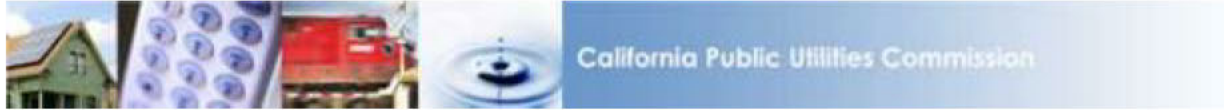


# Investigation Report

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**INVESTIGATION REPORT  
OF THE DECEMBER 5, 2017 WILDFIRE  
IN SAN BERNARDINO, CALIFORNIA  
INVOLVING SOUTHERN CALIFORNIA EDISON FACILITIES  
THAT CAME TO BE KNOWN AS THE MEYERS FIRE**

**SAFETY AND ENFORCEMENT DIVISION  
ELECTRIC SAFETY AND RELIABILITY BRANCH**

**LOS ANGELES**

# Investigation Report

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## Definitions

**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.

**Electrical fault** - Any abnormal electric current wherein electric current is redirected or interrupted from its intended electric path. Examples of faults are short-circuit and open-circuit faults.

**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.

**Power restoration** - A process to return from abnormal to normal electrical circuit conditions. Normal circuit conditions can be defined in terms of power sources, current paths, and power recipients.

**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

**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.

**Remote Automatic Reclosers (RAR)** - RARs are small circuit breakers located at the top of distribution poles and are typically used on very long distribution feeders. Their function is to isolate a section of the feeder in fault or overload conditions and thereby minimize the number of customers without service. Since they act as small circuit breakers, they have the capability to restore power automatically in temporary fault situations, hence the name "recloser". During a RFW, Edison restricts the reclosing function of RARs, preventing the RARs from restoring power automatically after a fault event.

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

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

**Tap** – An intermediate junction between two sections of primary power line that is used to electrically connect and disconnect the sections of primary power line

**Tie wire** – A length of wire used to affix a conductor to an insulator.

## I. Summary of Incident:

On Tuesday, December 5, 2017, at 1306 hours an outage occurred on a section of Southern California Edison's (Edison) Northpark 12 kV circuit out of the Shandin Substation. The outage occurred downstream from RAR 0822, however, no protective devices operated as a result of the outage or immediately prior to the outage.<sup>1</sup> The outage impacted a total of 1,066 customers and resulted in 1,245 customer hours of interruption.<sup>2</sup> Subsequently, at 1328 hours, a grass fire later known as the Meyers Fire ignited next to Highway 15 and Highway 215 junction, near Glen Helen Regional Park in San Bernardino County.<sup>3</sup> At 1403 hours, California Department of Forestry and Fire Protection (CAL FIRE) San Bernardino submitted an emergency service request to Edison, citing the presence of conductors on the ground and an active vegetation fire near a private residence on Meyers Road.<sup>4</sup> According to weather stations in the area, the wind speeds at the time were typical for that area. An Edison troubleman arrived at the location of the fire at 1730 hours and confirmed the location of the failed equipment.<sup>5</sup> Despite the fact that a conductor had detached from a utility pole and lay on the ground, the resulting load on the circuit did not surpass the minimum current necessary for RAR 0822 to operate and de-energize the conductor or the circuit that it was a part of.

The Meyers Fire burned 34 acres and was fully contained at 2000 hours on the evening of December 5, 2017.<sup>6</sup> The Meyers Fire caused minor property damage to a

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<sup>1</sup> Bates SCE-SED00003150.

<sup>2</sup> Bates SCE-SED00003150.

<sup>3</sup> Edison 315 Letter dated December 29, 2017. Under PU Code 315, public utilities must file a report for every accident that meets incident reporting requirements. This is informally known as a "315 Letter."

<sup>4</sup> Bates SCE-SED00003482.

<sup>5</sup> Bates SCE-SED00011742.

<sup>6</sup> Edison 315 Letter dated December 29, 2017. Under PU Code 315, public utilities must file a report for every accident that meets incident reporting requirements. This is informally known as a "315 Letter."

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driveway located at [REDACTED] Meyers Road in San Bernardino.<sup>7</sup> Edison did not report any fatalities or injuries, however, Edison reported the cost of repair to its facilities associated with the Meyers Fire to be \$424,850.<sup>8</sup>

CAL FIRE San Bernardino and San Bernardino County Fire Department personnel responded to the Meyers Fire.<sup>9</sup> The origin of the Meyers Fire was in a Tier 2 (i.e. “Elevated” fire risk) area of the California Public Utility Commission’s (CPUC) High Fire Threat District (HFTD) map. The burn area included both Tier 2 and Tier 3 HFTD areas.<sup>10</sup>

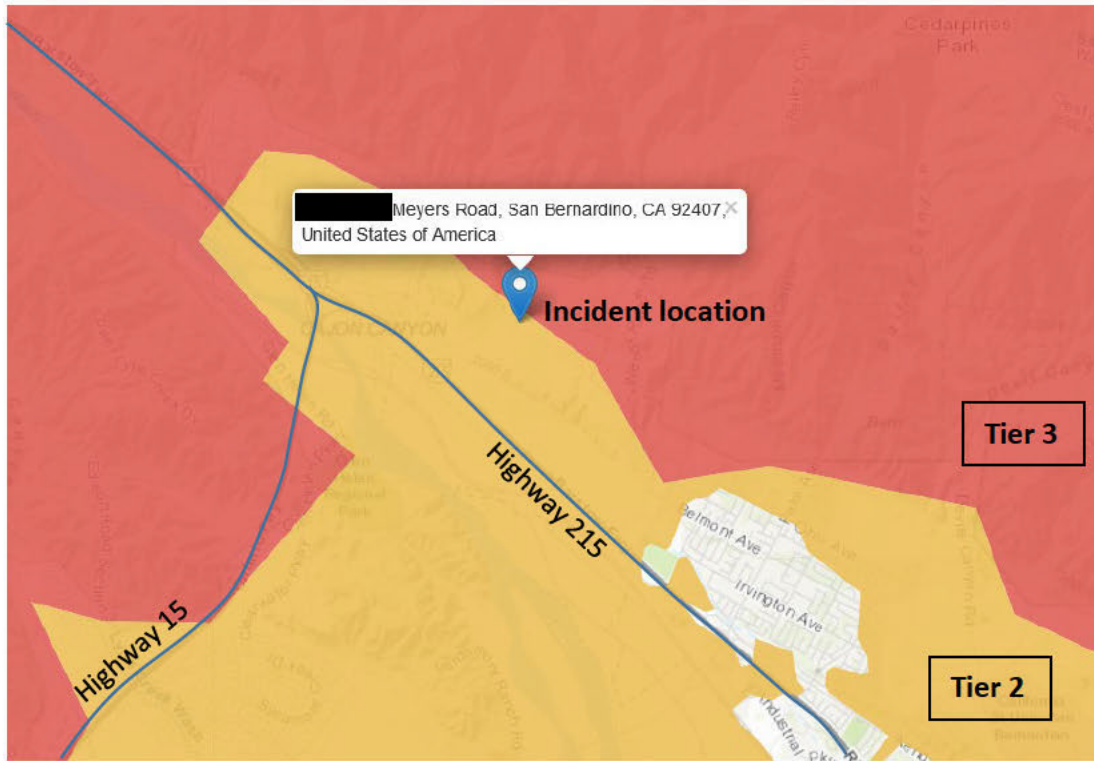


Figure 1: Incident location within HFTD Tiers 2 and 3.

## A. Violation(s):

SED reviewed and analyzed records, inspected and examined physical evidence, and interviewed witnesses related to this incident to determine compliance

<sup>7</sup> Edison 315 Letter dated December 29, 2017. Under PU Code 315, public utilities must file a report for every accident that meets incident reporting requirements. This is informally known as a “315 Letter.”

<sup>8</sup> Bates SCE-SED00004155.

<sup>9</sup> Bates SCE-SED00011743.

<sup>10</sup> The HFTD was not formally adopted until 2018, after the ignition of this fire, therefore enhanced rules and regulations applicable to Tiers 2 and 3 of the HFTD were not applicable to this location at the time of the incident.

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with Commission rules and regulations. SED's investigation found Edison in violation of four (4) regulatory requirements, as follows:

- One (1) violation of General Order (GO) 95, Rule 31.1, Design, Construction and Maintenance and one (1) violation of Public Utilities Code (PU Code) § 399.2 (a):
  - o Edison failed to properly maintain a 12 kV conductor and the tie wire around it in a safe manner to prevent it from falling and remaining energized on the ground creating a hazardous condition.
- One (1) violation of GO 95, Rule 19, Cooperation with Commission Staff and one (1) violation of PU Code § 316:
  - o Edison failed to provide the list of evidence and records used for Edison's own investigation.
  - o Edison failed to provide all photographs, notes, reports, and text messages generated by first responders to the incident.
  - o Edison delayed and obstructed SED's investigation by failing to identify individual pieces of the physical evidence and refusing to arrange the evidence for observation and measurement by SED investigators.

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## II. Background

### A. Witnesses:

No.	Name	Title	Address
1	Koko Tomassian	SED Investigator	320 W. 4th St, Los Angeles, CA 90013
2	Joceline Pereira	SED Investigator	320 W. 4th St, Los Angeles, CA 90013
3	Bryan Pena	SED Investigator	320 W. 4th St, Los Angeles, CA 90013
4	Aaron Lopez	Edison Claims Investigator	2244 Walnut Grove Ave, Rosemead, CA 91770
5	[REDACTED]	Edison Troubleman	2244 Walnut Grove Ave, Rosemead, CA 91770
6	[REDACTED]	Edison Journeyman Lineman	2244 Walnut Grove Ave, Rosemead, CA 91770
7	[REDACTED]	Edison Principal Manager – Transmission and Distribution	2244 Walnut Grove Ave, Rosemead, CA 91770
8	[REDACTED]	Edison Overhead Distribution Inspector	2244 Walnut Grove Ave, Rosemead, CA 91770

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### B. Evidence:

No.	Description
1	Email notification to USRB reporting address, Subject: Electric Safety Incident Reported- Southern California Edison Company Incident No: 171205-8646, dated Tuesday, December 05, 2017
2	SCE 315 Letter dated December 29, 2017 (Confidential)
3	SED Investigator Data Request (DR) SED-001 and responses
4	SED Investigator Data Request (DR) SED-001B and responses
5	SED Investigator Data Request (DR) SED-002 and responses
6	SED Investigator Data Request (DR) SED-003 and responses
7	SED Investigator Data Request (DR) SED-004 and responses
8	SED Investigator Data Request (DR) SED-005 and responses
9	SED Investigator Data Request (DR) SED-006 and responses
10	SED Investigator Data Request (DR) SED-007 and responses
11	SED Investigator Data Request (DR) SED-008 and responses
12	SED Investigator Data Request (DR) SED-009 and responses
13	SED Investigator Data Request (DR) SED-010 and responses
14	SED Investigator Data Request (DR) SED-011 and responses
15	Examination Under Oath_ EUO_ AARON LOPEZ_ 100918_ VOL_ 2
16	Examination Under Oath_ EUO_ [REDACTED]_ 101718
17	Examination Under Oath_ EUO_ [REDACTED]_ 100918
18	Examination Under Oath_ EUO_ [REDACTED]_ 100918

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## C. Description of Edison Facilities

The Northpark 12 kV circuit is fed from Shandin substation and incorporates four primary protective devices. These devices provide power sensing and protection for the Northpark 12 kV circuit starting from the furthest point upstream in the circuit at the Shandin Substation. Figure 2 shows the location of each protective device relative to the incident location.

## Critical Energy Infrastructure Information (CEII)



*Figure 2: Protective scheme for Northpark 12 kV circuit, protective device locations.*

These devices are configured to monitor the circuit and send signals to interrupt and de-energize the circuit after detecting overcurrent conditions. The devices are normally configured to wait for a set amount of time after detecting a fault condition. Then the devices send another signal to re-energize the circuit by reestablishing the circuit continuity, then testing to see if the fault condition has cleared. If the fault

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condition is still present, the protective device will interrupt and de-energize the circuit again. However, if the fault is cleared, circuit remains energized.

During RFWs, Edison implements operating restriction SOB 322 on circuits such as the Northpark 12 kV which operates in fire hazard areas.<sup>11</sup> In these instances, circuit breakers and remote automatic reclosers in areas affected by SOB 322 are made non-automatic and will lock out following the first relay operation. This prevents a circuit from becoming re-energized while a potential fault condition may still be present on the circuit. After a lock out, SOB 322 requires Edison's personnel to patrol the circuit before re-energization.<sup>12</sup>

The NWS issued a RFW for San Bernardino County effective from December 4, 2017 at 0300 hours until December 10, 2017 at 2000 hours. SOB 322 took effect on the Northpark 12 kV circuit on December 4, 2017 at 0300 hours and remained in effect during the December 5, 2017 Northpark 12 kV circuit interruptions.<sup>13</sup>

The Northpark 12 kV circuit breaker (CB) was a Mitsubishi Electric Power Products medium voltage circuit breaker with manufacture's designation MEPP117DV25-12(CB) and ABB Relay DPU2000R protection system.<sup>14</sup> RAR 0824 consisted of a G&W Viper recloser equipped with SEL-351R-4 relay.<sup>15</sup> RAR 0822 consisted of a G&W Viper recloser equipped with SEL-351R-2 relay.<sup>16</sup> RAR 2372 consisted of a G&W Viper recloser equipped with SEL-351-R relay.<sup>17</sup> Edison provided the fault settings that each device was set to at the time of the incident, shown below in Figure 3.<sup>18</sup>

The RAR devices out of the Northpark 12kV, including RAR 0822, are designed for overcurrent protection. This means that the device is set to sense different types of overcurrent conditions on the circuit and respond by de-energizing the circuit. The downed conductor did not cause an overcurrent condition, therefore no protective device actuated. When SED asked why the protective scheme used to protect the Northpark 12 kV circuit was not capable of detecting the downed 12 kV conductor, Edison merely reiterated that the fault current did not exceed the settings on the protective scheme.<sup>19</sup>

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<sup>11</sup> Bates SCE-SED00003591.

<sup>12</sup> Bates SCE-SED00003591.

<sup>13</sup> Bates SCE-SED00014019.

<sup>14</sup> Bates SCE-SED00003442.

<sup>15</sup> Bates SCE-SED00003442.

<sup>16</sup> Bates SCE-SED00003442.

<sup>17</sup> Bates SCE-SED00014755.

<sup>18</sup> Bates SCE-SED00014755.

<sup>19</sup> Bates SCE-SED00016597.

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Device Type	Model #	Settings
RAR 0822 (upstream)	G&W Viper (Recloser) SEL-351R-2 (Relay)	<u>Phase</u>
		Minimum Trip = 250 A
		Curve = 117
		<u>Ground</u>
		Minimum Trip = 60 A
RAR 0824 (upstream)	G&W Viper (Recloser) SEL-351R-4 (Relay)	Curve = 119
		<u>Phase</u>
		Minimum Trip = 400 A
		Curve = U3
		Time Dial = 2
Northpark 12 kV CB (upstream)	MEPPI 17DV25-12 (CB) ABB-DPU2000R (Relay)	<u>Ground</u>
		Minimum Trip = 100 A
		Curve = U3
		Time Dial = 8
		<u>Phase</u>
RAR 2372 (downstream)	G&W Viper (Recloser) SEL-351R (Relay)	51P = 720 A
		Curve = Very Inverse
		Time Dial = 3.2
		<u>Neutral</u>
		51N = 180 A
		Curve = Very Inverse
		Time Dial = 8.2
		<u>Phase</u>
		51P = 200 A
		Curve = U5
		Time Dial = 1
		<u>Ground</u>
		51N = 50 A
		Curve = U5
		Time Dial = 1

Figure 3: Protective scheme for Northpark 12 kV circuit, protective device settings.<sup>20</sup>

The facilities involved in this incident are located on a single-phase, two-wire section of the Northpark 12 kV circuit. The single 12 kV conductor involved in this incident was attached to Edison's poles numbered 200046S, 200045S, and 200047S. These are wooden poles installed in 1947 and located in Tier 2 of the HFTD.<sup>21</sup> The conductor was supported by a pin type insulator at the top of each pole and was held in place by a tie wire, which is meant to prevent the conductor from slipping out of the insulator. This configuration is demonstrated in Figure 4.

<sup>20</sup> Bates SCE-SED00014755

<sup>21</sup> The HFTD was not formally adopted until 2018, after the ignition of this fire, therefore enhanced rules and regulations applicable to Tier 2 of the HFTD were not applicable to this location at the time of installation or the incident.

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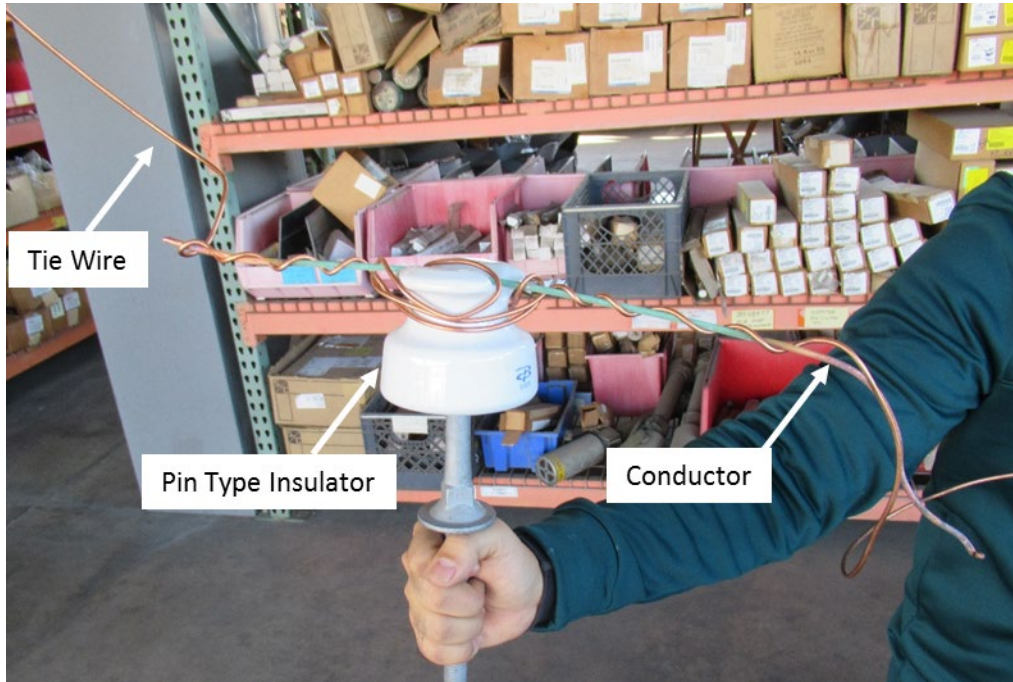


Figure 4: Example of how a conductor is tied down to an insulator

Edison failed to produce records supporting its belief that the subject conductor was installed in 1947. Edison believes that the subject conductor was installed in 1947 along with pole 200046S because Edison could not locate any work orders after 1947 related to conductor replacement.<sup>22,23</sup> Due to its lack of records, Edison also does not know who performed the installation. As a practice, Edison does not keep records of conductor installations, including information about the employee who installs those conductors.<sup>24,25</sup> Edison also failed to provide construction standards used during 1947, the assumed year of installation for the tie wire that supported the subject conductor. However, Edison believes that the construction method for the subject conductor, at the time of installation, was similar to the construction standard from Edison's 2006 Distribution Overhead Construction Standards as shown in Figure 5 below.<sup>26,27</sup> The 12 kV conductor was a number 6 (#6) American Wire Gauge (AWG) copper conductor, fastened to the insulator with #6 AWG solid soft drawn copper tie wire.<sup>28</sup> A #6 AWG

<sup>22</sup> Bates SCE-SED00010211.

<sup>23</sup> Bates SCE-SED00003973.

<sup>24</sup> Bates SCE-SED00003973.

<sup>25</sup> Bates SCE-SED00003974.

<sup>26</sup> Bates SCE-SED00010211.

<sup>27</sup> Bates SCE-SED00010212.

<sup>28</sup> Bates SCE-SED00010211.

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conductor can support a continuous current of 140 amps and has a diameter of 0.162 inches.<sup>29</sup>

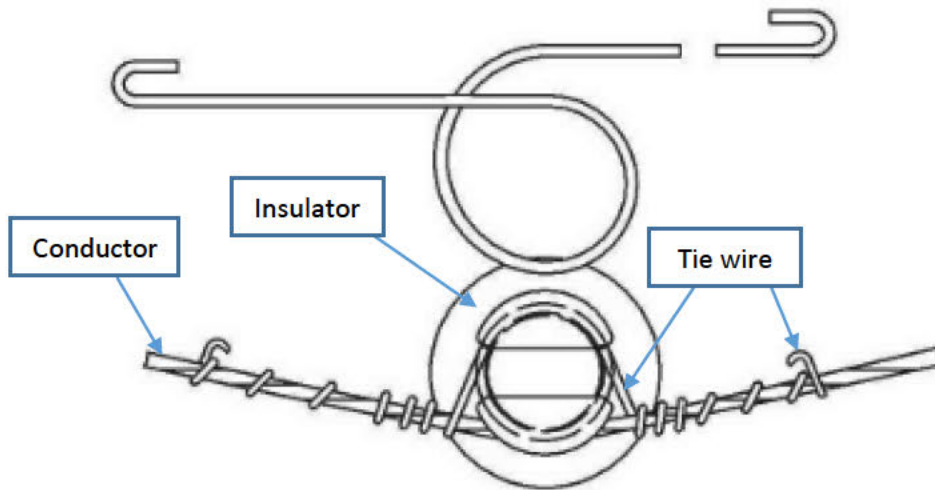


Figure 5: 2006 Construction Standards for primary tie wire used for securing conductor to insulator. Top view looking down.<sup>30</sup>

### D. Description of Events

On Sunday, December 3, 2017, the National Weather Service forecasted Santa Ana winds to impact parts of Edison's service territory with extreme fire danger expected and issued a RFW on December 4, 2017.<sup>31</sup> On Tuesday, December 5, 2017 at 1310 hours the weather station DVOC1, located in San Bernardino, 4 miles south from the incident location, recorded a peak wind speed of 28 miles per hour (mph) and a maximum wind gust of 44 mph.<sup>32</sup> At 1330 hours the weather station KSBD, located at San Bernardino Airport 11 miles southwest from the incident location, recorded a peak wind speed of 8 miles per hour (mph) and a maximum wind gust of 22 mph.<sup>33</sup> At 1330 hours, Edison's weather station at the San Bernardino Service Center, located 8 miles south of the incident location, recorded a wind speed of 17.02 mph and a wind gust of 36.05 mph and at the same time Edison's weather station at the Arrowhead Service Center, located 9 miles west from the incident location, recorded a wind speed of 8.73

<sup>29</sup> Bates SCE-SED00010210.

<sup>30</sup> Bates SCE-SED00010211.

<sup>31</sup> Bates SCE-SED00014019.

<sup>32</sup> <https://mesowest.utah.edu/>

<sup>33</sup> <https://mesowest.utah.edu/>

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mph and a wind gust of 23.08 mph.<sup>34</sup> Lastly, the weather station KCASANBE24, located 2 miles northwest of the incident location recorded the daily high wind speed and high wind gust of 27.5 mph and 42.5 mph respectively.<sup>35</sup>

On December 5, 2017, with RFW and SOB 322 in effect, the Northpark 12 kV circuit of the Shandin Substation relayed several times, at 0155, 0537, 1025, and 1216 hours.<sup>36</sup> In accordance with Edison policy, when SOB 322 is in effect and an interruption resulting in the operation of a CB or RAR, Edison personnel must conduct a patrol of the circuit to identify the source of the interruption before power can be restored. Edison patrolled the circuit each time it relayed but did not find the cause of the relay or interruptions, and thus, Edison re-energized the circuit after each patrol.<sup>37</sup>

The Northpark 12 kV circuit experienced a partial outage beginning at 1306 hours that lasted until 0255 hours on December 6, 2017.<sup>38</sup> This outage did not begin as the result of a protective device operation, unlike the outages resulting from the previous four RAR operations on the Northpark 12 kV circuit that day.<sup>39</sup> At 1403 hours on December 5, 2017, Edison received a trouble ticket from CAL FIRE San Bernardino reporting that a conductor had fallen from a utility pole and lay on the ground and that an active vegetation fire was occurring on Meyers Road.<sup>40</sup> The downed conductor did not cause a fault condition of sufficient magnitude to exceed the settings on the protective devices on the Northpark 12 kV circuit, and therefore the protective devices did not operate to de-energize the circuit.

On December 5, 2017, an Edison troubleman, responded to the downed conductor and arrived at the location of the incident at approximately 1730 hours. Upon arriving, the troubleman spoke to an unidentified fire agency employee who pointed him towards the conductor on the ground. The troubleman observed that a single-phase conductor between poles numbered 200045S, 200046S, and 200047S was on the ground. The conductor was still attached to poles numbered 200045S and 200047S but

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<sup>34</sup> Bates SCE-SED00009822.

<sup>35</sup> <https://www.wunderground.com/dashboard/pws/KCASANBE24/graph/2017-12-5/2017-12-5/daily>.

<sup>36</sup> Bates SCE-SED00003449.

<sup>37</sup> Bates SCE-SED00016581.

<sup>38</sup> Bates SCE-SED00003150.

<sup>39</sup> Bates SCE-SED00014753.

<sup>40</sup> Bates SCE-SED00003482.

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was broken between the two at pole 200046S.<sup>41, 42</sup> The tie wire that had previously secured the conductor to the insulator at the top of pole 200046S was broken and still attached to both ends of the conductor that lay on the ground.<sup>43</sup>

The downed span of conductor attached to pole 200045S, upstream from pole 200046S, landed on the concrete driveway of the residence located at [REDACTED] Meyers Road in San Bernardino. The driveway and the conductor sustained arcing damage from prolonged contact with the downed energized conductor. The troubleman observed that the downed span of conductor attached to pole 200047S, downstream from pole 200046S, was actively sparking on the ground.<sup>44</sup> Figure 6 below illustrates the troubleman's observations of the downed conductor.

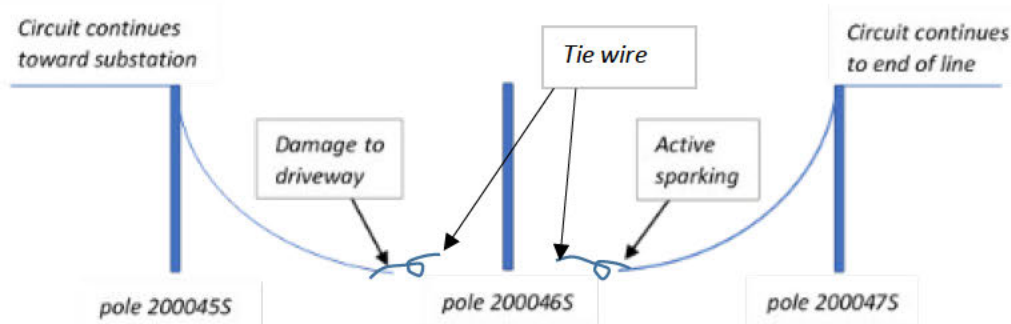


Figure 6: Configuration of downed conductor with tie wires attached as described by the responding troubleman upon arrival at the incident location.

At 1730 hours, the troubleman reported the fallen conductor to Edison's operator at the Vista Switching Center. The troubleman confirmed with the operator that no protective devices had operated on the Northpark 12 kV circuit following the wire down incident.<sup>45</sup> Then, the troubleman requested that the operator de-energize the section of the line on the ground around pole 200046S. The operator opened RAR 0822 at 1732 hours following the troubleman's request, de-energizing the section of the Northpark 12

<sup>41</sup> Examination Under Oath\_EUO\_[REDACTED]\_101718 page 66, line 8-16.

<sup>42</sup> Examination Under Oath\_EUO\_[REDACTED]\_101718 page 72, line 21-26.

<sup>43</sup> Examination Under Oath\_EUO\_[REDACTED]\_101718 page 46, line 5-12.

<sup>44</sup> Examination Under Oath\_EUO\_[REDACTED]\_101718 page 73, line 22-25.

<sup>45</sup> Bates SCE-SED00011742.

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kV circuit downstream of the open RAR0822 to the end of the distribution line. This action also de-energized the downed conductor that was sparking on the ground.<sup>46</sup>

After the circuit was de-energized, the troubleman tested the line section with the fallen conductor to ensure that it was de-energized.<sup>47</sup> He proceeded to cut and remove the conductor from its connection at the insulator on poles numbered 200045S and 200047S. He then opened a tap at pole number 4780265E, upstream from the incident location, to isolate the section of line with the downed conductor from the rest of the circuit.<sup>48</sup> The troubleman returned to the two spans he had previously cut down and observed that one end of conductor between poles numbered 200047S and 2157866E, downstream from the incident, had fallen on the ground because of the earlier cut he made. The troubleman stated that the end of the conductor had “slipped through, and came down for another span.”<sup>49</sup> In other words, the conductor had detached from the tie wire/insulator assembly on pole 200047S and fallen to the ground while the other end of the conductor remained attached to pole 2157866E. The troubleman proceeded to cut that span down as well from its attachment at pole 2157866E in order to eliminate unsafe conditions created by the hanging sections of the 12 kV conductor.

After removing the sections of downed and damaged conductor from the Northpark 12 kV circuit, the troubleman completed a Distribution Repair Order calling for the replacement of three (3) spans of the downed 12 kV conductor using the same type of #6 AWG copper wire.<sup>50</sup> Spans that were replaced were from pole 200045S to 200046S, 200046S to 200047S, and 200047S to 2157866E.

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<sup>46</sup> Bates SCE-SED00011742.

<sup>47</sup> Examination Under Oath\_EUO\_[REDACTED]\_101718 page 24, lines 20-22.

<sup>48</sup> Bates SCE-SED00011742.

<sup>49</sup> Examination Under Oath\_EUO\_[REDACTED]\_101718 page 28, lines 18-24; page 56, lines 19-28.

<sup>50</sup> Bates SCE-SED00003151.

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## III. SED's Investigation

### A. Observations and Findings

SED reviewed Edison's facility inspection programs, vegetation management programs, device logs, recent outages, maintenance history on the circuit, and work being performed in the area on the date of the Meyers Fire incident, as well as Edison's response to the incident.

A notable discrepancy in Edison's reporting emerged as a result of witness interviews with Edison first responders. Edison stated in its 315 Letter to the Commission on December 29, 2017 that the failed component was the copper primary tie-wire.<sup>51</sup> However, during examinations under oath (EUOs) of Edison first responders, the responding troubleman indicated that he observed a broken conductor in addition to the broken tie wire.<sup>52</sup> Edison later clarified that it believes that the primary conductor broke at the tire wire.<sup>53</sup> Accurate communications from utility companies helps SED to focus resources and conduct efficient investigations. Once clarified, this discrepancy did not cause any further delay in the SED investigation.

During a site visit on December 22, 2017 with Edison investigators near [REDACTED] Meyers Road in San Bernardino, SED investigators observed arcing damage on the driveway located at [REDACTED] Meyers Rd, as seen in Figure 7. The section of the concrete that was directly beneath the copper wire was burned in a pattern that ran parallel to the wire, consistent with where the downed energized conductor laid until the circuit was de-energized by Edison personnel.

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<sup>51</sup> Edison 315 Letter dated December 29, 2017. Under PU Code 315, public utilities must file a report for every accident that meets incident reporting requirements. This is informally known as a "315 Letter."

<sup>52</sup> Examination Under Oath [REDACTED] 101718 page 63, lines 5 – 10.

<sup>53</sup> Bates SCE-SED00016576.

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Figure 7: Damaged driveway at [REDACTED] Meyers Road

Edison's records showed that the only evidence it collected associated with the Meyers Fire incident was 1,000 feet of #6 AWG copper overhead primary conductor and a primary tie wire.<sup>54</sup> An Edison repair crew collected these items on December 5, 2017. Edison Claims Department personnel and the Edison repair crew both visually inspected the insulator to which the evidence was attached while in service. Because Edison did not identify damage to the insulator, it remained in service.<sup>55</sup> No other agency retained evidence associated with the Meyers Fire.

SED examined the physical evidence collected from the Meyers Fire incident at Edison's Redlands Service Center on December 22, 2017 and again at Edison's Westminster Evidence Storage Locker on July 16, 2019. During its July 16<sup>th</sup> examination of evidence, SED observed ten (10) sections of #6 AWG copper conductor. Two lengths of conductor (referred to in the figures below as *Conductor 1* and *Conductor 2*) each had a piece of tie wire still attached to one end. Figures 6 through 9 show the end portions of conductor and tie wires.

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<sup>54</sup> Bates SCE-SED00009815.

<sup>55</sup> Bates SCE-SED00016594.

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*Figure 8: Conductor 1, with a portion of a tie wire still wrapped around one end.*

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Figure 9: End of the tie wire attached to Conductor 1.



Figure 10: Melted end of Conductor 1.

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Figure 11: Conductor 2 and the portion of tie wire still attached.

During examinations under oath, Edison's troubleman described cutting the subject conductor in three places. Additionally, the conductor had already broken at pole 200046S when he arrived at the incident location. Therefore, the conductor was ultimately severed in four places, resulting in three individual spans of conductor on the ground.

Prior to the evidence examination on July 16, 2019, SED requested the presence of Edison personnel so that Edison personnel could move and arrange the evidence as necessary. Edison agreed to do so.<sup>56</sup>

Despite the fact that the troubleman's narrative indicated that Edison should have collected three individual spans of conductors, this was not observed by SED. During SED's examination of evidence on July 16, 2019, SED investigators observed ten (10) individual lengths of primary conductor, with ends appearing either cut with a wire cutting tool or showing signs of melting, burning, or breaking, as seen in the figures above. Edison also failed to label the individual spans of conductor when they were collected as evidence. Furthermore, all evidence that Edison collected for the Meyers Fire was stored under only a single evidence tag which named only the date of the incident, the location of the incident, and the name of the person who collected the evidence, but did not identify, quantify, or mark any notations for installation orientation of any of the items that were collected.

<sup>56</sup> Email, Thursday, July 11, 2019 at 2:13PM From Margarita Gevondyan (SCE) to Candace Choe (CPUC) and Laura Genao (SCE); Subject: RE: (External: SED request to examine Meyers Fire evidence.

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Because the evidence that Edison had collected was inconsistent with the troubleman's narrative, SED investigators asked Edison to identify the individual pieces of evidence and explain how it was collected such that they could identify how the evidence appeared in the field at the time of the incident. The Edison investigator present on July 16, 2019 was unable to answer these questions. He stated that he was not present during the evidence collection process on December 5, 2017 and was unable to provide any information regarding the order and general configuration of the pieces of evidence before they were collected, the condition of the evidence when Edison collected it, or which utility pole each piece of evidence was associated with. Because Edison did not provide details regarding the identification of the items collected as evidence, SED was unable to determine what part of Edison's facilities failed or caused the 12 kV conductor to fail (as explained above).

Additionally, SED staff requested for Edison to arrange the spans of conductor in order to take measurements and examine the full length of each span. Despite the fact that Edison had agreed in its July 11, 2019 email to have personnel present to move and arrange evidence, Edison refused to manipulate the evidence for SED investigators. Instead, Edison stated that SED submit a written data request and Edison would measure the evidence itself at a later date.

SED also reviewed the supervisory control and data acquisition (SCADA) system data for the hours leading to Edison's discovery of the downed 12 kV conductor. The data indicated that the normal and expected level of current on each phase conductor was between 20 and 120 amps as measured at RAR 0822, which was the point of measurement and control on the circuit nearest to where the downed primary conductor was discovered. RAR 0822 was equipped with Phase-to-Phase and Phase-to-Ground fault trip settings. The trip settings for RAR 0822 were set to 250 amps and 60 amps, respectively.<sup>57</sup> SCADA records for RAR 0822 show the phase current peaking at 100 amps, up from 87 amps. At no point during the incident did the conditions on the circuit reach the necessary thresholds to actuate one of the protective functions of RAR 0822 that would have de-energized the circuit. This is consistent with the fact that Edison personnel had to remotely operate RAR 0822 to isolate and de-energize the downed primary conductor after discovering the fire.<sup>58</sup>

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<sup>57</sup> Bates SCE-SED00003442.

<sup>58</sup> Bates SCE-SED00011742.

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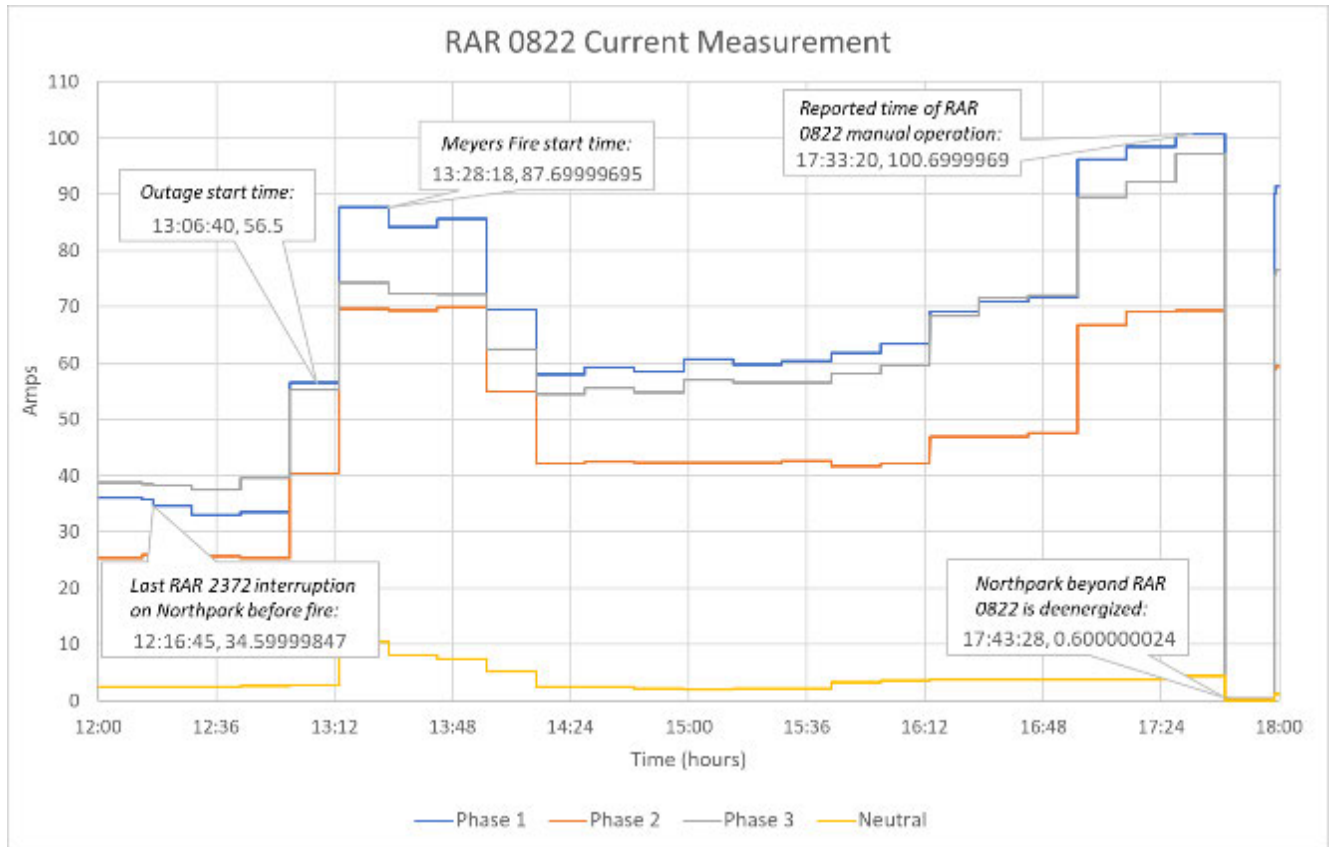


Figure 12: Current measured by RAR 0822 on December 5, 2017 from 1200 hours to 1800 hours.<sup>59</sup>

Edison asserted that the protective scheme of the circuit operated as designed, but did not provide any detail as to why the circuit was not capable of detecting the downed primary wire and de-energizing the circuit.<sup>60</sup> Edison also did not provide any detail as to why an appropriately designed protective scheme allowed for hazardous energized conductors to remain on the ground in an energized state for an undefined period of time.

SED could not determine the exact cause of the downed 12 kV conductor, particularly because of Edison's failure to properly tag and collect evidence. However, Edison suggested that, "The likely cause of the broken tie wire was wind related."<sup>61</sup> This suggestion was based on the responding troubleman's observations at the time that he arrived at the scene of the incident which he communicated to Edison's Claims

<sup>59</sup> Bates SCE-SED00003457.

<sup>60</sup> Bates SCE-SED00004205.

<sup>61</sup> Edison 315 Letter dated December 29, 2017. Under PU Code 315, public utilities must file a report for every accident that meets incident reporting requirements. This is informally known as a "315 Letter."

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Department.<sup>62</sup> The Distribution Repair Order also lists weather as the cause of the failure for this incident. It states that Edison's troubleman "report[ed] WD [wire down] near structure 4385999E [utility pole designation], line side down de-energized, broken, due to weather, no fuse"<sup>63</sup> As indicated by the Distribution Repair Order, Edison's comment regarding the cause was simply based on the troubleman's observations and not the result of an investigation or a detailed examination of the evidence.<sup>64, 65</sup>

As stated previously, SED was not able to determine the exact cause of the downed conductor because of Edison's failure to properly tag and collect evidence. However, based on the existing evidence, SED concluded that there are three possible scenarios that could have caused the 12 kV conductor to fall down:

Scenario 1: The tie wire broke at the insulator, thus, causing the 12 kV conductor to detach from the insulator and fall to the ground. The 12 kV conductor remained energized after it contacted the ground, thus, causing the burn marks on the concrete pavements as shown by the previous pictures in this report. Arcing of the energized 12 kV conductor, while on the ground, caused the 12kV conductor to break at different points (as SED observed on July 16, 2019, during examination of evidence).

Scenario 2: The 12 kV conductor broke at the insulator, and the tie wire broke or slipped from the insulator. This caused the 12 kV conductor and the tie wire to fall to the ground, both ends energized, causing the arcing and burn marks on the concrete pavement. Arcing of the energized 12 kV conductor, while on the ground, caused the 12 kV conductor and the tie wire to break at different points (as SED observed on July 16, 2019, during its examination of evidence).

Scenario 3: The tie wire became loose around the insulator and slipped from the insulator causing both the tie wire and primary conductor to fall to the ground. The 12 kV conductor remained energized after it fell down, thus, causing the burn marks on the concrete pavements as shown by the previous pictures in this report. Arcing of the energized 12 kV conductor, while on the ground, caused the 12kV conductor and the tie wire to break at different points (as SED observed on July 16, 2019, during examination of evidence).

Based on Edison's suggestion that wind conditions could have caused the conductor to fall, SED reviewed the historic weather patterns as recorded by the KCASANBE24 weather station located 2 miles northwest of the incident location. The data reviewed covered the period from September 2015 to December 2018, earlier data

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<sup>62</sup> Examination Under Oath\_EUO\_AARON LOPEZ\_100918\_VOL\_2 page 115, lines 18-28; page 116, lines 1-2.

<sup>63</sup> Bates SCE-SED00003151.

<sup>64</sup> Examination Under Oath\_EUO\_ [REDACTED] \_101718 page 71, lines 3-17.

<sup>65</sup> Examination Under Oath\_EUO\_ [REDACTED] \_101718 page 72, lines 17-28; page 73, lines 1-15.

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from weather station KCASANBE24 was not available. The data indicated that the highest wind speed and wind gust recorded over that time period was 40 mph and 49.9 mph respectively.<sup>66</sup> On December 5, 2017, KCASANBE24 recorded the daily high wind speed and daily high wind gust of 27.5 mph and 42.5 mph respectively.<sup>67</sup> A comparison of the historic data to the data recorded on the day of the incident shows that the magnitude of wind speed and wind gust on the day of the incident was typical for the area.

## **B. Violations**

To determine the violations related to this incident, SED considered various scenarios, and concluded that all of the scenarios considered would result in the same violations.

**Edison's violation of GO 95, Rule 31.1 and PU Code § 399.2 (a)** - Failure to properly maintain the Northpark 12 kV circuit in a safe manner to prevent the 12 kV conductor and the tie wire from falling and remaining energized on the ground creating an unsafe condition.

### ***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.*

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<sup>66</sup> <https://www.wunderground.com/dashboard/pws/KCASANBE24>

<sup>67</sup> <https://www.wunderground.com/dashboard/pws/KCASANBE24>

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In D. 12-04-024, the Commission stated *“In D.09-09-030, the Commission held that SDG&E has statutory under § 451 and § 399.2(a) to shut off power in emergency situations when necessary to protect public safety.”*<sup>68</sup> The decision also stated *“SDG&E has authority under Pub. Util. Code § 399.2(a) and § 451 to shut off power in emergency situations when necessary to protect public safety, including the situation where strong Santa Ana winds exceed the design basis for SDG&E’s overhead power-line facilities and threaten to topple energized power lines onto tinder dry brush.”*<sup>69</sup> It is clear that the Commission concluded that PU Code § 399.2(a) requires utilities to operate their facilities in a safe manner.

**California Public Utilities (PU) Code – PU Code § 399.2 (a)**, states in part:

*(a)(1) It is the policy of this state, and the intent of the Legislature, to reaffirm that each electrical corporation shall continue to operate its electric distribution grid in its service territory and shall do so in a safe, reliable, efficient, and cost-effective manner.*

Edison violated GO 95, Rule 31.1 and PU Code § 399.2(a) because it failed to maintain and operate the 12 kV conductor and the tie wire in a safe manner. The wind speed at the time the 12 kV conductor and the tie wire fell down was typical for the area (see footnote 61), and there was no indication that any other external force could have caused the 12 kV conductor to break and fall, or the tie wire to break or slip from the insulator. A 12 kV conductor and a tie wire that are properly installed and maintained should not fall down during normal conditions. Thus, Edison violated GO 95, Rule 31.1, and PU Code § 399.2 (a) for failing to maintain the 12 kV conductor and the tie wire safely to prevent them from falling to the ground and remaining energized during normal conditions.

**Edison’s violation of PU Code § 316 and GO 95, Rule 19 – Failure to identify the individual pieces of evidence and failure to provide responsive documents to Data Requests.**

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

*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*

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<sup>68</sup> D.12-04-024, paragraph 4.4 Discussion, page 24.

<sup>69</sup> D.12-04-024, Conclusion of Law, page 35.

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*scene of the incident has been made safe and service has been restored, each utility shall provide Commission staff upon request immediate access to:*

- o Any factual or physical evidence under the utility or utility agent's physical control, custody, or possession related to the incident;*
- o The name and contact information of any known percipient witness;*
- o Any employee percipient witness under the utility's control;*
- o 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;*
- o 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**

- (a) 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.*
- (b) 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.*

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- (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.*
- (c) 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.*

During the course of its investigation of this incident, SED requested documents from Edison.<sup>70</sup> 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.<sup>71</sup> 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 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, impeding 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.<sup>72</sup> Edison objected to this request and did not

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<sup>70</sup> SED Investigator Data Request SED-001, SED-001B, SED-002, SED-003, SED-004, SED-005, SED-006, SED-007, SED-008, SED-009, SED-010.

<sup>71</sup> Bates SCE-SED00009814.

<sup>72</sup> Bates SCE-SED00011709.

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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.

Additionally, the cooperative effort between utilities and SED during incident investigations includes the identification of evidence and the arrangement of evidence such that SED investigators can make observations and take pictures and measurements. Edison violated PU Code § 316 and GO 95, Rule 19, for failing to cooperate with SED because it failed to properly identify and collect evidence from the Meyers Fire incident and refusing to arrange the evidence for SED during its inspection at Edison's Westminster Evidence Storage Locker on July 16, 2019.

Edison's failure to label the individual pieces of evidence prevented SED investigators from determining

1. Which pieces of primary conductor could have been involved in the Meyers Fire
2. Which pieces could have been energized on the ground and involved in the arcing and sparking as witnessed by Edison employees
3. Which pieces were associated with the burning driveway concrete
4. Which pieces failed and caused the conductor to fall down
5. Generally verifying the circumstances of the incident as reported by Edison

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Edison's failure to arrange the evidence in its possession so that SED could take measurements compounded SED's inability to differentiate among each piece of conductor. Furthermore, if Edison had unraveled the pieces of conductors, SED could have

1. Surveyed the full extent of the burn marks along the conductor
2. Determined the nature of the damage along the conductor

Edison's failure to label the individual pieces of evidence and failure to arrange the evidence prevented SED from fully performing its duties under PU Code § 315. Examining evidence is critical when performing accident investigations. Observations recorded through the examination of evidence are used to support and provide accountability for all other sources of information (utility reports, witness interviews, etc.) gathered throughout the course of the investigation. Those observations help determine the events that occurred, the cause of the accident, and give insight into potential measures to prevent future accidents.

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## IV. Conclusion

Edison committed four (4) violations of the PU Code and Commission rules:

- One (1) violation of General Order (GO) 95, Rule 31.1, Design, Construction and Maintenance and one (1) violation of Public Utilities Code (PU Code) § 399.2:
  - o Edison did not properly maintain the 12 kV conductor and the tie wire in a safe manner to prevent them from falling and remaining energized on the ground creating an unsafe condition.
- One (1) violation of GO 95, Rule 19, Cooperation with Commission Staff and one (1) violation of PU Code § 316:
  - o Edison failed to provide the list of evidence and records used for Edison's own investigation.
  - o Edison failed to provide all photographs, notes, reports, and text messages generated by first responders to the incident.
  - o Edison delayed and obstructed SED's investigation by failing to identify individual pieces of the physical evidence and refusing to arrange the evidence for observation and measurement by SED investigators.

If SED becomes aware of additional information pertaining to this incident that could change 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.