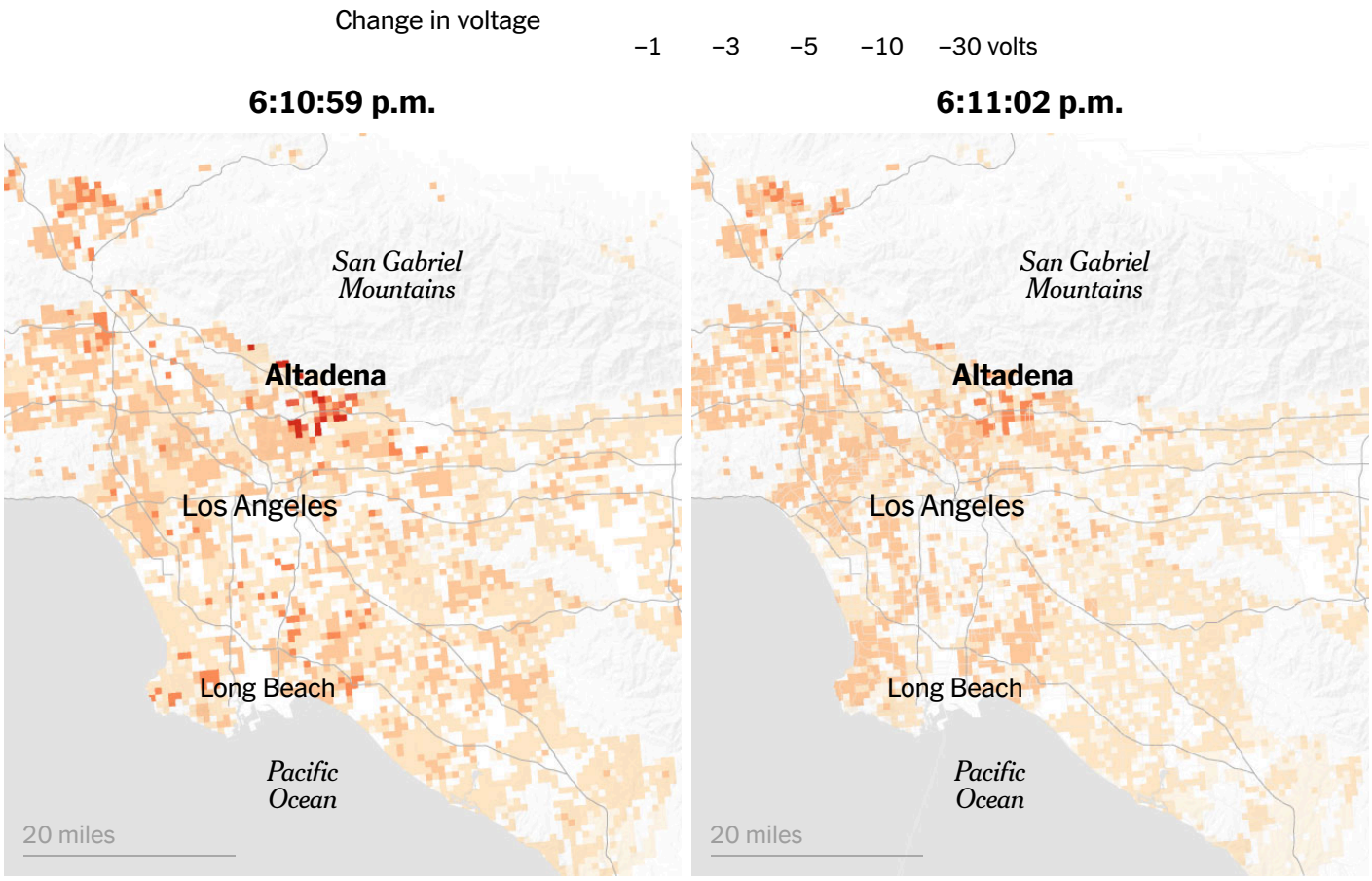
New Data Shows Major Electrical Disruption Ahead of Eaton Fire

By Ivan Penn, Zach Levitt and Martín González Gómez Jan. 29, 2025

Moments before flames erupted below transmission towers near Altadena, Calif., high-voltage power lines faulted in the area, new sensor data shows, offering fresh clues about whether utility equipment may have failed as the deadly Eaton fire broke out on Jan. 7.

Where voltage dropped on Jan. 7 as electrical equipment faulted



Source: Whisker Labs • Note: Data is anonymized readings from homes that have installed Whisker Lab sensors.

About three seconds later, another major fault was registered near Altadena, according to Whisker Labs, which has a network of sensors installed in homes around the country that are collectively able to measure abnormal activity on the electrical grid. The two electrical disruptions along transmission lines were so powerful that they reverberated as far away as Oregon and Utah, across tens of thousands of sensors.

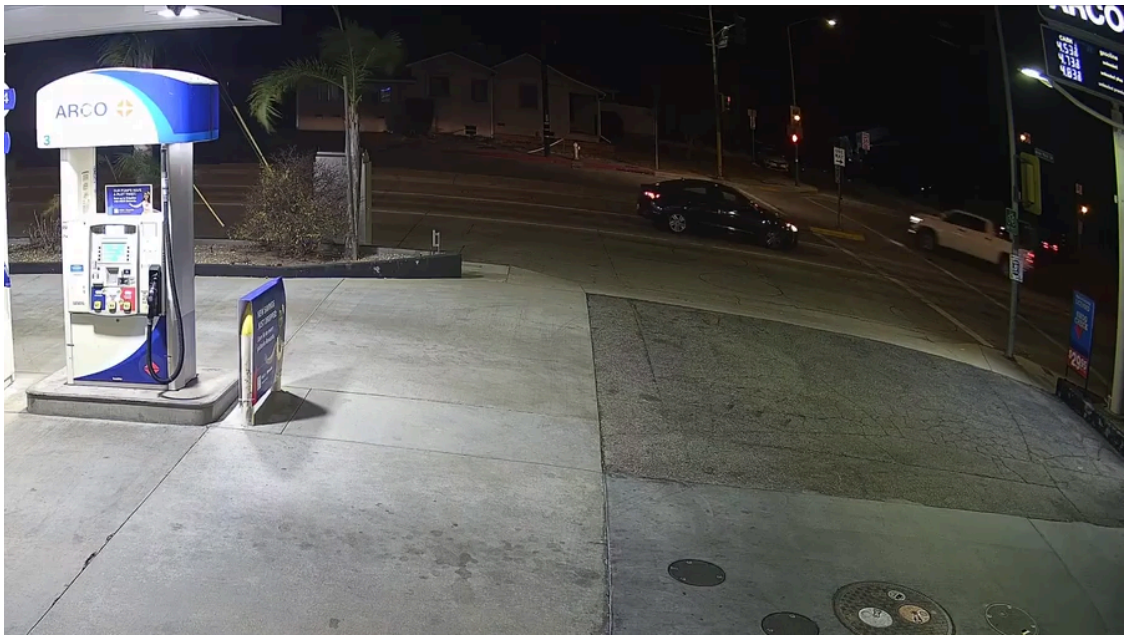
“We looked at this one — it was like, Holy cow,” said Bob Marshall, co-founder and chief executive of Whisker Labs. “This is a transmission-scale event. Any time something happens on the grid and we see a fault at exactly the same time on many, many sensors, then it is a fault on the utility grid.”

The faults at 6:10 p.m. and again at 6:11 p.m. coincided with two flashes in the vicinity of the transmission lines seen in a video captured by a camera at an Arco gas station in the moments before the Eaton fire began, followed by flames near the base of high-voltage transmission towers.

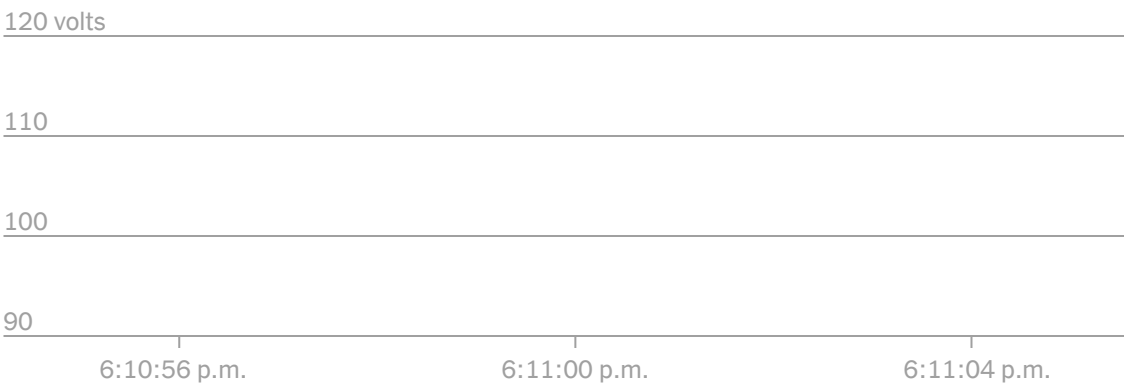
Major drops in voltage occurred at the same time as flashes known as arcing

6:10:55 p.m.

Footage from the Arco gas station



Voltage readings from a home near Eaton Canyon



Source: Whisker Labs; video: Arco gas station surveillance footage • Notes: Times are Pacific.

Whisker Labs' data, which does not provide conclusive evidence about how a wildfire began, could play a pivotal role in helping to determine the cause of the Eaton fire, which increasingly has focused on possible electrical failures on the transmission network in Eaton Canyon.

Combined with eyewitness accounts and cellphone video of fire raging beneath a set of three steel-lattice towers, the flashes in the gas station video have focused attention on a transmission line owned by Southern California Edison, the state's second-largest investor-owned utility.

Edison has not conceded that its equipment caused the Eaton fire, but said it is conducting its own investigation. The utility has agreed to meet with Whisker Labs about the data as part of its review. The exact cause of the fire, which killed 17 people and destroyed more than 9,000 homes and businesses, remains under investigation, and a final determination could take many months.

Electrical equipment — transmission lines in particular — has been the source of some of the most devastating wildfires in California and across the country. Fires caused by utility equipment have increased the risk and economic vulnerability for power providers as extreme weather driven by climate change has challenged the nation's aging electrical infrastructure.

In 2018, a live wire broke free from a 100-year-old transmission tower in high winds and sparked the Camp fire, which killed scores of people and destroyed the town of Paradise in Northern California. The Camp fire and a series of other blazes led California's largest utility, Pacific Gas & Electric, to file for bankruptcy in 2019 and to institute wildfire prevention measures as extreme weather conditions have become more persistent.

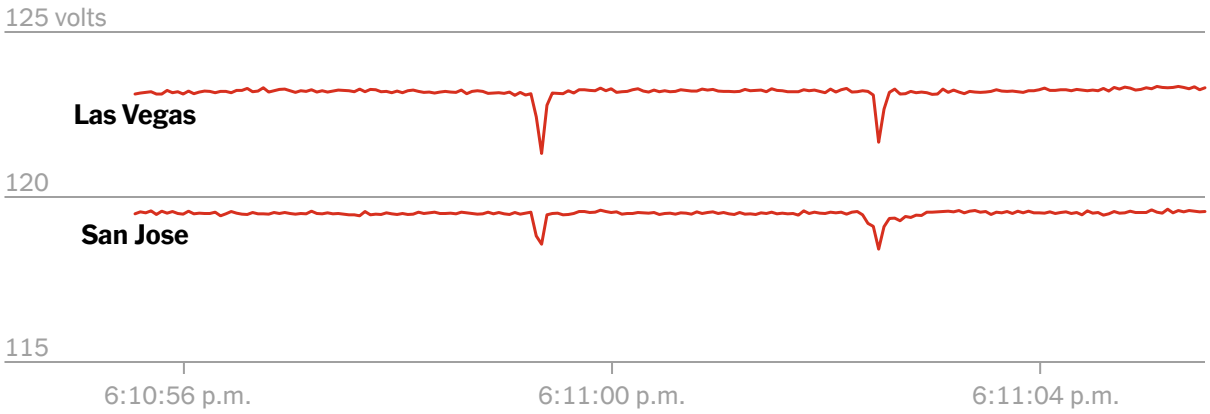
On the evening of Jan. 7, winds reached as high as 100 miles per hour across Southern California, downing trees and battering electrical poles, towers and lines.

The network at Whisker Labs, a technology company based in Germantown, Md., began measuring electrical problems at homes throughout the Los Angeles region using sensors, which help to predict and prevent residential fires.

But two stood out. A major fault on the electrical grid in the area of Altadena and Eaton Canyon caused a voltage drop one second before 6:11 p.m. and then another, in the area around Edison's Gould and Goodrich substations, according to Whisker Labs.

Voltage drops registered prominently in the Altadena area and with a lesser magnitude in other places across Southern California. But the faults had been so substantial that their weakening pulses propagated in a matter of milliseconds across Whisker Labs' western network — southeast to Phoenix; north to San Jose, Calif., and Portland, Ore.; east to Las Vegas; and northeast to Salt Lake City.

Where voltage dropped elsewhere



Source: Whisker Labs • Notes: Times are Pacific. Data is for individual homes in respective cities.

The magnitude of the two events suggested, according to Whisker Labs, that the faults were on the high-voltage transmission lines that carry electricity from facilities like power plants to substations. Low-voltage distribution lines, which deliver power from the electric grid to homes and businesses, experience faults more often during windy conditions, but they would not have the energy to send signals throughout the West.

When power lines touch one another, come into contact with poles or tree branches or become engulfed in smoke, they can produce flashes and sparks that can ignite nearby vegetation.

The two flashes in Eaton Canyon recorded on the gas station video at the same time as the two faults could depict the flash of energy that occurs during a fault as the disrupted electricity on the line seeks a place to go.

“All of that energy — that’s a lot of energy that went into that flash — it was enough energy that it actually lowered the voltage in nearly the entire western grid, which means it’s a lot,” Mr. Marshall said.

Robert McCullough of McCullough Research, a Portland, Ore.-based firm that conducted a review of Whisker Labs’ data and operation at the request of The Times, said the data lends further support to the possibility that utility equipment was involved in igniting the Eaton blaze.

“Everything that we’ve had,” Mr. McCullough said, “puts us at the same tower with the same relationships where we’re seeing unusual operations.”

In response to questions about disruptions on its system, Edison has said it registered a fault at 6:11 p.m. at its Gould substation, a facility about five miles away from what is believed to be the origin point of the fire. The utility later reported to state regulators that a preliminary analysis showed that as a result of the fault at the Gould substation, there was “a momentary and expected increase in current on SCE’s transmission system.”

But the company has given no indication that it registered a large, transmission-level disruption of the kind shown in the new data in relation to the Eaton fire.

The utility said it would meet with Whisker Labs representatives to review the findings.

“They approached us to discuss their data. We agreed to meet with them to review it because we will review all information available to us as part of our investigation,” said Kathleen Dunleavy, a spokeswoman for Edison. “If anyone has any evidence that can help the authorities determine the cause, we implore them to immediately provide it to the investigators.”

Edison has said that it did measure a large fault on a transmission line related to a separate fire, the Hurst fire, north of Altadena. That power line, in the Sylmar area of Los Angeles County, fell to the ground, though it is unclear whether a power line caused the fire.

Whisker Labs’ sensors also detected that incident.

A finding that Edison’s electrical equipment caused the Eaton fire could have important implications for the victims of the Eaton fire, who are seeking compensation for their losses, and the future of one of the state’s major utility companies. More than a dozen lawyers have filed lawsuits against Edison, arguing that mounting evidence points to the utility’s equipment as the source of the fire that devastated the Altadena community.

“The fault data, the videos, the witness accounts all paint the same picture,” said Mikal C. Watts, a lawyer based in Austin, Texas, who is representing some of the wildfire victims.

Liability for the Eaton fire alone is expected to exceed $10 billion, which could strain Edison's resources, insurance companies and even the state's backup wildfire fund, which is designed to protect utilities against liability.

The threat that electrical equipment poses to life and property has led energy and safety experts to push for power lines to be buried underground and for wider use of technologies that can better detect problems on the grid.

"We can't insure our way out of this problem," said Michael Wara, director of the climate and energy policy program at Stanford University. "We have to reduce risk."

Blacki Migliozzi contributed reporting.