

**CALIFORNIA PUBLIC UTILITIES COMMISSION**  
**Safety and Enforcement Division**  
**Wildfire Safety and Enforcement Branch**

**Incident Investigation Report**

**Report Date:** December 21, 2023

**Incident:** Emerald Fire

**Incident Number:** E20220720-02

**Regulated Utility Involved:** Southern California Edison Company (SCE)

**Date and Time of the Incident:** February 10, 2022, at approximately 0410 hours

**Location of Incident:** North of 1425 Emerald Bay, Laguna Beach, Orange County, California

**Fatality/Injury:** None/None

**Property Damage:** \$0 Utility, \$0 Other, SCE stated there was no damage to their facilities or to other third parties.

**Regulated Utility Facilities Involved:** Santiago-Crown-Morro 66 kV Subtransmission Circuit

**I. Summary**

On February 10, 2022, at approximately 0410 hours, the Emerald Fire (Incident) began in an area about 2000 feet north of 1425 Emerald Bay in Laguna Beach, California. The Orange County Fire Authority (OCFA) responded, and the fire was suppressed the same day after consuming 154 acres. Several months later, on July 20, 2022, the OCFA issued a report of the Incident, which determined that sparking from overhead power lines caused the fire. Upon learning of the OCFA's determination, SCE reported the Incident to the California Public Utilities Commission (CPUC or Commission) that same day.

The Safety and Enforcement Division's (SED) investigation of the Emerald Fire examined SCE's operation and maintenance records related to the Emerald Fire and found no violations of the Commission's General Orders (GO), Decisions, or Resolutions, or the California Public Resources Code.

## A. Rules and Requirements Reviewed

	Rule	Requirement	Violation
1	Decision (D.) 06-04-0555, Resolution E-4184, Appendix B	Accident Reporting Requirements	No
2	GO 165	Inspection Requirements for Electrical Distribution and Transmission Facilities	No
3	GO 95, Rule 35	Vegetation Management	No
4	Public Resources Code Section 4293	Electrical Transmission or Distribution Line Clearance Requirements	No

## B. Witnesses

	Name	Title
1	Desmond Lew	CPUC Investigator
2	Paul C. Pimentel	SCE Principal Manager
3	Natalie M. Rivera	SCE Senior Advisor

## C. Evidence

	Source	Date	Title
1	OCFA	April 07, 2022	Orange County Fire Authority Investigation Report Case No. 22-019703
2	SCE	July 20, 2022	Initial Incident Report
3	SCE	August 12, 2022	20-Day Report
4	CPUC	December 21, 2022	Data Request SED-01 (DR-1)
5	SCE	January 23, 2023	Data Request Responses to DR-1
6	CPUC	June 09, 2023	Data Request SED-02 (DR-2)
7	SCE	July 10, 2023	Data Request Responses to DR-2
8	CPUC	August 11, 2023	Data Request SED-03 (DR-3)
9	SCE	August 28, 2023	Data Request Responses to DR-3
10	CPUC	September 26, 2023	Subject Matter Expert Questions
11	SCE	September 28, 2023	Responses to Subject Matter Expert Questions

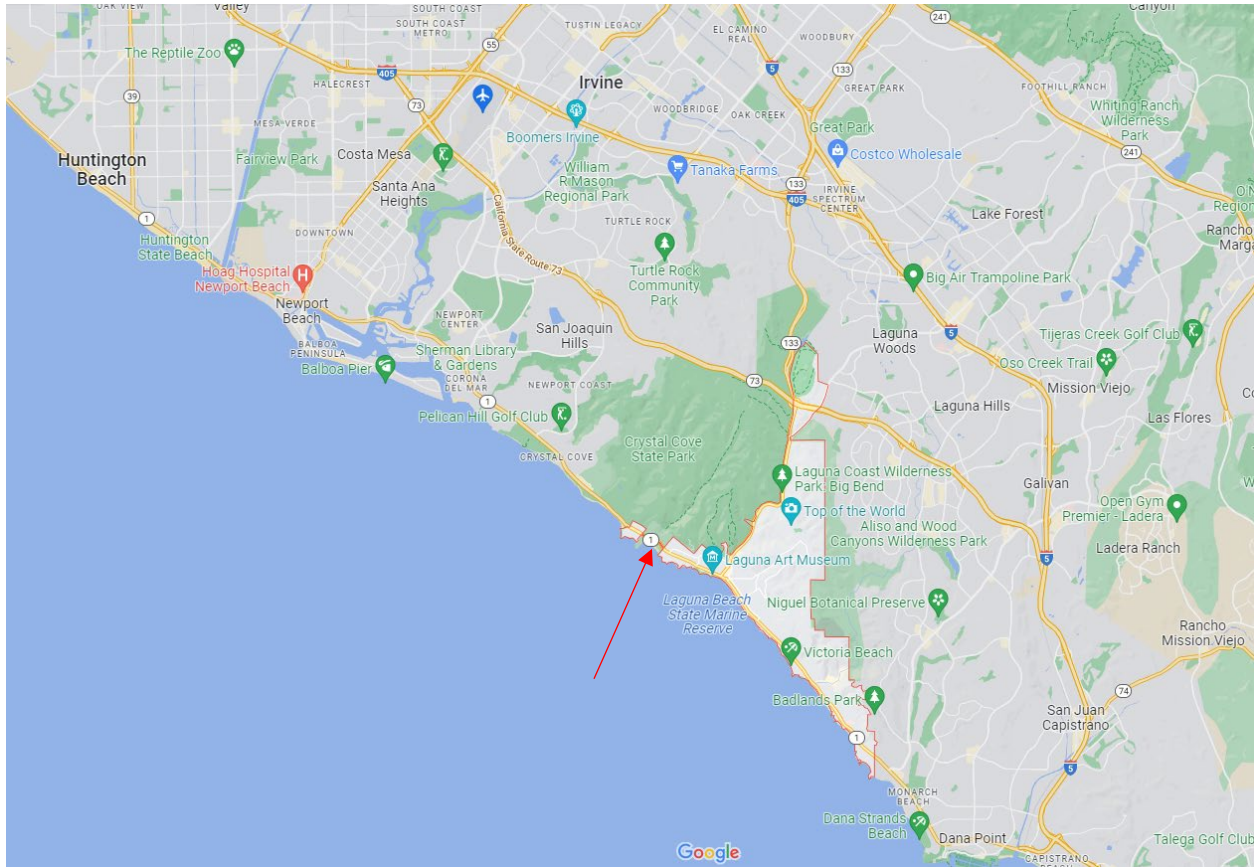
## II. Background

The Emerald Fire occurred on February 10, 2022, at approximately 0410 hours, just north of 1425 Emerald Bay in Laguna Beach, California (Incident Location). The Incident originated near poles 785851E, 785852E, and 785853E (Incident Poles) on the Santiago-Crown-Morro 66kV Subtransmission Circuit.<sup>1</sup> This area is in a Tier 2 High Fire Threat District (HFTD). Figure 1 provides a vicinity map of the Incident Location and Figure 2 provides a satellite view of the Incident Location. The OCFA issued evacuation orders soon after the fire started and lifted them around 1500 hours that day. The fire burned 146 acres of natural vegetation but did not burn any

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<sup>1</sup> SCE 20-Day Report.

structures or cause any other property damage. OCFA investigators cleared the Incident Location on February 16, 2022.<sup>2</sup>



**Figure 1.** Vicinity map pointing to the Incident Location.

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<sup>2</sup> OCFA Investigation Report Case No. 22-019703.



**Figure 2.** Satellite view of the Incident Location with three SCE conductors shown in red.

### **III. Fire Authority Report<sup>3</sup>**

The OCFA, the fire authority which responded to the Emerald Fire, reported that the fire ignited on February 10, 2022, at approximately 0410 hours. That day, when OCFA investigators arrived at the scene, they observed a vegetation fire in a large canyon area. OCFA fire crews had stopped the forward expansion of the fire and were extinguishing hot spots. Hand crews were placing perimeter lines around the fire. The firefighters extinguished the fire and cleared the scene on February 16, 2022.

In its report, OCFA observed the Incident Poles, three large utility poles located at the top of Moro Ridge Road. From the Incident Poles, three overhead electrical lines ran down into the canyon. The lines extended approximately 3650 feet across the canyon to three additional utility poles located at Boat Road on the adjacent ridge. Based on fire pattern indicators, OCFA identified the Incident Poles near Moro Ridge Road as the General Origin Area (GOA). Within the GOA, OCFA identified the Specific Origin Area (SOA) by observing multiple macro and micro indicators that the fire made advance runs in various directions. The SOA was approximately 20 feet wide and 40 feet long near the Incident Poles at Moro Ridge Road. (See Figure 3).

OCFA determined that lightning, campfire, cooking, fireworks, glass refraction, incendiary devices, smoking, and equipment use could not have caused the fire. After excluding all other possible causes, OCFA deduced that the most probable heat source was sparks from electrical arcing. OFCA’s report concluded that high wind conditions blew sparks from an unspecified electrical event on the three high voltage power lines into an underlying fuel bed and started the fire.

<sup>3</sup> OCFA Investigation Report Case No. 22-019703, pages 8-10 and 14-16.





**Figure 3.** The Incident Poles near the SOA identified by OCFA.

## **IV. SED Review and Analysis**

### **A. Review of Event Timeline**

SED reviewed SCE's Incident timeline as detailed below.<sup>4</sup>

On February 10, 2022, the day the fire started, the National Weather Service issued heat and wind advisories for parts of Orange County, including the area involved in the Incident. The advisories extended into the following day.

SCE received their first report of the fire at 0558 hours, which informed them that at 0536 hours, there was burning near and northeast of Emerald Bay in Laguna Beach. The Incident Location was in the vicinity of the Santiago-Crown-Morro 66 kV Subtransmission Line, the Artist 12 kV Distribution Line, and the Kewamee 12 kV Distribution Line.

- To assist in fire suppression efforts, SCE de-energized a portion of the Kewamee 12 kV Distribution Circuit from the Crown Substation at 0619 hours. Next, SCE de-energized a portion of the Artist 12 kV Distribution Circuit from the Morro Substation at 0623 hours.
- That morning, OCFA asked an SCE senior patrolman, who was out patrolling the Santiago-Crown-Morro 66 kV Subtransmission Circuit, about circuit activity in the area. The senior patrolman informed OCFA that no circuit interruption had occurred on the Santiago-Crown-Morro 66 kV Subtransmission Circuit that day.

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<sup>4</sup> SCE response to DR-1, Question 1.

- At 0903 hours, SCE Fire Management reported that the Emerald Fire started at 0409 hours and was burning near 1425 Emerald Bay in Laguna Beach. The fire had consumed 145 acres and was 0 percent contained with forward progress stopped.
- At 1505 hours, per the request of the Laguna Beach Fire Chief, SCE re-energized the Kewamee 12 kV Distribution Circuit from the Crown Substation and re-energized the Artist 12 kV Distribution Circuit from the Morro Substation. By 1528 hours, the fire had consumed approximately 151 acres and was 10 percent contained with forward progress stopped.

From this point on, until July 20, 2022, SCE had no information that its facilities were alleged to be involved in the ignition of the fire. The utility had no record of interruptions or circuit activity associated with faults on the circuits occurring during the reported alarm time. SCE had no wires down or damage to facilities in the area.

## **B. SED Field Observations**

SED conducted a single site visit to the Incident Location and made the following observations.

On July 27, 2022, SED met with SCE's Senior Advisor at the Crystal Cove State Park Ranger Station (8471 North Coast Highway, Laguna Beach). From there, the SCE Senior Advisor and SED rode an SCE four-wheel drive vehicle in a southeasterly direction on North Coast Highway to Moro Ridge Road where they were joined with an SCE Advisor. Moro Ridge Road is an unimproved street or path which is an entry point into the state park. The drive to the location which OCFA identified as the fire origin area took approximately 30 minutes. The fire origin area was a deep, hilly canyon with limited vehicle access.

SCE's Santiago-Crown-Morro 66 kV Subtransmission Circuit spans the canyon at the fire origin area (Incident Span). Three conductors span in the east-west direction. Each conductor is individually supported by its own pole, the three Incident Poles, which are approximately 17 feet apart. The conductors span 3650 feet over a deep canyon from one side, near Moro Ridge Road, to another ridge near Boat Road. The poles on the west side are higher than the poles on the east side. The canyon is irregular but could be described as running parallel to the conductors. Although the exact degree to which the conductors sag over the 3650-foot Incident Span is presently unknown, SED visually observed significant sag. (See Figures 4 through 6).

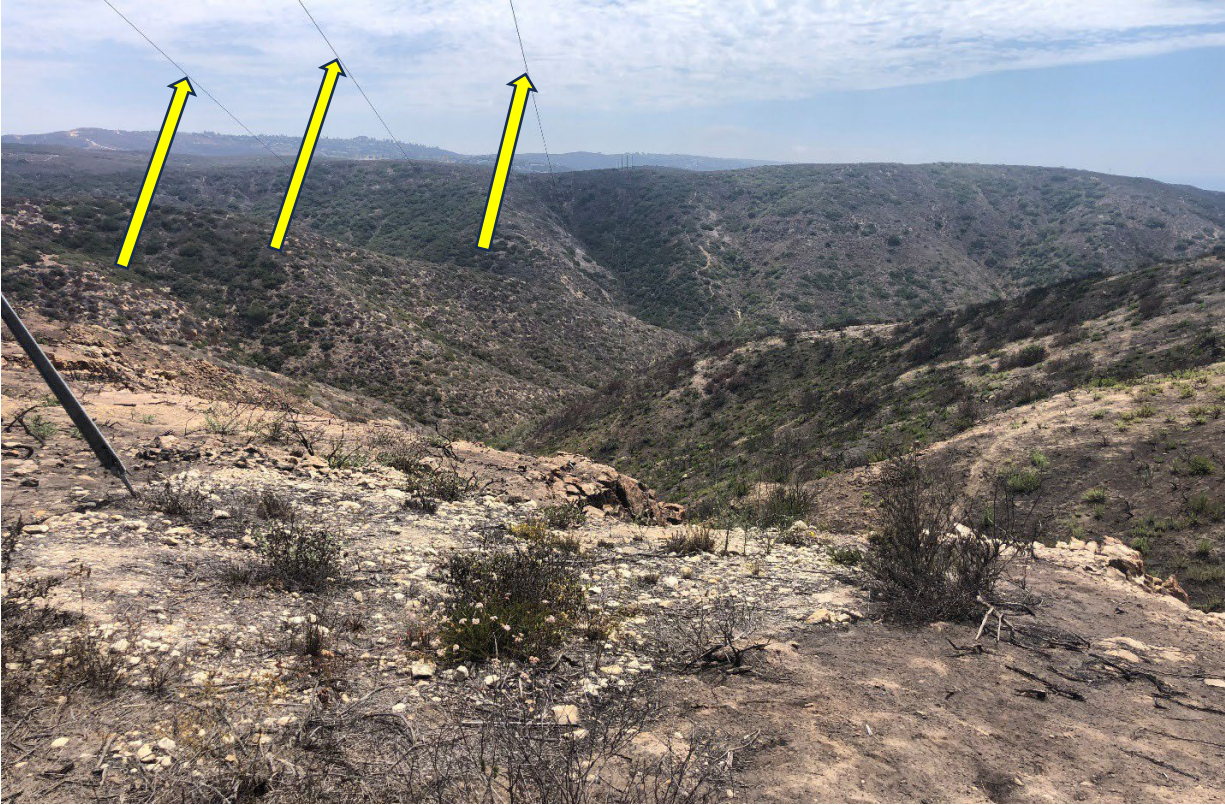


**Figure 4.** Photo of the configuration of the three Incident Poles (looking in the southwesterly direction toward Moro Ridge Road).



**Figure 5.** Photo of the three conductors (yellow arrows) spanning approximately 3650 feet east from Moro Ridge Road. The red arrow points to the three poles that support the conductors on the other side of the canyon near Boat Road.





**Figure 6.** Photo of the canyon below the conductors (yellow arrows) spanning in the easterly direction.

Approximately 200 feet west of the Incident Poles near Moro Ridge Road, a single pole supported three conductors (shown in Figure 7). SCE explained that the utility intended that the change in configuration would ensure phase spacing, to avoid phase to phase conductor clashing.<sup>5</sup> The long span and large conductor size create a high tensile force on the pole supports.

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<sup>5</sup> SCE response to DR-1, Question 6.





**Figure 7.** Photo of a single pole supporting three conductors west of Moro Ridge Road.

To support the poles against the tensile force created by the long Incident Span, guy wires braced the Incident Poles at two locations on each pole. Additionally, a guy wire braced each pole in the opposite direction of the Incident Span (as shown in Figure 8). SED examined each pole, conductor, and equipment, but found no evidence of excessive wear, corrosion, or deterioration. A close-up of the Incident Poles is shown in Figures 9 and 10.



**Figure 8.** Photo of the Incident Poles showing conductor, equipment, and guy wire support.



**Figure 9.** Close-up photo showing the condition of one of the Incident Poles supporting one of the conductors.





**Figure 10.** Photo showing the conductor and equipment supported on Incident Poles.

The location of the suspected ignition is within the 3650-foot Incident Span, east of the Incident Poles, and near Moro Ridge Road. The conductors span both west and east in a single direction with no junctions in this area.

SCE stated that OCFA did not take any evidence into custody.<sup>6</sup> SED reviewed OCFA's report and verified this statement. Furthermore, SED inspected the immediate area near Moro Ridge Road and used binoculars to inspect the area towards the east of the canyon. The area appeared to contain little to no debris or evidence of SCE equipment damaged from high voltage arcing which could have started the Emerald Fire.

OCFA's report has ruled out the following possible fire causes: lightning, campfire, cooking, fireworks, glass refraction, incendiary devices, smoking, and equipment use. OCFA based its assertion that electrical power lines ignited the Emerald Fire on surveillance video, which shows an initial flash of light followed by fire progression. OCFA also reported evidence of black scorch marks on one conductor cable. Using binoculars, SED unsuccessfully attempted to find the scorched cable mentioned by OCFA. The steep and hilly terrain limited access to the damaged cable area. As a result, SED was unable to observe the damaged cable in the field.

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<sup>6</sup> SCE response to DR-1, Question 3.



The ignition area is a wildland desert environment in a deep canyon with brush and few trees, as shown in Figure 11. Due to the geography and local environmental conditions, a fallen tree could not have caused the fire.



**Figure 11.** Photo showing the canyon with brush and few trees.

At approximately 1330 hours, SED concluded the site visit. SCE took SED back to the Crystal Cove State Park Ranger Station.

### **C. SED Document Review and Investigation**

SED reviewed utility regulations, procedures, and inspection documents obtained through SCE's 20-Day Report and subsequent responses to SED Data Requests (DR).

Prior to the start of the fire, no circuit within SCE's service territory, including the Kewamee 12 kV Distribution Circuit, the Artist 12 kV Distribution Circuit, and the Santiago-Crown-Morro 66 kV Subtransmission Circuit, was forecasted to meet or exceed SCE's PSPS criteria.<sup>7</sup>

According to SCE, none of the relays or meters connected to any of the subject circuits recorded any fault currents and no circuit breakers tripped open.<sup>8</sup>

The Incident Span between the poles at the ridge at Moro Ridge Road and the ridge at Boat Road is approximately 3650 feet. LiDAR data from January 13, 2022, confirms that the three conductors on the Incident Span are parallel and at approximately 17 feet from each other,<sup>9</sup>

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<sup>7</sup> SCE response to DR-1, Question 34.

<sup>8</sup> SCE response to DR-1, Question 22.

<sup>9</sup> SCE response to DR-2, Question 5.

which exceeds the minimum clearance of 96 inches required by GO 95, Rule 38, Table 2, Case 7.

SCE provided records of patrol inspections and detailed inspections of the Incident facilities (including the Incident Span and the Incident Poles), which were completed in November 2019, November 2020, and October 2021.<sup>10 11</sup> SCE's patrol inspections nor its detailed inspections identified any abnormal conditions.

For the poles on the Incident Span, SED requested pole loading calculations and previous Intrusive Test Records. SCE provided the requested pole loading calculations and sag calculations under the loading conditions for which the poles were designed.<sup>12</sup> Intrusive Test Records were not available as no such tests were performed because the poles were installed in 2018, which is less than the 15-year age for requiring Intrusive Inspections. SED reviewed the pole loading calculations and sag calculations, with the results conforming to GO 165.

SCE provided records of the April 2021 vegetation management inspection in the grid location containing the Incident Span.<sup>13</sup> In addition, SCE provided 2021 pole brushing records for poles in the grid location.<sup>14</sup> SCE's records show corrective actions were taken, including tree removal or tree brush cutting, conforming to GO 95, Rule 35 and Public Resources Code Section 4293.

## **V. Violations**

SED reviewed and analyzed SCE's inspection, maintenance records, and investigation reports related to the Incident to evaluate compliance with Commission regulations. After a comprehensive review of SCE's records, SED found no violations of the Commission's regulations.

SED reviewed and noted that SCE's patrol inspection and detailed inspection records did not identify any equipment defects or abnormalities with the facilities that might have contributed to the Incident. Furthermore, all inspection intervals were timely and within the requirements of GO 165. GO 165 requires utilities to conduct overhead patrol inspections every two years in rural areas. However, per GO 165, Table 1 (Footnote1), the frequency of the patrols is increased to once per year in Tier 2 HFTDs. The patrol inspections and detailed inspections conducted by SCE meet this interval criteria.<sup>15</sup>

In accordance with GO 95, SCE conducted annual vegetation patrols and completed identified vegetation work for all distribution facilities. SED noted that timely vegetation management inspections in April 2021 and pole brushing in 2021 show corrective action, including tree

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<sup>10</sup> SCE response to DR-1, Question 8.

<sup>11</sup> SCE response to DR-1, Question 9.

<sup>12</sup> SCE response to DR-1, Question 6.

<sup>13</sup> SCE response to DR-1, Question 10.

<sup>14</sup> SCE response to DR-1, Question 10.

<sup>15</sup> Twelve consecutive calendar months starting the first full calendar month after an inspection is performed, plus three full calendar months, not to exceed the end of the calendar year in which the next inspection is due.

removal or tree brush cutting. SED finds that SCE's actions were in conformance and in compliance with the vegetation management requirements at the time of the Incident.

Public Resources Code Section 4292 requires a fire break of at least 10 feet in each direction from the outer circumference of pole supports and vegetation. Section 4293 requires a minimum distance of four feet between the conductors and vegetation. SED finds that SCE's 2021 vegetation management inspections and pole brushing complied with Section 4292 at the time of the Incident.

## **VI. Conclusion**

Based on the evidence reviewed and examined, SED's investigation did not find SCE in violation of any General Order or Public Resources Code provisions. SCE reported the Incident promptly after becoming aware of OCFA report that it met the reportable criteria of damage. SCE became aware that the Incident was reportable on July 20, 2022, and reported it the same day as required by Resolution E-4184.

If SED becomes aware of additional information that could modify the findings in this report, the investigation may be re-opened. If so, SED may modify the report and take further action as appropriate.