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WSJ INVESTIGATION

PG&E Knew for Years Its Lines Could Spark Wildfires, and Didn't Fix Them

Documents obtained by The Wall Street Journal show that the utility has long been aware that parts of its 18,500-mile transmission system were dangerously outdated

By Katherine Blunt and Russell Gold

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PG&E Corp. knew for years that hundreds of miles of high-voltage power lines could fail and spark fires, yet it repeatedly failed to perform the necessary upgrades.

Documents obtained by The Wall Street Journal under the Freedom of Information Act and in connection with a regulatory dispute over PG&E's spending on its electrical grid show that the company has long been aware that parts of its 18,500-mile transmission system have reached the end of their useful lives.

The failure last year of a century-old transmission line that sparked a wildfire, killed 85 people and destroyed the town of Paradise wasn't an aberration, the documents show. A year earlier, PG&E executives conceded to a state lawyer that the company needed to process many projects, all at once, to prevent system failures—a problem they said could be likened to a “pig in the python.”

Even before November's deadly fire, the documents show, the company knew that 49 of the steel towers that carry the electrical line that failed needed to be replaced entirely.

In a 2017 internal presentation, the large San Francisco-based utility estimated that its transmission towers were an average of 68 years old. Their mean life expectancy was 65 years. The oldest steel towers were 108 years old.

PG&E, which supplies electricity and natural gas to 16 million people, or about one in 20 Americans, operates one of the oldest long-distance electrical transmission networks in the world. It was built beginning in the early 1900s to carry hydroelectric power from the Sierra Nevada to the San Francisco Bay Area. Many of its original steel towers and other equipment are still in service.

The danger posed by PG&E's neglect of its transmission lines increased around 2013, when a historic drought dried up much of California, creating extraordinary fire conditions. In its 2017 internal presentation, the company said it needed a plan to replace towers and better manage lines to prevent "structure failure resulting [in] conductor on ground causing fire."

Nevertheless, PG&E repeatedly delayed upgrades of some of its oldest transmission lines, ranking them as low-risk projects, while it spent billions of dollars on other work it considered higher priority, such as substation upgrades, according to federal regulatory filings.

Among the problems, the utility has struggled to figure out which of its lines needed the most attention.

Until recently, PG&E hadn't regularly climbed its towers to inspect their condition, despite the suggestion of an outside consultant it hired, according to interviews with current and former company officials and documents filed in connection with a spending dispute between PG&E and state regulators. It began detailed inspections of its transmission lines only after the Camp Fire that destroyed Paradise.

In addition to those inspections, PG&E said it began using drones and helicopters earlier this year to capture images of its transmission structures to analyze their



PG&E employees work on broken power lines after the Camp Fire ripped through Paradise, Calif. PHOTO: JOEL ANGEL JUAREZ/ZUMA PRESS

condition, identify potential points of failure and prioritize repairs.

State fire officials concluded in May that a failure of PG&E equipment on a line known as the Caribou-Palermo, built in 1921, caused the fire, the deadliest in California history.

Federal and state regulators have paid little attention to the condition of PG&E's transmission system, and have largely left it up to the company to decide what to upgrade and when. California officials are proposing adding more inspections and oversight.

Utilities across the U.S. have neglected to maintain older high-voltage lines, many built to support booming population growth in the decades before and after World War II, said Gregory Reed, director of the Energy GRID Institute at the University of Pittsburgh.

“We have known for a long time that we are dealing with aging and antiquated infrastructure,” he said. “In a lot of cases, the business model was to wait for a failure

and then respond.”

PG&E sought bankruptcy protection in January, citing more than \$30 billion in potential liability stemming from lawsuits and other claims related to its role in sparking fires. The company in December began “enhanced inspections” that included climbing towers, some for the first time in decades.

After completing those inspections, the company disclosed June 19 that it needs to make thousands of repairs. And it decided to permanently shut down the Caribou-Palermo line after assessing the amount of work it would take to operate it safely.

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PG&E said it already has repaired or made spot fixes to the most severe problems it uncovered throughout its system. Risks remain, and the company said it is working to prioritize and address them as wildfire season progresses.

“The reality is the number of safety risks that we’ve found from our standpoint is unacceptable,” said Sumeet Singh, vice president of the company’s community wildfire safety program.

Elizaveta Malashenko, the safety and enforcement chief for the California Public Utilities Commission, said that after reviewing the inspection results, she “would not be comfortable making a statement that [the Caribou-Palermo] was an outlier.”

Ms. Malashenko said the CPUC’s safety auditors have historically relied on utility records rather than field inspections, which are far more costly to conduct. After the

Camp Fire, the agency has asked the state for \$25 million to create a three-year program to put its own inspectors in the field, in part because of the problems PG&E has discovered within its system.

“No matter how you look at it, PG&E has a lot of work to do,” she said.

The part of PG&E’s grid that includes the Caribou-Palermo line, known as the Caribou-Valona system, is so old that segments were considered candidates for the National Register of Historic Places at one point by federal agencies. Approximately 800 of the original steel towers built to hold up the transmission lines are still in use, according to PG&E correspondence with federal officials, uncovered through a public-records request.

PG&E delayed safety work on the Caribou-Palermo line for more than five years, the Journal reported in February. The company needed to replace 49 steel towers “due to age,” and hardware and aluminum line on 57 towers “due to age and integrity,” according to memos PG&E officials sent in 2017 and early 2018 to the U.S. Forest Service, whose territory the line crosses. The Journal learned the scope of the work, which hasn’t previously been reported, through a Freedom of Information Act request to federal forest managers.

PG&E has delayed maintenance work on several lines in Northern California’s highest-threat fire areas, including at least one near the Plumas National Forest, federal documents show. The company hasn’t detailed the scope of the work needed for each line, but it has disclosed that some require upgrades similar to those needed on the Caribou-Palermo line it stopped using.

The deferred maintenance became a problem when drought this decade killed millions of trees, greatly heightening the risk of wildfire throughout Northern California. State fire officials concluded that the company’s equipment sparked 18 wildfires in 2017, in most cases because trees made contact with lower-voltage lines.

In response, the company doubled down on tree trimming. The Camp Fire forced PG&E to turn its attention to higher-voltage lines, which typically run through wide paths cleared of trees.

Documents show that PG&E is unaware of the exact age of many of its transmission towers and wires. In 2010, PG&E commissioned consulting firm Quanta Technology, a subsidiary of Quanta Services Inc., to assess the age and condition of transmission structures throughout its 70,000-square-mile service area.

The firm was unable to determine the age of about 6,900 towers in the 115-kilovolt system. It found that nearly 30% of the remaining towers in that system, more than 3,500, were installed in the 1900s and 1910s. About 60% of the structures in the 230-kilovolt system were built between 1920 and 1950.

It is common practice for utilities to use laser imaging equipment to inspect towers instead of having workers climb them. Because PG&E had so many old towers, Quanta concluded that the company should consider climbing at least a sample of them every three to five years.

PG&E didn't implement that recommendation, said Placido J. Martinez, a former PG&E head of strategic asset management. "We felt we were doing enough," he said.

Regulators have little say over such transmission-maintenance planning. Although PG&E files transmission-spending plans with the Federal Energy Regulatory Commission, the agency's jurisdiction is over rates and terms of service. If state officials or electric companies that rely on PG&E's wires want to challenge the utility's spending, it is up to them to parse the annual federal filings, which often exceed 1,500 pages. Projects that involve routine maintenance, such as replacing aging towers, hardware and conductors, don't require state or federal approval.

California regulators have hundreds of pages of rules for many aspects of utility operations. Their rules for transmission are three sentences long. They simply say that



State fire officials concluded that a failure of PG&E equipment caused the fire that destroyed Paradise, above.

PHOTO: JOSH EDELSON/AGENCE FRANCE-PRESSE/GETTY IMAGES

each utility must come up with its own procedures and follow them.

With no regulator keeping a close eye, the timetable for completing important upgrades slipped. PG&E told federal regulators it planned to overhaul the Caribou-Palermo line in 2013, yet it still hadn't made improvements when a piece of hardware holding a high-voltage line failed last November, sending sparks into the grass and igniting the Camp Fire.

After the Journal reported earlier this year that the planned upgrades to that line had been delayed, PG&E released a statement saying the work was "not maintenance-related (i.e., work relating to identifying and fixing broken or worn parts)."

Internally, however, that is how the company characterized it. In a 2017 email to Forest Service officials, PG&E land planner Paul Marotto wrote that the company's "planned maintenance includes structure replacement, conductor replacement, conductor re-tensioning, installation of new insulators and structure modifications." PG&E officials

said the work was needed in part because the strength of the aging towers and wires had deteriorated.

Asked about the email, PG&E said it still disputes that the work was maintenance related, saying it was needed to adhere to 2010 industry guidelines that called on companies to ensure their transmission lines met design specifications.

PG&E has told state regulators it has struggled to consolidate data on the condition of its equipment. Kevin Dasso, PG&E's vice president of electric asset management until earlier this year, said the lack of comprehensive information made it difficult to determine which transmission lines were approaching the point of failure.

In 2018, when PG&E proposed a spending plan to federal regulators for thousands of transmission-line upgrades, it used a risk-based system to prioritize the projects. Nearly 600 projects, with an estimated \$2.7 billion cost, had a higher risk score than Caribou-Palermo, indicating PG&E considered that work more urgent.

PG&E said it has improved its records in recent years by conducting inventories in the field and has built databases to upgrade its analytical capabilities.

Other PG&E transmission lines at least as old as the Caribou-Palermo remain in service. One leg of the Caribou-Valona network, known as the Ignacio-Mare Island line, delivers power to an electric switchyard at the edge of a high-fire-risk area in Marin County north of the Golden Gate Bridge and a now-closed naval shipyard. At least 28 of the towers on the line have been in place since 1921, according to a company inventory.

PG&E has repeatedly delayed work on the line, which has segments sagging too close to the ground, since first proposing it in 2014, federal regulatory filings show. The \$6.9 million project, which involves increasing the height of 44 towers, was initially expected to be completed in 2015 but now is slated to start next year, the company said.

The company also has delayed upgrades to several 115-kilovolt lines passing through



PG&E began detailed inspections of its transmission lines only after the Camp Fire that destroyed Paradise.

PHOTO: JUSTIN SULLIVAN/GETTY IMAGES

national forests that have become California's highest-risk fire areas, the filings indicate. A line partly in the Plumas National Forest was slated for work this year, but was delayed and now is on hold because of the Camp Fire investigation.

A line built to carry hydroelectric power through the Eldorado and Stanislaus national forests was scheduled for upgrades in 2016, but work isn't expected to start until the second half of next year. A line in the Los Padres National Forest near San Luis Obispo was initially set for upgrades in 2015 that now are scheduled to start in 2021.

PG&E acknowledged in its 2017 internal presentation that it had poor age data on the towers in its 60-kilovolt system. The company recently targeted one leg for extensive work after discovering that 10 towers within the Golden Gate National Recreation Area were at high risk of failure.

A June 5 letter from PG&E said the towers are in "critical condition with noticeable material loss and ground erosion" and require round-the-clock monitoring. The

company estimated it will take more than a year to replace towers and make permanent repairs.

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