

CALIFORNIA PUBLIC UTILITIES COMMISSION

Safety and Enforcement Division Electric Safety and Reliability Branch

Incident Investigation Report

Report Date: 06/13/2020

Incident Number: E20191028-01

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

Date and Time of the Incident: October 27, 2019 at 1440 hours

Location of the Incident: Marylinn Drive & Barker Street, Milpitas, Santa Clara County

Summary of Incident:

On October 27, 2019, at approximately 1440 hours, with gusting wind of up to 40 miles-per-hour (mph), PG&E's 12 kV Dixon Landing Feeder 2102 was broken and fell to the ground at Marylinn Drive & Barker Street. This downed electric wire resulted in power outage to 1,610 customers and caused four fires in the neighborhood. Milpitas Fire Department (MFD) extinguished the fires. PG&E restored power supply to almost all the customers on October 28, 2019 at 1650 hours. My investigation found that PG&E failed to maintain the minimum safety factor of 1.33 for the conductor of the Dixon Landing Feeder 2102.

Fatality / Injury: None

Property Damage: Dixon Landing Feeder 2102

Utility Facilities Involved: PG&E Dixon Landing Feeder 2102, 12 kV

Witnesses:

No.	Name	Title	Contact
1	Charles Mee	CPUC Investigator	415-730-7012 charles.mee@cpuc.ca.gov
2	Omid Sarvian	Event Lead	415-973-4470, F1S2@pge.com
3	Eric Emmanuele	Milpitas Fire Dept, Chief Enforcement Officer	669-252-5452, eemmanuele@ci.milpitas.ca.gov

Evidence:

No.	Source	Description
1	PG&E	Initial Report
2	PG&E	20-Day Final Report
3	PG&E	Responses to SED DR Set 1
4	MFD	Investigation Report
5	MFD	Pictures taken on October 27&28, 2019
6	SED	Pictures taken on October 29, 2019

Observations and Findings:

On October 29, 2019, I visited the fire sites, took some pictures. I interviewed Omid Sarvian, Event Lead for PG&E. I also interviewed Eric Emmanuele, Chief Enforcement Officer of Milpitas Fire Department. Based on the site visit, the interview, and reviewing of the reports and responses, I have developed the following observations and findings:

1. The Fire Incident

On October 27, 2019, the City of Milpitas experienced high winds of 15 mph, gusting up to 40 mph, and National Weather Service issued “Red Flag Warning”. At approximately 1440 hours, a resident heard two sharp sounds like glass bottles dropping on the ground and saw a fire, Fire 1, ignited from several palm trees on the north side of Marylinn Drive. Please see Figure 1 for the damages caused by Fire 1.

Figure 1: Fire 1 on North Side of Marylinn Drive, Milpitas, CA



Almost at the same time, another fire, Fire 2, started on the south side of Marylinn Drive near 294 Barker Street. Two to three houses were seriously damaged by Fire 2. Please see Figure 2 for the damages caused by Fire 2.

Figure 2: Fire 2 on South Side of Marylinn Drive, Milpitas, CA



The Fire 2 grew exponentially in the heavy bamboo landscaping, spreading to the residence and the detached garage of 294 Barker Street. Embers traveled further south and caused Fire 3 at 235 Casper Street, damaging at least one house. Please see Figure 3 for the damages caused by Fire 3.

Figure 3: Fire 3 at 235 Casper Street



Later on, another fire, Fire 4, started near 258 Barker Street, damaged two to three houses. Please see Figure 4 for the damages caused by Fire 4.

Figure 4: Fire 4 at 258 Barker Street



Overall, the incident caused four fires in the neighborhood. Please see Figure 5 for the locations of the above four fire sites.

Figure 5: Fire Map



Per the MFD report, the MFD responded the fire call on October 27 at 1445 hours and contained the fires to this scope and extinguished the fires on October 27 at 1600 hours with no injuries. The MFD also noted broken down wire segments located between Fire 1 and Fire 2 sites. Please see Figure 6 for the broken wire.

Figure 6: Broken Wire Between Fire 1 and Fire 2 Sites



PG&E received the first outage notification at 1445 hours and dispatched a PG&E troubleman at 1455 hours. The PG&E troubleman reviewed several trouble locations until he arrived at the wire down location between the Fire 1 and Fire 2 on October 27 at 1910 hours. PG&E reported that the wire down resulted in 1,610 customers out of power.

On October 27, 2019 at 2225 hours, PG&E closed Line Recloser XR084, restoring 400 customers.

The MFD also reported that during the power restoration, a service drop lost insulation and caused sparks. Fortunately, these sparks did not cause another fire. Through communication, someone cut and isolated the damaged service drop from the distribution system. After that, the power restoration was conducted smoothly. Please see the Figure 7 for the damaged service drop.

Figure 7: Damaged Service Drop



On October 28 at 0000 hours, the MFD informed the PG&E troubleman not to make repairs to the remaining facilities due to the ongoing fire investigation. PG&E collected five downed wire segments from the ground and removed one dead end from the pole at Fire 2 site into evidence.

On October 28, 2019 at 1535 hours, the MFD released the scene to PG&E. At this point, PG&E repair crews replaced one 100 foot span of 4 ACSR, and the remaining 1,210 customers were restored on October 28 at 1650 hours.

2. My investigation and analysis

- 1) PG&E failed to retain the design and construction data for the 4 ACSR wires of the 12 kV Dixon Landing Feeder 2102

Through data request, I found that PG&E failed to maintain the design and construction data for the 4 ACSR wire that was broken under the windy condition. On February 13, 2020, I issued Data Request Set 1 to PG&E. Question 2 of the Data Request Set 1 asked PG&E the following sub-questions:

“Please answer the following questions with regard to the broken wire and the wire replacement:

2.1. Please provide the clearance and tension of the broken wire before the incident including:

2.1.1. Clearance between the phases A, B, and C in both design value and measured value,

2.1.2. Clearance between the wires and the road surface of the Maylnn Drive in both design value and measured value,

2.1.3. Tension of the wires both in design value and measured value.

2.2 Please provide the clearance and tension of the new 4 ACSR wire replacement including:

2.2.1. Clearance of the new wires between the phases A, B, and C in both design value and measured value,

2.2.2. Clearance between the new wires and the road surface of the Maylnn Drive in both design value and measured value,

2.2.3. Tension of the new wires both in design value and measured value.”

However, PG&E’s response to the above questions is as following:

“PG&E constructs to Overhead Construction Manual standards but does not obtain and document measurements of clearances or tensions in the course of construction.”

PG&E failed to retain the design and construction data for the wires, so PG&E lacks essential information and data for the 4 ACSR wires. PG&E also failed to provide the design and construction data to SED, so SED does not know the strength of the wires.

2) PG&E failed to maintain the safety factor of 1.33¹ for the 4 ACSR wires in the Dixon Landing Feeder 2102

Since PG&E does not know the strength of the 4 ACSR wires in the Dixon Landing Feeder 2102, PG&E cannot maintain the required strength with minimum safety factor of 1.33 for the 4 ACSR wires, PG&E failed to replace the wires before the wires deteriorated to a safety factor of less than 1.33. Ultimately, the wires were broken, interrupting power supply and causing fires and damages.

Preliminary Statement of Pertinent General Order, Public Utilities Code Requirements, and/or Federal Requirements:

No.	Public Utility Code/General Order	Code/Rule No.	Violation
1	General Order 95	Rule 44.3	Yes

The Commission General Order 95, Rule 44.3 Replacement states:

¹ The Commission GO 95, Table 4: Minimum Safety Factors listed that for conductors, the original safety factor is 2 for Grade A, B, and C construction. Rule 44.3 required that for Grade A and B construction, the minimum safety factor should be maintained not less than 2/3 of original SF of 2 ----1.33. The 21 kV Dixon Landing Feeder 2102 is a Grade B construction and PG&E should maintain the minimum Safety Factor to be more than 1.33 for this feeder.

“Lines or parts thereof shall be replaced or reinforced before safety factors have been reduced (due to factors such as deterioration and/or installation of additional facilities) in Grades “A” and “B” construction to less than two-thirds of the safety factors specified in Rule 44.1 and in Grade “C” construction to less than one-half of the safety factors specified in Rule 44.1. Poles in Grade “C” construction that only support communication lines shall also conform to the requirements of Rule 81.3–A. In no case shall the application of this rule be held to permit the use of structures or any member of any structure with a safety factor less than one.”

GO 95, Rule 44.1, Installation and Reconstruction states in part:

“Lines and elements of lines, upon installation or reconstruction, shall provide as a minimum the safety factors specified in Table 4.”

The 4 ACSR wires in the 12 kV Dixon Landing Feeder 2102 is a Grade “B” construction. According to Table 4, a safety factor of 2 must be established for the 4 ACSR wires when installed.

In order to meet the above requirements, PG&E has to maintain the safety factor of $2/3 * 2 = 1.33$ for the 4 ACSR wires all the time. If PG&E can maintain the safety factor of 1.33 for the conductor all the time, it will not be broken. However, the conductor was broken, fell to the ground, and caused four fires that damaged number of houses. This is the evidence that PG&E failed to maintain the minimum safety factor of 1.33 for the Dixon Landing Feeder 2102. As a result, PG&E is in violation of this Rule 44.3.

Conclusion:

Table 4 of GO 95 requires a minimum safety factor of 2 for Grade B conductors. The failed conductor was identified as a Grade B construction; according to Rule 44.3, it required replacement prior to its safety factor reduced below 1.33 which is $2/3$ of the minimum safety factor of 2. Since the conductor failed to withstand the wind force and fell to the ground, PG&E did not maintain the minimum safety factor of 1.33 for the conductor; therefore, PG&E is in violation of GO 95, Rule 44.3.