State of California – A Natural Resources Agency

OFFICE OF ENERGY INFRASTRUCTURE SAFETY

POLICY BRIEF

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# Effectiveness of Enhanced Clearances

## Summary

***Enhanced Clearances reduce outages by 20% and are likely to reduce wildfire ignitions.***

California's investor-owned utilities (IOUs) have increased investment in tree maintenance to obtain greater distance between tree limbs and power lines in response to increasing wildfire risk. A study required by Energy Safety confirms Enhanced Clearances reduce outages by 20% and likely reduce wildfire ignitions by 4%-15%. However, the study also indicates that Enhanced Clearances are not effective in all conditions. Energy Safety recommends that IOUs maintain previously established enhanced clearances and expand clearance distances in other areas with high wildfire risk.

## Background

In response to the growing threat of wildfire ignitions caused by vegetation contact with powerlines, California's IOUs – Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric – have increased time-of-trim vegetation clearance distances to often exceed CPUC General Order 95, Rule 35 minimum numerical requirements. Clearance distances exceeding the required minimums are commonly called "Enhanced Clearances." In 2021, Energy Safety directed the IOUs conduct a joint study to determine the effectiveness of Enhanced Clearances at decreasing vegetation-cause outages and ignitions. The IOUs provided the study results in 2025 as part of their 2026-2028 Base Wildfire Mitigation Plans (WMP) submissions.

## Study Results

### Enhanced Clearances appear to reduce vegetation-related outages

The Effectiveness of Enhanced Clearances study analyzed vegetation-caused outages and shows Enhanced Clearances of twelve or more feet at the time-of-trim reduced vegetation-caused outages by 20% for all three IOUs.[1] The analysis is supported by IOU outage data that show the time between vegetation trimming and a reported outage was greatest when Enhanced Clearances were achieved.[2]

### The impact of Enhanced Clearances on vegetation-related ignitions is indirect

Vegetation-caused outages occur when vegetative material touch power lines, leading to a short circuit. Although this contact creates intense heat that could start a fire, most outages do not result in ignitions. Most of the outages analyzed in the study occurred in winter, while most ignitions occurred in summer.[3] Additionally, most outages that caused ignitions occurred in developed areas.[4] These findings indicate that the conditions and locations of most vegetation-caused outages are not conducive to large wildfire ignitions. Therefore, the study cannot conclude that a 20% reduction in outages indicates a 20% reduction in ignitions.

[1] Investor-Owned Utility Effectiveness of Enhanced Clearances White Paper (White Paper), page 18.

[2] Joint Investor-Owned Utility Study on the Effectiveness of Enhanced Clearances for Wildfire Management (Technical Report), page 34.

[3] Technical Report, page 28.

[4] Technical Report, page 28.

Despite the distinction between outages and ignitions, the underlying mechanism of vegetation contact with energized lines supports the idea that preventing outages may decrease ignitions. Energy Safety directed the IOUs to conduct sensitivity analyses of the effect on enhanced clearances on vegetation-cause ignitions. San Diego Gas & Electric estimated Enhanced Clearances decreased ignitions from 2023 to 2024 by 14.6%.[5] Pacific Gas & Electric estimated an ignition decrease from 2020-2025 of 4%.[6] Southern California Edison estimated an ignition decrease from 2020-2025 of 7.7%.[7]

### Enhanced Clearances are less effective during high winds

Enhanced clearances appear to have little impact on outage rate in the High Fire Threat District (HFTD) during Red Flag Warning and High Wind Warning events.[8] All three IOUs are implementing Enhanced Clearances primarily in the HFTD.[9] Accordingly, Enhanced Clearances should not be relied upon alone to decrease vegetation contact during high winds. Equipment-based grid-hardening methods, such as covered conductor and sensitive device settings, should be considered to account for the increased risks associated with high winds.

### Additional data collection is necessary

The study identified shortcomings in the outage and ignition data collection practices by the IOUs that impacted the study. Some IOUs have difficulty linking ignition data to vegetation management data. Some IOUs do not estimate how far vegetation is from the powerline at the time of an outage. Additionally, the IOUs do not currently have sufficient data to estimate the combined effectiveness of Enhanced Clearances and other ignition prevention measures such as covered conductor and sensitive device settings. Expanded and cross-referenced data collection are necessary.

## Leveraging Enhanced Clearances to Reduce Outages and Ignitions

Based on the study results, the IOUs identified several next steps to optimize Enhanced Clearance use:

1. Maintain existing Enhanced Clearances to reduce vegetation-caused outages and possibly reduce ignition risk events.
2. Explore expanding Enhanced Clearances, prioritizing the HFTD and areas with historically higher outage and ignition rates, while considering cost efficiency.
3. Standardize tree, outage, and ignition recordkeeping so every outage and ignition can be linked to past vegetation management actions.
4. Collect data that allows continued analysis of the effectiveness of Enhanced Clearances.
5. Collect data to analyze the effectiveness of Enhanced Clearances in combination with grid hardening measures.

### Requirements set forth by Energy Safety

To support these next steps, in their next Base WMPs, Energy Safety has required each IOU to:

- Report on its continued evaluation of the effectiveness of enhanced clearances on various risk components and in combination with other mitigations, such as covered conductor.
- Demonstrate that it has implemented data collection recommendations from the study.

[5] SDG&E, Impact of Enhanced Clearances on Vegetation-Caused Ignitions, pages 6-7.
[6] PG&E, Impact of Enhanced Clearances on Vegetation-Caused Ignitions, page 15.
[7] SCE, Impact of Enhanced Clearances on Vegetation-Caused Outages and Ignitions, pages 12-13.
[8] White Paper, page 9.
[9] California Public Utilities Commission High Fire Threat District (HFTD) Map