

# What Is the Safety Risk of Trees Above PG&E's Transmission Pipelines?

The research and analysis in this report is based on a combination of publicly available information and interviews with safety experts. The report was prepared by Save Lafayette Trees, a nonprofit association located in Lafayette, California. Save Lafayette Trees has a twofold mission: preserve Lafayette's rural California character by identifying and preventing unnecessary tree destruction; and improve the safety of the natural gas pipelines in our area by focusing safety improvement attention on the primary safety risks. For more information, go to [savelafayettetrees.org](http://savelafayettetrees.org).

## The Claim

PG&E says that it must remove thousands of trees in California that are located above its buried natural gas transmission pipelines because the trees pose an unacceptable safety risk.

## Our Conclusion

- Contrary to PG&E's claim, trees pose no significant safety risk to buried gas transmission pipelines.
- PG&E's current allocation of hundreds of millions of dollars for tree removal in its pipeline rights-of-way is a grave misallocation of organizational attention and financial resources that urgently needs to be redirected. There are significant PG&E transmission pipeline safety vulnerabilities that are not receiving effective attention, as described in our separate analysis describing PG&E's disappointing safety performance relative to its industry peers.

## The Basis of Our Conclusion

Save Lafayette Trees has conducted an extensive investigation of PG&E's tree risk claim, including:

- A review of assigned causes for every reported gas transmission pipeline safety incident in the U.S. over the past 20 years. Out of a total of 2,076 incidents associated with more than 300,000 miles of gas transmission pipeline, *there were zero in which a tree was found to be the cause of damage to an underground gas transmission pipeline—not only none in California but none anywhere in the United States!* (details below)
- A review of the findings from PG&E's 2014 "Tree Root Interference Assessment" (conducted in partnership with the consulting firm Dynamic Risk), which found no direct evidence that tree roots in contact with buried gas transmission pipelines cause pipeline damage. (details below)
- A review of the federal Pipeline and Hazardous Materials Safety Administration's (PHMSA) multiple responses over the past 40+ years to property owners' requests for federal policy clarification regarding gas utilities attempts to remove trees above their pipelines. Throughout this period, PHMSA has consistently and repeatedly stated that (1) it is not a federal requirement to keep a pipeline right-of-way clear of trees/other vegetation; (2) federal regulations do not give operators a right to cut down trees on their pipeline easements. (details below)
- Interviews with experienced Bay Area first responders and a PHMSA senior inspector. We sought their opinion about PG&E's frequent claim that one of the risks trees pose is that they can delay pipeline access during an emergency. The first responders we consulted uniformly rejected this idea. They said that when dealing with a significant incident on a transmission pipeline, the priorities are to evacuate the area, shut down the line, and wait for the gas to dissipate. At that

point, there will be plenty of time to clear any vegetation that might be affecting access. Attempting to work on a significant leak in a gas transmission line (characterized by their large diameter and high operating pressure) before it is shut down is simply foolish. The PHMSA senior inspector we consulted said that he completely agreed with the first responders' perspective as stated above.

## **Analysis of U.S. Gas Transmission Pipeline Safety Incidents**

U.S. gas utilities are subject to regulations issued by the Pipeline and Hazardous Materials Safety Administration (PHMSA). PHMSA is an agency within the U.S. Department of Transportation, and it is responsible for ensuring (among other things) the safe and environmentally sound operation of the country's gas pipeline system. The regulations include a requirement that pipeline operators (such as PG&E) submit a very detailed report within 30 days of any "significant" safety incident that occurs on a gas transmission line. Significant has a precise regulatory definition, but briefly it includes an event involving an emergency system shutdown, a sizeable gas release, a personal injury, or sizeable property damage. The reports are available to the public in spreadsheet format, and each report covers more than 400 data fields. Most of these fields concern the incident's cause, and they are designed to uncover the incident's "root cause." Failure to submit an incident report subjects the operator to a fine of up to \$100,000; failure to submit multiple incident reports can result in a \$1,000,000 fine. Compliance with this reporting requirement is an item that is routinely examined during PHMSA audits of pipeline operators.

Save Lafayette Trees chose PHMSA's incident reports covering all U.S. gas transmission pipelines because it offers a very complete and easy-to-analyze source of information about the cause associated with each incident. We were seeking objective evidence to clarify how often trees above a buried transmission pipeline have been the cause of a safety incident. In the interest of time, we limited the scope of our study to the past 20 years (1998-2017).

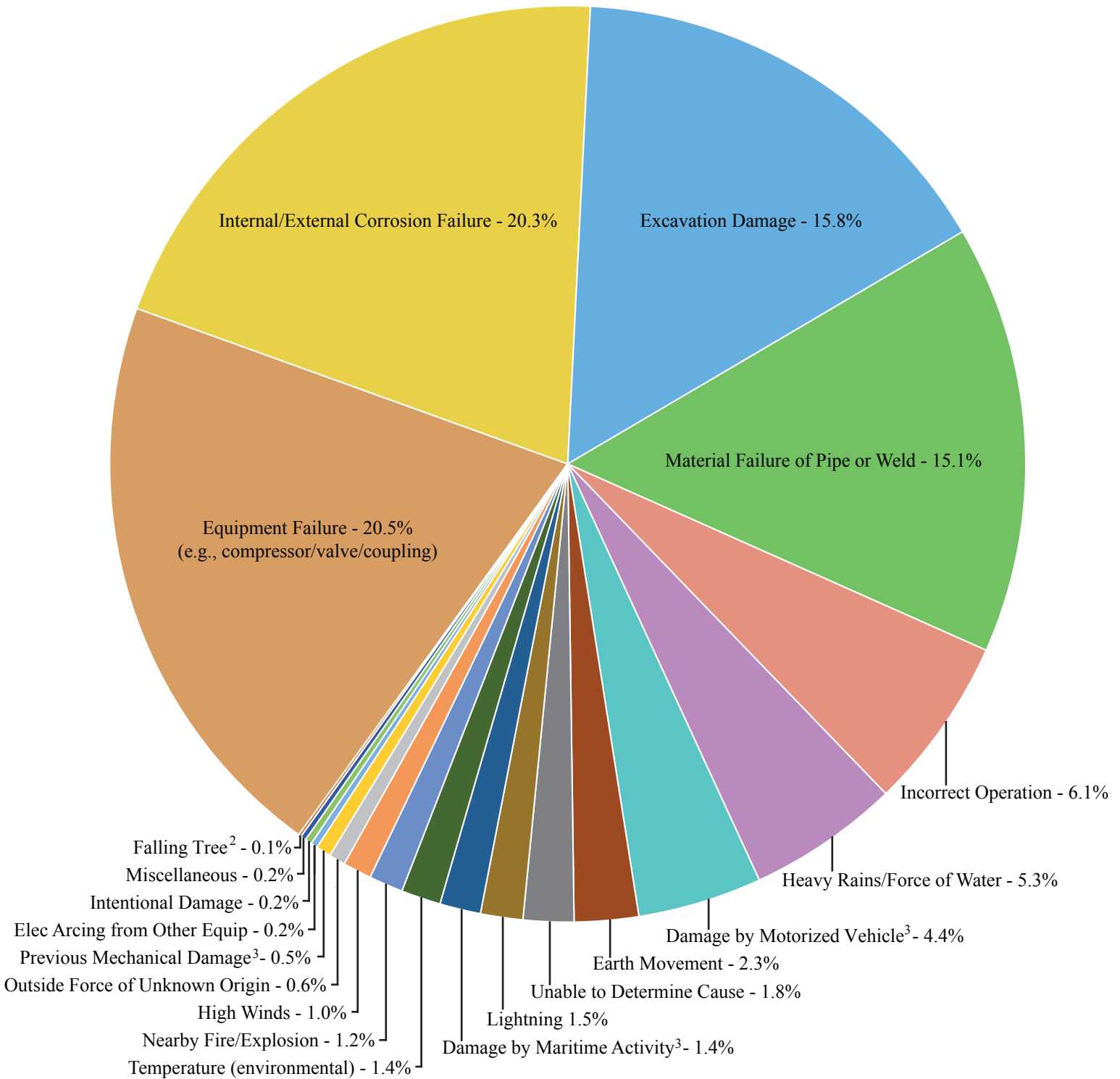
After many hours of careful review of every 1998-2017 gas transmission incident in the PHMSA database (total of 2,076 incidents), we were frankly surprised to discover that *there are zero incidents of trees determined as causing damage to underground gas transmission pipelines*. A falling tree was, however, identified as the cause in two incidents not connected to underground pipelines: (1) in Louisiana, a dead tree fell over and struck an underwater pipeline (the pipe was exposed without any protective soil/mud on top); (2) in Texas, a live tree fell and struck an above-ground component of the pipeline control system. These two are the only examples of trees causing an incident in these pipelines (which extend over more than 300,000 miles) in the past 20 years. In summary: 0.0% causing damage to underground gas transmission pipelines; 0.1% causing damage of any type to gas transmission pipeline systems over the past 20 years.

PG&E has also claimed that trees close to their transmission pipelines often need to be removed because they have the potential to delay quick access to the pipeline in the event of an emergency. We therefore searched the incident records described above for any mention of trees delaying quick access to transmission pipelines. There is no record of this problem occurring anywhere in the U.S. over the past 20 years. See also the fourth bullet in the Our Conclusion section on page 1.

The pie chart on the next page shows the various incident cause categories, as extracted from the 2,067 incident records described above.

# U.S. Gas Transmission Pipeline Safety Incidents 1998-2017 Analysis of Causes<sup>1</sup>

(2,076 Incidents)



<sup>1</sup>Based on pipeline incident reports submitted to PHMSA, an agency of the U.S. Dept of Transportation, and analyzed by Save Lafayette Trees

<sup>2</sup>No trees, however, caused damage to a buried gas pipeline

<sup>3</sup>Damage not associated with excavation activity

## **PG&E's 2014 Tree Root Assessment Study**

In 2011 (following the 2010 San Bruno explosion), PG&E launched a comprehensive safety improvement program focused on its 6500+ miles of natural gas transmission lines in Northern and Central California. Some of the program initially addressed surveying pipeline locations and improved pipeline marking, but most of effort (which actively continues in 2018) has been devoted to removal of trees in the gas transmission rights-of-way that PG&E regards as an unacceptable safety risk. The utility uses an algorithm involving multiple parameters to establish which trees fall into their “unacceptable risk” category, but despite repeated requests to make their algorithm public, to date they have refused to do this.

In 2013, the transmission pipeline safety improvement program evolved into PG&E's Pipeline Pathways program. The announced program budget was \$500 million. However, after developing a reputation in many communities for its coercive, heavy-handed tactics in pursuing tree removal from private and public property, the program was rebranded as the Community Pipeline Safety Initiative.

Also in 2013 (after the launch of their Pipeline Pathways program), PG&E commissioned the consulting/engineering firm Dynamic Risk to investigate the ways that trees could affect buried pipelines. Fifty-three targeted excavations were conducted as part of this study, and the excavations included 30 species of trees and pipeline installation date that ranged from 1931 to 1987. PG&E employees participated in both the data collection and report writing phases of this project, so the study is not an independent, third-party assessment.

The study's final report, issued in January 2014, can be downloaded from [this location](#). In summary, this is what the study concluded:

1. The study found no direct evidence that tree roots in contact with the pipe increased the susceptibility to the initiation of stress corrosion cracking.
2. At locations where pipelines and tree root systems co-exist, it is common for the roots to degrade the external coating on the steel pipe (extent varies with the type of coating used). However, the functioning of the cathodic protection system that PG&E routinely uses on its buried transmission lines does not appear to be adversely affected by tree roots. (Cathodic protection involves placing an electric charge on steel pipelines to control corrosion of the metal surface, and it is used on all PG&E transmission lines. The company sends corrosion management specialists to monitor proper operation of this equipment six times per year, and it has begun installing devices that permit continuous remote monitoring of its cathodic protection systems.)
3. Some external corrosion was noted in a minority of the surveyed sites where the roots damaged the pipeline's external coating. However, the study was unable to verify a causal link between the presence of tree roots and the initiation of external corrosion.
4. Above ground pipeline surveys are not significantly affected by the presence of tree roots.
5. The effectiveness of External Corrosion Direction Assessment does not appear to be adversely affected by the presence of tree roots.

## **PHMSA's Position on Removing Trees from Pipeline Rights-of-Way**

As the federal agency charged with regulating and insuring the safety of the nation's gas pipelines, PHMSA has been asked many times in the past to clarify the right of a pipeline operator to remove trees growing in pipeline rights-of-way that sit on private or public property. This comes up frequently because PHMSA requires the operators to patrol their rights-of-way as often as every three months and

observe surface conditions including indications of leaks, construction activity, erosion, and other factors affecting safe operation. The lowest cost method of doing this is generally aerial surveillance (an approved method), but the presence of trees often makes aerial surveillance impractical. Acceptable surveillance alternatives include walking and driving along the right-of-way.

Below is an extract from a September 2000 regulatory interpretation<sup>1</sup> that PHMSA sent to the mayor of Piscataway, N.J. The city was contesting Duke Energy's plan to remove all street trees along its natural gas pipeline right-of-way in a section of the city. PHMSA has been repeatedly providing essentially this same interpretation for more than 40 years.

“Pipelines operated by Duke Energy are subject to the safety regulations of Title 49 CFR Parts 190-199. These regulations require operators to patrol their pipeline easements for signs of leaks and construction activity. However, *the regulations do not require operators to keep their easements free of trees to make patrolling easier or to minimize the possibility of damage by tree roots, nor do the regulations give pipeline operators a right to remove trees on their pipeline easements.* The authority of an operator to remove trees is subject to private agreements with landowners and to any local land use controls. Although, aerial surveillance is usually the most practical method of patrolling, in areas where an easement is concealed by trees or large bushes, a pipeline operator may observe conditions on the easement by walking or driving along the easement.”<sup>1</sup>

<sup>1</sup> <https://www.phmsa.dot.gov/regulations/title49/interp/PI-00-0102>