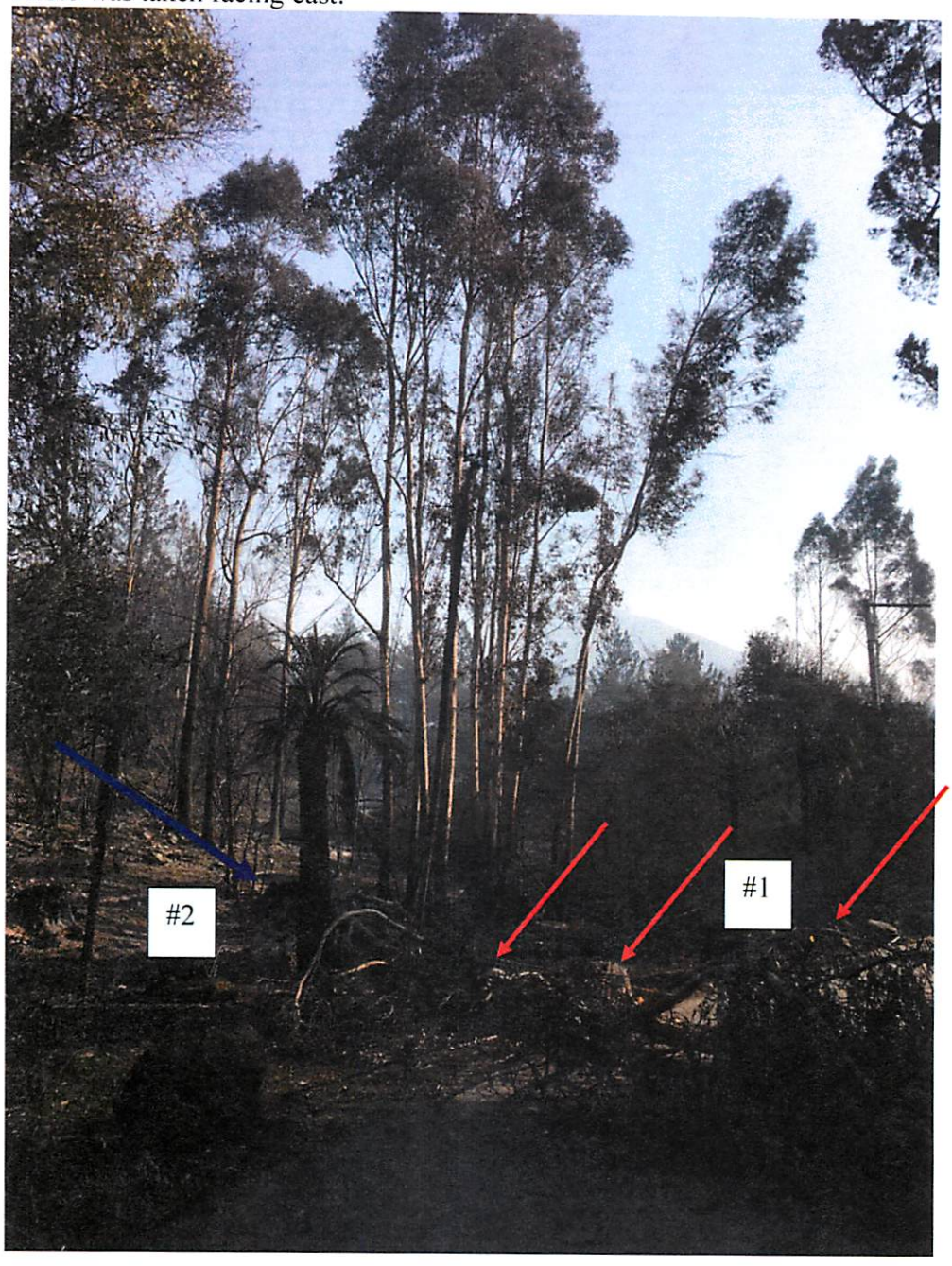
Appendix II Site Overview

8555 Sonoma Highway in Kenwood, California
Google Earth image 6/16/2017

Appendix III Photo 1 Subject Tree

1. Epicormic shoot (stump sprout) that fell
2. Original stump (blue arrow)

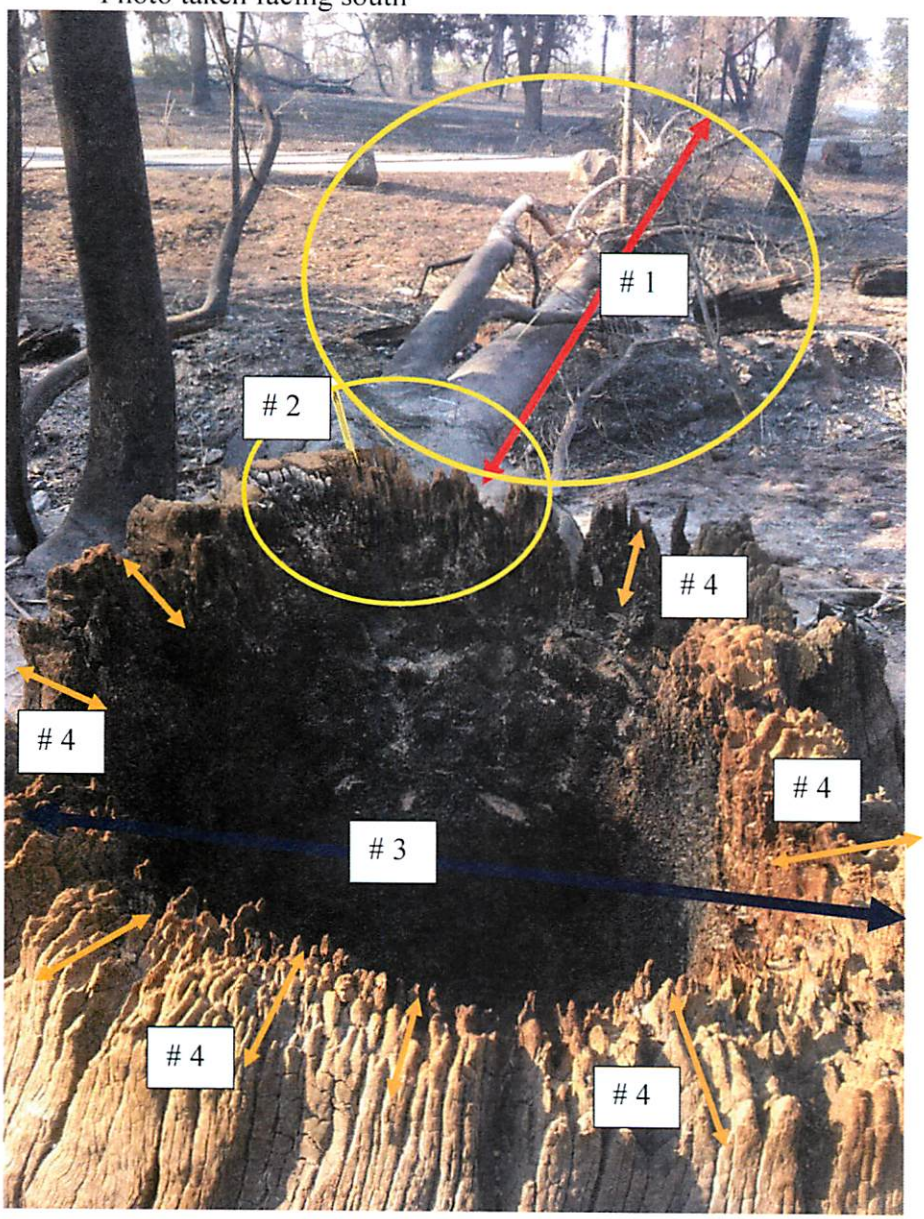
Photo was taken facing east.



Appendix III Photo 2 Subject Tree

1. Fall distance of epicormic shoot from rotting trunk to paved road is approximately 109 feet (double pointed red arrow). Large circle is the target impact area
2. Falttenning of the epicormic shoot connection to the rotting stump (yellow circle).
3. Rotting stump diameter appox. 26 inch diameter (thick blue double arrow).
4. Remaining shell thickness of rotting stump approx. 7-8 inches (narrow green arrows).

Photo taken facing south



Appendix III Photo 3 Subject Tree

Weakly attached epicormic shoot failure. Technically a trunk failure.

Appendix III Photo 4 Subject Tree

Glossary

Adventitious branch: branch arising from a stem or a parent branch and having no connection to apical meristems.

Adventitious root: roots arising from roots or stems and having no connection to apical meristems.

Bracket: the fruiting body of decay fungus (see conk)

Branch and trunk defects: Cavities, nesting holes. decay conks, old wounds, multiple branches arising at one level, dead branches and hangers, weakly attached branches from topping cuts, multiple pruning wounds from poor weight distribution, codominant branches with embedded bark, flat area on trunk with no basal flare, canker (Clark J. Matheny M. 1993. *A Handbook of Hazard Tree Evaluation for Utility Arborists)*

Buttress roots: roots at the trunk base that help support the tree and equalize mechanical stress

Conk: fruiting body or non-fruiting body (sterile conk) of a fungus. Often associated with decay (see bracket)

Crown: upper part of the tree, measured from the lowest branch, including all the branches and foliage.

CTFRP: The California Tree Failure Report Program

California Tree Failure Database: The California Tree Failure Report Program (CTFRP) was established in 1987 to collect quantitative information on the mechanical failure of urban trees (trunk breaks, branch breaks, and uprootings). This information is used to develop "failure profiles" for genera and species to more accurately assess failure probability in standing trees and thereby reduce failure potential in urban forests.

Conk: Fruiting body or non-fruiting body of a fungus. Often associated with decay. Woody or leathery spore-producing body of wood decay fungi, generally forming on the external surface of branches and trunks.

Consequences of Failure: Negligible, Minor, Significant, Severe.

Cooperators of the California Tree Failure Database Program: cooperators must be trained to report tree failures in writing to the program.

Coppicing: is a traditional method of woodland management which takes advantage of the fact that many trees make new growth from the stump or roots if cut down. In a **coppiced** wood, young tree stems are repeatedly cut down to near ground level.

Critical Risk of Failure: trees or tree parts are in the process of filling or prone to failure at any time.

DSH: Trunk diameter measured at 4.5 feet from ground level. A measurement used in tree size stats in chart form. DBH (diameter at breast height) refers to the same height where the diameter measurement is taken. DBH is used frequently in urban forestry.

Epicormic shoot: a shoot growing from an epicormic bud, which lies underneath the bark of a trunk, stem, or branch of a plant. A type of vegetative regeneration.

Heartwood: wood that is altered (inward) from sapwood and provides chemical defense against decay-causing organisms and continues to provide structural strength to the trunk. Trees may or may not have heartwood contrast with sapwood (outer wood that actively transports water and minerals).

Heart Rot/Heartwood Rot: Any of several types of fungal decay of tree heartwood, often beginning with infected wounds on the living portion of wood tissue. Also called heart rot.

Mode of Failure: when trees fail there are three modes of failure. Roots, trunk, or branch. The failure modes describe the type of failure that has occurred. Certain species with known failure profiles help managers make informed decisions to reduce the risk of tree failures. There are four possibilities: Very Likely, Likely, Somewhat Likely, Unlikely.

Static or Unmovable Target: include permanent or semi-permanent (not easily moved) structures such as buildings and powerlines.

Target Zone: an area in which the tree or tree part is likely to fall when it fails.

Trunk Failure: A tree failure that occurs somewhere along the trunk.

Bibliography

ANSI A300 (Part 9) -2011 Tree Risk Assessment. Tree Care Industry Association, 2011.

Bernhardt, Elizabeth A., and Tedmund Julian. Swiecki. *The State of Urban Forestry in California: Results of the 1988 California Urban Forest Survey*. Plant Science Consulting & Research, 1989.

Breloer, Helge. *The body language of trees A handbook for failure analysis*. Edited by Claus Mattheck, Rombach GmbH, 1994. Handbuch der Schadenskundle von Baumen

Clark, James R., et al. *A Handbook of Hazard Tree Evaluation for Utility Arborists*. International Society of Arboriculture, 1993

Dunster, Julian A., et al. *Tree Risk Assessment Manual*. International Society of Arboriculture, 2013.

Gregory A. Dahle, Kenneth R. James, Brian Kane, Jason C. Grabosky, and Andreas Detter. 6 *A Review of Factors That Affect the Static Load- Bearing Capacity of Urban Trees.* Arboriculture & Urban Forestry 2017. 43(3):89–10

Harris. 1992. *Arboriculture Integrated Management of Landscapes Trees, Shrubs, and Vines* Second Edition, ISBN 0-13-044280.

Ritter, Matt. *A Californian's Guide to the Trees among Us*. Heyday, 2011

University of California. *California Tree Failure Report Program* (http://ucanr.edu/sites/treefail/CTFRP_Statistics/

Urban Forest Ecosystems Institute NRES Department California Polytechnic State University San Luis Obispo, CA 93407 Ufei@calpoly.edu. *Select a Tree.* http://selectree.calpoly.edu/treedetail.lasso?rid=569.

E. Thomas Smiley – Nelda Matheny - Sharon Lilly - International Society of Arboriculture – 2011 *Tree Risk Assessment Best Management Practice.*

Kempter, Geoffrey P. *Utility Pruning of Trees, Best Management Practices*. International Society of Arboriculture, 2004.

Forest Research and Outreach Article Title: *Ponderosa Pine (Pinus ponderosa)* Date Accessed: October 27, 2017 Author: University of California Agriculture and Natural Resources.

Assumptions and Limiting Conditions

1. Any legal description provided to the consultant/appraiser is assumed correct. Any titles and ownerships to any property are assumed good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.

2. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other governmental regulations.

3. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant can neither guarantee nor be responsible for the accuracy of information provided by others.

4. The consultant shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.

5. Loss or alteration of any part of this part of this report invalidates the entire report.

6. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior express written or verbal consent of the consultant/appraiser.

7. Neither all nor any part of the contents of this report, nor copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales or other media, without my prior expressed written or verbal consent.

8. This report and any values expressed herein represent my objective and independent opinion. My fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.

9. Sketches, diagrams, graphs, or photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.

10. Unless expressed otherwise: information contained in this report covers only those items that were examined and reflects the condition of those items at the time of photographic inspection.

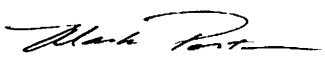
Certificate of Performance

I certify that the statements made in this report to be true and correct to the best of my knowledge. The opinions expressed are my personal, unbiased professional opinions and conclusions, and I have no present or prospective interest in the vegetation that is the subject of this report. I have no personal interest or biases with respect to the parties involved, and have based my assessment on the situation as I have seen it.

My compensation is not contingent on the reporting or a predetermined outcome or direction that favors the cause of the client, the attainment of a stipulated result, or the occurrence of a subsequent event.

My opinions and conclusions were developed, and this report prepared in conformity with standard arboricultural practices, my expertise, and experience. If further documentation or evidence is reviewed, these opinions could be changed, altered, or maybe strengthened.

I further certify that I made a personal inspection of the property, and no one provided any significant professional assistance to this report.



Mark Porter, Consulting Arborist

ATTACHMENT C

CAL FIRE Forester Report by Jeremiah Steuterman

DEPARTMENT OF FORESTRY AND FIRE PROTECTION

Jeremiah Steuterman
Forestry Assistant II
Boggs Mountain Demonstration State Forest
PO Box 839
Cobb, CA 95426
(707) 928-4378
Website: www.fire.ca.gov

Site 1 of 1

Date of visit: 10/11/2017

Incident #150: Adobe Incident

Location:
Chateau St. Jean Winery
8555 Sonoma Hwy
Kenwood, CA
95452

Prevention Officer: Gary Uboldi

Stand Description:

The environment in this location is California oak woodland with Douglas Fir and Blue Gum Eucalyptus ingrowth. The tree in question is part of a ¼ acre grove of eucalyptus growing adjacent to a Class IV (man-made) drainage (Figure 1). The stand features a codominant hardwood overstory with dominant Blue Gum Eucalyptus and Douglas Fir. Native species present in the stand include Douglas Fir (*Pseudotsuga menziesii*), Canyon Live Oak (*Quercus crysolepis*), and Pacific Madrone (*Arbutus menziesii*). Non-native species include Blue Gum Eucalyptus (*Eucalyptus Globulus*), Palm Trees (*Arecaceae sp.*), and other ornamentals planted adjacent to the nearby driveway.

Present in the stand are approximately 10 Eucalyptus stumps that, judging from the state of decay and consistent diameter of the stump sprouts, were cut at approximately the same time several decades ago (Figure 2). The economics of tree removal make it likely that these trees were all removed in a single harvest entry, as opposed to one at a time over a period of years. The original trees were removed from the site, instead of felled and left on site. Since the original harvest new trees have sprouted from the old stumps and have reached an average height of approximately 100 ft. There is no evidence of any

other management action (pruning, limbing, herbicide application, etc.) since the removal of the original parent trees.

No insect damage or pathogens were observed in the stand.

Figure 1: Fallen Eucalyptus stump sprout. Also in the frame are Eucalyptus sprouts growing from other stumps within the stand.

Figure 2: The flat top to this stump indicates that the portion of the tree above it was cut, as opposed to breaking off. The same flattened top can be seen in the stump in the background. The consistent state of decay and similar size of the stump sprouts indicate that these trees were all cut in one entry.

Species Description:

Blue Gum Eucalyptus is a widely cultivated tree native to Australia and first introduced to California in the mid-1800's. It is a fast growing, evergreen tree, with thin papery bark that peels off in large strips before falling to the forest floor. The mature leaves are dark green and sickle shaped. It is a vigorous stump sprouter that will regenerate quickly after the main stem is cut.

Individual Tree Description:

Fallen Eucalyptus Stump Sprout

- 26.2" diameter where sprout met stump (Figure 3)
- 11.6" diameter smaller stem (Figure 4)
- 19.0" diameter main stem (Figure 5)
- Length: 114.85' (Figure 6&7)
    - 5.1' from nail to root collar
    - 109.75' from nail to tip

The tree in question is a sprout growing from the still living root system of a tree that was cut down many years previously. The sprout forks into two stems, a secondary and a main stem, 8.2' above the root collar. The sprout was growing up over the top of the stump it was sprouting from, but was only rooted at the base of the tree at the root collar (Figure 8 and Figure 9). The failure of the stump appeared to be due to a structural weakness as opposed to any insects, decay, or other pathogen. The branches on the sprout in question were all weighted to one side, consistent with how the tree fell (Figure 10).

Figure 3: Diameter taken at the point where the sprout was growing over the top of the old stump. The ridge that is visible where the nail is driven in is the edge where the sprout met the top of the old stump.

Figure 4: Diameter of the smaller fork.

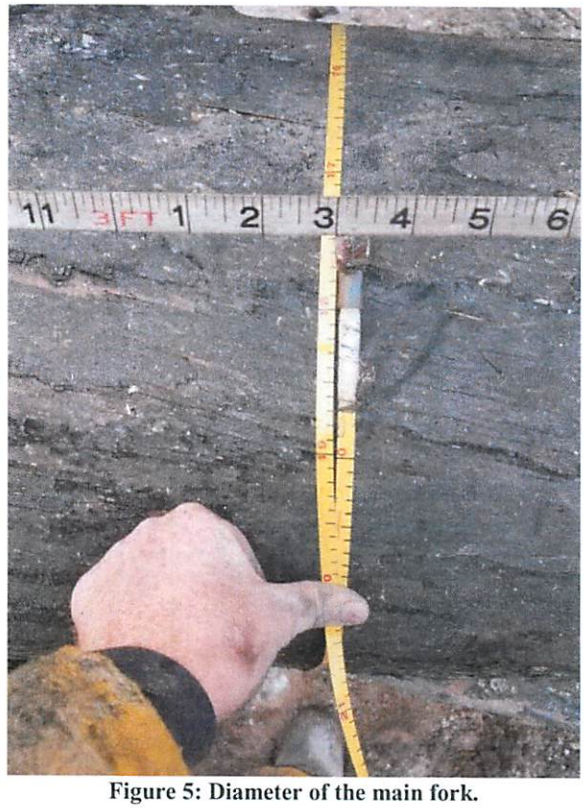


Figure 5: Diameter of the main fork.

Figure 6: Nail inserted at point where sprout was growing over the top of the stump. Tree length was measured from the nail to the farthest tip of the branches, and then from the nail to the root collar. The sum of these two numbers is given as the total tree length.

Figure 7: Measurement of the length of the fallen sprout from the nail to the farthest tip of the branches.

Figure 8: View of the portion of the sprout that was growing over the top of the old stump.

Figure 9: Close up view of the roots of the sprout at the base of the old stump.

Figure 10: The branches in this image can all be clearly seen growing from the same side of the main stem.

ATTACHMENT D

PG&E Work Order #103891848

Electric Overhead Tag

Notification #: 103891848
PM Order #: 30742010
Priority: E **Sub Priority:** M
Date Identified: 06/02/2009 **Date Required:** 12/31/2009

Identified in Field By:	KLLA	Plat:	II3223
Street Address:	8545 SONOMA HWY 12	Circuit:	04307-1101, DUNBAR
		SSD:	1261
City:	KENWOOD	Equipment #:	
Cross Street:	ADOBE CANYON RD	Pin #:	
Division:	North Coast (S)	Pole #:	
Latitude:		OIS #:	
Longitude:		SAP Func. Location:	ED.44-II32230000
Description:	REPL XARM - 8545 SONOMA HWY 12, KENWOOD	SAP Equipment:	
		Accessibility Tier:	

Item Details

	Facility Type	Damage	Cause	Action
Item 1	CRSS Crossarm	BROK Broken/Damaged	UNKN Unknown	REPL Replace
	☒ Completed ☐ Canceled			
Item 2	MOLD Molding	MISS Missing	UNKN Unknown	REPL Replace
	☒ Completed ☐ Canceled			

☐ Pole Test Sheet

User Status

Conductor/Operating Information		Field Identification		Field Condition (Exposure)		Field Condition (Accessibility)		Other	
Status	Description	Status	Description	Status	Description	Status	Description	Status	Description
SERV	Service	INSP	Inspection					COMP	Completed
OH	Overhead								

Job Estimates

Est. Total Hrs. to Complete: 0
Est. Electric Crew Size: 03
WTC: 605, 2AA_Genl Repl_No_Est_OH
Main Work Center: STROSA, Santa Rosa
Gas Crew Size: 00
MAT: 2AA, OH Genl Repl
Funded Repair Date:

Issued To

Reviewed By: _____ Date of Field Review: _____
Completed or Canceled in Field By (LAN ID): L I E U If No LAN ID Last Name, First Name: _____
Complete or Cancel Date: 01/14/2010 Actual Hours: 12.00 *Check One: PG&E Crew ☐ T-Man ☐ Contractor ☐
*Check One: Completed ☒ Canceled ☐ Found Completed Upon Arrival ☐
Signature: _____
I verify that all maintenance on this notification is addressed (completed, canceled, or found completed upon arrival)

***Public Safety & Regulatory Reviewer: If notification was canceled, check one (required):**

- ☐ **CONV:** Converted to another Notif-Type
- ☐ **EROR:** Created in Error (Desk Cancelation)
- ☐ **PROG:** Completed under another Program
- ☐ **DUMM:** "Dummy" for order only
- ☐ **NCOA:** All Found Completed/Resolved on Arrival
- ☐ **DUPL:** Duplicate EC for Same Location
- ☐ **NOCR:** No Compelling/Regulator Condition Exist

List of Tasks on Notification

Completed Completed By: LIEU Completion Date: 01/14/2010

Electric Overhead Tag

Notification #: 103891848
PM Order #: 30742010
Priority: E **Sub Priority:** M
Date Identified: 06/02/2009 **Date Required:** 12/31/2009

Field Comments:

Comments

07/02/2009 14:26:12 [redacted] (SXBF) Phone [redacted]
LOC: 218429527867
BTA/LTA - YES. 8' XARM ON THIS POLE IS BROKEN. MADE TEMP REPAIR WITH A SLING. ALSO REPLACE WOOD GROUND MOLDING. CONTRACTOR WORKING ON HOUSE SAID CUSTOMER IS PLANNING TO PUT ELECTRIC UNDER GROUND. SEE PHOTOS.
11/06/2009 13:24:14 [redacted] (LJL3) Phone [redacted]
PER [redacted] CUST STILL NOT READY - XARM CAN'T WAIT
TAG TO W&R TO SCHEDULE
11/09/2009 07:47:49 [redacted] (SAG0) Phone [redacted]
TAG FILED IN EPCM FILES SAG0
11/18/2009 10:10:09 [redacted] (LJL3) Phone [redacted]
CLICK SCHEDULED FOR [redacted] 12/14/09
11/19/2009 11:55:05 [redacted] (LJL3) Phone [redacted] CHANGED FROM OLD PRIORITY G TO NEW PRIORITY E
12/30/2009 10:47:12 [redacted] (LJL3) Phone [redacted]
CLICK SCHEDULED FOR [redacted] 1/14/2010 R EXPEDITE
12/30/2009 13:59:28 [redacted] (SAG0) Phone [redacted]
JOB HANDED OFF TO [redacted] FOR WK OF 1-11-10
01/15/2010 13:28:04 [redacted] (PDS8) Phone [redacted]
GATE COMBO [redacted]
BAD ORDER CROSSARM REPLACED WITH PART 4, REBUSS TRANSFORMER.
COMPLETED PER [redacted] 1/14/2010 (12 HRS)
03/05/2014 07:27:42 [redacted] (J2N2) Phone [redacted]
30742010E Mapping Received As-Built package
03/05/2014 07:27:45 [redacted] (J2N2) Phone [redacted]
30742010E Mapping Completed map & record posting, pending lead review
03/05/2014 07:27:47 [redacted] (J2N2) Phone [redacted]
30742010E Mapping Completed, job filed
03/04/2018 19:02:40 PST [redacted] (MAR4) Phone [redacted]
"2/27/2018-m1p3; Backlog Order Close; ZKOD clear, construction completed, mapping DC10 with LANID completed, all closing criteria met, orders reviewed by triage analyst team. WO0000003508887"

FDA		New	Priority	Comp
Anchor				
Broken/Damaged	Repair		E	
	Replace		E	
Corroded	Repair		E	
	Replace		E	
Missing	Install		F	
Soil/Eroded/Graded	Adjust		F	
	Replace		F	
Animal Mitigation				
Mitigation Missing	Install		E	
Bird Protection				
Bird Protection	Replace		E	
CB Pole				
Broken/Damaged	Replace		F	
Burnt	Replace		E	
Decayed/Rotten	Replace		F	
Booster/Regulator				
Broken/Damaged	Repair		E	
	Replace		E	
Burnt	Repair		E	
Excessive Operation	Overhaul		E	
Leaks/Seeps/Weeps	Clean		E	
	Repair		E	
	Replace		F	
Capacitor				
Broken/Damaged	Repair		E	
	Replace		E	
Burnt	Repair		E	
	Replace		E	
Leaks/Seeps/Weeps	Clean		B	
	Repair		E	
	Replace		E	
Climbing Space				
Obstructed	Adjust		F	
	Replace		F	
Conductor				
Broken/Damaged	Repair		E	
	Replace		E	
Burnt	Repair		F	
	Replace		F	
Clearance Impaired	Adjust		E	
	Install CL Pole		F	
	RayChem		E	
Floater	Repair		E	
Idle Facilities	Remove		F	
Improper Connection	Adjust		E	
Overloaded	Test		F	
Sag/Clearance	Adjust		F	
	Replace		F	

EMERGENCY ONLY Check Cause (Required)			
☐	Animal	☐	Bird
☐	Equip Failed	☐	Fire
☐	Lightning	☐	Pole Rotten
☐	Third Party	☐	Tree Branch
☐	Tree Contact	☐	Tree Fell
☒	Unknown	☐	

All FDA's identified in field
Priority = Default Priority for B, E, G, & F-Regulatory FDA's
Comp = Check if completing FDA in Field

FDA		New	Priority	Comp
Connector				
Burnt	Replace		E	
Corroded	Repair		E	
	Replace		E	
Temp Differential	Replace		E	
	Replace		F	
Crossarm				
Broken/Damaged	Repair		E	
	Replace		E	X
Burnt	Repair		E	
	Replace		E	
Decayed/Rotten	Repair		E	
	Replace		E	
Cutout				
Broken/Damaged	Repair		E	
	Replace		E	
Clearance Impaired	Adjust		F	
Flashed	Repair		E	
	Replace		E	
Decorative Streetlight				
Broken/Damaged	Replace		E	
Missing	Install		E	
Fault Indicators				
Broken/Damaged	Replace		E	
Ground				
Broken/Damaged	Repair		B	
	Replace		B	
Exposed	Repair		F	
Missing	Install		E	
Guy				
Broken/Damaged	Repair		E	
	Replace		E	
Clearance Impaired	Adjust		F	
Corroded	Repair		E	
	Replace		E	
Loose	Adjust		F	
Missing	Install		F	
Overgrown	Trim		F	
Strain/Abrasion	Adjust		F	
	Remove		F	
Guy Marker				
Missing	Install		F	
Hardware/Framing				
Bird Prot Required	Install		E	
Broken/Damaged	Repair		E	
	Replace		E	
Loose	Adjust		E	
Missing	Install		E	
High Sign				
Missing	Install		F	
Insulator				
Broken/Damaged	Replace		E	
Flashed	Replace		E	
Primary Squatter	Repair		F	
	Replace		F	
Secondary Squatter	Repair		E	
	Replace		E	
Jumper				
Burnt	Replace		E	
Clearance Impaired	Adjust		E	

FDA		New	Priority	Comp
Lightning Arrester				
Broken/Damaged	Replace		E	
Flashed	Replace		E	
Marking				
Broken/Damaged	Replace		F	
Missing	Install		F	
Molding				
Broken/Damaged	Repair		F	
	Replace		F	
Loose	Adjust		F	
Missing	Install		F	
OH Facility				
Bird Prot Required	Install		E	
Graffiti	Paint		E	
Idle Facilities	De-Energ		E	
	Remove		F	
	Transfer		F	
Limited Access	Inspect		B	
	Patrol		E	
	Remove		E	
Obstructed	Inspect		B	
Pole				
Broken/Damaged	Re-Frame		E	
	Repair		E	
	Replace		E	
	Pole Stub		E	
Burnt	Repair		E	
	Replace		E	
	Pole Stub		E	
Clearance Impaired	Repair		E	
	Replace		E	
Decayed/Rotten	Pole Top Repair		E	
	Repair		E	
	Replace		E	
	Pole Stub		E	
Idle Facilities	Remove		F	
Leaning	Adjust		F	
	Replace		F	
Overloaded	Replace		E	
	Test		E	
No Safe Access to Pole	Inspect		B	
Woodpecker Damage	Assessment		E	
Recloser/Sectionalizer				
Broken/Damaged	Repair		E	
	Replace		E	
Excessive Operation	Overhaul		E	
Flashed	Repair		E	
	Replace		E	
Leaks/Seeps/Weeps	Clean		E	
	Repair		E	
	Replace		E	
Riser/Pothead				
Broken/Damaged	Repair		E	
	Replace		F	
Flashed	Repair		E	
	Replace		F	
RTVI				
Interference	Repair		E	
	Replace		E	

FDA		New	Priority	Comp
SCADA/PDAC				
Broken/Damaged	Repair		F	
	Replace		F	
Leaks/Seeps/Weeps	Repair		F	
	Replace		F	
	Test		B	
Steel Lattice Pole				
Guarding Missing	Install		E	
Pole Step				
Clearance Impaired	Remove		F	
Streetlight				
Broken/Damaged	Repair		E	
	Replace		E	
Missing	Install		E	
Switch				
Broken/Damaged	Repair		E	
	Replace		E	
Trans_Dist Pole				
Bonding Broken	Repair		E	
Tie Wire				
Broken/Damaged	Replace		E	
Loose	Replace		E	
Transformer				
Broken/Damaged	Repair		E	
	Replace		F	
Corroded	Replace		E	
Flashed	Repair		E	
	Replace		E	
Idle Facilities	Remove		F	
Overloaded	Test		E	
Leaks/Seeps/Weeps	Clean		B	
	Repair		F	
	Replace		E	
Tree/Vine				
Clearance Impaired	Remove		E	
	Trim		F	
Decayed/Rotten	Install CL Pole		E	
Overgrown	Remove		E	
	Trim		E	
Trip Saver				
Broken/Damaged	Repair		E	
	Replace		E	
Under-Arm Bus				
Broken/Damaged	Repair		F	

ATTACHMENT E

PG&E Data Request Response
(In Response to Data Request #1, Question 10)

PACIFIC GAS AND ELECTRIC COMPANY
October 2017 Wildfires
CPUC Data Request – Common

Requesters: Leslie L. Palmer and Nicholas Sher
Request Date: November 21, 2017

Question 10 – Part 3:
Please provide all Vegetation Management records (Records for request 7 & 8) for subject circuit(s) for the past five (5) years.

Response to Question 10 – Part 3:
PG&E's initial response to this question was sent on February 28, 2018 and included copies of PG&E's Vegetation Management (VM) inspection records, work requests, and vegetation control inspection records for the incident locations, as defined by the CPUC's December 7, 2017, letter completed between October 8, 2012 and October 8, 2017. The response also stated that PG&E was continuing to compile hard copy inspection maps associated with the increased VM inspection activities, also known as enhanced ground patrols, for the incident locations in the last five years.

PG&E is now producing the hard copy inspection maps associated with the drought-related, increased VM inspection activities (enhanced ground patrols) for the incident locations in the Bates number range PGE-CPUC_00012586 – PGE-CPUC_00012651. Please note that, as requested, PG&E is only producing the map pages that include information about the incident locations. In all cases, the produced map covers patrol areas beyond the incident locations. Also note that records pertaining to LiDAR and/or spectral imagery data collected at incident locations are provided in response to Question 14.

In addition to the enhanced ground patrols documented in these hard copy inspection maps, PG&E's Project Management Database (PMD) indicates that the following drought response patrols were also completed on the subject circuits in the last five years. After a reasonable search of its records, PG&E is unable to locate the maps for these patrols. As such, PG&E cannot definitively determine whether the precise incident locations were included in these patrols. PG&E's VM records at these incident locations, produced with its initial response to this question on February 28, 2018, indicate that no work was prescribed during these enhanced ground patrols.

- Adobe (Incident No. 171010-8558): 2015 CEMA WUI Patrol
- Lobo (Incident No. 171012-8565): 2014 CEMA Patrol
- Potter Valley (Incident No. 171009-8553): 2016 CEMA WUI Patrol
- Sulphur (Incident No. 171011-8562): 2016 CEMA WUI Patrol

Response provided by:

[redacted] Principal, Vegetation Management, 245 Market Street, San Francisco, CA 91405