

INVESTIGATION REPORT
OF THE
WOOLSEY FIRE

SAFETY AND ENFORCEMENT DIVISION
ELECTRIC SAFETY AND RELIABILITY BRANCH
LOS ANGELES

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I. Summary of Incident:

On Thursday, November 8, 2018 at 1422 hours, the Edison 16 kV Big Rock circuit out of Chatsworth substation relayed and locked out. At 1424 hours, the Ventura County Fire Department received notice of a fire, now known as the Woolsey Fire, at the Santa Susana Field Laboratory in the Simi Hills, just south of Simi Valley. The fire ignited at two points simultaneously and these two locations were designated by CalFire as Sites 1 and 2.

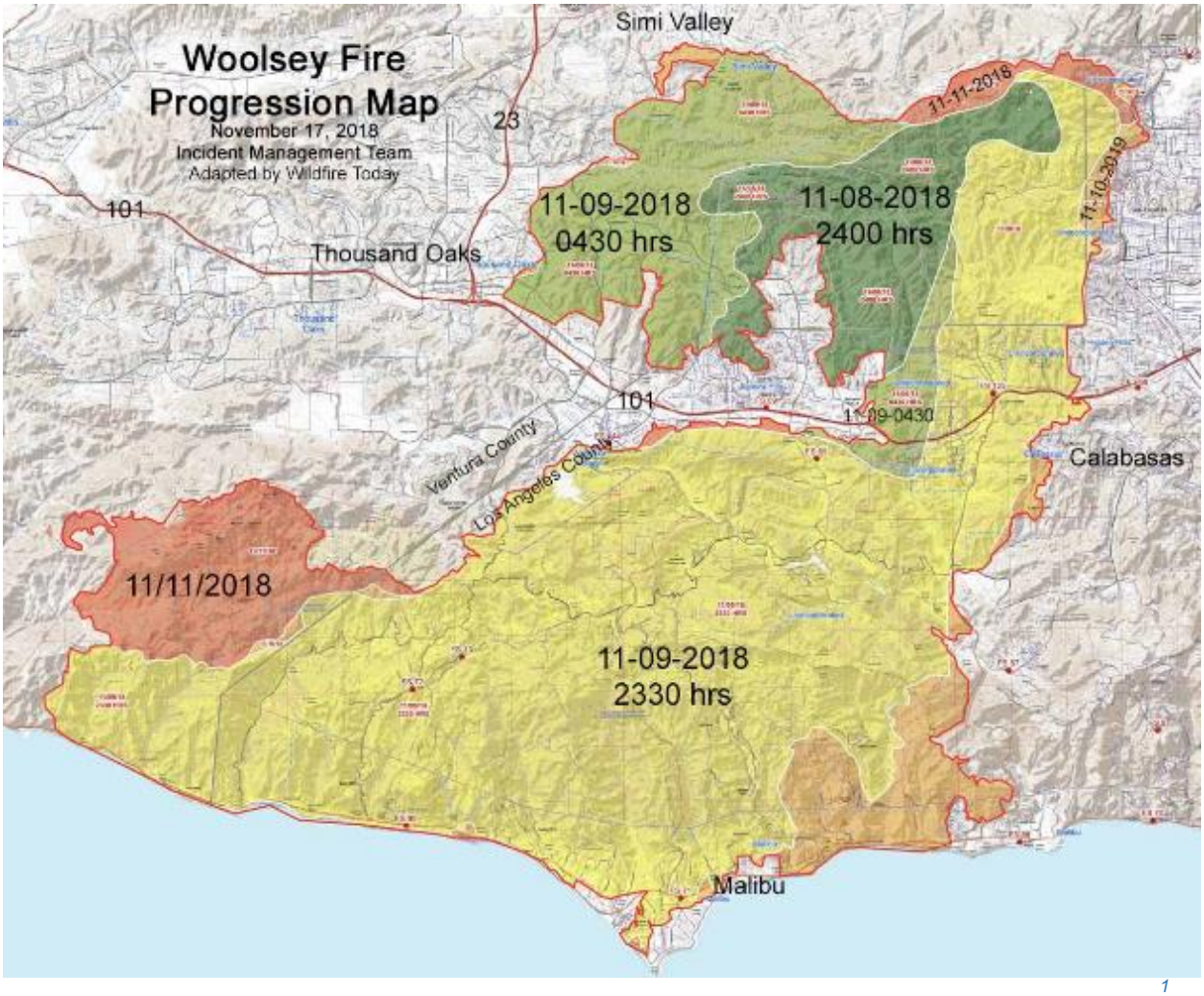
SED's investigation determined that a loose transmission down guy wire attached to pole number 4534353E (the "Steel Pole") contacted an Edison 16 kV jumper wire and caused an arc flash between them. The arc flash caused hot metal fragments to drop to the ground, igniting the brush below. This ignition site came to be known as Site 2. In addition, the contact caused the steel pole to become energized, thus energizing all guy wires attached to it. Among these guy wires was a distribution down guy wire that was in contact with an Edison Carrier Solutions (ECS) messenger wire on a wooden pole nearby. This messenger wire also became energized and went on to transmit the power to a second ignition site down the road that would be designated as Site 1.

The messenger wire extended about one quarter mile east to Site 1 between poles number 4650857E and 4557126E; these two poles supported several other communications conductors in addition to an ECS communications conductor from Site 2. Trees in this area had been growing into the communication conductors between these poles and pressing them together. This overgrowth caused the energized messenger wire and its lashing wire to make contact with another messenger wire and its lashing in the same span. The contact between the two sets of wires caused an arc, which partially melted the lashing wires and caused hot fragments of lashing wire to fall into the brush below. These hot metal fragments ignited the brush and started a second fire there at Site 1. These two brush fires converged as they burned south and became the Woolsey Fire.

The Woolsey Fire went on to burn 96,949 acres of land, destroy 1,643 structures, cause three fatalities, and prompted the evacuation of more than 295,000 people in the area. The total damage to property is estimated to be approximately $6 billion. The total cost of damages to Edison facilities had not been tabulated as of the time this report was issued. The fire was 100% contained at 1821 hours on November 21, 2018.

Cal Fire's investigation report states, "the Investigation Team (IT) determined electrical equipment associated with the Big Rock 16kV circuit, owned and operated by Southern California Edison (SCE), was the cause of the Woolsey Fire. The IT determined the fire was caused by a series of events. The series of events began when a slack SCE transmission guy wire arced with the energized A-phase jumper conductor on pole number 4534353E at Site #2. This event energized pole number 4534353E and its guy wires. A slack distribution guy wire located on the south side of pole number 4534353E was in contact with hardware associated with the SCE communication line, thus causing the SCE communication line strand, traveling east towards Site #1, to energize. The

SCE communication line between Site #1 and Site #2 was continuous with no ground and contacted an adjacent unidentified communication line at Site #1. This series of events resulted in heated material falling into a receptive fuel bed at both Site #1 and Site #2, thereby causing the Woolsey Fire."



[1]

[1] https://wildfiretoday.com/2019/10/23/draft-report-released-for-the-woolsey-fire-has-94-recommendations/

A. Violations in Brief:

SED reviewed and analyzed records, inspected and examined physical evidence, and interviewed witnesses related to this incident to determine compliance with Commission rules and regulations. SED's investigation determined that Edison committed 26 violations of Commission rules.

Violations associated with conductors, guy wires, and communication cables supported on Pole number 4534353E at Site 2:

- Four (4) violations of General Order 95, Rule 38 - Minimum Clearances of Wires from Other Wires
- Three (3) violations of General Order 95, Rules 56.2 - Use (of Overhead Guys, Anchor Guys and Span Wires)

Violations associated with the overgrown vegetation and the adjacent communication cables at Site 1:

- One (1) violation of General Order 95, Rule 38 – Minimum Clearances of Wires from Other Wires
- One (1) violation of General Order 95, Rule 35 – Vegetation Management
- One (1) violation of General Order 95, Rule 31.1 – Design, Construction, and Maintenance

Other violations at Site 2:

- Two (2) violations of General Order 95, Rule 84.4-D4 – Conductors Passing Supply Poles and Unattached Thereto
- One (1) violation of General Order 95, Rule 92.4-D1 – Exposed Cables and Messengers
- One (1) violation of General Order 95, Rule 83.4B – Messengers of Different Pole Line Systems
- Three (3) violations of General Order 95, Rule 31.1 – Design, Construction, and Maintenance
- One (1) violation of General Order 95, Rule 44.3 – Replacement (of lines or parts thereof)
- One (1) violation of General Order 95, Rule 37 - Minimum Clearances of Wires above Railroads, Thoroughfares, Buildings, Etc.
- One (1) violation of General Order 95, Rule 31.6 – Abandoned Lines

- Two (2) violations of General Order 95, Rule 18 - Maintenance Programs and Resolution of Potential Violations of General Order 95 and Safety Hazards
- Two (2) violations of General Order 95, Rule 31.2 – Inspection of Lines

Cooperation with Commission staff

- One (1) violation of Public Utilities Code § 316; for failing to cooperate with SED
- One (1) violation of General Order 95, Rule 19, Cooperation with Commission Staff; for failing to cooperate with SED

II. Background

A. Witnesses:

No.	Name	Title	Address
1	Derek Fong	SED Investigator	320 W. 4th St, Los Angeles, CA 90013
2	James Miller	SED Investigator	320 W. 4th St, Los Angeles, CA 90013
3	Bryan Pena	SED Investigator	320 W. 4th St, Los Angeles, CA 90013
4	Eric Coolidge	Edison Claims Investigator	2244 Walnut Grove Ave, Rosemead, CA 91770
5	Scott Hayashi	Edison Claims Investigator	2244 Walnut Grove Ave, Rosemead, CA 91770
6	Juan Alvarado	Edison Cable Splicer	2244 Walnut Grove Ave, Rosemead, CA 91770
7	Scott Baumgardner	Edison Senior Patrolman	2244 Walnut Grove Ave, Rosemead, CA 91770
8	Frank Cardosa	Edison Planner	2244 Walnut Grove Ave, Rosemead, CA 91770
9	Jose Chavez	Edison Cable Foreman	2244 Walnut Grove Ave, Rosemead, CA 91770
10	Brian Due	Edison Troubleman	2244 Walnut Grove Ave, Rosemead, CA 91770
11	Dan Hovechar	Edison Planner	2244 Walnut Grove Ave, Rosemead, CA 91770

12	Aaron Hoyt	Edison General Foreman	2244 Walnut Grove Ave, Rosemead, CA 91770
13	Matthew Payne	Edison Production Specialist	2244 Walnut Grove Ave, Rosemead, CA 91770
14	Juan Perez	Edison Cable Splicer	2244 Walnut Grove Ave, Rosemead, CA 91770
15	Daniel Urquidez	Edison System Inspector	2244 Walnut Grove Ave, Rosemead, CA 91770
16	Julio Bravo	Circle Wood Services Construction Site Representative	3670 W Temple Ave #273, Pomona, CA 91768
17	Michael Haskell	Contra Costa Electric Supervisor	3208 Landco Dr, Bakersfield, CA 93308
18	Dirk Obenshain	Contra Costa Electric Supervisor	3208 Landco Dr, Bakersfield, CA 93308
19	Keith Dennis	Henkels & McCoy Foreman	2840 Ficus St, Pomona, CA 91766
20	Gabriel Ponce	Henkels & McCoy Foreman	2840 Ficus St, Pomona, CA 91766
21	Henry Madrid	Quanta Utility Services Technician	2315 W Foothill Blvd, Upland, CA 91786
22	Vince Bergland	CalFire Investigator	210 S Academy Ave Sanger, California
23	Ryan Miller	Ventura County Fire Department Investigator	165 Durley Avenue, Camarillo CA 93010

B. Evidence:

No.	Description
1	Email notification to USRB reporting address, Subject: Electric Safety Incident Reported- Southern California Edison Company Incident No: 171205-8645, dated Tuesday, December 05, 2017
2	Edison 315 Letter dated December 6, 2018 (Confidential)
3	SED Data Request SED-001 Edison and responses
4	SED Data Request SED-002 Edison and responses
5	SED Data Request SED-003 Edison and responses
6	SED Data Request SED-004 Edison and responses
7	SED Data Request SED-005 Edison and responses
8	SED Data Request SED-001 AT&T and responses
9	SED Data Request SED-001 Boeing and responses
10	Photographs Taken by SED Staff
11	2015 Fire Report by Ventura County Fire Department
12	EUO of Substation Workers Bravo, Haskell, Madrid, and Obenshain

C. Description of Edison Facilities

The Woolsey Fire involved two sites of ignition, designated as Sites 1 and 2. The events at Site 2 occurred first and ultimately led to the ignition at Site 1 as well. Site 2 is located at the Santa Susana Field Laboratory (SSFL) about 400 feet south of Chatsworth Substation, and Site 1 is located in a wooded field about one quarter mile east of Site 2.

Site 2

The facilities involved at Site 2 included pole number 4534353E (hereafter referred to as "the Steel Pole") and pole number 984161E,[2] a stubbed wooden pole (hereafter "the Stubbed Pole"), located about thirty feet south of the Steel Pole. See Figure 2.



Figure 2: Site 2 as viewed from the north (left) and from the south (right).[3]

It is a common practice for electrical utility companies to create a Stubbed Pole, also known as a "buddy pole," in the process of replacing a pole that supports both communications and electrical conductors. First, the new pole is installed near the old one, and then the utility company or its contractor transfers the utility's conductors from the old pole onto the new one. All communications conductors remain on the old pole, which is then cut or "topped" just above the highest remaining conductor. Afterwards, it is the responsibility of the owner of the communications conductors to move them to the new pole.

[2] Bates EDISON-SEDWS00013253.

[3] Photos taken as part of the SED's inspection of the sites with CALFIRE.

Edison staff installed the Steel Pole in March of 2008 to replace two poles, numbered 1528777E and 984161E.[4] Pole number 1528777E supported three conductors of a 66 kV transmission circuit which Edison transferred to the Steel Pole when it was installed. Pole number 984161E supported four conductors (three energized conductors and one neutral conductor; neutral conductors are not energized) of the 16 kV Big Rock distribution circuit as well as four communications conductors. In May of 2008, Edison's contractor, Hot Line Construction, moved the four conductors of the 16 kV Big Rock circuit on pole number 984161E to the Steel Pole. Hotline staff then cut or "topped" the wood pole above the height of the communications conductors and left it as a stubbed pole.

On the date of the incident, November 8, 2018, the Steel Pole supported facilities at multiple levels: three conductors of a 66 kV Edison transmission circuit, four conductors of the 16 kV Big Rock circuit, and two Edison fiber optic cables.[5] The Steel Pole also supported several down guy wires, three of which were loose at the time the incident occurred. Two of those loose down guy wires located at site 2 would be involved in the ignition of the Woolsey Fire by acting as conductors on which the fault current would travel.

Overhead circuit designers and planners use down guy wires to provide structural support to utility poles. These wires attach to the pole and to an anchor in the ground, and help poles resist bending forces. Since a wire has no significant compressive strength, they must remain taut in order to provide this support.

One of the loose down guy wires on the Steel Pole was in contact with a messenger wire on the Stubbed Pole. Another loose down guy wire on the Steel Pole would make contact with an energized conductor on the Steel Pole, setting off a chain of events that lead to the two fires.

The Stubbed Pole supported four communications conductors. Two belonged to Edison Carrier Solutions (ECS), but Edison had stopped using the one of them by the time the incident occurred.[6] The owners of the other two communications conductors could not be determined.

Three of the four communications conductors supported by the Stubbed Pole ran north from the Stubbed Pole and past the Steel Pole. This included the two ECS conductors and one conductor of unknown ownership. These three conductors were deflected by the Steel Pole, but not attached to it. The messenger wire that had previously supported the two ECS conductors running past the steel pole had been broken or cut, and one end of it had been wrapped around the base of the steel pole (this messenger wire will be referred to as "Messenger Wire 3" further in the report; see figure 3). The other end

[4] Bates EDISON-SEDWS00003624.

[5] Bates EDISON-SEDWS00013473.

[6] Bates EDISON-SEDWS00000375.

of the broken messenger wire was lying on the ground between the Steel Pole and a pole to the north. The northern pole had a pole tag marking it as pole number 1258776E, however Edison's records designate the pole as number 1528776E.



Figure 3: Messenger Wire 3 broken and wrapped around the base of the Steel Pole.[7]

Communications conductors have a low strength-to-weight ratio, so utility companies often use messenger wires to support them and to provide additional strength. A messenger wire is a twisted strand of wires totaling about one-quarter inch in diameter. The messenger wire is attached to the communications conductor by another, smaller wire known as lashing wire, which is wrapped around both the communications conductor and the messenger wire. See Figure 4.

[7] Photo taken as part of the SED's inspection of the sites with CALFIRE.



Figure 4: A messenger wire supporting a communications conductor and wrapped with lashing wire. Note that this is a stock image and that this particular communications conductor was not involved in the Woolsey Fire in any way. However, the communications infrastructure involved in the Woolsey Fire was very similar to that depicted in the image.

The Stubbed Pole supported communications conductors that ran to the north, east, and west. The communications conductors running east and west from the pole each had their own messenger wires which were connected together via a "through bolt", a bolt that penetrated all the way through the pole horizontally. One of the northbound communications conductors also had a messenger wire (Messenger Wire 3, which was wrapped around the base of the Steel Pole), but this messenger wire was not electrically linked to the other two messenger wires on the Stubbed Pole. Messenger Wire 1 ran to the west, and Messenger Wire 2 ran to the east toward Site 1. Although the east-and-westbound messenger wires were separate and distinct, they were electrically connected by the through bolt they had in common. One of the loose down guy wires on the Steel Pole was in contact with Messenger Wire 1 at the time the incident occurred. See Figure 5.

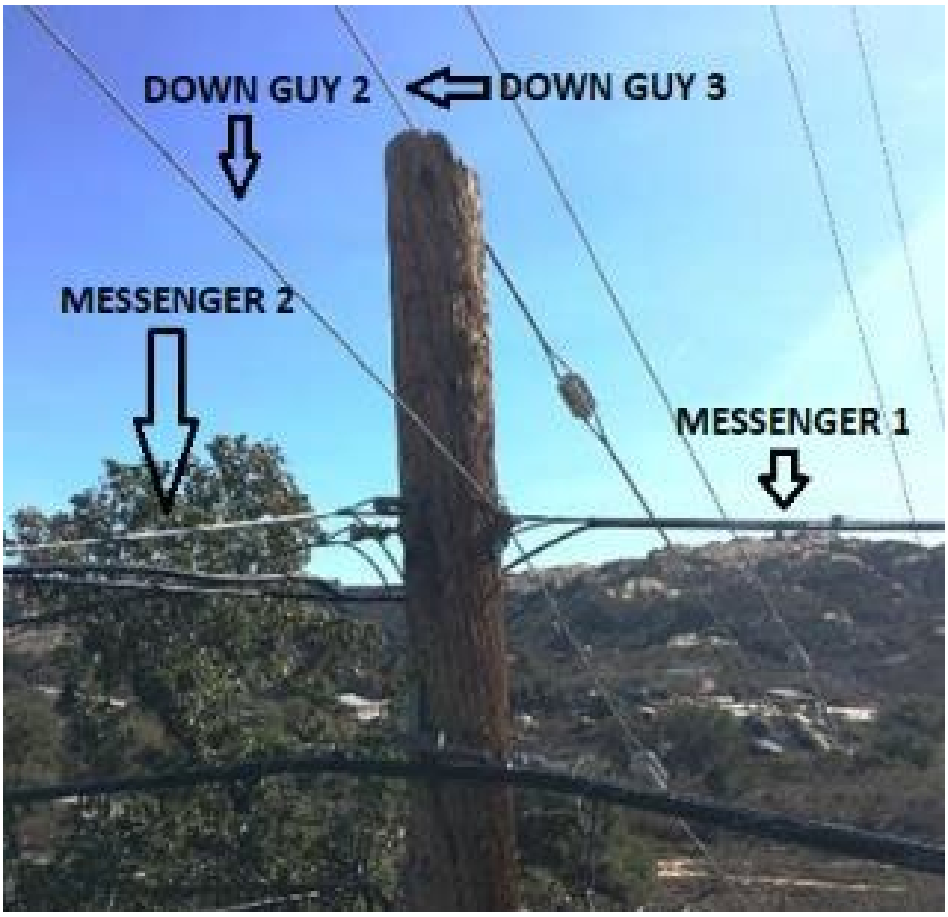


Figure 5: The Stubbed Pole as viewed from the northwest. Note the loose down guy in contact with Messenger Wire 1.[8]

The three messenger wires on the Stubbed Pole had been designed to be bonded together, that is, electrically linked for grounding purposes. Each of the three messenger wires had a wire extension on the end and these ends were designed to be connected to one another by way of bonding clamps, which are small, simple metal clamping devices. However, at the time of the incident, the three messenger wires were not bonded together, although the bonding clamps were present and ineffectually attached to the wire extension on Messenger Wire 1. See Figure 6.

[8] Photo taken as part of the SED's inspection of the sites with CALFIRE.



Figure 6: The top of the Stubbed Pole as viewed from the southwest. Note the unattached bonding extension on Messenger Wire 1 in the photograph on the left. On the right is a detail of the extension showing the unused bonding clamps.[9]

The topmost communications conductors on the stubbed pole belonged to Edison Carrier Solutions (ECS). These communications conductors were installed some time before January of 2006[10]. The westbound conductor (Cable No. 06044) was no longer in use at the time of the incident.[11] The eastbound conductor (Cable No. 06051) was still in use at the time of the incident, although Edison had installed a fiber optic cable for a similar purpose on July 29, 2014.[12][13] Cable No. 06051 extended east from Site 2 to Site 1, about one quarter mile away. This communications conductor and its associated messenger guy (referred to as "Messenger Wire 2") and lashing wire were involved in the ignition at Site 1.

Site 1

Site 1 is located about one quarter mile east of Site 2 between poles numbered 4650857E and 4557126E. These two poles supported some of the same facilities as the Steel Pole at Site 2, including the four conductors of the Big Rock 16 kV circuit and the fiber optic cables. Additionally, these two poles also supported ECS Cable No. 06051 (the one involved in the incident) and two additional communications conductors of unknown ownership. At the time of the incident, overgrown tree branches were pressing the ECS conductor into contact with one of the other communications conductors there. See Figure 7.

[9] Photos taken as part of the SED's inspection of the sites with CALFIRE.

[10] Bates EDISON-SEDWS00003986.

[11] Bates EDISON-SEDWS00000375

[12] Bates EDISON-SEDWS00013257.

[13] Bates EDISON-SEDWS00000016



Figure 7: Overgrown tree branches pressing the ECS communications conductor into the third-party communications conductor at Site 1. The communications conductors separated from their messenger guys when their lashing wires melted during the arcing event.[14]

See Figure 8 for a simplified diagram of the facilities at Sites 1 and 2 at the time of the incident.

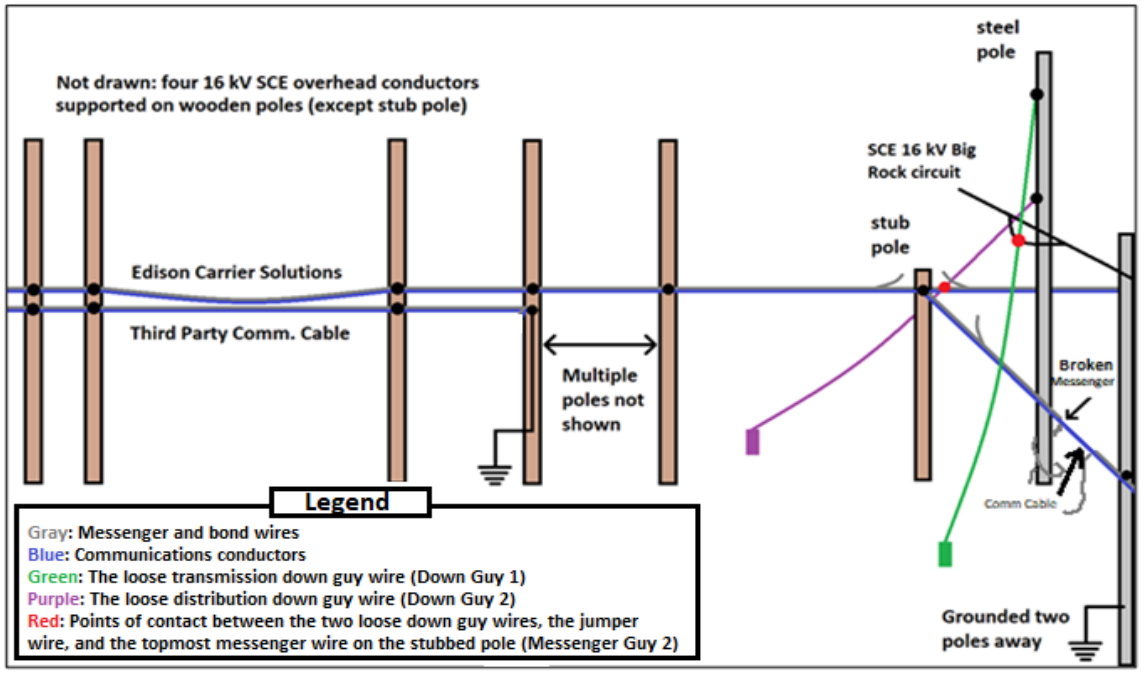


Figure 8: Diagram of the facilities at Site 1 and Site 2. Site 1 is on the left, and Site 2 is on the right.

[14] Photo taken as part of the SED's inspection of the sites with CALFIRE.

D. Description of Events

On November 8, 2018, the Big Rock circuit out of Chatsworth Substation operated under System Operating Bulletin (SOB) 322[15] due to high winds and low humidity.[16] The area was experiencing sustained wind speeds of 23 miles per hour, wind gusts of up to 37 miles per hour, and a relative humidity of around 7%.[17]

Some portions of the chain of events below have not been confirmed by Edison. SED staff has inferred the following events through observation and inspection of evidence at Sites 1 and 2.

At 1422 hours, the Big Rock circuit relayed[18] and locked out when a loose Edison transmission down guy wire ("Down Guy 1") contacted an energized Edison 16 kV jumper wire supported on the Steel Pole (number 4534353E). When Down Guy 1 contacted the jumper wire, an arc flash occurred between the two wires that sprayed hot metal fragments to the ground, igniting the brush below. CalFire designated this ignition site as Site 2.

An arc flash can occur when a large amount of electrical current passes through a small air-filled space between two conductors. The result is a sudden and intense emission of light and heat as the arc reaches temperatures of between approximately 5,000 and 35,000° F. This is hot enough to melt or vaporize most metals (the melting point of stainless steel is about 2,750 °F and the boiling point of iron is 5,184 °F).

When Down Guy 1 contacted the jumper wire, it became energized, which caused the Steel Pole to become energized as well. As a result, a loose Edison distribution down guy wire (Down Guy 2) attached to the Steel Pole also became energized. Down Guy 2 was also in contact with an ECS messenger wire (Messenger Wire 1) via a steel through-bolt that was supported on the Stubbed Pole. This contact caused Messenger Wires 1 and 2 to become energized along with their respective lashing wires. See Figure 9.

[15] SOB 322 requires reclosers to be set to manual.

[16] Edison's Incident Report (315 Letter).

[17] Bates Edison-SEDWS00000107.

[18] SCE's Initial Reporting Email.

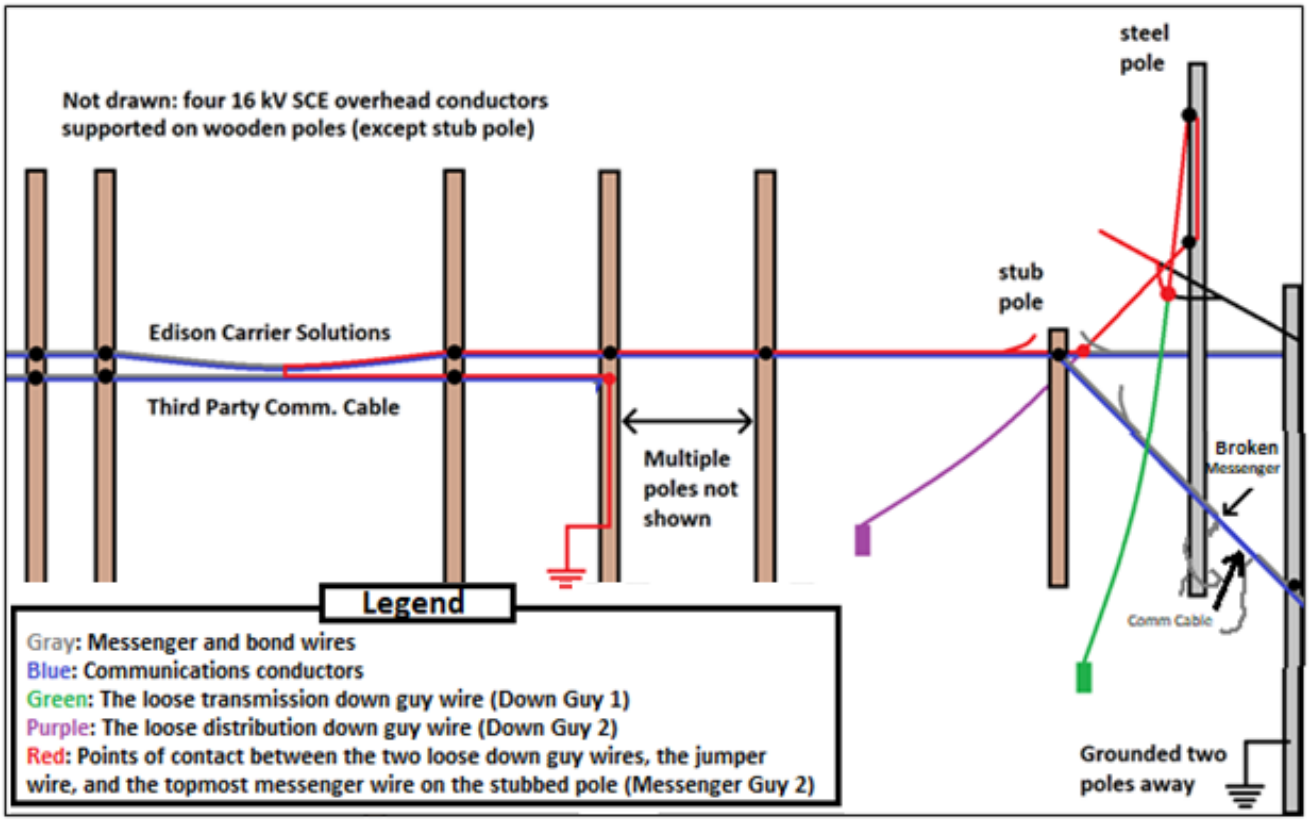


Figure 9: Path of electrical current during the incident. The path of the electric current is represented in red. The loose transmission down guy wire in green made contact with the jumper wire on the Steel Pole, energizing the pole and all its attachments. The loose distribution down guy wire in purple made contact with the messenger wire on the Stubbed Pole. The eastbound messenger wire made contact with the grounded messenger and lashing wires of the third-party communications conductor at Site 1.

About one-quarter mile to the east of Site 2 and between poles 4650857E and 4557126E, Messenger Wire 2 and its lashing wires contacted a third-party messenger wire (Messenger Wire 4) and its lashing wire. Messenger Wire 4 supported a third-party communications conductor of unknown ownership. This contact resulted in a second arc flash that caused the lashing wires to partially melt, fall to the ground, and ignite the brush below it. CalFire designated this ignition site as Site 1.

At 1424 hours, an Edison contractor employee working at Chatsworth Substation called 911 and reported a fire to the south of the substation.[19] Edison reported the incident to SED at 2012 hours that evening.[20]

[19] EUO of Bravo, Haskell, Madrid, and Obenshain.

[20] Bates Edison-SEDWS00000208.

III. SED's Investigation

A. Observations and Findings

On November 14, 2018, SED Staff visited Site 2. SED Staff observed damage to an Edison transmission down guy wire (Down Guy 1), which was near an Edison 16 kV jumper wire on the east side of the Steel Pole. SED Staff rode an aerial work platform up to the height of the jumper wire and observed damage to the jumper wire and down guy consistent with arcing. Staff measured the radial clearance between the jumper wire and Down Guy 1 and found the clearance to be approximately seven inches. From measurements taken after the incident, Edison also confirmed that the clearance was approximately seven inches.[21] See Figures 10-14.

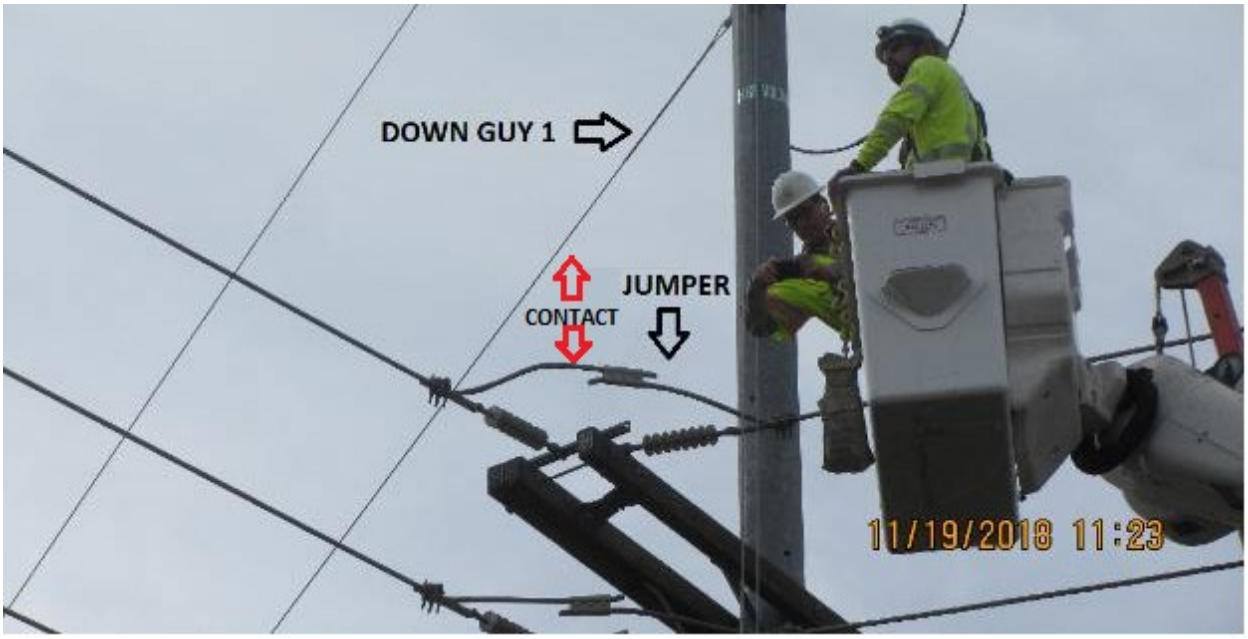


Figure 10: Utility staff taking photographs of the down guy and jumper that made contact on the Steel Pole. Contact occurred between the red arrows.[22]

[21] Bates EDISON-SEDWS00013441.

[22] Photo taken as part of the SED's inspection of the sites with CALFIRE.



Figure 11: A lateral view of Down Guy 1 and the jumper wire taken from an elevated work platform from the northeast.[23]



Figure 12: The jumper wire and transmission down guy wire (Down Guy 1) on the Steel Pole. Note the burn marks on the jumper wire and the damage to the down guy wire.[24]

[23] Photo taken as part of the SED's inspection of the sites with CALFIRE.

[24] Photo taken as part of the SED's inspection of the sites with CALFIRE.



Figure 13: A detail of the damage to the jumper wire on the Steel Pole and the transmission down guy wire, Down Guy 1.[25]



Figure 14: The jumper and down guy that made contact as viewed from the base of the Steel Pole.[26]

[25] Photo taken as part of the SED's inspection of the sites with CALFIRE.

[26] Photo taken as part of the SED's inspection of the sites with CALFIRE.

Staff observed that Down Guy 1 was loose and had sustained damage consistent with contacting the Edison 16 kV jumper wire. Staff noted that two other Edison down guy wires on the south side of the Steel Pole were also loose. The second loose down guy wire, Down Guy 2, was in contact with Messenger Wire 1 on the Stubbed Pole. The third loose down guy wire, Down Guy 3, was in contact with the top of the Stubbed Pole. Staff observed dark discoloration around the contact point between Down Guy 2 and the ECS through-bolt. See Figures 15-18.



Figure 15: The Steel Pole and Stubbed Pole as viewed from the northeast.

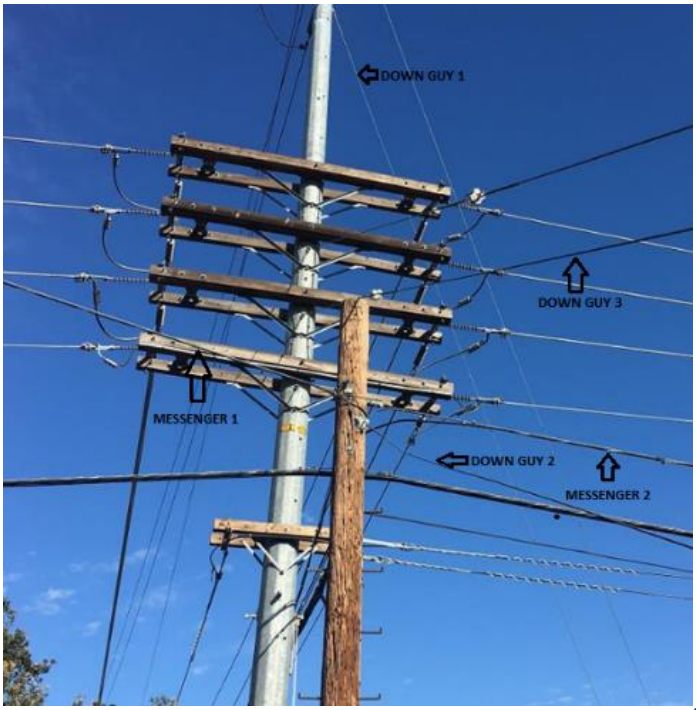


Figure 16: The Stubbed Pole and the Steel Pole as viewed from the south.[27]

[27] Photo taken as part of the SED's inspection of the sites with CALFIRE.



Figure 17: A closeup of the Stubbed Pole. Note that the bonding extension on Messenger Wire 1 is not attached to anything.[28]



Figure 18: A detail of the distribution down guy, Down Guy 2, in contact with Messenger Wire 1 and the through bolt on the Stubbed Pole. Note the blackened area on the down guy and the Stubbed Pole at the point of contact.[29]

[28] Photo taken as part of the SED's inspection of the sites with CALFIRE.

[29] Photo taken as part of the SED's inspection of the sites with CALFIRE.

Staff observed that the two ECS communications conductors attached to the Stubbed Pole traveled north past the Steel Pole towards Chatsworth substation. The two northbound ECS communications conductors were in contact with the surface of the Steel Pole but not attached to it. See Figure 19.



Figure 19: Communications conductors in contact with the surface of the steel pole, but not attached to it. Viewed from the northeast.[30]

Moreover, Messenger Wire 3 was broken between the Steel Pole and pole number 1258776E/1528776E. One end of Messenger Wire 3 was wrapped around the base of the Steel Pole and the other end of Messenger Wire 3 was lying on the ground between the poles. See Figure 20.

[30] Photo taken as part of the SED's inspection of the sites with CALFIRE.



Figure 20: Messenger Wire 3 wrapped around the base of the Steel Pole.[31]

Messenger Wire 3 was not bonded to the two other ECS messenger wires (Messenger Wires 1 and 2) that were attached to the through-bolt on the Stubbed Pole, although all three messenger wires had bonding wires and the bonding brackets were present on Messenger Wire 1. Bonding wires are short extensions on the end of messenger guys. They are designed to be connected together with brackets as part of a grounding scheme. See Figure 21.

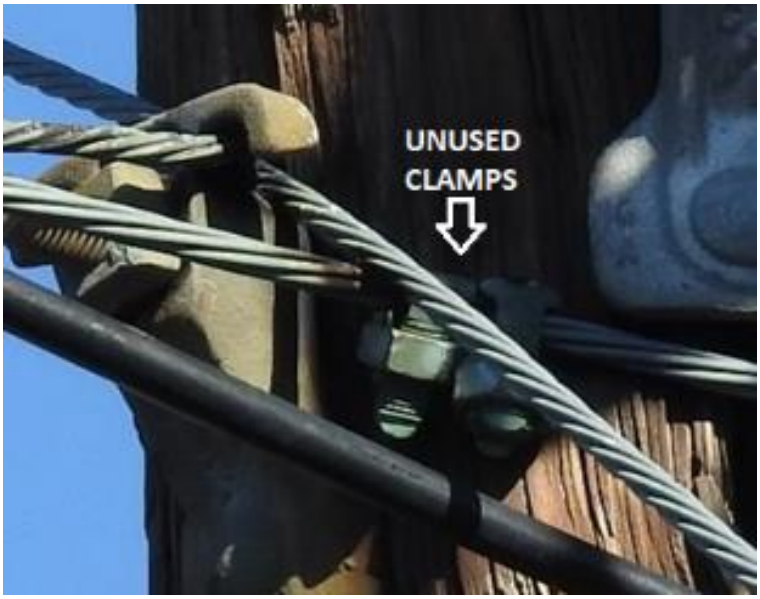


Figure 21: A detail of Messenger Wire 1 and Down Guy 2 showing the unused bonding clamps.[32]

[31] Photo taken as part of the SED's inspection of the sites with CALFIRE.

[32] Photo taken as part of the SED's inspection of the sites with CALFIRE.

At Site 1, Staff observed tree branches pressing into the communications conductors between poles numbered 4650857E and 4557126E. This caused insufficient clearance between the ECS communications conductor supported on Messenger Wire 2 and a third-party communications conductor on Messenger Wire 4. The lashing wires on both communications conductors were damaged, and the messenger wires had separated from the conductors they supported. See Figures 22-24.



Figure 22: Tree branches pressing the communications facilities together at Site 1. Viewed from the southwest from an elevated position.[33]

[33] Photo taken as part of the SED's inspection of the sites with CALFIRE.



Figure 23: Another view of the overgrown tree branches pressing the communications facilities together. Viewed from an elevated position in the south.[34]



Figure 24: One of the branches pressing the communications conductors together at Site 1.[35]

[34] Photo taken as part of the SED's inspection of the sites with CALFIRE.

[35] Photo taken as part of the SED's inspection of the sites with CALFIRE.

SED Staff used an aerial work platform to observe the damage up close. SED Staff observed burn marks on the messenger wires and found that pieces of lashing wire had been welded onto them. This damage is consistent with electrical arcing between the wires. See Figure 25.



Figure 25: A closeup of damage to a messenger guy and its lashing wire. Pieces of lashing wire were found welded together and also welded to the messenger guy.[36]

VCFD shared a 2015 fire report with SED that documented a fire that occurred at Site 1 on December 26, 2015.[37] VCFD also shared photographs taken on December 26, 2015 that showed overgrown tree branches pushing together the same two communications conductors. CalFire staff reported orally to SED staff that they had found small pieces of lashing wire buried under debris at Site 1 on or around November 14, 2018. It is likely that this 2015 fire occurred in the same manner as the November 8, 2018 fire and that these bits of lashing wire fell there during the 2015 incident. Edison could not provide any evidence of vegetation management taking place between these poles between the dates of November 8, 2008, and November 8, 2018.[38] See Figure 26.

[36] Photo taken as part of the SED's inspection of the sites with CALFIRE.

[37] VCFD's Incident No. 150089467.

[38] Bates EDISON-SEDWS00013268.



Figure 26: On the left are the communications conductors and tree branches as they appeared on November 14, 2018. On the right is a photograph taken by VCFD of the same part of the span in December 2015.[39]

SED attempted to identify the owners of the second communications conductor at Site 1 but could not determine the owner with certainty.

Edison claimed that AT&T was a joint owner of the two poles at Site 1 as well as the Stubbed Pole at Site 2. However, AT&T denied this.[40] Edison supported its claim by showing that AT&T had been billed for its portion of the joint pole fees for these poles as recently as November 2017.[41] Edison also provided records from the Southern California Joint Pole Association showing that AT&T was listed as a joint-owner of these poles as of June 29, 2019.[42] Additionally, Edison claims that it notified AT&T by mail of the planned transfer of facilities from the Stubbed Pole to the Steel Pole at Site 2 on both September 25, 2007 and February 17, 2009.[43] The Steel Pole was installed in 2008 as a replacement for pole number 1528777E,[44] which does not exist anymore.

The Steel Pole was supported by down guys at the transmission and distribution level. Edison's relay records showed that Down Guy 1 had previously contacted the 16 kV jumper wire located on the Steel Pole on January 20, 2017. In 2017, this contact caused a fault on phase A conductor of the Big Rock 16 kV circuit which resulted in a relay and several reclosures until the recloser locked out.[45] Those records indicate that the fault was caused by a loose down guy wire on the Steel Pole slapping against the 16kV

[39] Photo on left taken as part of the SED's inspection of the sites with CALFIRE. Photo on right provided courtesy of VCFD.

[40] AT&T's Response to SED 001.

[41] Bates EDISON-SEDWS00011715.

[42] Bates EDISON-SEDWS00012736-00012745.

[43] Bates EDISON-SEDWS00013270.

[44] Bates EDISON-SEDWS00013252.

[45] Bates EDISON-SEDWS00000097.

jumper wire. An Edison Troubleman who patrolled the circuit after the recloser locked out in 2017 observed that the down guy wire was loose and noted damage to it near the jumper before tightening the down guy wire.[46]

SED Staff traced Messenger Wire 2 and Messenger Wire 1 for about a mile in both the east and west directions and determined that they were not grounded or connected to ground wires. Edison also confirmed that the messenger was ungrounded.[47]

An electric fault current takes all paths available, including ground, in order to return to the original source of power. Proper grounding, such as the use of ground wires, provides alternative paths for that current to travel and return to the original source of power. The total amount of current will be distributed among each of those paths. The more paths the current has, the less current will travel on each path, and the less energy that will be dissipated by each of them as heat.

Staff observed that Messenger Wire 3 (the broken messenger wire) was bonded to a metal pole with a grounding rod to the north of Site 2. However, since Messenger Wire 3 was broken, it was neither bonded to Messenger Wire 1 nor bonded to Messenger Wire 2. Thus, the grounded portion of Messenger Wire 3 was electrically separated from Messenger Wire 2.[48]

With no grounding devices/wires attached to the messenger wires, the current from the fault event at Site 2 had only one path to ground which was through the messenger and lashing wires of the other communications conductor at Site 1. The contact between the two messenger wires caused arcing and melted parts of the lashing wire and ignited the brush below it. If Messenger Wire 1 or 2 had been properly grounded as prescribed by GO 95, Rule 92.4, some of the fault current would have traveled to ground through that ground connection and less heat would have been produced between the sets of messenger and lashing wires at Site 1. The production of less heat would have reduced chances of the lashing wire melting and igniting the brush below.

[46] Bates EDISON-SEDWS00013266.

[47] Bates EDISON-SEDWS00000377.

[48] The broken messenger guy, i.e. Messenger Wire 3, was noted by an inspector during a May 2018 telecom inspection. Bates EDISON-SEDWS00002892.

B. Violations

SED reviewed and analyzed records, inspected and examined physical evidence, and interviewed witnesses related to this incident to determine compliance with Commission regulations. SED's investigation discovered 26 violations:

Violation 1

General Order 95, Rule 38 - Minimum Clearances of Wires from Other Wires, Table 2, Column F, Case 19, requires the minimum clearance between a down guy wire and an energized, 16 kV conductor to be nine (9) inches.

SED Staff measured the clearance between Down Guy 1(or the loose Edison transmission down guy wire on the Steel Pole) and the Edison 16 kV jumper wire supported on pole number 4534353E (at Site 2) and found it to be approximately seven (7) inches. This clearance was measured with the guy wire at rest (no wind or outside forces that may cause the guy wire to move in any direction). Since the guy wire was less than the minimum mandatory clearance, there was a greater chance for it to make contact with the 16 kV jumper wire due to outsides forces, such as wind or any events that may cause he guy wire to move. Edison is in violation of Rule 38 for failing to ensure that Down Guy 1 maintained the minimum required clearance of nine (9) inches from the jumper wire.

Violation 2

General Order 95, Rule 38 - Minimum Clearances of Wires from Other Wires, Table 2, Column A, Case 1 requires the vertical clearance between messenger wires and down guy wires not supported on the same poles to be 18 inches.

Down Guy 2, at Site 2, on the south side of pole number 4534353E was touching the through-bolt supporting Messenger Wire 1. Down Guy 2 did not have the minimum required vertical clearance of 18 inches above Messenger Wire 1.

Violation 3

General Order 95, Rule 38 - Minimum Clearances of Wires from Other Wires, Table 2, Column A, Case 3 requires the minimum vertical clearance between down guy wires and communications conductors not supported on the same poles to be 24 inches.

Down Guy 2, at Site 2, was touching the through-bolt supporting Messenger Wire 1, which in turn supported ECS communications conductor No. 06044. As shown in Figure 14, Down Guy 2 passed approximately three (3) inches above the ECS communications conductor. Edison is in violation of the Rule 38 for failing to ensure that Down Guy 2 maintained the minimum required vertical clearance of 24 inches above the ECS communications conductor.

Violation 4

General Order 95, Rule 38 - Minimum Clearances of Wires from Other Wires, Table 2, Column C, Case 18 requires the minimum radial separation clearance between "guys passing conductors supported on other poles" and "communications conductors" to be three (3) inches.

Down Guy 2 was touching the through-bolt supporting Messenger Wire 1, which in turn supported ECS communications conductor No. 06044 traveling westbound. Edison is in violation of the Rule 38 for failing to ensure that Down Guy 2 maintained the minimum required radial clearance of three (3) inches from the ECS communications conductor.

Violation 5

General Order 95, Rule 38 - Minimum Clearances of Wires from Other Wires, Table 2, Column C, Case 8 requires the minimum vertical clearance between communications conductors supported at different levels on the same pole to be 12 inches.

The ECS communications conductor and the third-party communications conductor supported by poles numbered 4650857E and 4557126E had less than 12 inches of vertical clearance because they were pushed together by vegetation at Site 1. Therefore, Edison is in violation of Rule 38 for failing to ensure that ECS communications conductor No. 06051 maintained a minimum vertical clearance of 12 inches from the third-party communications conductor. This condition most likely existed since at least December of 2015 as shown by photographs taken by VCFD[49].

Violation 6, 7, and 8

General Order 95, Rule 56.2 – Use states in part:

> *Guys shall be attached to structures, as nearly as practicable, at the center of load. They shall be maintained taut and of such strength as to meet the safety factors of Rule 44.*

Violation 6

Down Guy 1 on pole number 4534353E was loose or not taut, which allowed it to make contact with the 16 kV jumper wire. Edison is in violation of Rule 56.2 for failing to ensure that this down guy wire was maintained taut.

[49] Ventura County Fire Department's Incident No. 150089647.

Violation 7

Down Guy 2 on pole number 4534353E was loose or not taut. Edison is in violation of Rule 56.2 for failing to ensure that this down guy wire was maintained taut.

Violation 8

Down Guy 3 on pole number 4534353E was loose or not taut. Edison is in violation of Rule 56.2 for failing to ensure that this down guy wire was maintained taut.

Violations 9 and 10

General Order 95, Rule 84.4-D4 – Conductors Passing Supply Poles and Unattached Thereto states in part:

> *The center line clearance between poles supporting supply conductors and any communications conductors which pass such poles unattached shall be not less than 22 1/2 inches (1 1/2 times the clearance specified in Table 1, Case 8), except where the supply pole is within 10 feet of the pole on which the communications conductors are supported. Where poles of the two lines are less than 10 feet apart, clearances not less than as specified in Table 1, Case 8, shall be maintained.*

The two northbound ECS communications conductors were contacting steel Pole 4534353E but were not attached to the pole. Edison is in violation for Rule 84.4-D4 for failing to ensure that the center line clearance between the two northbound ECS communications conductors and Pole 4534353E was at least 22.5 inches.

Violation 11

General Order 95, Rule 92.4-D1 – Exposed Cables and Messengers states in part:

> *The exposed communications conductors and messengers shall be grounded: At all deadend poles and at intervals not greater than every one–quarter of a mile (1320 feet).*

SED Staff traced Messenger Wire 2 east for approximately one (1) mile and Messenger Wire 1 west for approximately one (1) mile and did not observe any grounding of either messenger wire. Edison is in violation of Rule 92.4-D1 for failing to ground the messenger wires at intervals not greater than every one-quarter of a mile on the exposed ECS communications conductor.

If Messenger Wires 1 and 2 had been properly grounded, the grounding devices may have prevented the ignition of the fire at Site 1 by reducing the amount of current that passed between Messenger Wires 2 and 4 and their respective lashing wires.

Violation 12

General Order 95, Rule 83.4B – Messengers of Different Pole Line Systems states:

> *Bonding is required between communication messengers or guys, or both, where the pole line systems intersect at a common pole.*

Messenger Wire 3 was not bonded to Messenger Wire 1, nor was it bonded to Messenger Wire 2 at the Stubbed Pole. Edison is in violation of Rule 83.4B for failing to bond messenger wires that intersect at a common pole.

Violations 13, 14, and 15

General Order 95, Rule 31.1 – Design, Construction, and Maintenance states in part:

> *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.*

Violation 13

- Messenger Wires 1, 2, and 3 all had bond wires. One of the bond wires were attached to two grounding brackets, but the bond wires were not connected to each other. None of the three bond wires were used for their intended purpose, i.e. none of the bond wires were bonded together. Edison is in violation of Rule 31.1 for failing to maintain the bond wires for their intended use.

Violation 14

- Messenger Wire 3 was broken. Edison is in violation of Rule 31.1 for failing to maintain Messenger Wire 3 for its intended use. This condition existed since at least May of 2018 when it was discovered during an inspection. This wire also had been in contact with the steel pole without being attached to it since the steel pole had been installed in 2008. Rather than replacing the broken messenger guy wire, an unidentified person had wrapped the south end of the guy wire around the base of the steel pole. Edison could not determine who had wrapped the messenger wire, or even whether or not it was done by an Edison employee.

Violation 15

- The lashing wire on Messenger Wire 3 was broken. Edison is in violation of Rule 31.1 for failing to maintain the lashing wire for its intended use. This condition existed since at least January of 2018 when Messenger Wire 3 was discovered to be broken during an inspection at that time.[50]

Violations 16 and 17

General Order 95, Rule 18, Reporting and Resolution of Safety Hazards Discovered by Utilities states in part:[51]

> *For purposes of this rule, "Safety Hazard" means a condition that poses a significant threat to human life or property.*
>
> *…*
>
> *Each company (including utilities and CIPs) is responsible for taking appropriate corrective action to remedy Safety Hazards and GO 95 nonconformances posed by its facilities.*
>
> *…*
>
> *All companies shall establish an auditable maintenance program for their facilities and lines. All companies must include a timeline for corrective actions to be taken following the identification of a Safety Hazard or nonconformances with General Order 95 on the company's facilities.*
>
> *The auditable maintenance program shall prioritize corrective actions consistent with the priority levels set forth below and based on the following factors, as appropriate:*
>
> - *Safety and reliability as specified in the priority levels below;*
> - *Type of facility or equipment;*
> - *Location, including whether the Safety Hazard or nonconformance is located in the High Fire-Threat District;*
> - *Accessibility;*
> - *Climate;*

[50] Bates EDISON-SEDWS00002892

[51] This version of Rule 18 was effective from December 21, 2017 (Decision No.17-12-024) until a further amendment went into effect on June 30, 2019 (Decision No.18-05-042).

- *Direct or potential impact on operations, customers, electrical company workers, communications workers, and the general public.*

…

There shall be 3 priority levels.

Level 1:

- *Immediate safety and/or reliability risk with high probability for significant impact.*
- *Take action immediately, either by fully repairing the condition, or by temporarily repairing and reclassifying the condition to a lower priority.*

Level 2:

- *Variable (non-immediate high to low) safety and/or reliability risk.*
- *Take action to correct within specified time period (fully repair, or by temporarily repairing and reclassifying the condition to a lower priority).*

Time period for correction to be determined at the time of identification by a qualified company representative, but not to exceed: (1) six months for nonconformances that create a fire risk located in Tier 3 of the High Fire-Threat District; (2) 12 months for nonconformances that create a fire risk located in Tier 2 of the High Fire-Threat District; (3) 12 months for nonconformances that compromise worker safety; and (4) 59 months for all other Level 2 nonconformances.

Level 3:

- *Acceptable safety and/or reliability risk.*
- *Take action (re-inspect, re-evaluate, or repair) as appropriate.*

Violation 16

General Order 95, Rule 18 requires companies to prioritize corrective actions consistent with the three levels set forth in that rule. This applies to both communications and electric facilities. Edison stated in a letter dated November 1, 2019[52] that Mr. Urquidez

[52] Bates EDISON-SEDWS00013396.

brought the broken messenger wire (Messenger Wire 3) to Edison's attention as a result of his January 23, 2018 inspection, but that Edison did not assign a priority level to that finding or the corresponding corrective action.

Edison is in violation of General Order 95, Rule 18, for failing to document and assign a priority level to the condition associated with the ECS broken messenger wire.

Violation 17

Edison did not document and prioritize the corrective action for the broken lashing wire during its last inspection in 2018 as required by Rule 18. Edison is in violation of General Order 95, Rule 18 for failing to document and assign a priority level to the condition associated with the ECS broken lashing wire on Messenger Wire 3.

Violations 18 and 19

General Order 95, Rule 31.2, Inspection of Lines states in part:

> *Lines shall be inspected frequently and thoroughly for the purpose of ensuring that they are in good condition so as to conform with these rules. Lines temporarily out of service shall be inspected and maintained in such condition as not to create a hazard.*

Violation 18

General Order 95, Rule 31.2 requires utilities to *thoroughly* inspect their lines. A thorough inspection would have discovered that the messenger wires were unbonded. However, Edison did not create a notification for the unbonded messenger wires (Messenger Wires 1, 2, and 3) on the Stubbed Pole during any of its patrol or detailed inspections during the ten years preceding the November 8, 2018 incident. Edison is in violation of this rule for failing to thoroughly inspect its communications conductors and messenger wires attached to the Stubbed Pole.

Violation 19

A thorough inspection of Edison's facilities at Site 1 would have revealed that the vegetation there was overgrown, and that minimum clearances between Edison's communications conductor and the other communications conductors in the span were not being maintained. These violations were not noted on any inspection forms from between the 2015 fire (the report of which shows that the vegetation in this area was already severely straining the conductors) and the 2018 Woolsey Fire. Edison is in violation of this rule for failing to thoroughly inspect its communications facilities at Site 1 during that period.

Violation 20

General Oder 95, Rule 31.1 – Design, Construction, and Maintenance, states in part:

> *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.*

Edison's written procedure for the inspection of communications conductors, Outside Plant Communication Inspection and Maintenance Process, states that detail and patrol inspections should be performed to identify discrepancies and safety hazards[53]. An inspection that identified discrepancies and safety hazards of Edison's facilities at Site 1 would have revealed that the vegetation there was overgrown, and that minimum clearances between Edison's communications conductor and the other communications conductors in the span were not being maintained. These violations were not noted on any inspection forms from between the 2015 fire (the report of which shows that the vegetation in this area was already severely straining the conductors) and the 2018 Woolsey Fire. Edison is in violation of this rule for failing to inspect its communications facilities at Site 1 according to its own standards, an accepted good practice, during that period.

Violation 21

General Order 95, Rule 44.3 – Replacement states in part:

> *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.*

Rule 44.3 requires a messenger wire in Grade C construction to be replaced or reinforced before its safety factor is reduced to less one-half of 2, i.e. 0.5*2 = 1.0. Messenger Wire 3 was broken, meaning that its safety factor became reduced to less than 1.0. Edison is in violation of Rule 44.3 for failing to replace Messenger Wire 3 (which supported two ECS communications conductors) before its safety factor became reduced to less than 1.0. This condition existed since at least May of 2018.

[53] Bates EDISON-SEDWS00013388.

Violation 22

General Order 95, Rule 37, Table 1, Case 5, Column A requires a minimum clearance of eight (8) feet for messenger wires above ground in areas accessible to pedestrians.

Messenger Wire 3 was broken and one end of the broken messenger was found wrapped around the base of Pole 4534353E (the Steel Pole), and the other end lay on the ground. As a result, Messenger Wire 3 had an above ground clearance of approximately zero feet in an area accessible to pedestrians. Therefore, Edison is in violation of the above rule for failing to maintain the minimum above ground clearance of its messenger wire.

Violation 23

General Order 95, Rule 31.6 – Abandoned Lines states:

> *Lines or portions of lines permanently abandoned shall be removed by their owners so that such lines shall not become a public nuisance or a hazard to life or property. For the purposes of this rule, lines that are permanently abandoned shall be defined as those lines that are determined by their owner to have no foreseeable future use.*

Edison stated that communications cable No. 06044 was not in service at the time of the incident.[54] This abandoned communications conductor was supported by a through-bolt and messenger wire that conducted electrical current from Down Guy 2 to Messenger 2 and caused the ignition at Site 1. If this communications conductor and its supporting components had been removed, no fire could have resulted at Site 1 (Down Guy 2 was resting on the through-bolt connecting this conductor to the Stubbed Pole). Therefore, Edison is in violation of Rule 31.6 for failing to remove its abandoned communications conductor so that it would not become a hazard to life or property.

Violation 24

General Order 95, Rule 35 – Vegetation Management states in part:

> *When a supply or communication company has actual knowledge, obtained either through normal operating practices or notification to the company, that its circuit energized at 750 volts or less shows strain or evidences abrasion from vegetation contact, the condition shall be corrected by reducing conductor tension, rearranging or replacing the conductor, pruning the vegetation, or placing mechanical protection on the conductor(s).*

[54] Bates EDISON-SEDWS00010375.

The ECS communications conductor at Site 1 was strained by vegetation to such a degree that it was pushed into a third-party communications conductor (Figures 16-18). Therefore, Edison is in violation of Rule 35 for failing to correct the strain caused by vegetation on the ECS communications conductor.

Violations 25 and 26

General Order 95, Rule 19 - Cooperation with Commission Staff; Preservation of Evidence Related to Incidents Applicability of Rules, states:

> *Each utility shall provide full cooperation to Commission staff in an investigation into any major accident (as defined in Rule 17) or any reportable incident (as defined in CPUC Resolution E-4184), regardless of pending litigation or other investigations, including those which may be related to a Commission staff investigation. Once the scene of the incident has been made safe and service has been restored, each utility shall provide Commission staff upon request immediate access to:*
>
> - *Any factual or physical evidence under the utility or utility agent's physical control, custody, or possession related to the incident;*
> - *The name and contact information of any known percipient witness;*
> - *Any employee percipient witness under the utility's control;*
> - *The name and contact information of any person or entity that has taken possession of any physical evidence removed from the site of the incident;*
> - *Any and all documents under the utility's control that are related to the incident and are not subject to the attorney-client privilege or attorney work product doctrine.*
>
> *Any and all documents or evidence collected as part of the utility's own investigation related to the incident shall be preserved for at least five years. The Commission's statutory authorization under Cal. Pub. Util. Code §§ 313, 314, 314.5, 315, 581, 582, 584, 701, 702, 771, 1794, 1795, 8037 and 8056 to obtain information from utilities, which relate to the incidents described above, is delegated to Commission staff.*

California Public Utilities Code – PU Code § 316, states:

> *Each electrical corporation shall cooperate fully with the commission in an investigation into any major accident or any reportable incident, as these terms are defined by the commission, concerning overhead electric supply*

facilities, regardless of pending litigation or other investigations, including, but not limited to, those that may be related to a commission investigation.

(a) After the scene of the incident has been made safe and service has been restored, each electrical corporation shall provide the commission, upon its request, immediate access to all of the following:

(1) Any factual or physical evidence under the electrical corporation's, or its agent's, physical control, custody, or possession related to the incident.

(2) The name and contact information of any known percipient witness.

(3) Any employee percipient witness under the electrical corporation's control.

(4) The name and contact information of any person or entity that has taken possession of any physical evidence removed from the site of the incident.

(5) Any and all documents under the electrical corporation's control that are related to the incident and are not subject to attorney-client privilege or attorney work product doctrine.

(b) Each electrical corporation shall preserve any and all documents or evidence it collects as part of its own investigation related to the incident for at least five years or a shorter period of time as authorized by the commission.

Any and all documents collected by an electrical corporation pursuant to this section shall be catalogued and preserved in an accessible manner for assessment by commission investigators as determined by the commission.

General Order 95, Rule 19 and PU Code § 316 require that utilities cooperate with Commission staff, including SED, for the purposes of investigating accidents.

During the course of its investigation of this incident, SED requested documents from Edison. In one request, SED asked for a comprehensive list of all evidence and records that Edison would be using in its own investigation of the incident.[55] Edison objected to the request and did not comply, citing the attorney work product doctrine as the basis of its objection. In other incident investigations SED has discovered, through data request inquiries, that Edison creates maintenance, operation and/or repair records beyond the Commission's explicit General Order requirements. As is the case with all electric

[55] Bates SCE-SED00011709.

utilities, SED relies on Edison to maintain such internal records for its equipment and programs and provide such records to SED investigators when requested to do so. Under such circumstances, unless Edison had directly provided the records themselves or included such records in a comprehensive list, SED investigators would otherwise be unaware of their existence. By not providing a list of all evidence and records to SED, Edison impeded SED's ability to perform its own evidence review. Furthermore, Edison's actions prevented SED from reviewing all of the records available for the subject equipment or programs involved in the incident that may have contributed to the cause or circumstances that led up to the incident, impending SED's ability to conduct a thorough investigation.

In another data request, SED asked that Edison provide all photographs, notes, reports, and text messages generated by Edison's first responders, which captured their observations of the start of the incident.[56] Edison objected to this request and did not comply, citing the attorney work product doctrine as the basis for its objection. Instead, Edison provided Interruption Log Sheets, repair orders, and photographs which were a limited subset of first responder documents that SED requested.

Because the destructive force of a wildfire can quickly alter a scene and destroy evidence, the earliest observations can be critical to understanding the events that occurred and determining the potential findings of an investigation. By not providing the comprehensive set of data and evidence that SED requested, Edison impeded and prolonged SED's investigation. Edison's actions prevented SED from reviewing all available information from the point at which the fire had least disturbed the electric facilities. The actions of Edison's first responders cannot preemptively be under the direction of Edison counsel. Any notes, reports, or text messages that SED requested would not be generated under the direction of Edison counsel and accordingly should not be subject to attorney-client or work product privilege.

For the reasons stated above, SED's investigation determined that Edison is in violation of PU Code § 316 and GO 95, Rule 19 for failing to provide: the list of evidence and records used for Edison's own investigation, as well as photographs, notes, reports, and text messages generated by first responders. In the spirit of full and transparent cooperation with the Commission and its staff, it is imperative that Edison respond to SED data requests with the most comprehensive information available. Without such comprehensive information, SED cannot conduct a thorough investigation, determine the root cause of the incident, expeditiously remedy any issues and prevent future similar incidents from occurring.

[56] Bates SCE -SEDWS00002827; SEDWS00002827.

IV. Conclusion

SED's investigation has discovered twenty-six (26) violations:

(a) Five (5) violation of General Order 95, Rule 38 - Minimum Clearances of Wires from Other Wires

(b) Three (3) violations of General Order 95, Rule 56.2 – Use

(c) Two (2) violations of General Order 95, Rule 84.4-D4 – Conductors Passing Supply Poles and Unattached Thereto

(d) One (1) violation of General Order 95, Rule 92.4-D1 – Exposed Cables and Messengers

(e) One (1) violation of General Order 95, Rule 83.4B – Messengers of Different Pole Line Systems

(f) Four (4) violations of General Order 95, Rule 31.1 – Design, Construction, and Maintenance

(g) One (1) violation of General Order 95, Rule 44.3 – Replacement

(h) One (1) violation of General Order 95, Rule 37 – Basic Minimum Allowable Clearances of Wires Above Railroads, Thoroughfares, Ground or Water Surfaces, etc.

(i) One (1) violation of General Order 95, Rule 31.6 – Abandoned Lines

(j) One (1) violation of General Order 95, Rule 35 – Vegetation Management

(k) Two (2) violations of General Order 95, Rule 18 - Maintenance Programs and Resolution of Potential Violations of General Order 95 and Safety Hazards

(l) Two (2) violation of General Order 95, Rule 31.2 – Inspection of Lines

(m) One (1) violation of Public Utilities Code § 316; for failing to cooperate with Commission Staff

(n) One (1) violation of General Order 95, Rule 19 – Cooperation with Commission Staff

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.

Glossary

Circuit breaker: An electrical component that incorporates automatic operation and protective features to monitor, control, and protect downstream circuits from excess current and other potentially damaging electrical transients.

Guy wire: A cable that is placed under tension and that is designed to add stability and support to a free-standing structure. One common configuration of a guy wire is a down guy wire which is connected from a structure (such as a utility pole) to the ground with an anchor.

Messenger wire: a messenger wire, sometimes called a messenger guy, is a tensioned steel wire that is used to support the weight of a communications conductor. This support is achieved by wrapping a steel lashing wire around both the messenger wire and the communications conductor.

Jumper: A piece of wire connecting two conductors to form one continuous electrical path.

Lashing wire: Wire wrapped around a communications conductor and its messenger wire. The lashing wire is used to firmly bind them together.

Lockout: When a circuit breaker relays to lockout, it opens and an additional protective lockout circuit is activated. In these instances, the lockout circuit needs to be manually reset by an operator before the circuit breaker can be closed again. The purpose of the lockout circuit is to notify the operator that one of the protective sensing elements within the circuit breaker control center (also called a Relay) has sensed a problem and that the circuit breaker, as well as the entire circuit to which it is connected, needs to be investigated.

Red Flag Warning (RFW): A warning issued by the National Weather Service to indicate that warm temperatures, very low humidity, and stronger winds are expected to combine to produce an increased risk of fire danger. Thresholds for Los Angeles county where this incident occurred are 25 mile per winds or stronger and a relative humidity below 15%.

Relay (noun): An electrically automated operated switch. It is a programmable microprocessor-based device that provides control, protection, automation, monitoring, and metering for circuit breakers and the electrical distribution circuits to which circuit breakers are electrically connected.

Relay (verb): When a circuit breaker “relays”, it changes positions. It can change from the open position to the closed position or vice versa, based on the design of the control circuit for the circuit breaker. Distribution scale circuit breakers utilize relay circuits for the opening and closing functions of a circuit breaker.

Switch: A device for making and breaking a connection in an electrical circuit.

System Operating Bulletin (SOB): Southern California Edison (Edison) uses SOBs to define operating procedures, policies, and restrictions for both regular and conditional operations.

Through bolt: A metal bolt that passes completely through a utility pole. Brackets on either side of a through bolt can be used to support messenger guy wires or other equipment.