

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

Incident Investigation Report

Report Date: August 31, 2022

Incident Number: E20200915-03

Regulated Entity Involved: Southern California Edison (SCE)

Date and Time of the Incident: September 6, 2020, at 1216 hours

Location of the Incident: Azusa, Angeles Forest
Los Angeles County

Summary of Incident: A wildfire that came to be known as the Bobcat Fire ignited in Angeles National Forest. Shortly after the initial signs of fire, the SCE Jarvis 12 kV circuit relayed and locked out due to a sudden increase in voltage. The cause of the voltage increase has not been determined. My investigation could not identify the source of the overvoltage condition or any malfunction/failure of SCE's facilities.

Fatality / Injury: None reported

Property Damage: None reported

Witnesses:

<i>Name</i>	<i>Title</i>	<i>Phone</i>
1. Joceline Pereira	Utilities Engineer, CPUC	(213) 269-2510
2. Paul Pimentel	Senior Claims Manager, SCE	(626) 302-5830
3. Aaron Lopez	Claims Investigator, SCE	(626) 302-6650
4. Jennifer Taylor	Special Agent, USFS	(909) 929-7075

Evidence:

<i>Source</i>	<i>Description</i>
1. SCE	Initial Incident Report
2. SCE	Final Incident Report
3. SCE	Response to SED Data Request 001
4. SCE	Response to SED Data Request 002
5. SCE	Response to SED Data Request 003
6. SCE	Response to SED Data Request 004
7. SCE	Response to SED Data Request 005

Observations and Findings:

On September 6, 2020, at 1216 hours, an interruption occurred on SCE's Jarvis 12kV circuit. RAR 0992 responded to a neutral overvoltage condition, tripping a relay and locking out. On September 6, 2020, at 1221 hours, a wildland fire later referred to as the Bobcat Fire was reported. Video footage from the wildfirealert.org website captured early stages of the fire, as early as 1210 hours, before the circuit activity. No other protective devices on the Jarvis 12 kV circuit operated on September 6, 2020.

On September 6, 2020 at 1305 hours, an SCE Troublemaker reported to the Mesa Switching Center that there was an active fire near RAR 0992. At 1906 hours, another SCE Troublemaker reported that 6 to 8 SCE poles had been damaged by the fire. The second Troublemaker opened pole switch (PS) 1007, upstream of RAR 0992, to isolate the damage.

On September 15, 2020, the USFS contacted SCE with a request to view some facilities of interest near Cogswell Reservoir. SCE notified me of the request, however, due to short notice I was unable to participate in the site visit. During the site visit, the USFS identified a subject SCE conductor in the area and requested to collect it as evidence. SCE notified me that the collection was scheduled to take place the following morning, September 16, 2020.

On September 16, 2020, at 0900 hours, I met with Paul Pimentel and Aaron Lopez of SCE Claims, and USFS Special Agent Jennifer Taylor, approximately 8 miles west of San Gabriel Canyon Road along Devil's Canyon Road, near Cogswell Dam. USFS was conducting the primary investigation regarding the ignition of the Bobcat Fire and had control over the site.

The Bobcat Fire was still burning in other areas of the Angeles Forest but not in the Cogswell Dam area. I observed the canyon through which the fire had previously burned, as well as one of the two H-frames to which the subject conductor was attached. The section of interest on the subject conductor was uphill beyond visibility.

The SCE facility involved in the USFS investigation of the Bobcat Fire is an approximately 23-foot section of primary 12 kV conductor collected from between H-Frame structure comprised of poles 2127468E/1583439E ("H-frame 1") and a second H-frame structure comprised of poles 4786005E/4786004E ("H-frame 2"). H-frame 1, located at the bottom of the hill at the incident site, was comprised of two 40-foot class 5 Douglas Fir poles and was installed in 2019. H-frame 2, located within the USFS restricted area beyond visibility, was comprised of two 50-foot class H1 Douglas Fir poles and was installed in 2009.

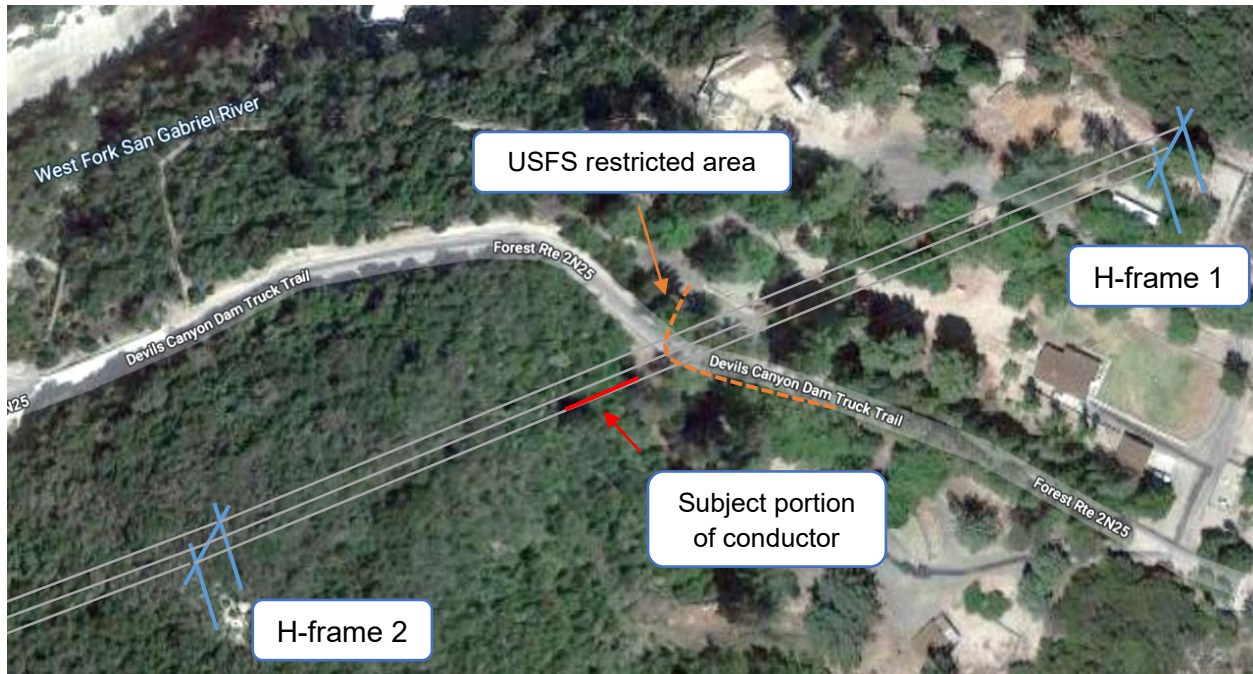


Figure 1: Location of the subject conductor within USFS restricted area.

The USFS had cordoned off a section of the forest and denied us access. From outside the area, I noticed three fallen conductors lying across the trees above. Looking into the restricted area, I observed the same conductors lying across the ground. I was unable to observe the condition of the conductors on the ground.



Figure 2: Three fallen conductors between the two H-frame structures resting on the trees below.



Figure 3: View from outside the USFS restricted area. The subject conductors are no longer supported by the H-frames and are lying across the ground.

On September 16, 2020 at approximately 1300 hours, the SCE Mesa Switching Center issued clearance to allow the conductor removal on the subject portion of the circuit. Special Agent Taylor of the USFS provided visual guidance for what section of the conductor SCE should remove. SCE was instructed to attach a rope to the subject conductor to safely pull the conductor down to the ground where it would be cut for collection. From outside the restricted access area, I noticed that the section identified by USFS was resting on a tree branch. I did not observe identifiable damage to the tree or the conductor at the point of contact.

Special Agent Taylor briefly left the area in search of a colleague. During this time, the SCE crew raised a bucket truck and an SCE lineman attached a rope to the area on the subject conductor that the USFS had previously identified. Upon return, Special Agent Taylor stated that the SCE crew had been instructed to standby until she returned. Special Agent Taylor further explained that the SCE lineman had attached the rope in the wrong place, thus damaging the evidence in which the USFS was interested. The view of the contact point between the rope and the conductor was obstructed by surrounding trees. The USFS has declined to provide details to me regarding what was damaged or the nature of the damage¹, therefore I could not determine whether any action by SCE resulted in damage to the evidence.

¹ During in-person conversation on September 16, 2020.



Figure 4: SCE field personnel preparing to lower the subject conductor.

The USFS instructed SCE to proceed in pulling the conductor down to approximately 5 feet off the ground. JHNolt Associates, an independent contractor working on behalf of the USFS, instructed SCE to place five colored tags at various locations on the conductor, as well as the location at which to cut the conductor. USFS declined to share information regarding the placement of each tag. The conductor section measured approximately 23 feet in length. I observed several places on the conductor that were coated in a sticky residue. Some parts of the conductor showed evidence of burning. Due to the heavy slack on the east side of the conductor, it can be inferred that subject area on the conductor could not have been resting on the same tree in its original position before H-frame 2 was no longer supporting it.



Figure 5: The approximately 23-foot section of the subject conductor.



Figure 6: Burn marks on subject conductor.



Figure 7: Residue on subject conductor.

The subject conductor collected was 1/0 ACSR primary 12 kV conductor with a current carrying capacity of 280 amps. SCE was unable to provide an installation date for the conductor. SCE indicates that it does not track the date of installation for conductors.² This is a problematic practice because the majority of GO 95 rules are based on the date of installation. Due to the extensive damage that the Bobcat Fire caused to

² Email from SCE representation dated August 26.

facilities upstream of the incident site, SCE could not trace the conductors back to the substation to identify the phase voltage of the conductor. However, manufacturers labels on the RAR indicate that the subject conductor was likely connected to the B-phase.

SCE conducted the most recent detailed inspections of the subject H-frame structures in April 2019 and only recorded findings of missing high voltage signs. Inspection findings from other poles in the area did not include any conditions that may cause a fault. SCE performed aerial inspections on both H-frame structures in December 2019 and recorded no findings. Vegetation patrol records show the trees in this area being last trimmed in March 2020.

The Jarvis 12 kV circuit out of Dalton substation incorporates five primary protection devices. RAR 0992 consists of a G&W Viper recloser equipped with a Schweitzer Engineering Laboratories SEL-351R-4 relay. The minimum trip current was 70 amps at the time of the incident. The ground trip was set to 16 volts. This means that if the current on the circuit exceeds 70 amps, or if the phase-to-ground voltage exceeds 16 volts, the relay will operate and the recloser will open.

During Red Flag Warnings, SCE implements SOB 322 as an additional safety measure to protect against fault currents that may occur during high wind conditions. While SOB 322 is in effect, operating conditions for protection devices are changed so that remote automatic reclosers and circuit breakers will lock out following a single relay operation. SOB 322 was in effect on the Jarvis 12 kV circuit at the time of the incident.

The minimum trip current was set to 70 amps at the time of the incident. Current recordings from the RAR show that the current did not exceed 70 amps at any time on the day of the incident. The ground minimum trip was set to 16 volts.

RAR 0992 recorded seven events within approximately 11 seconds at 1216 hours on September 6, 2020. The relay target that tripped indicated that the source of the events was a neutral overvoltage condition. The RAR recognized the event that opened the automatic recloser as a ground fault and recorded a voltage of 2844 volts on the neutral conductor. A ground fault, or a phase-to-ground fault, occurs when there is contact between a conductor and a grounded structure, whereas a phase-to-phase fault indicates contact between two conductors. Although such data indicates a fault condition, however, there was no evidence to indicate that the fault source was contact between the conductor and vegetation. Conductor contact with a tree would likely show a decrease in the current on that phase, as the tree carries part of the current to the ground. The RAR detected no change in the current on either the A, B, or C phase conductors. Additionally, the RAR detected the increase in voltage on the neutral conductor and did not produce targets to indicate that either the A, B, or C phase conductors were involved in the fault. SCE has determined that the subject conductor was most likely phase B conductor. SCE was not able to determine the cause of the fault. There was no work being performed on the Jarvis 12 kV circuit during the time

leading up to the incident, therefore work activity is ruled out as a cause for the fault current.

A voltage increase on the neutral conductor can occur if the voltages across the three primary phase conductors are unbalanced. This means that the loads on the three phases are unequal, causing the voltage difference across two or more phases to increase. It is unclear whether this was the case with the RAR operation because SCE was unable to provide voltage information for the time leading up to the incident. There was not enough evidence that would allow me to determine the source of the additional voltage on the neutral conductor.

I was not able to determine the cause of the fault event that occurred on September 6, 2020. My investigation determined that the fault event resulted from an overvoltage condition. There is not enough evidence to determine the cause of the condition. My investigation found that RAR 0992 recorded no activity from any of the three primary conductors, therefore, it is possible that the fault event that triggered the recloser operation likely did not originate from conductor-to-conductor contact, or conductor to ground contact.

USFS has refused to share information regarding their investigation of the source of the ignition.³

Requirements:

<i>General Order</i>	<i>GO Rule</i>	<i>Violation</i>
1. GO 95	Rule 35	No
2. GO 95	Rule 38	No

Conclusion:

My investigation did not reveal any GO 95 violation by SCE. The evidence available did not suggest any contact between a conductor and vegetation/ground, contact between conductors, or other equipment failure prior to the incident.

³ Phone calls between SED Legal and USFS between October 2020 and June 2021.