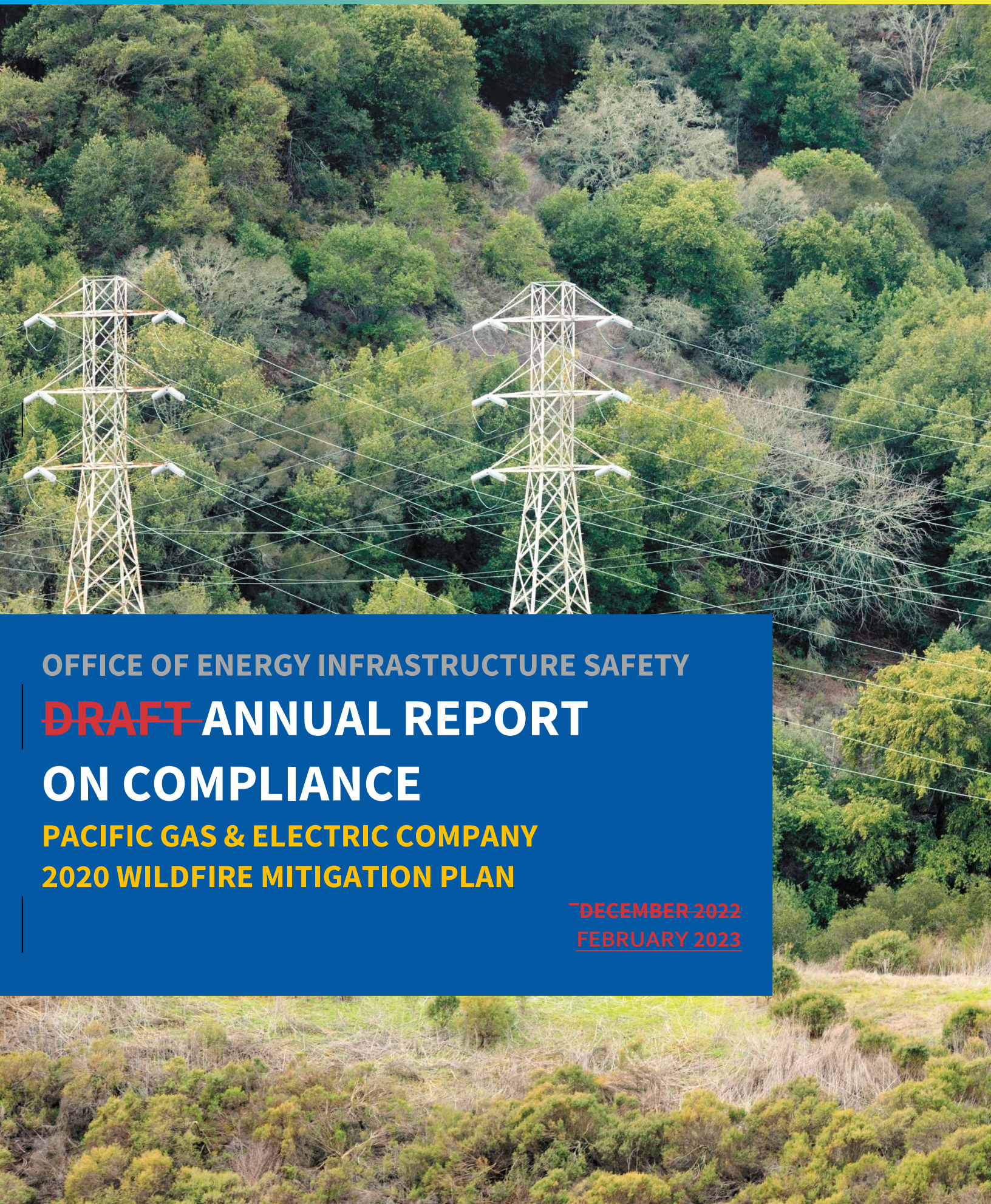

OFFICE OF ENERGY INFRASTRUCTURE SAFETY

~~DRAFT~~ ANNUAL REPORT ON COMPLIANCE

PACIFIC GAS & ELECTRIC COMPANY
2020 WILDFIRE MITIGATION PLAN

~~DECEMBER 2022~~
FEBRUARY 2023

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~~1.0~~

1.0 EXECUTIVE SUMMARY

The Office of Energy Infrastructure Safety (Energy Safety) is tasked with evaluating and either approving or denying Wildfire Mitigation Plans annually filed by electrical corporations pursuant to Public Utilities Code section 8386 et seq. The law also directs Energy Safety to ensure that the electrical corporations have complied with their plans.

Pursuant to Government Code section 15475.1, Energy Safety's primary objective is to ensure that electrical corporations reduce wildfire risk and comply with energy infrastructure safety measures. Therefore, as detailed in the Compliance Framework, Energy Safety's evaluation of PG&E's performance to its 2020 WMP went beyond a "check-box" exercise of looking at whether PG&E met its initiative targets and instead wholistically evaluated whether PG&E's performance in 2020 reduced the risk of PG&E equipment igniting a catastrophic wildfire.

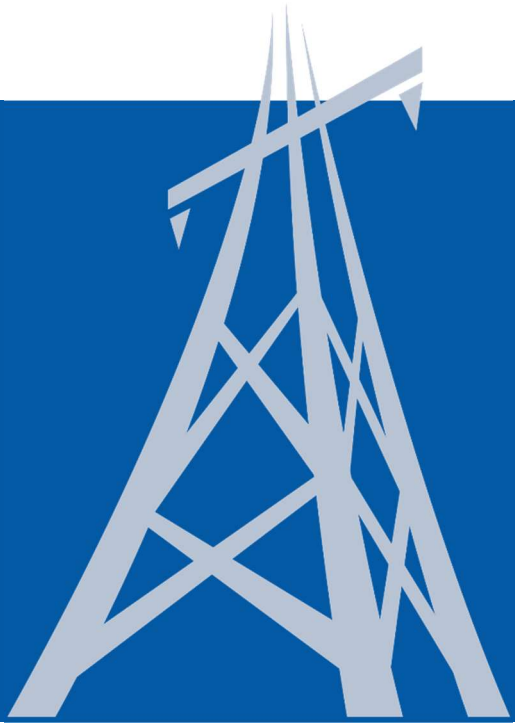
Energy Safety's compliance review process is conducted through a variety of means including audits, field inspections, and analysis of data submitted by PG&E to Energy Safety. Substantial compliance with a WMP includes meeting not only its program targets and plan objectives, but also reducing risk. As such, Energy Safety also evaluated several performance metrics, including ignition and Public Safety Power Shutoff metrics, as well as metrics that reveal the risk on the system due to an electrical corporation's failure to identify and remediate conditions known to pose wildfire risk. Energy Safety also performed an analysis that compared the electrical corporation's performance during the 2020 WMP compliance period to trends from previous years.[1] Finally, Energy Safety reviewed PG&E's self-assessment in its Electrical Corporation Annual Report on Compliance (EC ARC) and the findings of its independent evaluator.

After considering all the sources of information before it, Energy Safety finds that PG&E failed to substantially comply with its 2020 WMP during the compliance period, January 1 – December 31, 2020. PG&E suffered from systemic failures that caused it to miss program targets, inadequately implement its initiatives, and hindered its ability to reduce the risk of catastrophic wildfire on its system. Specifically, Energy Safety has identified pervasive data governance issues in PG&E's reporting, indicating organizational data management issues throughout PG&E's operations, and ineffective communications.

Energy Safety acknowledges that PG&E undertook significant efforts to reduce its wildfire risk, and in many instances, PG&E achieved its stated objectives and targets. However, on balance, PG&E failed to meet the targets highly correlated with risk, failed to achieve critical stated objectives, and failed to sufficiently address risk on its system. These shortcomings combined with systemic communication and data governance issues contributed to PG&E

[1] Energy Safety assessed previous year performances dating back to 2015, where available and reported in PG&E's data submissions, or any year thereafter for which data was available and reported.

inadequately reducing catastrophic wildfire risk. Consequently, PG&E did not substantially comply with the WMP during the 2020 compliance period.



2.0 INTRODUCTION

This Annual Report on Compliance (ARC) presents the Office of Energy Infrastructure Safety's (Energy Safety's) statutorily mandated assessment of PG&E's compliance with its 2020 Wildfire Mitigation Plan (WMP).[2] Mitigation of wildfire risk is a highly dynamic and circumstantial endeavor that varies as a function of climate, weather, topography, and fuel conditions. The factors impacting catastrophic wildfire risk vary both temporally and geographically. Just as the mitigations to address an electrical corporation's wildfire risk are specifically unique to the dynamics of its territory, location, infrastructure, and various other temporal factors, Energy Safety's assessment of compliance with WMPs is equally tailored to the electrical corporation's unique scenario and circumstances.

Pacific Gas and Electric (PG&E) submitted its 2020 WMP on February 7, 2020. Energy Safety reviewed the plan and issued a conditional approval on June 10, 2020.

2.1 Background

In 2019, following the devastating wildfires in 2017 and 2018, the California Legislature passed several bills increasing regulatory supervision of electrical corporations' efforts to reduce utility-related wildfires. Assembly Bill (AB) 1054 and AB 111 created Energy Safety and tasked it with reviewing WMPs submitted annually by electrical corporations and ensuring compliance with those plans.[3] Energy Safety's primary objective is to ensure that electrical corporations reduce wildfire risk and comply with energy infrastructure safety measures.[4]

2.2 Legal Authority

Energy Safety is responsible for overseeing compliance with electrical corporations' WMPs.[5] Energy Safety has broad authority to obtain and review information and data and to inspect property, records, and equipment of every

[2] Pub. Util. Code, § 8386.3(c).
[3] The legislation which created Energy Safety mandated that the office be formed on January 1, 2020, as the Wildfire Safety Division (WSD) of the California Public Utilities Commission. (CPUC) and transition to Energy Safety under the California Natural Resources Agency (CNRA) on July 1, 2021 – 18 months after being formed.
[4] Gov. Code, § 15475.1.
[5] Pub. Util. Code, § 8386.3(c).

electrical corporation in furtherance of its duties, powers, and responsibilities.[6] In addition to performing an overall assessment of compliance[7] with the WMP, Energy Safety audits each electrical corporation's vegetation management work for compliance with WMP requirements[8] and performs other reviews and audits. Energy Safety may rely upon metrics[9] to evaluate WMP compliance, including performance metrics adopted by the California Public Utilities Commission (CPUC).[10] Annually, in consultation with Energy Safety, the CPUC adopts a wildfire mitigation plan compliance process.[11] The CPUC adopted the 2020 Compliance Process via Resolution WSD-012 on November 23, 2020.[12]

2.3 Annual Compliance Process Cadence

Pursuant to Public Utilities Code section 8385(a)(1), a "compliance period" means a period of approximately one year. In its Compliance Operational Protocols issued on February 16, 2021, Energy Safety defined the compliance period for 2020-2022 WMPs as January 1 to December 31 for each calendar year of the three-year WMP.[13]

Public Utilities Code section 326(a)(3) instructs that Energy Safety utilize visual inspection of electrical corporation infrastructure and wildfire mitigation programs as a means of assessing WMP compliance. Furthermore, Public Utilities Code section 8386.3(c) outlines the baseline statutory framework for assessing WMP compliance through a series of audits, reviews, and assessments performed by Energy Safety, independent evaluators, and the electrical corporations themselves. The statutory framework also lays out a defined timeframe for several of the compliance assessment components as follows:

- Three months after the end of an electrical corporation's compliance period, each electrical corporation must submit a report addressing the electrical corporation's compliance with the plan during the prior calendar year.[14] Pursuant to this requirement, PG&E submitted its Electrical Corporation Annual Report on Compliance (EC ARC) for its 2020 WMP on March 31, 2021.
- Six months after the end of an electrical corporation's compliance period, an independent evaluator must submit an Independent Evaluator Annual Report on Compliance (IE ARC). The independent evaluators are engaged by each electrical corporation to review and assess the electrical corporation's compliance with its plan

[6] Gov. Code, § 15475.
[7] Pub. Util. Code § 8386.3(c)(4).
[8] Pub. Util. Code § 8386.3(c)(5)(A).
[9] Pub. Util. Code §§ 326(a)(2), 8389(b)(1).
[10] Pub. Util. Code § 8389(d)(4).
[11] Pub. Util. Code § 8389(d)(3).
[12] https://energysafety.ca.gov/wp-content/uploads/docs/compliance-process/20201008-compliance-staff-proposal_final.pdf
[13] https://efiling.energysafety.ca.gov/Search.aspx?docket=2021-OPS_GUIDELINES
[14] Pub. Util. Code, § 8386.3(c)(1).

for the prior year. As a part of this report, the independent evaluator must determine whether the electrical corporation failed to fund any activities included in its plan.[15] PG&E selected Bureau Veritas North America (BVNA) as its independent evaluator for compliance with the 2020 WMP. BVNA issued its IE ARC for PG&E's 2020 WMP on July 1, 2021.

- In parallel with the above assessments, Energy Safety audits vegetation management activities. The results of the audit must specify any failure of the electrical corporation to fully comply with the vegetation management requirements in the wildfire mitigation plan. Energy Safety then grants the electrical corporation a reasonable amount of time to correct and eliminate any deficiency specified in the audit.[16] Subsequently, Energy Safety issues a report describing any failure of the electrical corporation to substantially comply with the substantial portion of the vegetation management requirements in the electrical corporation's WMP.[17]
- Eighteen months after the electrical corporation submits its compliance report pursuant to section 8386.3(c)(1), or twenty-one months after the end of the compliance period, Energy Safety completes its annual compliance review to determine whether the electrical corporation substantially complied with its WMP.[18] Energy Safety memorializes its conclusions in this ARC.

3.0 ARC COMPLIANCE FRAMEWORK

Public Utilities Code prescribes that the overarching intended objective of electrical corporation wildfire mitigation planning efforts is to ensure that electrical corporations are constructing, maintaining, and operating their infrastructure in a manner that will minimize the risk of catastrophic wildfire.[19] The statutory objective of a WMP, and consequently the focus of Energy Safety's assessment of compliance, is wildfire risk reduction. An electrical corporation's obligations extend beyond meeting WMP targets. If the risk of catastrophic wildfire is not reduced, an electrical corporation has not satisfied the objective of its WMP.

[15] Pub. Util. Code, § 8386.3(c)(2)(B)(i).
[16] Pub. Util. Code, § 8386.3(c)(5)(C).
[17] Id.
[18] Pub. Util. Code, § 8386.3(c)(4); CPUC Resolution WSD-012 2020 WMP Compliance Process. November 2020. https://energysafety.ca.gov/wp-content/uploads/docs/compliance-process/20201008-compliance-staff-proposal_final.pdf
[18] Pub. Util. Code, § 8386(a).
[19] ~~Pub. Util. Code, § 8386(a).~~ Id.

Therefore, Energy Safety's compliance evaluation of the 2020 WMPs went beyond an assessment of whether an electrical corporation met all stated targets (e.g., number of miles of covered conductor installed) to also examine whether the electrical corporation has reduced the risk of catastrophic wildfires. Energy Safety also evaluated whether there were systemic issues that hindered the electrical corporation's ability to meet targets and reduce wildfire risk.

Energy Safety's compliance evaluation examined the totality of data and findings before the department and applied rigorous analysis to determine whether an electrical corporation substantially complied with its WMP.

Energy Safety conducted its compliance assessment to answer the following questions:

1. Did the electrical corporation implement its WMP through completion of approved initiatives (i.e., did the electrical corporation meet its stated qualitative and quantitative targets)?
2. Did the electrical corporation achieve the stated objectives set forth in its 2020 WMP (see Section 4.2)?
3. Was the electrical corporation's performance consistent with achieving wildfire risk reduction?

3.1 Completion of Approved WMP Initiatives

To assess compliance with approved WMP initiatives, Energy Safety evaluated whether the electrical corporation met all stated quantitative and qualitative targets set by the electrical corporation in its plan. Energy Safety particularly focused on those initiatives directly associated with the achievement of WMP objectives as well as those that constituted a significant portion of financial expenditures by the electrical corporation as the expenditures demonstrated where the electrical corporation focused most of its resources to reduce wildfire risk. For 2020 only, Energy Safety also assessed whether the electrical corporation satisfied the conditions placed upon it through Energy Safety's conditional 2020 WMP approval (see Section 4.1).

Where an electrical corporation failed to meet a stated target, Energy Safety evaluated the rationale provided by the electrical corporation, if any, for such failure. Energy Safety also looked for systemic issues that may have caused underperformance, e.g., conflicting/inconsistent documentation, poor communication practices, or substandard quality control practices (see Section 3.3).

Finally, Energy Safety evaluated the quality of WMP initiative implementation. Even where an electrical corporation met a target for work volume, to comply with a WMP and ensure

reduction of risk, the work must be completed correctly and in an effective, high-quality manner.

3.2 2020 WMP Objectives

To assess whether an electrical corporation achieved its 2020 WMP objectives, Energy Safety relied upon the information sources set forth in Section 3.4 below. Where an electrical corporation failed to meet a stated objective, Energy Safety evaluated the rationale, if any, provided by the electrical corporation. Energy Safety also looked for systemic issues that may have caused underperformance (see Section 3.3).

3.3 Achieving Wildfire Risk Reduction

The 2020 WMP is the base year in the first three-year WMP cycle (2020-2022). As such, Energy Safety was limited in making direct determinations on the effectiveness of the 2020 WMP in reducing wildfire risk in that same year as the benefits of some actions may take time to come to fruition. Energy Safety conducted a trend analysis on several outcome metrics (e.g., ignitions) from 2015-2020, normalized for weather and fuel conditions, to assess prior performance and to track any notable changes that occurred in 2020. Energy Safety will again evaluate these metrics at the end of the three-year WMP cycle to evaluate correlations between WMP implementation performance and outcomes.

Energy Safety further analyzed how the electrical corporation prioritized implementation of WMP initiatives to determine whether work was undertaken in the areas of highest risk. Not all areas in an electrical corporation's service territory present equal ignition risk or consequence. Therefore, it is not enough to meet a target; WMP initiatives must first be concentrated and deployed in the areas of highest risk to buy down as much risk as possible.

Finally, Energy Safety undertook a holistic evaluation of all relevant information sources and assessments, including field verifications, to bring to light systemic failings of the electrical corporation that may hinder its ability to reduce catastrophic wildfires. Such failings could contribute to increased risk on the system even if WMP targets are achieved. Therefore, Energy Safety looked for trends across analyses to weave together a deeper and more nuanced understanding of WMP compliance.

3.4 Information Sources Used for ARC Analysis

Energy Safety relied upon the following sources of information to conduct its analysis:

- Information provided by the electrical corporation i.e., the EC ARC, Quarterly Initiative Updates, compliance self-reporting, 2021 WMP Update.
- Information provided by the independent evaluator's review of the electrical corporation's compliance with its 2020 WMP (IE ARC).
- Findings from Energy Safety field inspections.
- Findings from Energy Safety's audits and assessments of the electrical corporation.
- Data submitted to Energy Safety by the electrical corporation[20] including responses to data requests.
- Findings from Independent Monitor Report.[21]

3.4.1 EC ARC

Three months after the end of the compliance period, the electrical corporation must submit a report to Energy Safety addressing its compliance with its approved 2020 WMP.[22] The Compliance Operational Protocols outline the minimum requirements and structure for PG&E's 2020 WMP compliance review report.[23] The report must include:

- An assessment of whether the electrical corporation achieved the risk reduction intent by implementing all of their approved WMP initiatives, i.e., the degree to which initiative activities have reduced ignition probabilities. If the electrical corporation failed to achieve the intended risk reduction, Energy Safety required the electrical corporation to provide a detailed explanation of why and a reference to where associated corrective actions were incorporated into their most recently submitted WMP.
- A full and complete listing of all change orders[24] and any other operational changes, such as initiative location changes, made to WMP initiatives, with an explanation of why the changes were necessary, and an assessment of whether the changes achieved the same risk reduction intent.
- Descriptions of all planned WMP initiative spend versus actual WMP initiative spend and an explanation of any differentials between the planned and actual spends.

[20] Energy Safety receives data from the electrical corporation through three main paths: Quarterly Advice Letter submissions, Quarterly Data Request submissions, and Quarterly Initiative Updates.
[21] PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021.
[22] Pub. Util. Code, § 8386.3(c)(1).
[23] Wildfire Safety Division – Compliance Operational Protocols, pages 10-12.
[24] See CPUC Resolution WSD-002, pages 32-35, for detail regarding the 2020 WMP change order process.

- A description of whether the implementation of WMP initiatives changed the threshold(s) for triggering a Public Safety Power Shutoff (PSPS) event and/or reduced the frequency, scale, scope, and duration of PSPS events.
- A summary of all defects identified by Energy Safety within the annual compliance period, the corrective actions taken and the completion and/or estimated completion date.[25]

3.4.2 IE ARC

Each year before March 1, Energy Safety, in consultation with the Office of the State Fire Marshall, must publish a list of qualified independent evaluators.[26] The electrical corporations must each engage an independent evaluator from the list to review and assess its compliance with the respective approved WMP.[27] The independent evaluator must issue a report, referred to as the Independent Evaluator Annual Report on Compliance (IE ARC), by July 1 of each year covering the previous calendar year. As a part of the report, the independent evaluator must determine whether the electrical corporation failed to fund any activities included in its plan.[28] [29] Energy Safety considered the independent evaluator's findings in this ARC, but the independent evaluator's findings are not binding on Energy Safety's final determination of WMP compliance.[30]

3.4.3 Inspections

Pursuant to Public Utilities Code section 326(a)(3), to ensure electrical corporations complied with their WMPs and operated their infrastructure in a manner that reduces wildfire risk, Energy Safety conducted detailed visual inspections of electrical infrastructure to verify work was performed by electrical corporations, as reported in approved WMPs, and to assess the condition of infrastructure.

Energy Safety began conducting inspections related to the 2020 WMPs in May 2020. Inspections covered core wildfire mitigation efforts related to vegetation management, system hardening, situational awareness, and emergency preparedness and response, in addition to general compliance with applicable Government Order (GO) 95 requirements. The

[25] The defect summary component of the ARC contents does not supplant detailed defect correction responses, which shall be filed with WSD throughout the year as needed (see Appendix Part 2. Response and Corrective Action Timeline in the Operational Protocols for details).
[26] Pub. Util. Code § 8386.3 (c)(2)(A).
[27] Pub. Util. Code, § 8386.3(c)(2)(B).
[28] Id.
[29] The independent evaluator reviews performed for the 2020 WMPs were the first of their kind and completed in a considerably truncated timeframe.
[30] Pub. Util. Code, § 8386.3(c)(2)(B)(ii).

review and analysis of data compiled on findings from these inspections formed the basis of Energy Safety's observations and conclusions in Section 5.3.

3.4.4 Audits

Public Utilities Code section 8386.3(c)(5) requires Energy Safety to perform an audit to determine whether the electrical corporation "substantially complied with the substantial portion"[31] of its vegetation management requirements in its WMP. Energy Safety refers to this audit as the "Substantial Vegetation Management" (SVM) audit. Pursuant to Public Utilities Code section 8386(c)(5), Energy Safety conducted an audit of PG&E's compliance with the vegetation management requirements in its 2020 WMP.

In addition to the statutorily prescribed SVM audit, Energy Safety performed an additional audit of PG&E's Enhanced Vegetation Management (EVM) program. Finally, Energy Safety retained a contractor, Crowe, LLC, to conduct a performance audit of WMP expenditures.

3.4.5 Data

Energy Safety analyzed performance metrics and other data when assessing whether the electrical corporation complied with its 2020 WMP. Energy Safety required electrical corporations to submit spatial and non-spatial data through Quarterly Data Reports (QDRs), Quarterly Initiative Updates (QIUs), and Quarterly Advice Letters (QALs).

3.4.6 Third-Party Reports

Energy Safety also relied upon the PG&E Independent Monitor Report of November 19, 2021, to supplement and corroborate the evidence collected during its compliance process. The Independent Monitorship was established in 2017 in a federal criminal proceeding pertaining to the explosion of a gas transmission line in San Bruno. In 2018, the Court expanded the scope of the Monitorship to include an assessment of PG&E's wildfire mitigation efforts following the 22 deaths and destruction caused by PG&E in the 2017 Northern California wildfires. Specifically, the Independent Monitor team evaluated (1) vegetation management; (2) infrastructure inspections and repairs; (3) system hardening; and (4) emergency preparedness and response.[32]

[31] Pub. Util. Code, § 8386.3(c)(5)(C).

[32] PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021.

4.0 PG&E'S 2020 WMP

The 2020 WMP Guidelines (Guidelines) were issued on December 16, 2019, via *Administrative Law Judge's Ruling on Wildfire Mitigation Plan Templates and Related Material and Allowing Comment*.[33] The 2020 WMP Guidelines outlined the requirements and expectations for the 2020 WMP submissions including reporting templates, metrics, timelines, structure, and minimum levels of detail. The 2020 WMP Guidelines were designed to:

- Increase standardization of information collected on electrical corporations' wildfire risk exposure.
- Enable systematic and uniform review of information each electrical corporation submits.
- Move electrical corporations toward an effective long-term wildfire mitigation strategy, with systematic tracking of improvements over time.[34]

The 2020 WMP Guidelines structured the submission into five sections, as follows:

1. Persons responsible for executing the plan.
2. Metrics and underlying data.
3. Baseline ignition probability and wildfire risk exposure.
4. Inputs to the plan and directional vision including objectives.
5. Listing of wildfire mitigation initiatives for each year of the three-year plan period.

4.1 Conditional Approval

In its disposition of PG&E's 2020 WMP, Energy Safety issued a conditional approval that identified and classified certain deficiencies requiring varying responsive action. Energy Safety evaluated PG&E's fulfilment of its 2020 WMP conditions in this ARC. Energy Safety's assessment regarding resolution of conditions placed on PG&E's 2020 WMP are further discussed in Section 5.8.

Energy Safety released Resolution WSD-002, *Guidance Resolution on 2020 Wildfire Mitigation Plans Pursuant to Public Utilities Code Section 8386* (Guidance Resolution). The Guidance Resolution applied to the electrical corporations collectively and contained deficiencies and associated conditions (remedies).[35] Deficiency Guidance-5 noted that electrical corporations combined various initiatives into broader programs and reported data at the programmatic

[33] See CPUC Rulemaking R.18-10-007.
[34] CPUC Resolution WSD-002, page 2.
[35] The Guidance Resolution did not apply to the Independent Transmission Operators, Horizon West, and Trans Bay Cable, as they received a full approval of their respective 2020 WMPs.

level. This aggregation made it difficult to track progress against individual initiatives, among other issues. The associated condition to Deficiency Guidance-5 required electrical corporations to disaggregate initiatives in their quarterly filings.[36]

As a result of the required disaggregation, some electrical corporation data submissions, including quarterly filings and Quarterly Initiative Updates (QIUs), reference a different number of initiatives than that set forth in the electrical corporation's WMP. In this ARC, Energy Safety reported the number of initiatives as they were presented in the underlying reference document.

4.2 2020 WMP Objectives

The Guidelines required each electrical corporation to describe the specific objectives of its 2020 WMP in section 4.1.[37] The Guidelines also specified that objectives must be described with respect to the following timeframes:

1. Before the upcoming wildfire season (as declared by CALFIRE).
2. Before the next annual update.
3. Within the next three years.
4. Within the next 10 years.[38]

In determining whether PG&E substantially complied with its 2020 WMP, Energy Safety considered and weighed the plan's objectives. For the purposes of this ARC, Energy Safety only considered PG&E's objectives with respect to the first two timeframes.

PG&E states its overarching objective as:

"The objective of PG&E's Wildfire Mitigation Plan (WMP) for 2020 and beyond is to reduce the risk and consequences of wildfires associated with utility electrical equipment, and thereby avoid catastrophic wildfires across central and northern California."[39] To achieve this objective, PG&E stated that it would invest in many wildfire measures including enhanced vegetation management, asset inspection and repair, situational awareness, system hardening, and system automation.[40] PG&E also committed to reducing the scope, frequency, and duration of PSPS events.[41]

[36] CPUC Resolution WSD-002, page 24.
[37] 2020 WMP Guidelines, page 43.
[38] Id.
[39] PG&E 2020 WMP, page 4-1.
[40] ~~PG&E 2020 WMP, page 4-1.~~ Id.
[41] ~~PG&E 2020 WMP, page 4-1.~~ Id.

PG&E explicitly committed to the following:

1. Before the upcoming wildfire season:

- Continue to reduce wildfire risk through mitigation programs including system hardening and enhanced vegetation management.[42]
- Implement PSPS impact mitigation activities to make each 2020 PSPS event affect one-third fewer customers than it would have in 2019 and to shorten restoration time after high-risk weather clears to 12 daylight hours for nearly all impacted customers.[43]
- Further improve situational awareness and meteorology tools to increase weather forecast granularity and improve targeting of fire risk forecasts and PSPS events.[44]

2. Before the next annual update:

- Continue to modify wildfire mitigation programs by incorporating lessons learned throughout the 2020 wildfire season and in response to new regulations, requirements, guidelines, or other changes.[45]
- Work towards gathering data and performing the analysis necessary to establish modified PSPS criteria for distribution facilities that have been hardened.[46]

4.3 PG&E's 2020 WMP Initiatives

The 2020 WMP Guidelines required each electrical corporation to group its discussion of wildfire mitigation initiatives into the 10 categories listed in Table 1, below.

PG&E's 2020 WMP included a total of 113 initiatives allocated across the 10 categories.[47] Table 1 below provides a summary of PG&E's allocation of WMP initiatives across categories, its reported planned spending in each category for 2020, and the percentage of the total 2020 WMP budget the spending in each category comprised.

[42] PG&E 2020 WMP, page 4-2.
[43] Id.
[44] Id.
[45] Id.
[46] Id.
[47] See Section 4.1 for an explanation of the source of some reporting discrepancies in initiative numbers and targets.

Table 1: PG&E's 2020 WMP Initiatives and planned spend by Category based on PG&E's EC ARC, Cost Variance Tables[48]

Initiative Category	No. of Initiatives	2020 Planned Spend ($K)	% Of 2020 WMP Budget
Risk assessment and mapping	6	$5,311	0.16%
Situational awareness and forecasting	25	$42,191	1.31%
Grid design and system hardening	23	$1,695,179	52.58%
Asset management and inspections	15	$216,529	6.72%
Vegetation management and inspections	20	$846,018	26.24%
Grid operations and protocols	6	$244,065	7.57%
Data governance	4	$90,975	2.82%
Resource allocation methodology	3	$2,148	0.07%
Emergency planning and preparedness	7	$44,619	1.38%
Stakeholder cooperation and community engagement	4	$37,261	1.16%
Total	**113**	**$3,224,296**	**100%**

Some initiatives provided quantitative targets (e.g., miles completed for system hardening initiatives). Other initiatives included qualitative measures (e.g., integration of all vegetation data into a singular database as a data governance initiative). A few included both qualitative and quantitative measures.

Energy Safety also reviewed the planned spend for each WMP initiative to assess how PG&E prioritized its risk mitigation efforts as a function of the percentage of total budget allocated across WMP categories and initiatives. Table 2 provides an overview of PG&E's planned 2020-2022 WMP spend.[49]

[48] PGE_2020 ARC_20210331_2020 Variance Explanations.xlsx, sum of 2020 WMP Expense Forecast and Capital Forecast.

[49] CPUC Resolution WSD-003, pages 3-4.

Table 2: PG&E's Planned 2020-2022 WMP Spend

Planned 2020-2022 WMP Spend[50]	
2020	$3.17 billion
2021	$3.13 billion
2022	$3.24 billion
2020-2022 Plan Period	$9.54 billion

Table 3: PG&E's 2020 WMP Top 10 Planned Spend Initiatives

Initiative #	Initiative	2020 Planned Spend ($K)	% Of 2020 WMP Budget[51]
5.3.5.20	Vegetation management to achieve clearances around electric lines and equipment	$438,311	14%
5.3.3.12	Other corrective action	$320,509	10%
5.3.3.17	Updates to grid topology to minimize risk of ignition in HFTDs	$313,530	10%
5.3.3.15	Transmission tower maintenance and replacement	$284,012	9%
5.3.3.6	Distribution pole replacement and reinforcement, including with composite poles	$212,477	7%
5.3.6.5	PSPS events and mitigation of PSPS impacts	$210,358	7%
5.3.3.11	Mitigation of impact on customers and other residents affected during PSPS event	$155,715	5%
5.3.3.8	Grid topology improvements to mitigate or reduce PSPS events	$132,695	4%
5.3.5.11	Patrol inspections of vegetation around distribution electric lines and equipment	$105,349	3%
5.3.5.15	Remediation of at-risk species	$98,545	3%
Total		**$2,271,501**	**72%**

Table 3 lists the top 10 initiatives by planned spend. The last row in Table 3 shows that the 10 listed initiatives (out of 113 total) make up 72% of PG&E's total 2020 WMP planned spend.

[50] Any variances in WMP spend data are a function of PG&E reporting costs differently across various submissions to Energy Safety.

[51] PGE_2020 ARC_20210331_2020 Variance Explanations.xlsx, sum of 2020 WMP Expense Forecast and Capital Forecast.

5.0 COMPLIANCE ASSESSMENTS

In the following sections, Energy Safety provides the findings from the compliance source inputs it relied upon in making its annual determination of compliance in this ARC.

5.1 PG&E Self-Assessed Compliance Reporting

In addition to the statutorily mandated self-assessment that PG&E completed on its 2020 WMP compliance review (PG&E EC ARC), Energy Safety also considered all relevant self-assessments of compliance with the 2020 WMP performed by PG&E and made available to Energy Safety. Notably, there are inconsistencies among PG&E's submissions, as discussed below. Based on reporting by PG&E, Energy Safety understands that PG&E missed seven initiative targets: substation inspections (Initiative 5.3.4.15), Sensor IQ (Initiative 5.3.2.2.6), partial voltage detection (Initiative 5.3.2.2.3), remote grid (Initiative 5.3.3.8), PSPS restoration (Initiative 5.3.9.5.2), distribution pole inspections (Initiative 5.3.4.1), and weather stations (Initiative 5.2.3.1.3). Information is presented below in chronological order of receipt.

Prior to submitting the PG&E EC ARC, PG&E self-reported two missed initiatives to Energy Safety. On March 4, 2021, PG&E submitted a letter regarding updates to its 2019 WMP and 2020 WMP progress (March 4th Letter).[52] In the March 4th Letter, PG&E self-reported missed inspections of 63 hydroelectric substations in HFTD Tier 2 (39) and Tier 3 (24) in 2020 as part of executing Initiative 5.3.4.15 Substation Inspections of its 2020 WMP.

In its 2020 WMP, PG&E committed to "detailed inspections of substations as building on the 2019 [Wildfire Safety Inspection Program (WSIP)] to further minimize the risk posed by substations." PG&E's Initiative 5.3.4.15 Substation Inspections also committed to completing "supplemental inspections once annually for all HFTD Tier 3 [sub]stations, on a three-year cycle for stations in HFTD Tier 2."[53] The three-year cycle equated to inspections of approximately 33% of the assets per year.

The explanation for missing these inspections in 2020 was a failure to include hydroelectric substations, in addition to transmission and distribution substations, in its 2020 asset inspection plan upon transitioning from its 2019 WSIP to its 2020 Enhanced Inspection Program. In the March 4th Letter, PG&E self-reported missing its 2020 WMP target by not performing annual inspections on 24 hydroelectric substations in Tier 3, and 39 hydroelectric substations in Tier 2 (13% of the 33% target).

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[52] March 4, 2021 – Substation Inspection Letter, Self-Identified WMP Update Letters, (https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/Deborah-Powell-Letter.pdf).

[53] PG&E's 2020 WMP, Section 5.3.4.15 Substation Inspections, page 5-172.

On March 12, 2021, PG&E submitted an update to its progress on the missed hydroelectric substations inspections (March 12th Letter).[54] In the March 12th Letter, PG&E stated that it had completed all inspections of its Tier 3 substations, as indicated in Initiative 5.3.4.15 of its 2020 WMP.

PG&E timely submitted its EC ARC on March 31, 2021. In its EC-ARC, PG&E reported the following:

1. PG&E did not meet the targets for five initiatives. Two of the missed initiatives had approved change orders. PG&E reported that it nearly completed two additional initiatives but still fell slightly short of the WMP target. Finally, PG&E admitted to missing the target on one initiative.
    a. Substation inspections (missed).
    b. Sensor IQ[55] (approved change order).
    c. Partial Voltage detection[56] (approved change order).
    d. Remote Grid (substantially complete).
    e. PSPS Restoration[57] (substantially complete).
        i. PG&E missed one goal with respect to PSPS restoration.[58] In section 4.1 of the 2020 WMP, PG&E set a target of restoring 98% of customers within 12 daylight hours of the weather "all-clear." PG&E did not meet this goal instead achieving a restoration timeframe 96% of customers.[59]
2. PG&E reported that it called six PSPS events in 2020 that in aggregate were 55% smaller than they would have been had they occurred in 2019 under the same weather patterns. PSPS events in 2020 were also shortened, with the average time to restore power being reduced by over 40%.[60]
    a. PG&E completed evaluation of 552 transmission lines in HFTD areas to determine which lines could potentially be removed from scope for future PSPS events.[61]

[54] March 12, 2021 – Substation Inspection Letter Update 1, Self-Identified WMP Update Letters, (https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/Deborah-Powell-Letter-Update.pdf).
[55] PG&E submitted and Energy Safety approved change orders for two initiatives: (1) The Sensor IQ implementation timeline was revised from February 2021 to October 2021 due to software incompatibility issues. (2) Partial voltage detection software deployment was delayed to June 2021. Change Order submitted on December 11, 2020, and approved on January 5, 2021.
[56] First Change Order Report: WSD Response to PG&E 9-11-2020 Change Order Report.
[57] PG&E 2020 WMP, page 4-1.
[58] PG&E EC ARC, page 5.
[59] Id.
[60] Id.
[61] PG&E EC ARC, Appendix, Table 1, Row C.4, page 18 of 25 in pdf.

b. PG&E completed calibration of its PSPS tools to alter the criteria for hardened distribution infrastructure and applied these criteria for an October 25, 2020, PSPS event to simulate the application of the criteria for future descoping of a segment of the Oakland K 1102 circuit.[62]

3. The Compliance Operational Protocols require that PG&E provide information on "the degree to which initiative activities have reduced ignition probabilities." PG&E stated that the risk reduction was achieved through the successful completion of nearly all 2020 WMP commitments and initiatives. PG&E also pointed to Table 12 of its 2021 WMP to support its risk reduction claims.[63] However, Table 12 presents, among other information, expected risk reduction effectiveness assuming full and complete implementation whereas the requirement for the EC ARC is to discuss risk reduction achieved[64] from implementation of PG&E's 2020 WMP.

Notably, in its EC ARC, PG&E did not discuss missing weather station installations or distribution pole inspection targets, both key objectives of its 2020 WMP. [65]

On May 7, 2021, PG&E submitted a letter self-reporting missed General Order (GO) 165 and WMP Enhanced Inspections (May 7th Letter).[66] In its 2020 WMP, PG&E stated that, in 2020, it would conduct "detailed overhead inspections on 100% of HFTD Tier 3, and 33% of HFTD Tier 2 assets."[67] PG&E further stated that inspections performed as part of its Wildfire Safety Inspection Program (WSIP) expedited and expanded its detailed overhead inspections in Tier 2 and Tier 3 HFTD areas.[68] In the May 7th Letter, PG&E admitted that it did not complete detailed overhead inspection of 3,296 (1%)[69] poles in Tier 3 as part of its enhanced inspection program as indicated in its 2020 WMP. These 3,296 poles had WSIP records but did not have GO 165 inspection records in 2020.

On June 1, 2021,[70] PG&E submitted a letter reporting missed installation targets of weather stations (June 1st Letter). PG&E reported installing 378 weather stations in 2020, against a

[62] PG&E EC ARC, Appendix, Table 1, Row C.9, page 19 of 25 in pdf.
[63] PG&E EC ARC to 2020 WMP, page 2.
[64] WMP, 2021WMP_Section7.3_Attachment 01 workpapers.
[65] PG&E 2020 WMP, page 4-1.
[66] May 7, 2021 – GO 165 Inspection Letter, Self-Identified WMP Update Letters, (https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/GO-165-Inspection-Self-Report.pdf).
[67] PG&E's 2020 WMP, Section 5.3.4.1 Detailed Inspections of Distribution Electric Lines and Equipment, page 5-156.
[68] PG&E's 2020 WMP, Section 5.3.4 Asset Management and Inspections, page 5-153.
[69] The Q4 2020 QIU data had a target of 339,728 poles for detailed inspection. 3296/339,728 is approximately 1%.
[70] June 1, 2021 – Weather Stations and HD Cameras Letter, Self-Identified WMP Update Letters, (https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/WMP-Self-Idenfitication-Letter.pdf).

target of 400 in its 2020 WMP.[71] In its 2021 WMP Update, PG&E incorrectly reported that 404 weather stations had been installed in 2020. PG&E counted weather stations installed in 2019 that exceeded its 2019 WMP target as installed in 2020.

On December 23, 2021, Energy Safety issued a notice of violation to PG&E regarding PG&E's self-reported missed inspections of 63 hydroelectric substations in HFTD Tier 2 (39) and Tier 3 (24) in 2020 as part of executing Initiative 5.3.4.15 of its 2020 WMP in PG&E's March 4th Letter. Energy Safety requested that PG&E respond to the notice within 30 days and advise Energy Safety of the corrective actions taken or planned by PG&E to remedy the identified violation.[72]

On January 24, 2022, PG&E submitted a response to the notice of violation.[73] PG&E agreed that it did not meet the 2020 WMP target to perform detailed overhead inspections on 100% of HFTD Tier 3 assets. PG&E completed all enhanced inspections of Tier 3 substations and addressed all highest priority tags resulting from the Tier 3 inspections by March 2021. PG&E stated that it addressed all B priority tags from the Tier 3 inspections by June 2021.

5.2 Independent Evaluator Review

PG&E selected BVNA as the independent evaluator to assess its compliance with the 2020 WMP. BVNA issued its PG&E IE ARC on July 1, 2021. Energy Safety carefully weighed the quality and utility of the PG&E IE ARC when evaluating PG&E's compliance with its approved 2020 WMP.

BVNA reviewed 113 initiatives[74] and submitted a total of nine findings related to five initiatives (~4%). The findings are grouped by initiative listed below:[75]

1. Per 2020 WMP initiative 5.2.3.1.3, BVNA inspected 51 of 378 weather stations installed.[76] BVNA found one of the weather stations was out of compliance (2% failure rate).[77] The weather station had become non-operational because tree growth near the station had obscured the solar panels.[78]

[71] June 1, 2021 – Weather Stations and HD Cameras Letter, Self-Identified WMP Update Letters, (https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/WMP-Self-Idenfitication-Letter.pdf).
[72] NOV_PGE_QP_20210304-01.
[73] NOV Response NOV_PGE_QP_20210304-01.
[74] See Section 4.1 for an explanation of the source of some reporting discrepancies in initiative numbers and targets.
[75] Independent Evaluator Report on PG&E 2020 WMP.
[76] Independent Evaluator Report on PG&E 2020 WMP, page 12.
[77] Independent Evaluator Report on PG&E 2020 WMP, page 13.
[78] PG&E Response to Independent Evaluator Report Concerning 2020 WMP, page 7.

2. Per 2020 WMP initiative 5.2.3.1.4, BVNA inspected 32 of 216 high definition (HD) cameras installed.[79] BVNA found one of the HD cameras was non-operational (3% failure rate) due to failure of the wireless service provider's router. [80] [81]
3. Per 2020 WMP initiative 5.3.3.8.1 BVNA inspected 100 of 603 distribution sectionalizing devices installed.[82] BVNA found five of the devices were out of compliance (5% failure rate). Two devices were at an incorrect location, two devices had bird guards out of position, and one with a solid blade cutout was disconnected and a non-exempt fuse was still connected.[83]
4. Per 2020 WMP initiative 5.3.4.1, PG&E had a target of inspecting 339,728 poles in HFTD in 2020.[84] BVNA reviewed the inspection records of 315 poles.[85] Two records had poor photo quality and were removed from the review.[86] BVNA found non-compliance in 25 of the remaining 313 records (8% failure rate)[87] noting that the asset presented in the photo was different from the asset that was listed in the inspection form.[88]
5. Per 2020 WMP initiative 5.3.5.15, BVNA inspected 1381 sites where PG&E performed EVM.[89] BVNA found that 105 of these sites (8%) were out of compliance noting that the vegetation at the inspected sites were not maintained 12-feet away from PG&E's infrastructure.[90]

PG&E responded to BVNA's IE ARC and the findings therein on August 16, 2021.[91] PG&E agreed with seven out of nine findings noting that it had already corrected the defects or had work orders in place to correct the identified defects. Energy Safety verified that PG&E timely corrected the defects identified by the BVNA.[92] PG&E disagreed with one finding (Initiative 5.3.4.1) and partially disagreed with another finding (Initiative 5.3.5.15). Where there was disagreement between BVNA and PG&E, Energy Safety evaluated and reviewed the BVNA's IE ARC and PG&E's response and made a determination of compliance.

Table 4 below summarizes BVNA's findings, PG&E's response, and Energy Safety's determination. Section 5.2.1 provides Energy Safety's assessment on areas of disagreement.

[79] Independent Evaluator Report on PG&E 2020 WMP, page 14.
[80] PG&E Response to Independent Evaluator Report Concerning 2020 WMP, page 7.
[81] Independent Evaluator Report on PG&E 2020 WMP, page 14.
[82] Independent Evaluator Report on PG&E 2020 WMP, page 16.
[83] Independent Evaluator Report on PG&E 2020 WMP, page 16.
[84] Independent Evaluator Report on PG&E 2020 WMP, page 22.
[85] ~~Independent Evaluator Report on PG&E 2020 WMP, page 22.~~ Id.
[86] ~~Independent Evaluator Report on PG&E 2020 WMP, page 22.~~ Id.
[87] ~~Independent Evaluator Report on PG&E 2020 WMP, page 22.~~ Id.
[88] Independent Evaluator Report on PG&E 2020 WMP, Appendix F.
[89] Independent Evaluator Report on PG&E 2020 WMP, page 91.
[90] ~~Independent Evaluator Report on PG&E 2020 WMP, page 91.~~ Id.
[91] PG&E Response to Independent Evaluator Report Concerning 2020 WMP.
[92] PG&E Response to Energy Safety Data Request PGE IE 2020 ARC DR 081-220414.

Table 4: BVNA Findings, Electrical Corporation Response, and Energy Safety Determination

2020 Initiative name and number	BVNA Finding	PG&E Response	Energy Safety Determination
Weather Station Installation (5.2.3.1.3)	One out of 51 weather stations was not working.[93]	PG&E agreed with the finding and relocated the weather station.[94]	Concur with BVNA finding.
High-definition camera installation (5.2.3.1.4)	One out of 32 cameras was not working.[95]	PG&E agreed with the finding and had the wireless router repaired.[96]	Concur with BVNA finding.
Sectionalizing device installation (5.3.3.8.1)	Two out of 100 devices at incorrect location.[97]	PG&E agreed with the findings and updated the device location in their database[98]	Concur with BVNA finding.
Sectionalizing device installation (5.3.3.8.1)	Two out of 100 devices had bird guard out of position.[99]	PG&E agreed with the findings and repositioned the bird guards.[100]	Concur with BVNA finding.
Sectionalizing device installation (5.3.3.8.1)	One device had a disconnected solid blade cutout and non-exempt fuse still connected.[101]	PG&E agreed with the findings and connected the solid blade cutout.[102]	Concur with BVNA finding.
Distribution Pole Inspections (5.3.4.1)	In 11 of the 313 cases, the asset seen in the photo was different than what was listed	PG&E agreed with the findings. The inspector failed to update the prepopulated data in the form. The forms have been	Concur with BVNA finding.

[93] Independent Evaluator Report on PG&E 2020 WMP, page 12
[94] PG&E Response to Independent Evaluator Report Concerning 2020 WMP, page 7.
[95] Independent Evaluator Report on PG&E 2020 WMP, page 14.
[96] PG&E Response to Independent Evaluator Report Concerning 2020 WMP, page 7.
[97] Independent Evaluator Report on PG&E 2020 WMP, page 16.
[98] PG&E Response to Independent Evaluator Report Concerning 2020 WMP, page 8.
[99] Independent Evaluator Report on PG&E 2020 WMP, page 16.
[100] PG&E Response to Independent Evaluator Report Concerning 2020 WMP, page 8.
[101] Independent Evaluator Report on PG&E 2020 WMP, page 16.
[102] PG&E Response to Independent Evaluator Report Concerning 2020 WMP, page 8.

2020 Initiative name and number	BVNA Finding	PG&E Response	Energy Safety Determination
	in the inspection form.[103]	updated and inspectors trained.[104]	
Distribution Pole Inspections (5.3.4.1)	In 13 of the 313 cases, the asset seen in the photo was different than what was listed in the inspection form.[105]	PG&E agreed with the findings and attributed the defect to human error while documenting the inspection. The forms have been updated and inspectors trained.[106]	Concur with BVNA finding.
Distribution Pole Inspections (5.3.4.1)	In one of the 313 cases, a secondary conductor was supported by a tree.[107]	PG&E stated that this was not a violation of the 2020 WMP. [108]	Do not concur with BVNA finding.[109]
Enhanced Vegetation Management (5.3.5.15)	105 of the 1381 sites did not meet the PG&E EVM scope.[110]	PG&E agreed that seven sites were out of compliance and the clearance between conductor and vegetation was less than four feet.[111] PG&E performed corrective action to bring these locations into compliance. PG&E disagreed that the remaining sites were out of compliance and attributed the disagreement to BVNA's understanding of the scope of the EVM program which requires the 12 feet of clearance	Do not concur with BVNA finding.[113]

[103] Independent Evaluator Report on PG&E 2020 WMP, Appendix F.
[104] PG&E Response to Independent Evaluator Report Concerning 2020 WMP, page 7.
[105] Independent Evaluator Report on PG&E 2020 WMP, Appendix F.
[106] PG&E Response to Energy Safety Data Request PGE IE 2020 ARC DR 081-220414, Question 3(b).
[107] Independent Evaluator Report on PG&E 2020 WMP, Appendix F.
[108] PG&E Response to Energy Safety Data Request PGE IE 2020 ARC DR 081-220414, Question 3(b).
[109] See narrative below the table.
[110] Independent Evaluator Report on PG&E 2020 WMP, page 91.
[111] PG&E Response to Independent Evaluator Report Concerning 2020 WMP, page 4; and PG&E Response to Energy Safety Data Request PGE IE 2020 ARC DR 081-220414, question 4.
[113] See narrative below the table.

2020 Initiative name and number	BVNA Finding	PG&E Response	Energy Safety Determination
		only at the time of the vegetation management work.[112]	

5.2.1 Energy Safety's Assessment of Disputed BVNA Findings

5.2.1.1 Distribution Pole Inspections (Initiative 5.3.4.1)

The BVNA found a secondary conductor supported by a tree and determined it was noncompliant with the WMP.[114] PG&E disagreed.[115] PG&E stated that it discovered the tree-attachment on June 3, 2020, a year before it was found by BVNA and issued a work order to replace the tree-attachment with a pole by June 3, 2021.[116] [117] PG&E reassessed the tree-attachment on May 18, 2021 and pushed out the deadline for removal another twelve months.[118] PG&E removed the tree attachment on March 8, 2022.[119] Given that PG&E had discovered the tree-attachment and issued a work order for its removal prior to BVNA inspection, Energy Safety agreed with PG&E that the condition identified by BVNA is not a WMP compliance issue. [120]

5.2.1.2 Enhanced Vegetation Management (Initiative 5.3.5.15)

When inspecting the EVM program, BVNA found 105 sites that it believed did not meet the radial clearance requirement that the distance between conductor and vegetation be no less

[112] PG&E Response to Independent Evaluator Report Concerning 2020 WMP, page 4; and PG&E Response to Energy Safety Data Request PGE IE 2020 ARC DR 081-220414, question 4.
[114] Independent Evaluator Report on PG&E 2020 WMP, Appendix F, Row 22.
[115] PG&E Response to Energy Safety Data Request PGE IE 2020 ARC DR 081-220414, Question 3.
[116] PGE Response to Data Request 081, Question 3 Supplemental. This was a priority E work order which needs to be completed ~~within~~within a year of detection.
[117] Table PG&E 5-3: WILDFIRE SAFETY INSPECTION PROGRAM (WSIP) TAG PRIORITY CLASSIFICATION of PG&E's 2020 WMP p.5-41 specifies A, B, E, and F tag descriptions and repair timeframes. If the condition is of low potential impact to safety or reliability, corrective actions for distribution facilities is recommended to be addressed within 5 years from the date the condition is identified. Corrective actions for transmission facilities recommended to be addressed within 2 years from the date the condition is identified.
[118] PGE Response to Data Request 081, Question 3 Supplemental.
[119] ~~PGE Response to Data Request 081, Question 3 Supplemental.~~ Id.
[120] WSIP Compliance Plan and Utility Bulletin TD-8999B-01 outlines the company protocol for conducting field re-assessments of existing open corrective notifications.

than 12 feet.[121] PG&E agreed that seven out of the 105 sites were out of compliance.[122] PG&E disagreed that the remaining 98 sites were noncompliant. PG&E stated that it inspected the 98 sites and determined that the vegetation was more than four feet from the conductor.[123] PG&E's asserted that its EVM program requires a 12- foot clearance between conductor and vegetation is at the time of trim.[124] This means that if an inspection is performed a few months after the vegetation work, it is possible for the radial clearance between conductor and vegetation to be less than 12 feet. PG&E stated that BVNA visited the sites at least five months after PG&E performed the vegetation work.

Energy Safety did not visit these 98 locations; however, maintenance of a 12-foot clearance is not a requirement of this WMP initiative. Instead, as stated by PG&E, the 12-foot clearance is required solely at the time of trim. Therefore, Energy Safety agrees with PG&E that the 98 locations identified by BVNA are in compliance with PG&E's EVM program. Energy Safety notes, however, that the relevant WMP initiative scope as presented by PG&E in its WMP makes no mention of the protocols in the procedural document, cited by PG&E in its response to BVNA, that a trim is only required if encroachment on the 4-foot radius is imminent before the next vegetation management cycle. These conflicting program specifications were also identified in Energy Safety's Substantial Vegetation Audit summarized in Section 5.4.1 of this report.

5.3 Inspections

Energy Safety conducted a total of 1948 inspection activities of PG&E's infrastructure in 2020. A summary of inspection activities and defects is presented in Table 5 below.

Table 5: 2020 Inspection Results of PG&E Service Territory

Metrics Considered	Totals
Total Activities	1948
Total Defects	149
Defect Rate	7.65%
Total Defect Resolutions	149
Defect Resolution Rate (Total Defect Resolved/Total Defects)	100%

[121] Independent Evaluator Report on PG&E 2020 WMP, page 91.

[122] PG&E Response to Independent Evaluator Report Concerning 2020 WMP, p.4; and PG&E Response to Energy Safety Data Request PGE IE 2020 ARC DR 081-220414, question 4.

[123] ~~PG&E Response to Independent Evaluator Report Concerning 2020 WMP, p.4; and PG&E Response to Energy Safety Data Request PGE IE 2020 ARC DR 081-220414, question 4.~~ Id.

[124] PG&E 2020 WMP, section 5.3.5.15, page 5-195.

5.3.1 Field Inspection Defect Findings

Defects found during Energy Safety's inspections generally pertained to vegetation proximity and condition, as well as electrical infrastructure and equipment conditions. Vegetation management defects included vegetation too close to or touching power lines and other facilities, trees marked for removal, but not removed, and woody debris piles left on site without removing hazardous slash. In addition, Energy Safety noted dangerous pole conditions, such as unstable "down guy" wires that anchor the pole to the ground and significant woodpecker damage and pole cracking. In addition, Energy Safety found that several telecommunication assets were too close to utility assets.

In 2020, PG&E had a defect rate of 7.65% and timely resolved all the defects identified by Energy Safety.

5.4 Audits

Energy Safety conducted three audits on PG&E's 2020 WMP activities. Descriptions of the audits and associated findings are presented in the following sections.

5.4.1 Substantial Vegetation Management (SVM) Audit

On June 14, 2022, Energy Safety issued its SVM audit for PG&E. In the audit, Energy Safety evaluated PG&E's quantitative commitments[125] and verifiable statements[126] for each of the 20 WMP vegetation management initiatives. Energy Safety reviewed available information and requested additional documentation to evaluate whether PG&E fully met its quantitative commitments and executed its verifiable statements. Energy Safety found PG&E was not compliant in seven out of the 20 vegetation initiatives audited in its 2020 WMP, as detailed in Table 6 below.[127]

[125] For example, miles of lines to inspect, minimum work quality thresholds, etc.
[126] For example, holding public meetings with communities regarding future vegetation management activities, training personnel on utilities protocols, etc.
[127] PG&E SVM audit, page 5.

Table 6: Energy Safety's Analysis of PG&E's 2020 WMP Vegetation Management Initiatives

2020 WMP Initiative Number	2020 WMP Initiative Name	Determination [128]
5.3.5.1	Additional Efforts to Manage Community and Environmental Impacts	Noncompliant
5.3.5.2	Detailed Inspections of Vegetation Around Distribution Electric Lines and Equipment	Compliant
5.3.5.3	Detailed Inspections of Vegetation Around Transmission Electric Lines and Equipment	Compliant
5.3.5.4	Emergency Response Vegetation Management Due to Red Flag Warning or Other Urgent Conditions	Compliant
5.3.5.5	Fuel Management and Reduction of "Slash" from Vegetation Management Activities	Noncompliant
5.3.5.6	Improvement of Inspections	Compliant
5.3.5.7	LiDAR Inspections of Vegetation Around Distribution Electric Lines and Equipment	Noncompliant
5.3.5.8	LiDAR Inspections of Vegetation Around Transmission Electric Lines and Equipment	Compliant
5.3.5.9	Other Discretionary Inspection of Vegetation Around Distribution Electric Lines and Equipment, Beyond Inspections Mandated by Rules and Regulations	Compliant
5.3.5.10	Other Discretionary Inspection of Vegetation Around Transmission Electric Lines and Equipment, Beyond Inspections Mandated by Rules and Regulations	Compliant
5.3.5.11	Patrol Inspections of Vegetation Around Distribution Electric Lines and Equipment	Compliant
5.3.5.12	Patrol Inspections of Vegetation Around Transmission Electric Lines and Equipment	Compliant
5.3.5.13	Quality Assurance / Quality Control of Inspections	Noncompliant
5.3.5.14	Recruiting and Training of Vegetation Management Personnel	Noncompliant
5.3.5.15	Remediation of At-Risk Species	Noncompliant
5.3.5.16	Removal and Remediation of Trees with Strike Potential to Electric Lines and Equipment	Compliant
5.3.5.17	Substation Inspections	Compliant
5.3.5.18	Substation Vegetation Management	Compliant
5.3.5.19	Vegetation Inventory System	Noncompliant

[128] As used in this context, "Compliant" means the utility was able to provide Energy Safety document(s) to support statements made in its 2020 WMP. "Noncompliant" means the utility was not able to provide Energy Safety document(s) to support commitments and statements made in its 2020 WMP. Energy Safety's analysis did not assess the quality of how said WMP statement was executed.

2020 WMP Initiative Number	2020 WMP Initiative Name	Determination [128]
5.3.5.20	Vegetation Management to Achieve Clearances Around Electric Lines and Equipment	Compliant

Notable findings include:

1. PG&E used inconsistent naming convention within its vegetation management programs. For example, in the 2020 and 2021 WMPs, PG&E calls the Catastrophic Event Memorandum Account (CEMA) program all the following: "Mid-cycle Patrol," "dead and dying tree program," "Tree Mortality Program," "second patrol program," "CEMA Patrol," and "VM Second Patrol."
2. PG&E failed to include a complete description of the EVM scope in the 2020 WMP. Specifically, PG&E failed to state that only if vegetation risks encroaching the four-foot radius will it be trimmed to a 12-foot clearance.
3. During a public workshop on November 8, 2021, PG&E stated that in mid-June 2021, a Work Verification (WV) manager identified a procedural gap with a difference in interpretation between the pre-inspection and work verification teams of the in the EVM encroachment criteria for "next routine/compliance cycle."[129] As a result of this gap, PG&E had to re-patrol approximately 530 miles of EVM work conducted in 2020. Of the approximately 530 miles of 2020 EVM work re-patrolled, approximately 32 miles (6%) required additional vegetation management work to align with the EVM scope according to the proper procedural documents.
4. Energy Safety found that PG&E kept data on vegetation management work in decentralized disparate systems. PG&E's vegetation management data is tracked across at least six different databases.

In the SVM audit, Energy Safety specified 12 required Corrective Actions for PG&E to either resolve or explain its failures, and it required PG&E to provide a Corrective Action response. These 12 corrective actions were tied to seven noncompliant PG&E initiatives. On August 15, 2022, PG&E timely provided its Corrective Action response and included supporting documentation.[130] Additionally, PG&E provided a "General Response" to the Corrective Actions detailing steps it is currently taking and will take in the future to ensure its vegetation management operations align with statements made in its WMPs.

[129] PG&E's Enhanced Oversight and Enforcement Process Corrective Action Plan 90-Day Report Pursuant To Resolution M-4852 November 4, 2021. P.8 states "PG&E's EVM Work Verification (WV) team incorrectly indicated to WV inspectors that, for WV purposes, the encroachment criteria should be thirty (30) days for both radial clearance and overhang, rather than the 12 months for overhang prescribed in Procedure TD-7106P-01."

[130] PG&E 2020 SVM Audit Corrective Action Plan is published on Energy Safety's e-filing system in the 2020 WMP Substantial Vegetation Management Audits docket and available here: https://efiling.energysafety.ca.gov/EFiling/DocketInformation.aspx?docketnumber=2020-SVM (accessed on September 22, 2022).

After reviewing PG&E's response to the Corrective Actions, on September 9, 2022, Energy Safety issued its final SVM Report finding that PG&E sufficiently addressed nine of the 12 Corrective Actions.[131] As a result of the Corrective Actions, Energy Safety found that PG&E substantially complied with the substantial portion of the vegetation management requirements in its 2020 WMP.[132] However, Energy Safety reaffirms that PG&E failed to complete the following commitments from its vegetation management section of the 2020 WMP during the compliance period (January 1, 2020 to December 31, 2020):

- Initiative 5.3.5.7: PG&E failed to provide a pattern identified by LiDAR from 2020.
- Initiative 5.3.5.15: The language in the 2020 WMP describing the EVM scope conflicts with the EVM scope as described in PG&E's procedural document (see above).
- Initiative 5.3.5.15: PG&E did not start the process with other California utilities to develop a targeted species program in 2020.

5.4.2 Enhanced Vegetation Management Audit

On October 21, 2020, Energy Safety initiated an audit of PG&E's Enhanced Vegetation Management (EVM) program as detailed and described in Section 5.3.5.15 of its 2020 WMP.[133] The audit examined PG&E's prioritization of EVM work, communication with Energy Safety regarding the data underlying its prioritization approach for its EVM program, inconsistencies between PG&E's various prioritization data, and the EVM defects identified through Energy Safety's inspections. Audit findings are listed below in Table 7.

Table 7: Energy Safety's Findings from EVM Audit

Number	Finding
1	PG&E failed to communicate its use of a new Risk Overlay Model and provided Energy Safety with conflicting information regarding when different risk prioritization models were utilized.
2	Energy Safety received three different EVM prioritization models from PG&E (in September 2020, December 2020, and January 2021). The three data submissions contained inconsistencies and conflicting information.
3	Energy Safety identified concerns in the methodology used to arrive at the final risk score rankings provided in the December 2020 model.
4	PG&E appeared to not be sufficiently prioritizing or reducing the risk of wildfire ignition in its implementation of its EVM initiative. PG&E

[131] Energy Safety's Report on PG&E's 2020 SVM Audit is published on Energy Safety's e-filing system in the 2020 Substantial Vegetation Management Audits docket and available here: https://efiling.energysafety.ca.gov/EFiling/DocketInformation.aspx?docketnumber=2020-SVM (accessed on September 22, 2022).

[132] Pub. Util. Code, § 8386.3(c)(5)(C).

[133] PG&E EVM audit (2021.02.08.evmaudit.pdf (ca.gov))

Number	Finding
	completed less than 5% of its EVM work in 2020 on its top 20 highest risk circuits.
5	PG&E's January 13, 2021, data request response did not substantiate that PG&E's risk prioritization activities were being effectively operationalized.
6	Energy Safety documented four EVM defects through inspections, three of which remained open/unresolved as of issuance of the audit.
7	PG&E did not adequately communicate with Energy Safety regarding defect resolution (PG&E corrected seven Energy Safety-identified defects without notifying Energy Safety), data requests, or large-scale clearing projects.

Energy Safety submitted the results of the EVM audit to PG&E on February 8, 2021. PG&E responded to the EVM audit on February 23, 2021. In its response, PG&E presented its plan to implement the corrective actions to the EVM program for 2021.[134] Specifically, PG&E committed to targeting the highest risk areas in their 2021 EVM program.[135] In PG&E's 2021 WMP, PG&E committed to performing 80% of the EVM work on the top 20% highest risk circuit segments.[136]

On April 16, 2021, based on Energy Safety's EVM audit, the CPUC placed PG&E into "Step 1" of the CPUC's Enhanced Oversight Enforcement Process (EOE) for insufficiently prioritizing its EVM program based on risk.[137] Step 1 of the EOE subjected PG&E to enhanced reporting requirements and required PG&E to submit a separate, EOE Corrective Action Plan.

5.4.3 Performance Audit of WMP Expenditures

On June 29, 2020, Energy Safety engaged Crowe, LLC to conduct an independent audit of WMP expenditures by the six investor-owned electrical corporations that submitted 2019 and 2020 WMPs.[138] The purpose of Crowe's audit was to examine expenditures in the execution of investor-owned electrical corporation WMP programs and initiatives relative to their prior General Rate Cases (GRCs). Crowe assessed the relationship between expenses and/or

[134] PG&&E's response to SVM audit (pgetowsd_evmresponse_2021.03.12.pdf (ca.gov))
[135] PGE's response to SVM audit, page 13 of 40 in pdf (pgetowsd_evmresponse_2021.03.12.pdf (ca.gov))
[136] PG&E 2021 WMP Revised, page 5.
[137] CPUC Resolution M-4852. The Enhanced Oversight and Enforcement (EOE) Process approved in (D.)20-05-053 is triggered by specific events and contains six steps ranging from requiring additional reporting requirements to a formal review of PG&E's Certificate of Public Convenience and Necessity. Step 1 of the EOE contained enhanced oversight requirements and reporting by PG&E. Found here: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M378/K247/378247394.PDF.
[138] The six investor-owned electrical corporations are: Pacific Gas and Electric, Southern California Edison, San Diego Gas & Electric, PacifiCorp, Liberty Utilities, and Bear Valley Electric Service.

investments identified in the 2019 and 2020 WMPs and operating and capital expenditures approved in previous GRCs.

One objective of this audit was to determine whether PG&E's actual expenditures to date, and documented future planned expenditures, comported with the activities approved in the 2019 and 2020 WMPs and for which PG&E received funding in its GRC or similar applications submitted to the CPUC between 2017 and 2020.[139] The audit did not contain negative findings related to this objective.[140]

5.5 Data Analysis

Relying upon data timely submitted by PG&E, Energy Safety undertook two main analyses: 1) a risk-prioritization analysis to determine whether PG&E undertook its 2020 conductor replacement and undergrounding (CRU) work and vegetation management work in the areas of highest risk, and 2) an analysis of PG&E's WMP initiative performance. Energy Safety undertook these analyses to ensure that PG&E completed work in areas of high wildfire risk and completed its 2020 initiatives as stated in its WMP.

5.5.1 Risk Prioritization Analysis

In its 2020 WMP, PG&E stated that it evaluated wildfire risk of its electrical lines,[141] and used that understanding of risk to prioritize its grid hardening work.[142] PG&E also stated that its distribution inspection process was moving to an approach driven by risk, with the highest risk assets requiring more frequent and in-depth inspections.[143]

Energy Safety conducted a risk prioritization analysis of PG&E's non-routine vegetation management and conductor replacement and undergrounding (CRU) projects to assess where those projects were completed relative to where PG&E understood the risks on its distribution system to be in 2020.[144]

PG&E's non-routine vegetation management work incorporated into the scope of this analysis included the following 2020 WMP initiatives:

- Additional Efforts to Manage Community and Environmental Impacts.

[139] PG&E's 2019 and 2020 Wildfire Mitigation Plans (WMPs) Engagement letter.
[140] Performance Audit of PG&E Wildfire Mitigation Plan Expenditures Final Report, date: September 15, 2021.
[141] PG&E Updated 2020 WMP, page 5-43.
[142] PG&E Updated 2020 WMP, page 5-51.
[143] PG&E Updated 2020 WMP, page 5-156.
[144] Non-routine vegetation management and CCU project data used is this analysis was received through PG&E's QDRs from 2020 Q2 through 2020 Q4, file names: "PGE_2020_Q2.gdb," "PGE_2020_Q3.gdb," and "PGE_2020_Q4.gdb," respectively.

- Assessing trees with the potential to strike.
- Hazard trees.
- Tree mortality.
- Clearances – enhanced.
- Brush clearance.
- Tree removal (hazard tree, tree mortality).
- Tree trimming.
- Radial clearance – enhanced.

PG&E's CRU projects incorporated into the scope of this analysis included the following 2020 WMP initiatives:

- Conductor Replacement Installation.
- Undergrounding of Electric Lines and/or Equipment.

Energy Safety relied upon data submitted by PG&E that assigned wildfire risk scores to individual circuit segments. Energy Safety refers to these individual circuit segments with assigned risk scores as "risk segments."[145] Energy Safety rank ordered each risk segment from highest to lowest ~~wildfire~~ risk and grouped the risk segments into five bins of approximately equal risk.[146] Each equal risk bin is representative of 20% of the ~~wildfire~~ risk on PG&E's distribution lines and ranked from highest to lowest risk. Energy Safety applied a buffer of 100-200 meters[147] to the risk segment location to account for potential locational imprecision of the PG&E submitted data. Energy Safety then used PG&E submitted data regarding the location of where non-routine vegetation management and CRU projects were completed to overlay that data on the buffered risk segments.

After binning the risk segments by quintiles of highest to lowest ~~wildfire~~ risk, buffering the risk segment boundaries to account for locational imprecision, and overlaying non-routine vegetation management and CRU projects, Energy Safety calculated the proportion of the work that was completed in each risk bin. The results of this analysis are presented in the subsections below.

For additional context, provided in the tables below are details on the proportions of PG&E's overhead distribution system comprised by each risk segment, as well as the amount of line miles, the respective risk scores, and risk per mile of the total risk segments in each risk bin.

[145] Risk segments may significantly vary in length.

[146] The risk segment data used in this analysis was provided by PG&E in response to Energy Safety data request number PGE-43895-E-384, file name: "PGE-43895-E-384.gdb".

[147] Energy Safety applied a 100-meter buffer for CRU projects and a 200-meter buffer for non-routine vegetation management work. A larger buffer was used for non-routine vegetation management work because vegetation management work can be reasonably expected to occur at greater distances from the infrastructure than conductor replacement or undergrounding work.

Table 8: Length of PG&E's Overhead Distribution System Relative to HFTD Areas and Risk Segments

Distribution OH (mi)[148]	HFTD (mi)[149]	Risk Segments (mi)[150]
80,606	25,224	107,429

Table 9: Total Length (in miles) of All Risk Segments in Each Risk Segment Quintile

Risk Bin	Total Length (mi)	Risk Score	Risk per Mile
81-100% of Risk	18,993	8,089	0.43
61-80% of Risk	17,124	8,082	0.47
41-60% of Risk	16,957	8,070	0.48
21-40% of Risk	19,609	8,086	0.41
0.01-20% of Risk	34,581	8,072	0.23
Risk Score of 0	166	0	0.00

The above tables show that of PG&E's over 80,000 miles of overhead distribution lines, approximately 31% (over 25,000 miles) are in HFTD areas. As Table 9 shows, both the 61-80% and 41-60% risk bins contain more risk per circuit mile than the 81-100% risk bin. This peculiar allocation of risk per circuit mile associated with each risk bin was unique to PG&E when compared to similar data received from other electrical corporations. Energy Safety expected that, like the circuit risk data received from other electrical corporations, the risk per circuit mile would be highest in the 81-100% risk bin and significantly decrease in each successive risk bin. However, this was not the case with PG&E's circuit risk data and the risk per circuit mile was calculated to be nearly identical in PG&E's top three risk bins, representing approximately 60% of its total risk on the distribution system. This led to the conclusion that, at least for risk segments that made up 60% of PG&E's distribution risk, the difference in risk scores between different segments was based on how long those segments happen to be.

The results of this analysis are presented in the subsections below.

5.5.1.1 CRU Project Results

PG&E reported completion of ~~299~~241 miles of CRU projects in 2020. Table 10 provides an overview of the proportion of CRU projects completed by PG&E that were within and outside the scope of this analysis (i.e., further than 100 meters from the nearest risk segment).

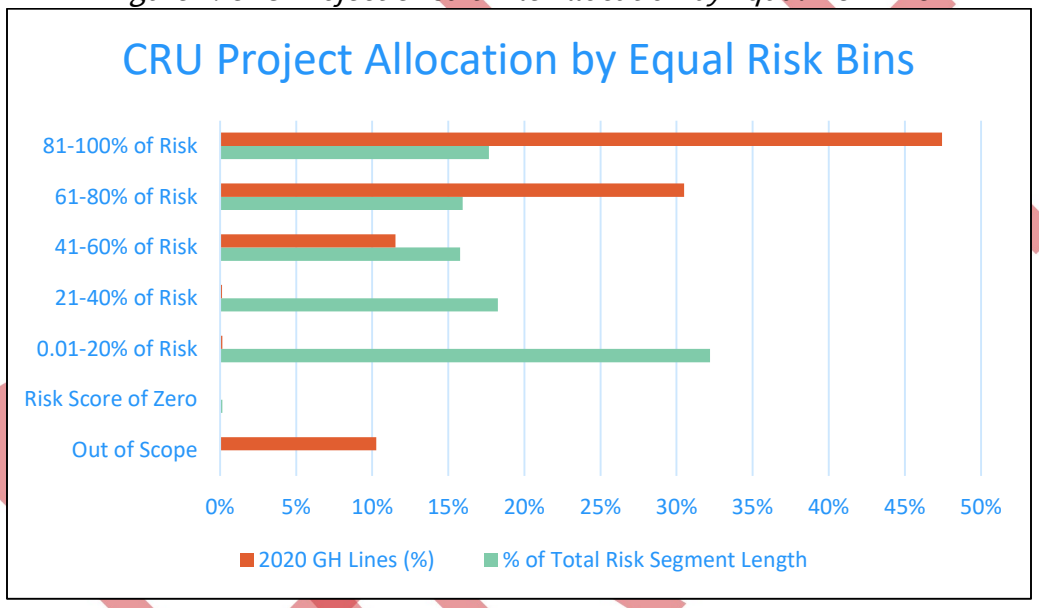
[148] PG&E Q1 2021 QDR, Table 8, sum of columns Y-AB for metrics 1k, 2k, and 3k.
[149] PG&E Q1 2021 QDR, Table 8, sum of columns Z-AB for metrics 1k, 2k, and 3k.
[150] The risk segment data used in this analysis was provided by PG&E in response to Energy Safety data request number PGE-43895-E-384, file name: "PGE-43895-E-384.gdb", Layer: "DISTRIBUTION".

Table 10: Overview of CRU Project Data

Row Labels	CRU Projects (Miles)	CRU Projects (%)
Within Scope	216	90%
Outside of Scope	25	10%
Overall Total	241	100%

Figure 1 below illustrates the results of Energy Safety's analysis of PG&E's completed CRU projects. CRU projects completed on risk segments with a risk score of zero and CRU projects completed more than 100 meters from a risk segment were sorted into separate bins, respectively.

Figure 1: CRU Project Circuit Mile Allocation by Equal Risk Bins



As shown in Figure 1, 10% of the CRU projects completed by PG&E in 2020 were out of the scope of this analysis. While PG&E completed nearly half of its CRU projects in its highest risk bin, as discussed above, the 61-80% and 41-60% risk bins contained more risk per circuit mile. Given the amount of CRU projects completed in 2020, more risk may have been reduced for the same number of miles completed had there been more work allocated in the 61-80% and 41-60% risk bins.

5.5.1.2 Vegetation Management Results

Energy Safety's analysis of vegetation management work only included work designated as a non-routine work type by PG&E.[151] Energy Safety scoped the analysis to filter for non-routine vegetation management work to focus the assessment on discretionary work completed to

[151] In instances where PG&E did not designate a work type, Energy Safety applied its subject matter expertise to determine whether the vegetation management work was routine or non-routine.

enhance wildfire safety, as opposed to routine work to achieve regulatory compliance. For non-routine vegetation management work, Energy Safety analyzed vegetation management inspections (VMI) and vegetation management projects (VMP) separately, as these are distinct phases of completing vegetation management work.

Table 11 lists the specific work type attributes that constitute VMI and VMP. Table 12 provides an overview of the proportion of VMI and VMP completed by PG&E that were within and outside the scope of this analysis (i.e., further than 200 meters from the nearest risk segment).

Table 11: VMI and VMP Non-Routine and Routine Work Type Attributes

Program	VMI Attributes	VMP Attributes
Non-Routine	Assessing trees with the potential to strike, hazard trees, tree mortality, Clearances – enhanced	Brush clearance, tree removal (hazard tree, tree mortality), tree trimming, Radial clearance – enhanced, other
Routine	Clearances – routine, PRC 4292 pole clearing, Tree Growth Regulator	Radial clearance – standard

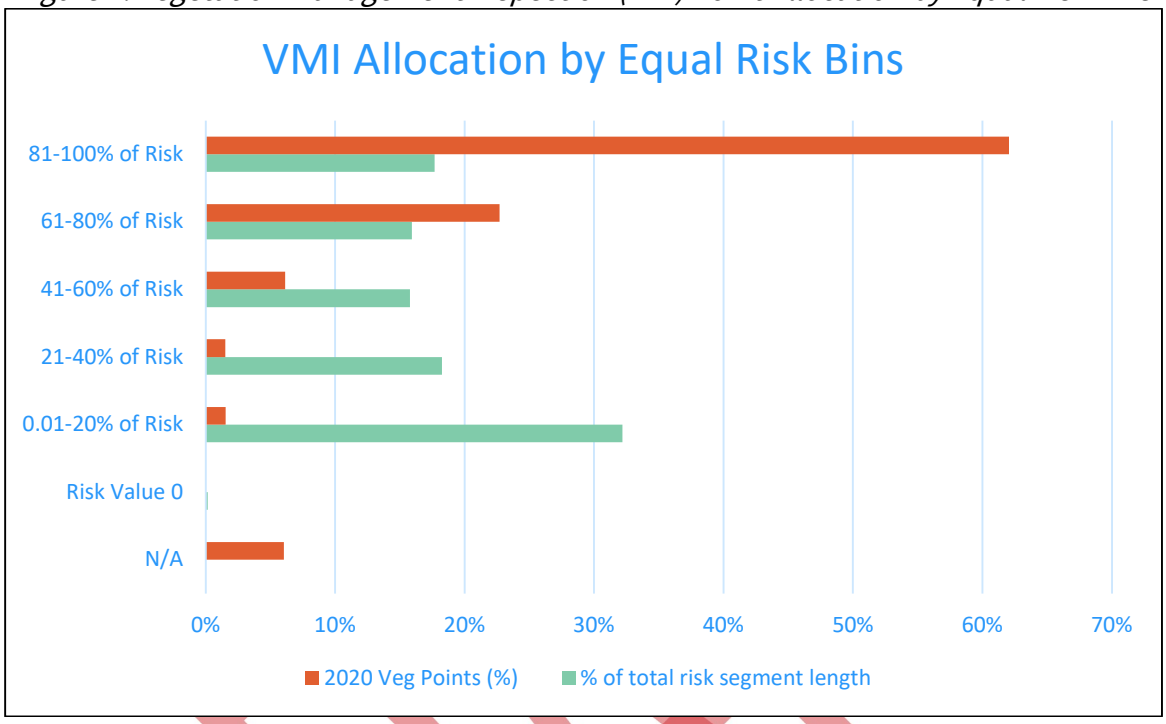
Table 12: Overview of Non-Routine Vegetation Points

Scope	VMI Points	VMI Points (%)	VMP Points	VMP Points (%)
Within Scope	99,607	94%	146,108	96%
Outside of Scope	6,404	6%	6,414	4%
Overall Total	106,011	100%	152,522	100%

5.5.1.2.1 Vegetation Management Inspections

Figure 2 below presents the results of Energy Safety's analysis of PG&E's completed non-routine VMI. Non-routine VMI work completed on risk segments with a score of zero and non-routine VMI work more than 200 meters from a risk segment were sorted into separate bins, respectively.

Figure 2: Vegetation Management Inspection (VMI) Point Allocation by Equal Risk Bins



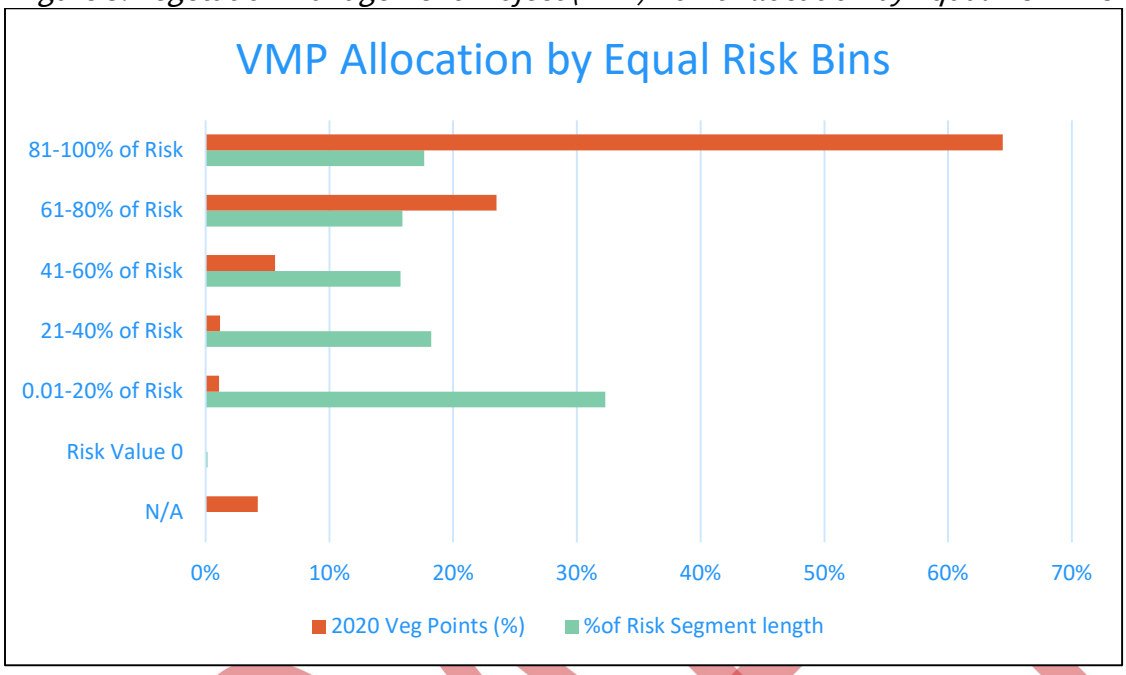
PG&E completed approximately 90% of its non-routine VMI near risk segments that make up 60% of its distribution risk.[152] While PG&E completed over 60% of its VMI work in its highest risk bin, as discussed above, the 61-80% and 41-60% risk bins contained more risk per circuit mile. Given the amount of VMI completed in 2020, more risk may have been reduced for the same volume of VMI work completed had there been more work allocated in the 61-80% and 41-60% risk bins.

5.5.1.2.2 Vegetation Management Projects

Figure 3 below presents the results of Energy Safety's analysis of PG&E's completed non-routine VMP. Non-routine VMP work completed on risk segments with a score of zero and non-routine VMP work more than 200 meters from a risk segment were sorted into separate bins, respectively.

[152] Differences between the results of this analysis and the results of the EVM Audit discussed in Section 5.4.2 can be attributed to the inclusion of vegetation management work beyond just PG&E's EVM program.

Figure 3: Vegetation Management Project (VMP) Point Allocation by Equal Risk Bins



PG&E completed 88% of its non-routine VMP near risk segments making up the top 40% of riskiest segments.[153] While PG&E completed over 60% of its VMP work in its highest risk bin, as discussed above, the 61-80% and 41-60% risk bins contained more risk per circuit mile. Given the amount of VMP work completed in 2020, more risk may have been reduced for the same volume of work completed had there been more work allocated in the 61-80% and 41-60% risk bins.

5.5.2 Initiative Performance Analysis

Energy Safety analyzed whether PG&E achieved its WMP initiative targets. To conduct this analysis, Energy Safety relied upon PG&E's Q4 2020 Quarterly Initiative Update (QIU) submission from March 31, 2021, PG&E's EC ARC, and PG&E's Q4 2020 QAL.

Energy Safety requires electrical corporations to submit a QIU to track progress on implementation of their WMP initiatives. The purpose of the QIU is for both the electrical corporation and Energy Safety to have a holistic understanding of the electrical corporation's annual targets and projected quarterly progress towards completion of each initiative through the course of the WMP compliance period. In addition to projected progress, electrical corporations report actual progress for each initiative quarterly; this information enables Energy Safety to track the electrical corporation's compliance with its initiative targets throughout the year.

[153] Differences between the results of this analysis and the results of the EVM Audit discussed in Section 5.4.2 can be attributed to the inclusion of vegetation management work beyond just PG&E's EVM program.

Energy Safety reviewed the Q4 2020 QIU report submitted by PG&E on March 31, 2021, to verify the completion of PG&E's 2020 WMP initiatives and its adherence to the Compliance Operational Protocols. Energy Safety's analysis was complicated by PG&E providing inconsistent and inaccurate reporting on WMP initiative progress. For example, PG&E inconsistently reported its actual progress for 2020 WMP initiatives across submissions in the QIU, Q4 2020 Quarterly Advice Letter (QAL)[154] and PG&E EC ARC, as shown in Tables 14 and 15 below. Energy Safety compared PG&E's fourth quarter 2020 QIU and QAL submission, which revealed further inconsistencies between PG&E's reports. For example, in Table 16, initiative D.4 - Substation HFTD Inspections (substations) was reported as 100% completed in the QAL while that same initiative was reported as delayed in the QIU. Although discrepancies are shown below, Energy Safety ultimately relied upon PG&E's initiative targets reported in the approved 2020 WMP and progress reported in the QIU to determine compliance with the WMP.

5.5.2.1 Results

PG&E's 2020 Q4 QIU reported progress on 134[155] initiatives in 2020 as shown in Table 13.

Table 13: PG&E 2020 WMP Initiatives

PG&E 2020 WMP Initiatives (QIU data)	Number
Initiatives with only Quantitative Targets	10
Initiatives with only Qualitative Targets	117
Initiatives with both Quantitative and Qualitative Targets	7
Total Initiatives	134

5.5.2.1.1 Results for Initiatives with only Quantitative Targets

In its 2020 Q4 QIU, PG&E reported that it had either met or exceeded targets for all 10 of its initiatives with only quantitative targets. However, Energy Safety found that PG&E did not meet a qualitative commitment for initiative 5.3.5.15 E.1 - EVM line miles (See section 5.4.1 SVM audit for details).

[154] PG&E submitted Q4 2020 QAL via Advice Letter 6068-E on January 29, 2021.

[155] See Section 4.1 for an explanation of the source of some reporting discrepancies in initiative numbers and targets.

As shown in Table 14, Energy Safety compared reported progress in the 2020 Q4 QIU, 2020 Q4 QAL,[156] and 2020 EC ARC and found several discrepancies. One discrepancy was that PG&E misreported the progress amount for initiative 5.3.2.1 B.10 - Weather Stations and failed to meet this initiative target by 22 units.[157] Another discrepancy was the conflicting totals for miles completed per initiative 5.3.3.17 C.10 System Hardening. Additionally, PG&E failed to report WMP targets and actual progress on three of its quantitative initiatives: 5.3.3.17 C.6 Non-Exempt Surge Arrester Replacement Program, 5.3.3.7 C.12 Expulsion Fuse Replacement (non-exempt equipment), and 5.3.3.8 C.4 Transmission Line Evaluation for PSPS Scoping in its 2020 Q4 QAL.

Table 14: Initiatives with only Quantitative Targets

Initiative No.	Initiative Name	WMP Target	Reported Actual Progress		
			QIU	QAL	EC ARC
5.3.2.1	B.10 - Weather Stations	400	404	404	404
5.3.2.1	B.9 - HD Cameras Deployment	200	216	216	216
5.3.3.17	C.10 System Hardening (line miles)	221	342	369	342
5.3.3.17	C.11 Butte County Rebuild (UG de-energized miles)	20	21.3	21.3	21.3
5.3.3.17	C.6 Non-Exempt Surge Arrester Replacement Program	8,850	10,263	-	10,263
5.3.3.7	C.12 - Expulsion Fuse Replacement (non-exempt equipment)	625	643	-	643
5.3.3.8	C.1 - SCADA Transmission Switching (switches)	23	54	54	54
5.3.3.8	C.2 - Distribution Sectionalizing (automated devices)	592	603	603	603
5.3.3.8	C.4 -Transmission Line Evaluation for PSPS Scoping	552	552	-	552
5.3.5.15[158]	E.1 - EVM line miles	1,800	1,878	1,878	1,878

5.5.2.1.2 Results for Initiatives with both Quantitative and Qualitative Targets

In its 2020 Q4 QIU, PG&E reported that it either met or exceeded the quantitative targets for the seven initiatives that have both quantitative and qualitative targets. PG&E also reported that it completed six of the seven qualitative targets for those same initiatives. The target of

[156] PG&E submitted Q4 2020 Advice 6068-E on January 29, 2021.

[157] In its Q4 2020 QIU data, Q4 2020 QAL and EC ARC, PG&E reported that it completed 404 units. However, PG&E installed 378 weather stations in 2020, 22 under target. See Section 5.1 Utility-Assessed Compliance Reporting for details.

[158] Energy Safety's SVM audit found with Initiative 5.3.5.15: "PG&E did not start the process with other California utilities to develop a targeted species program in 2020." (See section 5.4.1 SVM audit for details)

the missed initiative [5.3.4.1 D.2 Distribution HFTD Inspections (poles)] needed to be verified that work was performed "consistent with 2020 WMP commitments."[159]

As shown in Table 15, Energy Safety compared reported progress across three reports, the 2020 Q4 QIU, 2020 Q4 QAL,[160] and 2020 EC ARC and found several discrepancies. One discrepancy was that PG&E misreported the progress amount for initiative 5.3.4.1 D.2 Distribution HFTD Inspections (poles) by 3,296 units.[161] Another discrepancy was the conflicting progress totals for initiative 5.3.3.8 I.6 - Microgrids for PSPS Mitigation. Additionally, PG&E failed to report WMP targets and actual progress on four of its initiatives with both quantitative and qualitative targets in its 2020 Q4 QAL.

Table 15: Initiatives with both Quantitative and Qualitative Targets

Utility Initiative Name	WMP Target		Reported Actual Progress			QIU Status
	Qualitative	Quantitative	QIU	QAL	EC ARC	
Distribution Arcing Fault Signature Library (5.3.2.2)	Install 1 distribution feeder that will cover approximately 201 Line-Miles.	1	1	-	-	Completed
Line Sensor Devices (5.3.2.2)	Deploy line sensors to approximately 20 feeders covering up to 3,000 line miles.	20	46	-	-	Completed
C.7 - System Protection deploy DCD (reclosers) (5.3.3)	Enable downed conductor detection (DCD) in another 100 reclosers within the Tier 2 and 3 fire areas. Evaluate a high impedance fault detection algorithm for feeder relays at ATS in the Q1 of 2020.	100	126	-	126	Completed

[159] PG&E 2020 Q4 QIU, line 71 stated "PG&E is currently investigating pole inspections which occurred during calendar year 2020 to determine whether these inspections were performed consistent with the 2020 WMP commitments and initiatives."

[160] PGE submitted Q4 2020 Advice 6068-E on January 29, 2021.

[161] PG&E missed the quantitative target for 3,296 poles. See Section 5.1 Utility-Assessed Compliance Reporting for details.

Utility Initiative Name	WMP Target		Reported Actual Progress			QIU Status
	Qualitative	Quantitative	QIU	QAL	EC ARC	
I.6 - Microgrids for PSPS Mitigation (operationalized units) (5.3.3.8)	Continue operationalizing microgrid installations	≥1	3	6	6	Completed
Replacement of Legacy 4C Controllers (reclosers) (5.3.3.9)	Installation of transmission SCADA switches and additional sectionalization devices; replacement of legacy 4C controllers. Evaluate new proposed protection schemes	20	20	-	-	Completed
D.2 - Distribution HFTD Inspections (poles) (5.3.4.1)	Perform detailed overhead inspections on 100% of HFTD Tier 3, and 33% of HFTD Tier 2 Distribution assets[162]	339,728	339,728	339,728	339,728	Preliminary completed
D.3 - Transmission HFTD Inspections (structures) (5.3.4.2)	Perform detailed overhead inspections on 100% of HFTD Tier 3, and 33% of HFTD Tier 2 Transmission assets	~26,282	26,282	26,282	26,282	Completed

5.5.2.1.3 Results for Initiatives with only Qualitative Targets

Energy Safety noted that many of the targets listed in the QIU as qualitative targets appeared to be quantitative targets. Energy Safety did not attempt to rectify this discrepancy in the

[162] In its Q4 2020 QIU, Q4 2020 QAL, and EC ARC, PG&E reported that it completed the quantitative target of 339,728 but missed the Qualitative Target for this initiative. However, PG&E also missed quantitative target by 3,296 poles. See Section 5.1 PG&E Self-Assessed Compliance Reporting for details.

tables reported within this section. Nine of the listed qualitative initiatives were reported as not completed by the end of 2020, as shown below in Table~~.~~ 16.

Energy Safety's comparison of PG&E 2020 Q4 QIU, 2020 Q4 QAL, and 2020 EC ARC in Table 16 revealed inconsistencies in PG&E's reports for 2 initiatives. Initiative B.7 – Smart Meters - Partial Voltage Detection (5.3.2.2) was reported as off track and a missed commitment on QAL but was reported as on track in the QIU and EC ARC; Initiative D.4 - Substation HFTD Inspections (substations) (5.3.4.15) was reported complete in the QAL but delayed and a missed target in the QIU and EC ARC. Additionally, Energy Safety ascertained that PG&E failed to provide actual progress on four of its quantitative and qualitative initiatives in its 2020 Q4 QAL. Furthermore, Energy Safety's SVM audit found that PG&E was noncompliant with initiative 5.3.5.7 "LiDAR inspections of vegetation around distribution electric lines and equipment" even though PG&E reported meeting the qualitative target for this initiative on its Q4 2020 QIU (See section 5.4.1 SMV audit for details).

Table 16: Initiatives with only Qualitative Targets not Completed

Initiative No.	Utility Initiative Name	WMP Annual Qualitative Target	PG&E-Reported Status		
			QIU	QAL	EC ARC
5.3.2.2	B.7 – Smart Meters - Partial Voltage Detection	Deploy 365,000 Three-Phase Smart Meters™ covering up to 25,597 line-miles of Tier 2 and Tier 3 HFTD areas with 4-wire distribution.[163]	In Progress	Off track/ Commitment Missed	Commitment is on target
5.3.2.2	B.8 - Sensor IQ Pilot Deployment	Deploy Sensor IQ pilot to 500K Smart Meters covering ~25,597 distribution line miles in HFTD areas and customize reads and alarms to identify service transformer failures.[164]	In Progress	On track/ On plan	Commitment is on target

[163] PG&E submitted a Change Order Report on December 11, 2020, to postpone the deployment of the SmartMeter™ Partial Voltage Detection initiative from February 2021 to June 2021. Energy Safety approved this Change Order Report on January 28, 2021.

[164] PG&E submitted a Change Order Report on September 11, 2020, to postpone its completion of the Sensor IQ Pilot Program from February 2021 to October 2021. Energy Safety approved this Change Order Report on January 5, 2021.

Initiative No.	Utility Initiative Name	WMP Annual Qualitative Target	PG&E-Reported Status		
			QIU	QAL	EC ARC
5.3.3.1	Capacitor maintenance and replacement program	1) Test and inspect capacitor banks with any repairs completed by June 1. 2) Planning and Operations Distribution Engineering evaluates the Capacitor bank needs on that circuit for normal and emergency situations before a call is made to overhaul that capacitor bank in the same location or perhaps remove it if it is not necessary.	Completed / In Progress	-	-
5.3.3.13	Pole Loading Assessments	Perform pole loading assessments at a rate of approximately 230,000 poles per year in HFTD Tier 2 and Tier 3 locations through 2024	In Progress	-	-
5.3.3.8	C.3 - Remote Grids	Deploy 4-8 initial sites to validate use cases, design standards, deployment processes and commercial arrangements and deliver recommendations for scale-up	In Progress/ Substantially Completed	Substantially Completed	Substantially ~~Complete~~Completed
5.3.4.11	Patrol inspections of distribution electric lines and equipment	1) Continue to implement the patrol inspection program. 2) PG&E intends to pilot paperless digital (mobile) patrol inspections protocols and records.	Completed/ In Progress	-	-

Initiative No.	Utility Initiative Name	WMP Annual Qualitative Target	PG&E-Reported Status		
			QIU	QAL	EC ARC
5.3.4.12	Patrol inspections of transmission electric lines and equipment	1) Continue to implement the patrol and inspection program. 2) PG&E intends to pilot paperless digital (mobile) patrol inspections protocols and records.	Completed/ In Progress	-	-
5.3.4.15	D.4 - Substation HFTD Inspections (substations)	Perform in PG&E-owned substations based on the following risk factors: HFTD, Transmission Substation criticality, and Distribution Substation customer count. In 2020, supplemental inspections once annually for all HFTD Tier 3 stations, on a three-year cycle for stations in HFTD Tier 2.[165]	Delayed	Completed	Commitment Missed
5.3.9.5	I.2 - PSPS - Service Restoration	Conduct safety patrols and restoring service to 98 percent of PSPS-affected customers within 12 daylight hours of the weather "all-clear" declaration.	Substantially ~~complete~~completed	Substantially Completed	Substantially ~~Complete~~Completed

[165] PG&E's 2020 WMP had a quantitative target of 105 electric and distribution substations. PG&E's Q4 QAL had an adjusted quantitative target of electric and distribution substations, PG&E's QIU listed this initiative as qualitative only, referring to the hydroelectric substations to be completed at the same frequency as distribution and transmission.

Overall, PG&E did not complete ~~13~~11 out of 134 (~~9.7~~8.2%) total initiatives according to its 2020 WMP.[166] Additionally, Energy Safety identified reporting discrepancies in ~~18~~16 out of 36 initiatives (~~50~~44%), as provided in the Table 14 - Table 16 above. Discrepancies found included misreporting of actual progress, conflicting actual progress between reports, or failing to provide actual progress per Energy Safety's Compliance Operational Protocols.[167]

5.6 Wildfire and Risk Reduction Outcomes

PG&E has seen a steady increase in extreme fire weather events since 2015 with a significant spike in 2017. Energy Safety uses a metric, the red flag warnings circuit mile days (RFWCMD) for overhead assets, to depict wildfire risk normalized for the size of an electrical corporation's service territory. Use of this metric allowed for comparisons across reporting years and enabled assessment of performance in 2020 relative to previous trends from 2015-2019. As noted in Figure 4 below, the RFWCMD experienced in 2020 represented the largest value (i.e., worst fire weather and greatest exposure) over the six-year 2015-2020 reporting period.

Energy Safety requires electrical corporations to report data, such as ignitions in the HFTD, that will enable Energy Safety to, over time, assess whether an electrical corporation's wildfire mitigation planning activities successfully achieve the primary objective of a WMP – reducing catastrophic wildfire risk and reliance on PSPS. As noted earlier in this document, it is not enough to solely evaluate whether an electrical corporation met its targets for implementing specific initiatives if ultimately the electrical corporation did not reduce the risk of catastrophic wildfires.

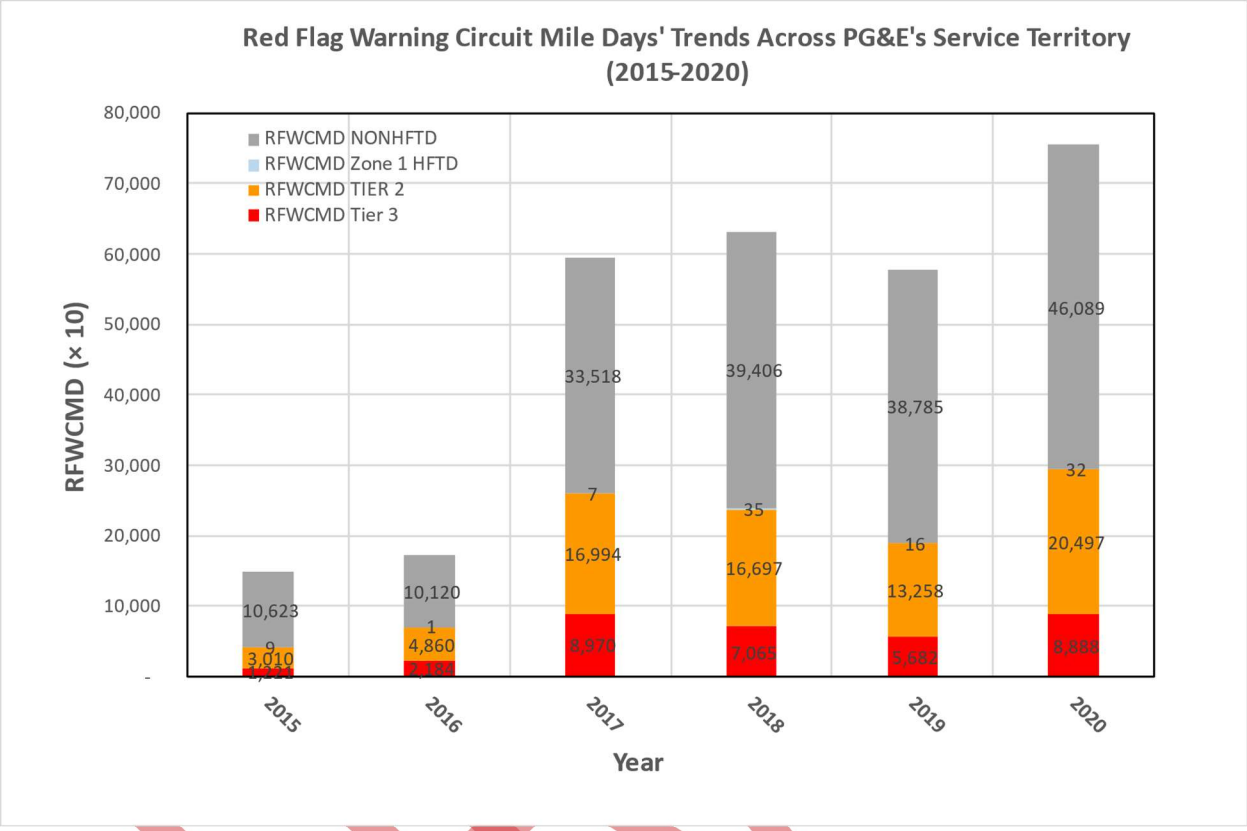
In 2020, Energy Safety evaluated a variety of metrics (calculations based on data provided) to set a baseline that can be measured against in future years, including several metrics adopted in the 2020 WMP Guidelines.[168] In addition to these metrics, Energy Safety also utilized the knowledge and expertise gained since the adoption of the 2020 WMP Guidelines to present additional metrics correlated to PG&E's wildfire risk. Where data was available and applicable, Energy Safety evaluated different permutations of ignition risk metrics to also account for geographical risk factors, as indicated by HFTD tiers, and causal information.

Energy Safety relied upon data reported in an electrical corporation's 2020 WMP as well as Quarterly Data Report (QDR) submissions from May 3, 2021. Energy Safety also performed analysis that compared the electrical corporation's performance during the 2020 WMP

[166] 2 of the 13 incomplete initiatives had Energy Safety approved changes for extending timeframe for implementation post 2020.
[167] https://efiling.energysafety.ca.gov/Search.aspx?docket=2021-OPS_GUIDELINES
[168] See Attachment 4 of CPUC Resolution WSD-001, titled "WMP Metrics."

compliance period to trends from previous years.[169] Metrics analyzed are discussed in the following sections.

Figure 4: Variances in Extreme Fire Weather Across PG&E Territory from 2015-2020 by location.



5.6.1 Ignition Risk

Energy Safety evaluated ignition risk as a function of various metrics reported in PG&E's QDR submission. PG&E reported these risk metrics in Table 7.1 and Table 7.2 of its QDR submission (QDR Table 7.1 and QDR Table 7.2, respectively). Ignition risk metrics considered include:

1. **Ignitions** – incidents in which electrical corporation infrastructure was involved.
2. **Wire down events** – incidents in which overhead electrical lines fall to the ground or land on objects.
3. **Vegetation-caused outages** – outages experienced in which the cause was determined to be vegetation contact with electrical lines.
4. **Unplanned outages** – all unplanned outages experienced.

[169] Energy Safety looked at previous year performances dating back to 2015, where available and reported in PG&E's data submissions, or any year thereafter for which data was available and reported.

5.6.1.1 Ignition Data

QDR Table 7.2 includes data on PG&E's ignitions from 2015 through 2020, plotted below. Figure 5 shows the ignitions across PG&E's service territory normalized by the total RFWCMD for each year and broken out by location (i.e., Tier 3 HFTD areas, Tier 2 HFTD areas, Zone 1 HFTD areas, and non-HFTD areas). Figure 6 shows the ignitions in Tier 3 HFTD areas of PG&E's service territory normalized by the RFWCMD in Tier 3 only for each year. Figure 7 shows the ignitions in Tier 2 HFTD areas of PG&E's service territory normalized by the RFWCMD in Tier 2 only for each year.

Figure 5: PG&E Ignitions from 2015-2020 Normalized by Total RFWCMD.

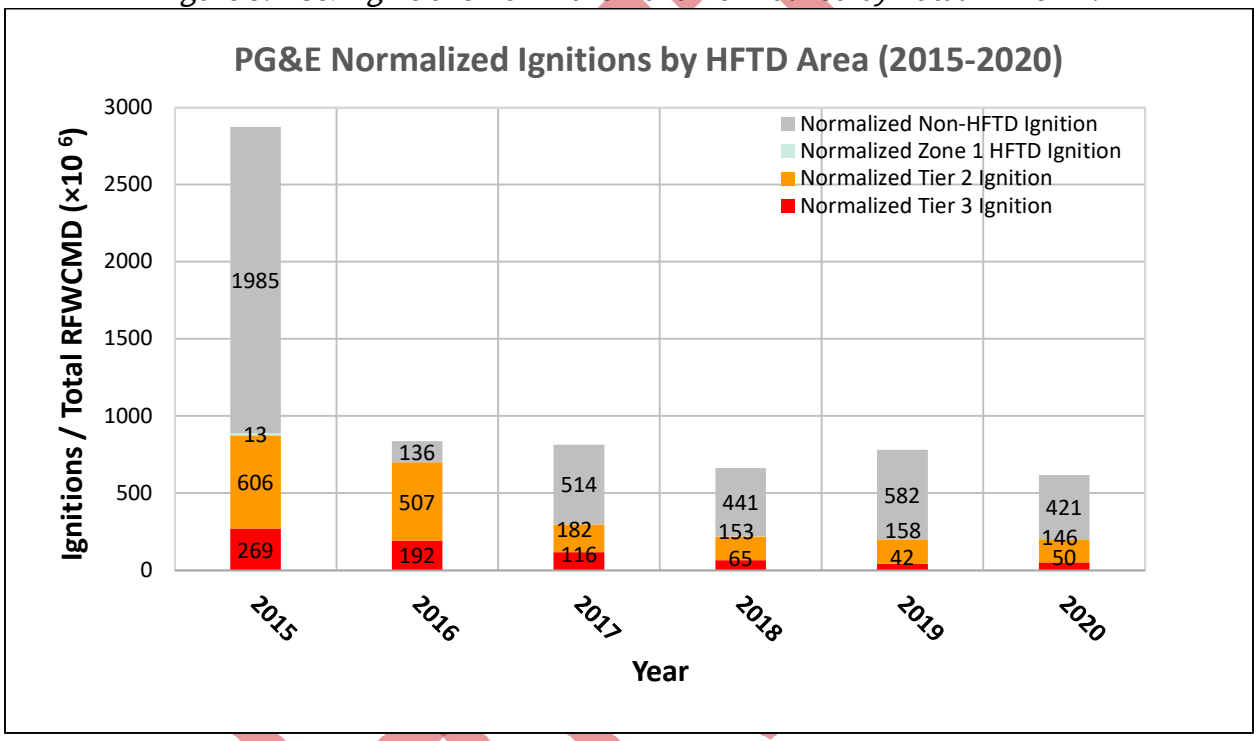


Figure 6: PG&E Ignitions in Tier 3 HFTD Areas from 2015-2020 Normalized by RFWCMD in Tier 3 Only.

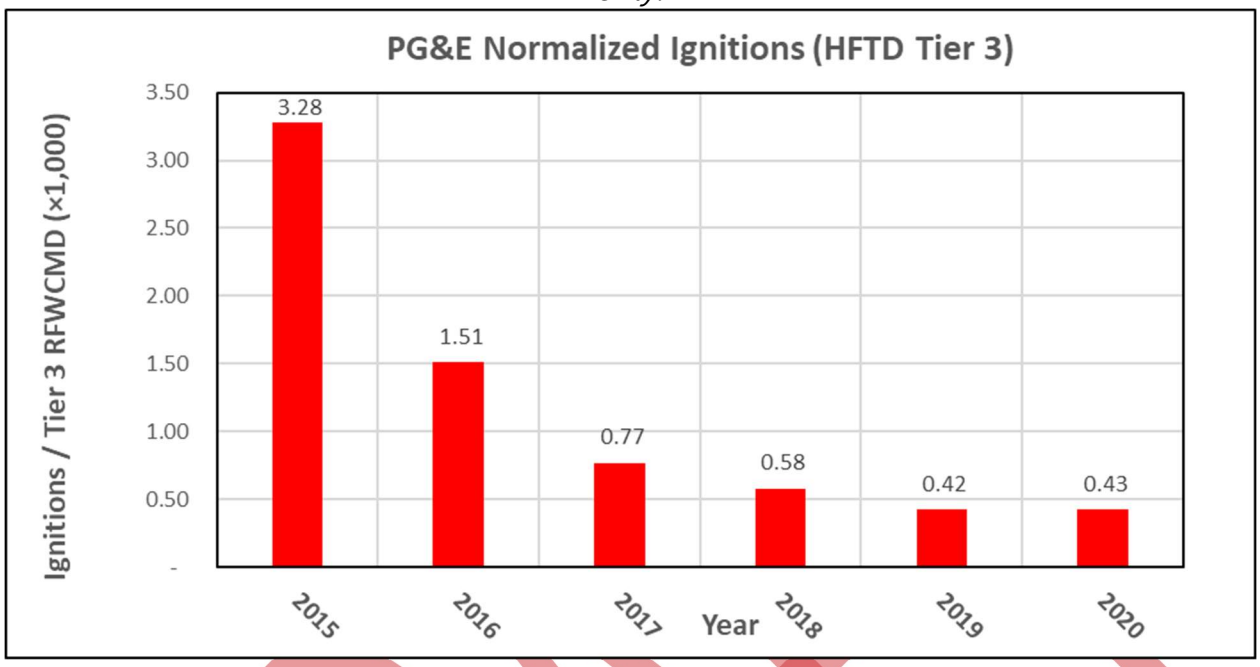
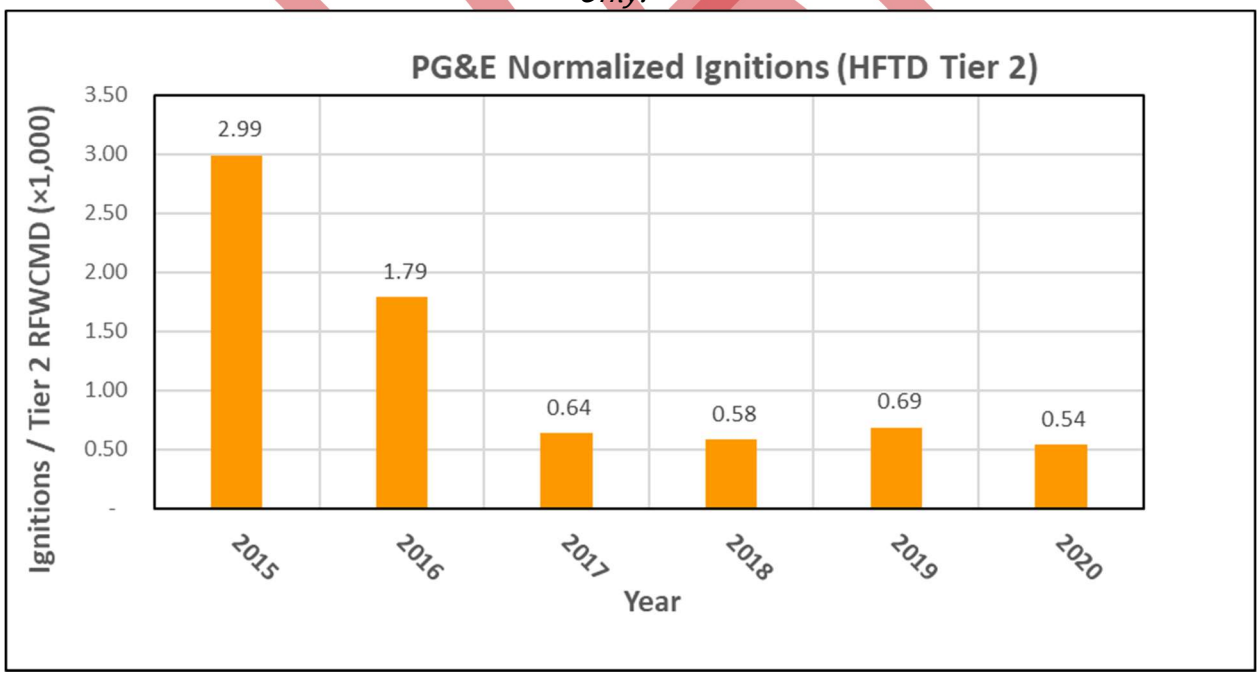


Figure 7: PG&E Ignitions in Tier 2 HFTD Areas from 2015-2020 Normalized by RFWCMD in Tier 2 Only. [170]

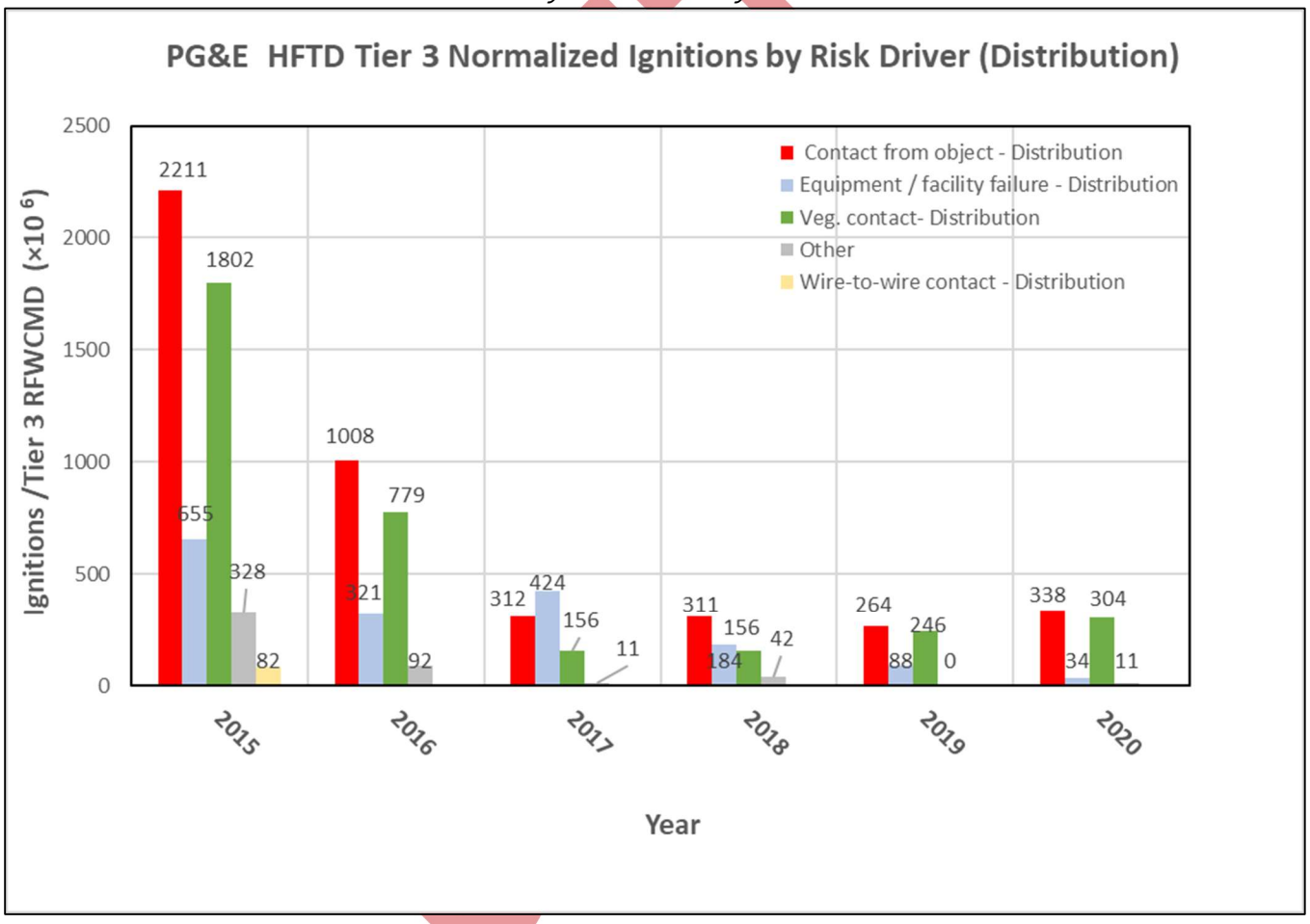


[170] QDR Table 7.2, titled, "Key recent and projected drivers of ignitions by HFTD region."

As can be seen in the three figures above, PG&E's normalized ignitions decreased during the 2015-2020 period. There is a general downward trend in ignitions across PG&E's service territory, as well as in Tier 2 and Tier 3 HFTD areas specifically.

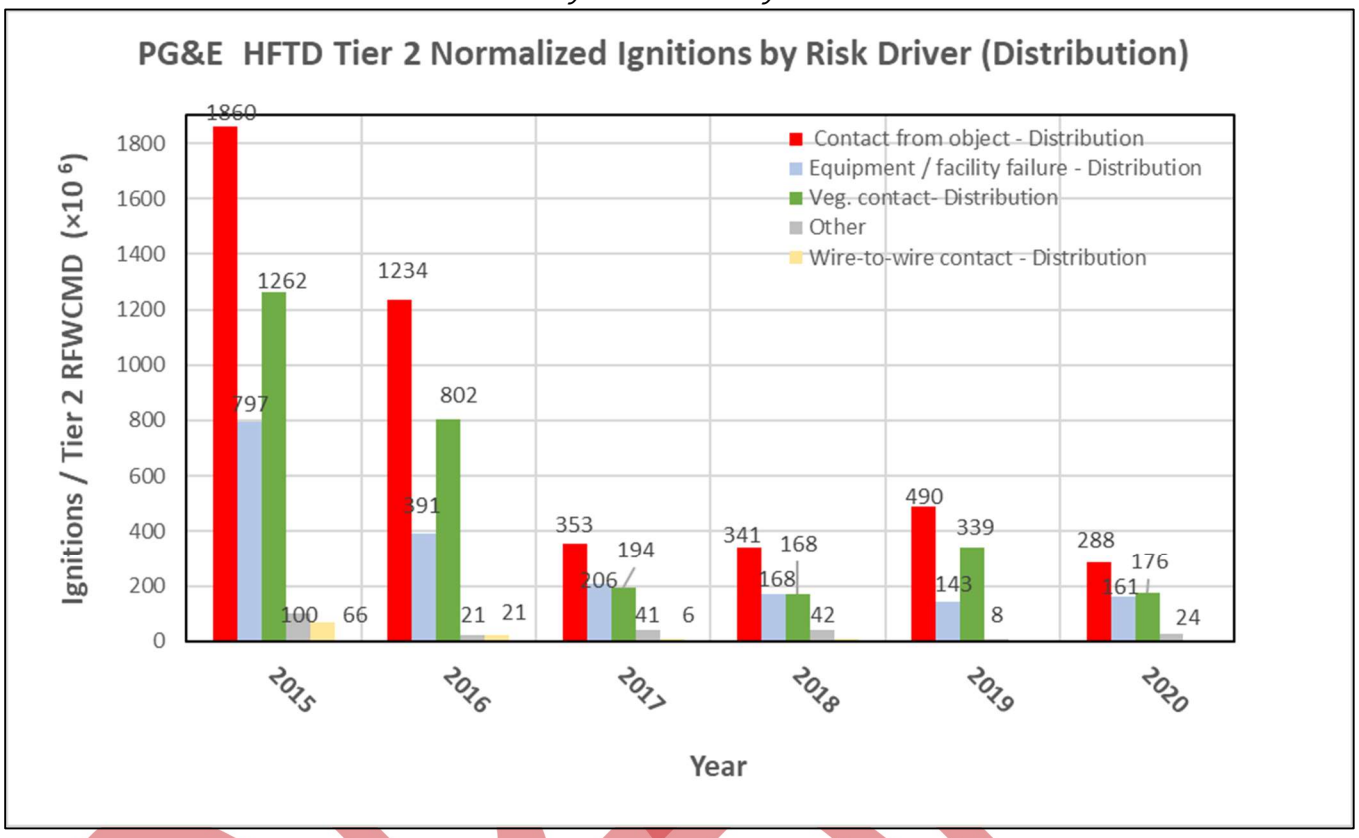
The following four figures show drivers of PG&E ignitions during the 2015-2020 period broken out by asset classification i.e., distribution (first two figures) and transmission (second two figures) and HFTD location (i.e., Tier 3 and Tier 2).

Figure 8: PG&E Distribution Ignitions in Tier 3 HFTD Areas from 2015-2020 Normalized by RFWCMD in Tier 3 Only Broken out by Risk Driver. [171]



[171] QDR Table 7.2, titled, "Key recent and projected drivers of ignitions by HFTD region."

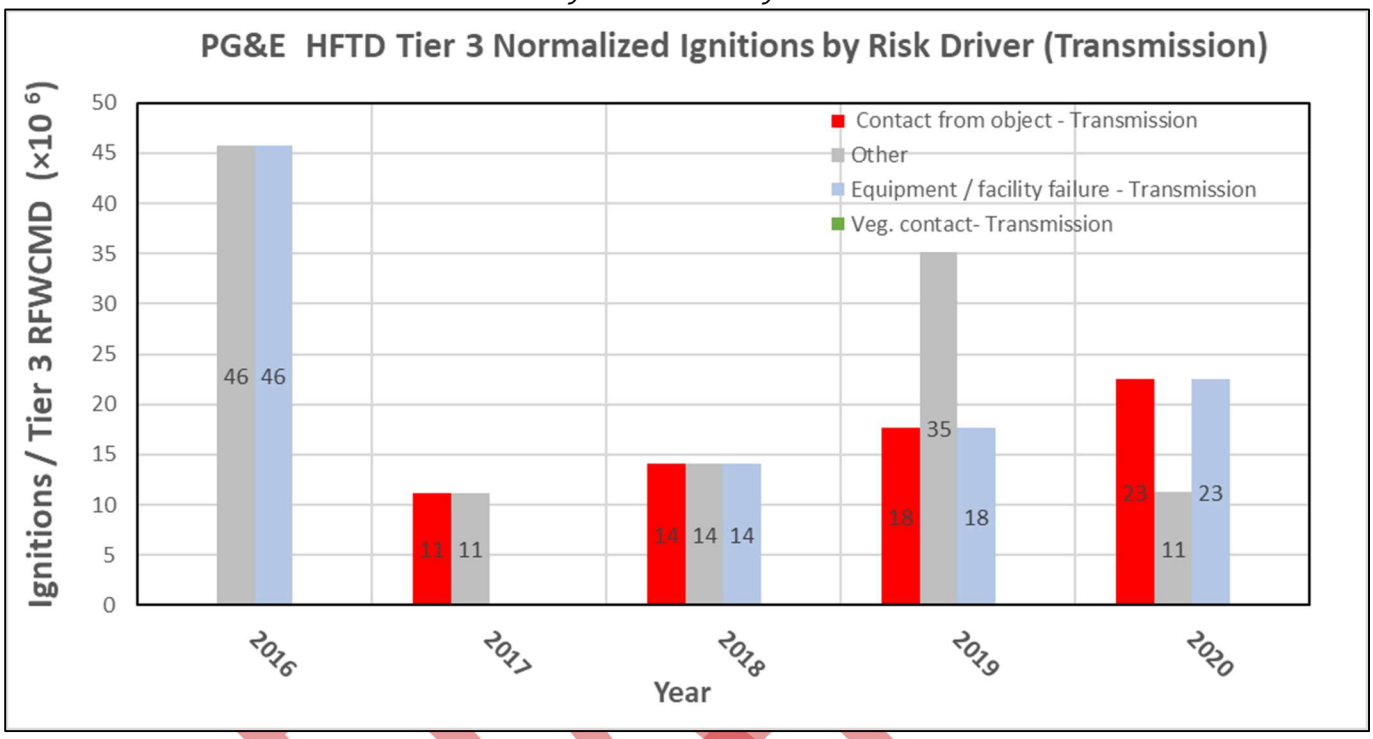
Figure 9: PG&E Distribution Ignitions in Tier 2 HFTD Areas from 2015-2020 Normalized by RFWCMD in Tier 2 Only Broken out by Risk Driver. [172]



As can be seen from the figures above for the distribution system, the primary drivers of ignition are object contact and vegetation contact followed by equipment or facility failure.

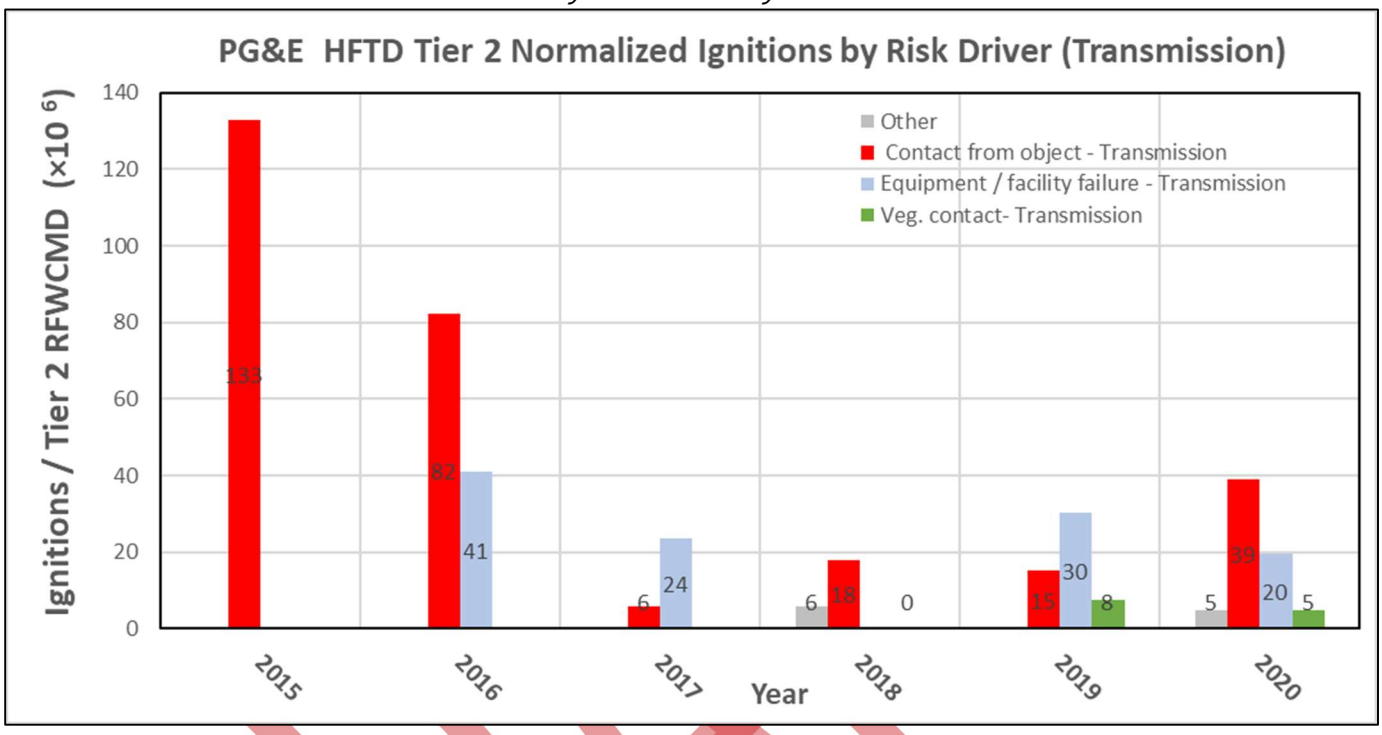
[172] QDR Table 7.2, titled, "Key recent and projected drivers of ignitions by HFTD region."

Figure 10: PG&E Transmission Ignitions in Tier 3 HFTD Areas from 2015-2020 Normalized by RFWCMD in Tier 3 Only Broken out by Risk Driver. [173]



[173] QDR Table 7.2, titled, "Key recent and projected drivers of ignitions by HFTD region."

Figure 11: PG&E Transmission Ignitions in Tier 2 HFTD Areas from 2015-2020 Normalized by RFWCMD in Tier 2 Only Broken out by Risk Driver. [174]



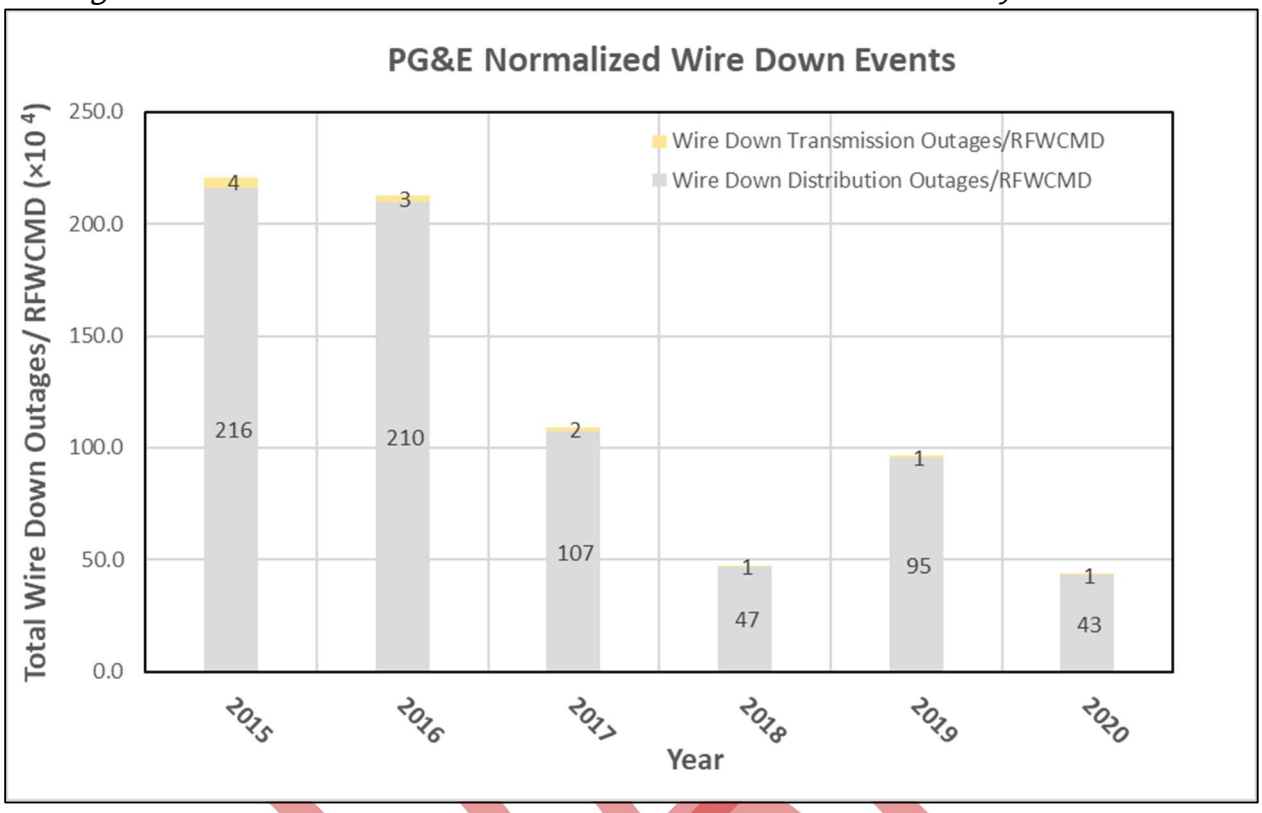
On the transmission system, the primary ignition drivers are object contact and equipment or facility failure, although HFTD Tier 3 ignitions are notably driven by drivers in the "other" category.[175]

5.6.1.2 Wire Down Event Data

QDR Table 7.1, metrics 1 through 16 include data on PG&E's distribution and transmission wire down events from 2015 through 2020, which were normalized for RFWCMD and plotted below in Figure 12. Wire down events can be a precursor to ignitions; therefore, Energy Safety will look for a downward trend over time.

[174] QDR Table 7.2, titled, "Key recent and projected drivers of ignitions by HFTD region."
[175] 'Other' Ignition Risk Driver includes: Contamination, Utility work, Vandalism and Theft, and Unknown causes.

Figure 12: PG&E Total Wire Down Events from 2015-2020 Normalized by RFWCMD. [176]



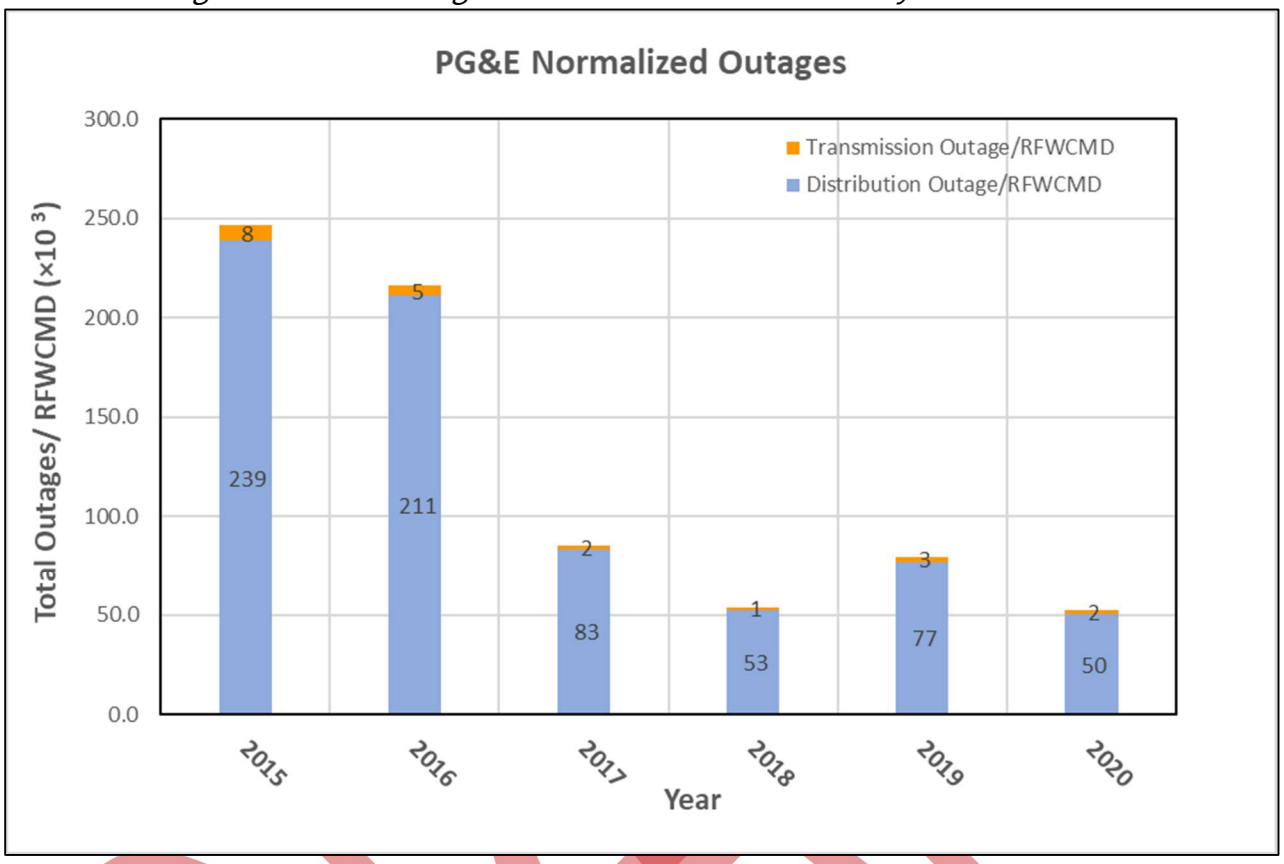
Although there was an uptick in 2019, normalized wire down events trended lower over the 2015-2020 timeframe.

5.6.1.3 Outage Data

QDR Table 7.1, metrics 17 through 32 include data on distribution and transmission outages of all cause types from 2015 through 2020. Unplanned or unscheduled outages correlate to a potential for ignitions on the system, although they are not as strong a predictor as wire down events. Figure 13 below plots PG&E's transmission and distribution outages normalized for RFWCMD.

[176] QDR Table 7.1, titled, "Key recent and projected drivers of risk events."

Figure 13: PG&E Outages from 2015-2020 Normalized by RFWCMD. [177]



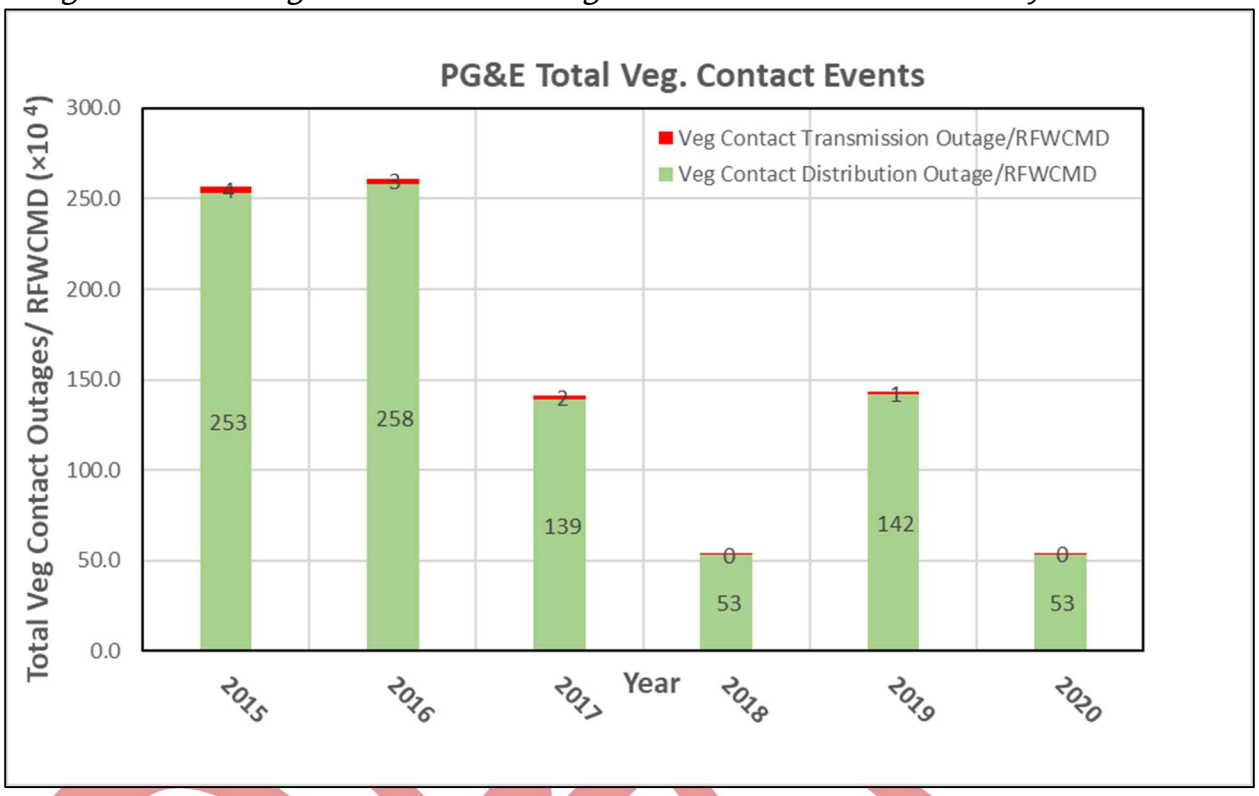
Although there was an uptick in 2019, normalized total unplanned outages trended lower over the 2015-2020 timeframe.

5.6.1.3.1 Vegetation-Caused Outage Data

QDR Table 7.1, metrics 17a and 25a include data on transmission and distribution outages that are caused by vegetation contact from 2015 through 2020. Figure 14 below plots PG&E's transmission and distribution vegetation contact-caused outages normalized for RFWCMD.

[177] QDR Table 7.1, titled, "Key recent and projected drivers of risk events."

Figure 14: PG&E Vegetation Contact Outages from 2015-2020 Normalized by RFWCMD. [178]



Although there was an uptick in 2019, normalized outages due to vegetation contact trended lower over the 2015-2020 timeframe.

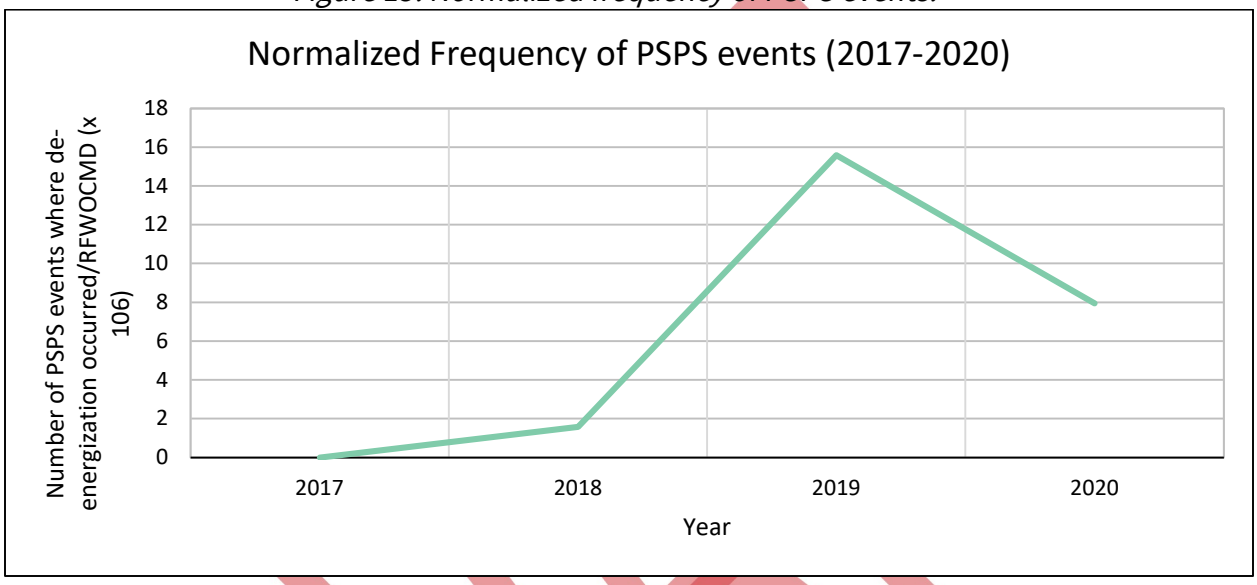
5.6.2 PSPS Risk

While effective as a wildfire mitigation measure, PSPS carries its own risks to customers. As such, electrical corporations must reduce the duration, scope, and frequency[179] of PSPS events.[180] With the exception of San Diego Gas & Electric Company, for most electrical corporations, broad use of PSPS as a wildfire mitigation measure did not occur until 2018. As such, limited data is available to conduct a trend analysis.

[178] QDR Table 7.1, titled, "Key recent and projected drivers of risk events", metrics 17a and 25a.
[179] 2021 Performance Metrics Data Templates titled "Attachment-2.3-to-wsd-011-2021-performance-metrics-data-templates.xlsx," sheet "Table 11"; duration is defined as customer hours per year; scope is defined as circuit-events, measured in number of events multiplied by number of circuits de-energized per year; frequency is defined as number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability per year. https://energysafety.ca.gov/what-we-do/electrical-infrastructure-safety/wildfire-mitigation-and-safety/wildfire-mitigation-plans/2021-wmp/
[180] Pub. Util. Code, § 8386(c)(6) and (c)(7).

PG&E reported data on its use of PSPS and other PSPS metrics in Table 11 of its QDR (QDR Table 11).[181] Again, Energy Safety applied the RFWCMD metric as a normalizing parameter. All charts show a sharp uptick in usage and impact of PSPS in 2019 followed by a significant decline in 2020, although still well above zero.

Figure 15: Normalized frequency of PSPS events.[182]



[181] Broad use of PSPS as a wildfire mitigation measure did not occur until 2018, and as such, limited data is available for analysis.

[182] QDR Table 11, Metric 1 titled, "Recent use of PSPS."

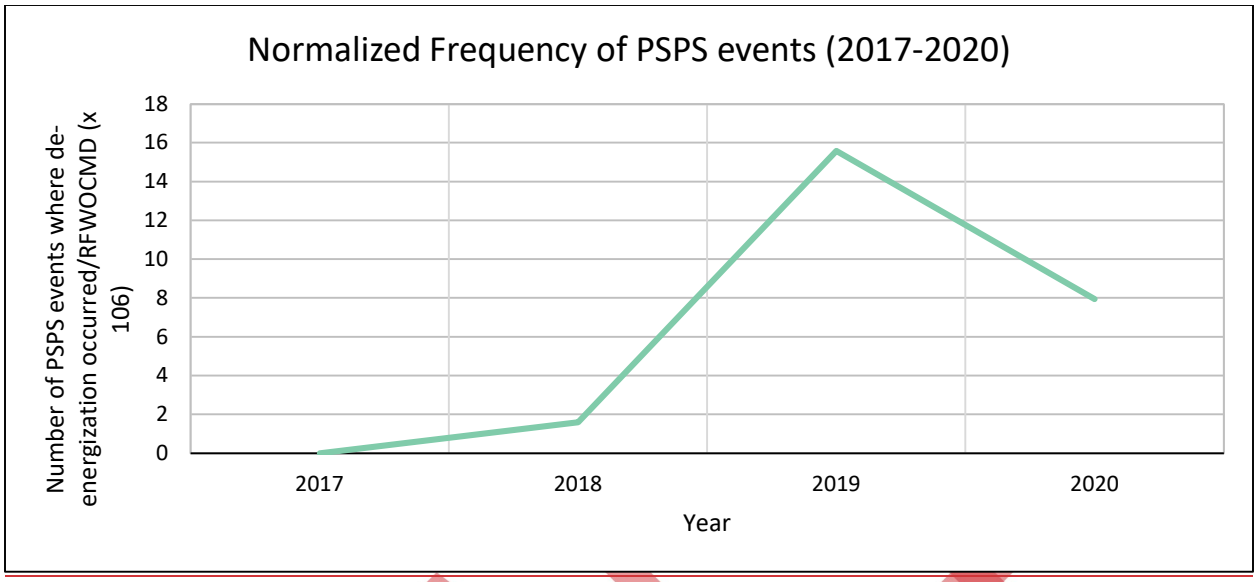
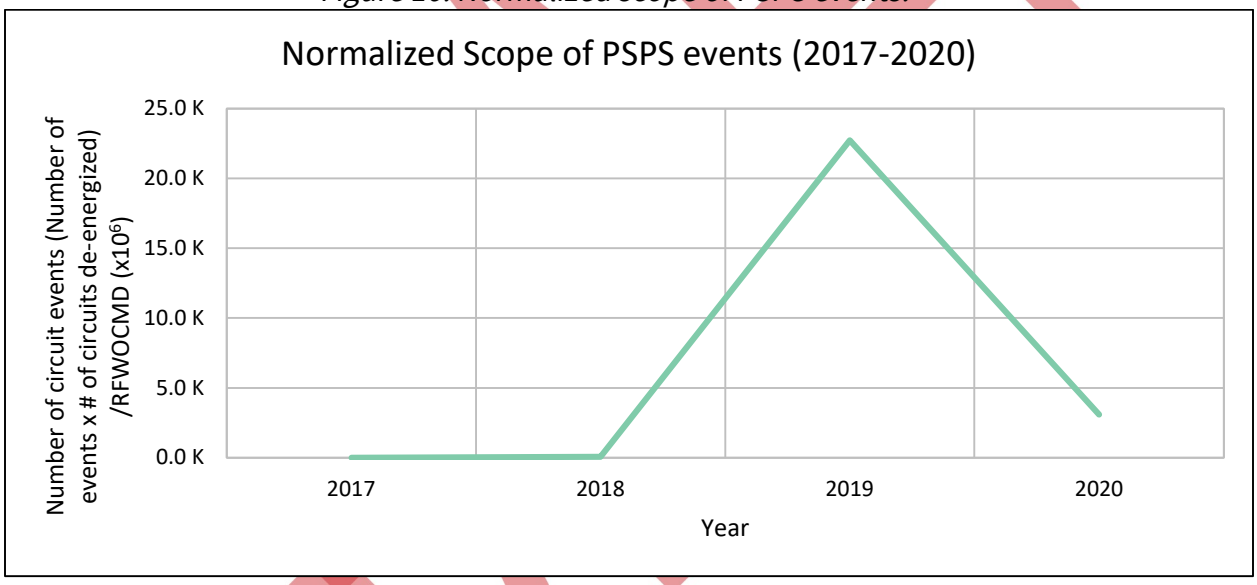


Figure 16: Normalized scope of PSPS events.[183]



[183] ~~QDR Table 11, Metric 1 titled, "Recent use of PSPS."~~ Id.

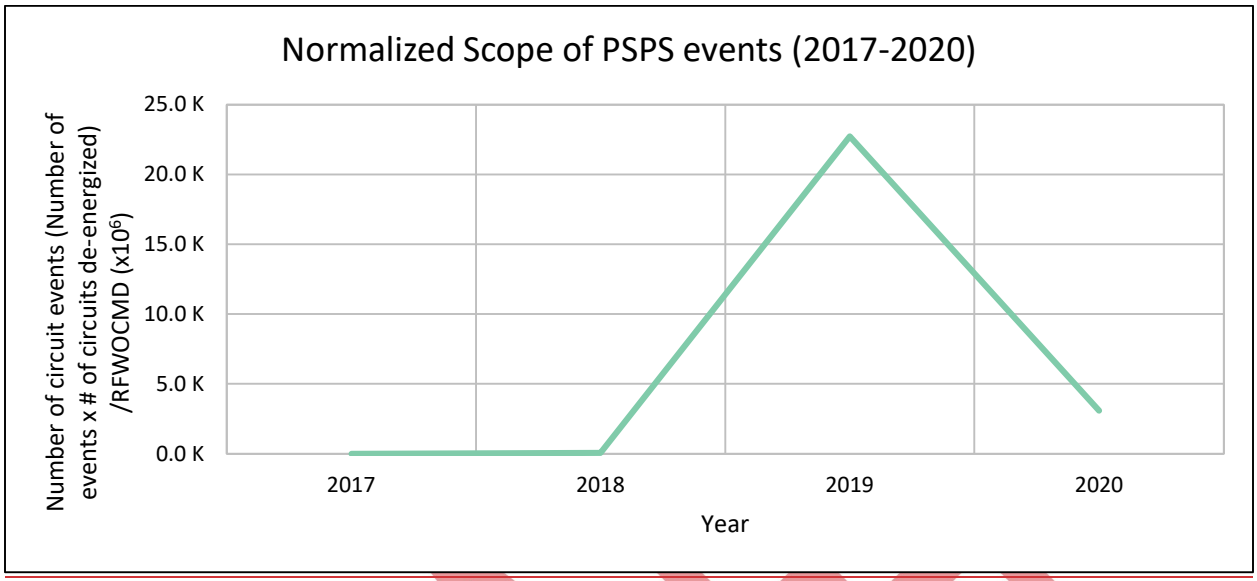
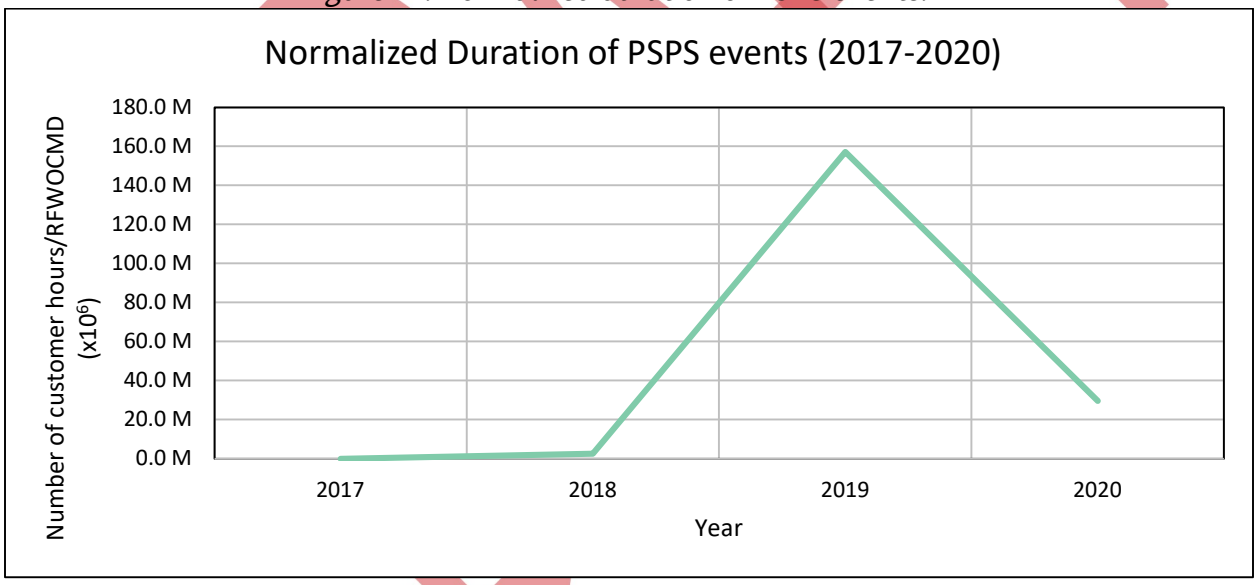


Figure 17: Normalized duration of PSPS events.[184]



[184] QDR Table 11, Metric 1 titled, "Recent use of PSPS."

Figure 18: Normalized critical infrastructure outage customer-hours due to PSPS. [185]

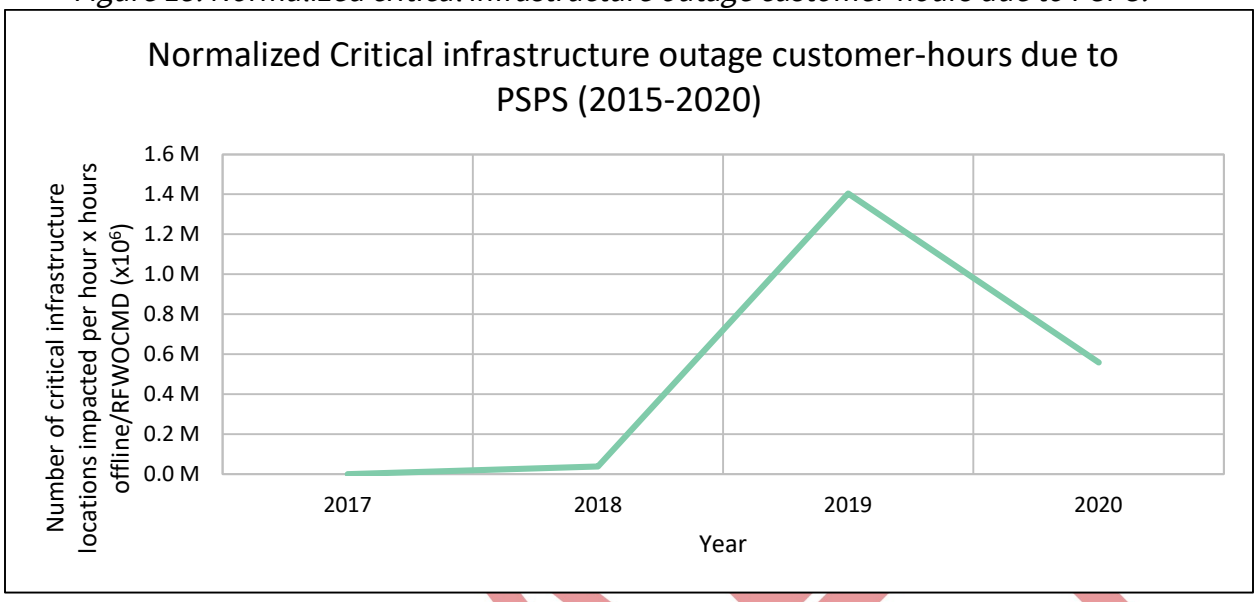
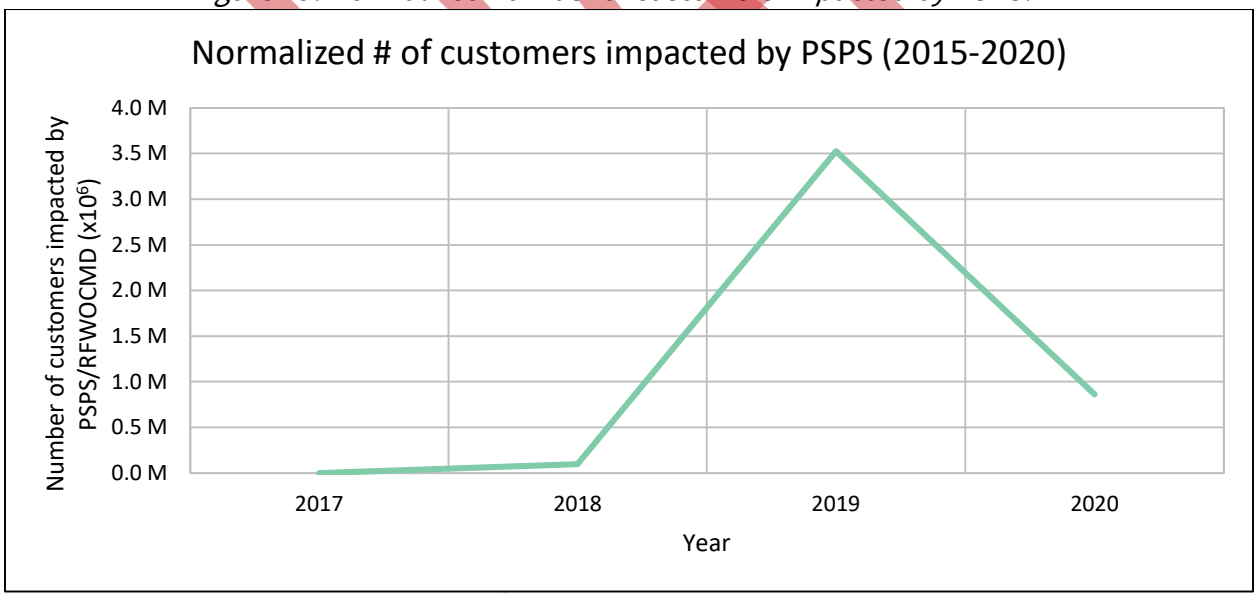


Figure 19: Normalized number of customers impacted by PSPS. [186]



The above figures show a marked decreased in PSPS duration, scope, and frequency from 2019 to 2020; however, PG&E's use of PSPS in 2019 was significant. Therefore, the downward trend between 2019 and 2020 belies PG&E's progress. Energy Safety will compare future years to 2020 in order to assess progress more accurately in this area.

[185] QDR Table 11, Metric 3 titled, "Critical infrastructure impacted by PSPS."
[186] QDR Table 11, Metric 4 titled, "Community Outreach of PSPS metrics."

5.6.3 Identified and Unresolved Risk

To ensure safe operations and the reduction of wildfire risk, Energy Safety expects that electrical corporations maintain electrical lines and equipment through: (1) thorough inspection of those lines and equipment to identify conditions that increase wildfire risk, and (2) expedient remediation of conditions identified during inspections to reduce known wildfire risks. Unresolved conditions leave known wildfire risk on the system.

In Table 1 of its QDR (QDR Table 1), PG&E reported data on findings from inspections it performed in accordance with its 2020 WMP.[187] The inspection data provided in QDR Table 1 includes detail on:

- Asset classification (i.e., transmission or distribution).
- Inspection type (i.e., detailed inspection, patrol inspection, other inspection).
- Location (i.e., in or out of HFTD areas).
- Priority of findings (i.e., Level 1, Level 2, or Level 3).[188]
- Number of circuit miles inspected for each inspection type.

The priority levels of inspection finding data reported in QDR Table 1 are derived from the CPUC's GO 95, Rule 18, which outlines requirements for electrical corporation maintenance programs and resolution of safety hazards. Rule 18 identifies three priority levels, described below:

1. **Level 1** – an immediate risk of high potential impact to safety or reliability requiring immediate corrective action.
2. **Level 2** – any other risk of at least moderate potential impact to safety or reliability requiring corrective action no later than 36 months.
3. **Level 3** – any risk of low potential impact to safety or reliability requiring corrective action within 60 months with some exceptions.[189]

In addition to data on inspection findings, Energy Safety assessed data on PG&E's progress on fixing the unresolved conditions. Energy Safety requested data from PG&E on the number and type of conditions it fixed during the 2020 WMP compliance period.[190] The data on conditions

[187] QDR Table 1, Metric 1 titled, "Grid Condition Findings."
[188] CPUC's GO 95, Rule 18 identifies and defines priority levels, and associated corrective action timeframes, applicable to identified noncompliance issues. Level 1 findings are of highest concern and Level 3 are of lowest concern.
[189] See CPUC GO 95, Rule 18(B)(1)(a).
[190] Energy Safety Data Request DR 088 sent on May 10, 2022.

fixed by PG&E is of the same detail and includes the same assumptions as the inspection finding data in QDR Table 1.[191]

Table 17 below provides an overview of the circuit miles PG&E inspected in 2020, broken out by inspection type.

Table 17: Miles of Inspection Completed by PG&E in 2020

Inspection Type	Distribution Miles Inspected		Transmission Miles Inspected		Transmission & Distribution Miles Inspected	
Patrol	56,884	64%	16,666	60%	73,550	63%
Detailed	23,469	27%	6,525	24%	29,994	26%
Other	7,961	9%	4,392	16%	12,353	11%
Total	**88,314**	**100%**	**27,583**	**100%**	**115,897**	**100%**[192]

PG&E completed over 100,000 miles of inspections in 2020; approximately 76% of which was performed on its distribution lines and equipment. In total, patrol inspections made up approximately 63% of all inspections performed, while detailed inspections made 26%, and other inspections approximately 11%.

Table 18 and Table 19 below detail the number of inspection findings and fixes, broken out by priority level, that PG&E made on its distribution and transmission infrastructure, respectively.

Table 18: Conditions Found and Fixed on PG&E's Distribution Infrastructure in 2020.

Analysis	Level 1	Level 2	Level 3	Total
Conditions Found	1,008	5,469	87,304	93,781
Conditions Fixed	18,640	48,473	5,836	72,949
Difference	**17,632 More Fixed**	**43,004 More Fixed**	**81,468 More Found**	**20,832 More Found**

Table 19: Conditions Found and Fixed on PG&E's Transmission Infrastructure in 2020

Analysis	Level 1	Level 2	Level 3	Total
Conditions Found	905	31,308	18,668	50,881

[191] PG&E response to Energy Safety Data Request DR 088, received on May 20, 2022.
[192] Values in this column do not sum to 100% as presented due to the rounding of percentages to whole numbers.

Conditions Fixed	1,102	23,099	9,740	33,941
Difference	**197 More Fixed**	**8,209 More Found**	**8,928 More Found**	**16,940 More Found**

As shown in the above tables, in 2020, PG&E fixed more Level 1 and Level 2 conditions on its distribution infrastructure than it found. However, PG&E found significantly more Level 3 conditions than it fixed – a difference of more than 81,000. Similarly, a large factor in the reason that the number of conditions found on PG&E's transmission infrastructure exceeded those fixed was attributable to an abundance of Level 2 and 3 findings. Although, unlike on the distribution infrastructure, PG&E also found more Level 2 conditions than it fixed on its transmission infrastructure.

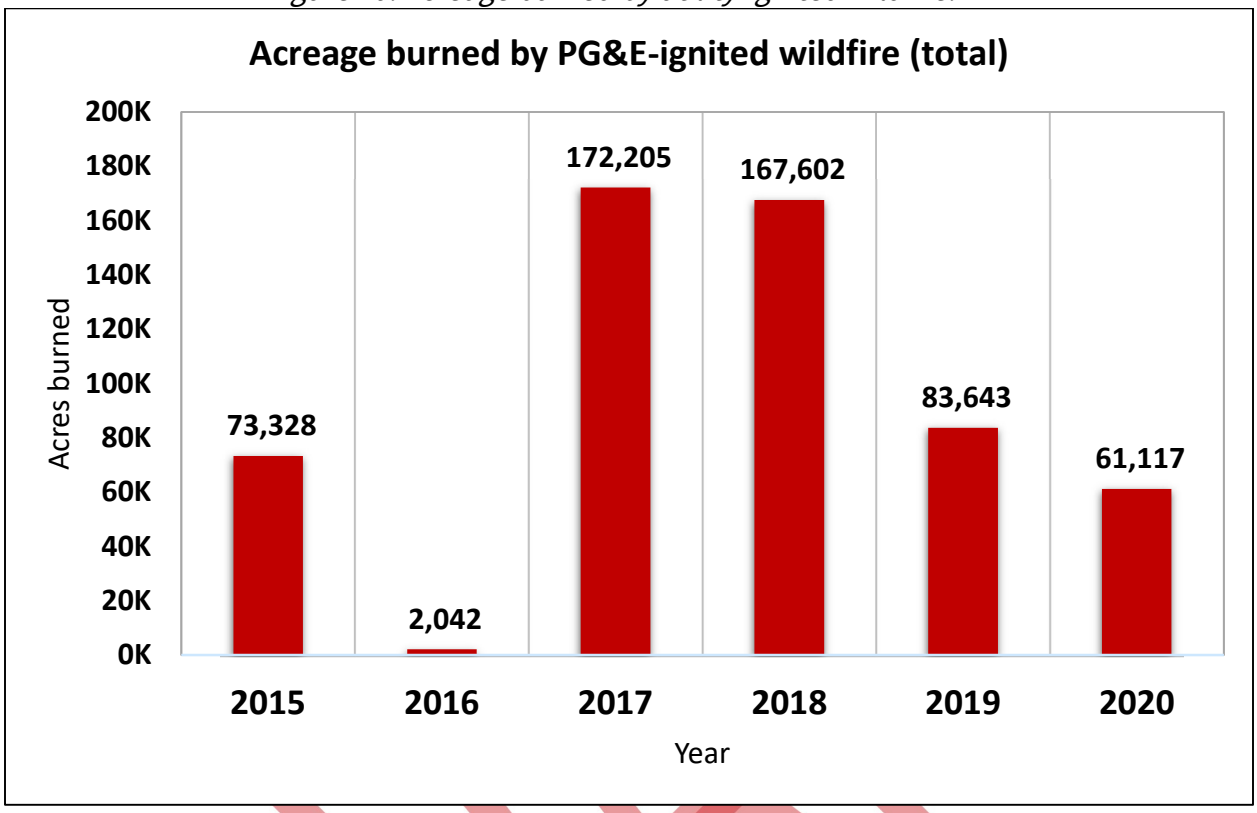
5.6.4 Wildfire Outcomes

Table 2 of the QDR (QDR Table 2) provides data on impacts from electrical corporation-related wildfires including:

1. Acres burned.
2. Structures damaged/destroyed.
3. Injuries/fatalities.
4. Value of assets destroyed.

Presented in the figures below is PG&E's performance relative to the above outcome metrics from 2015 through 2020.

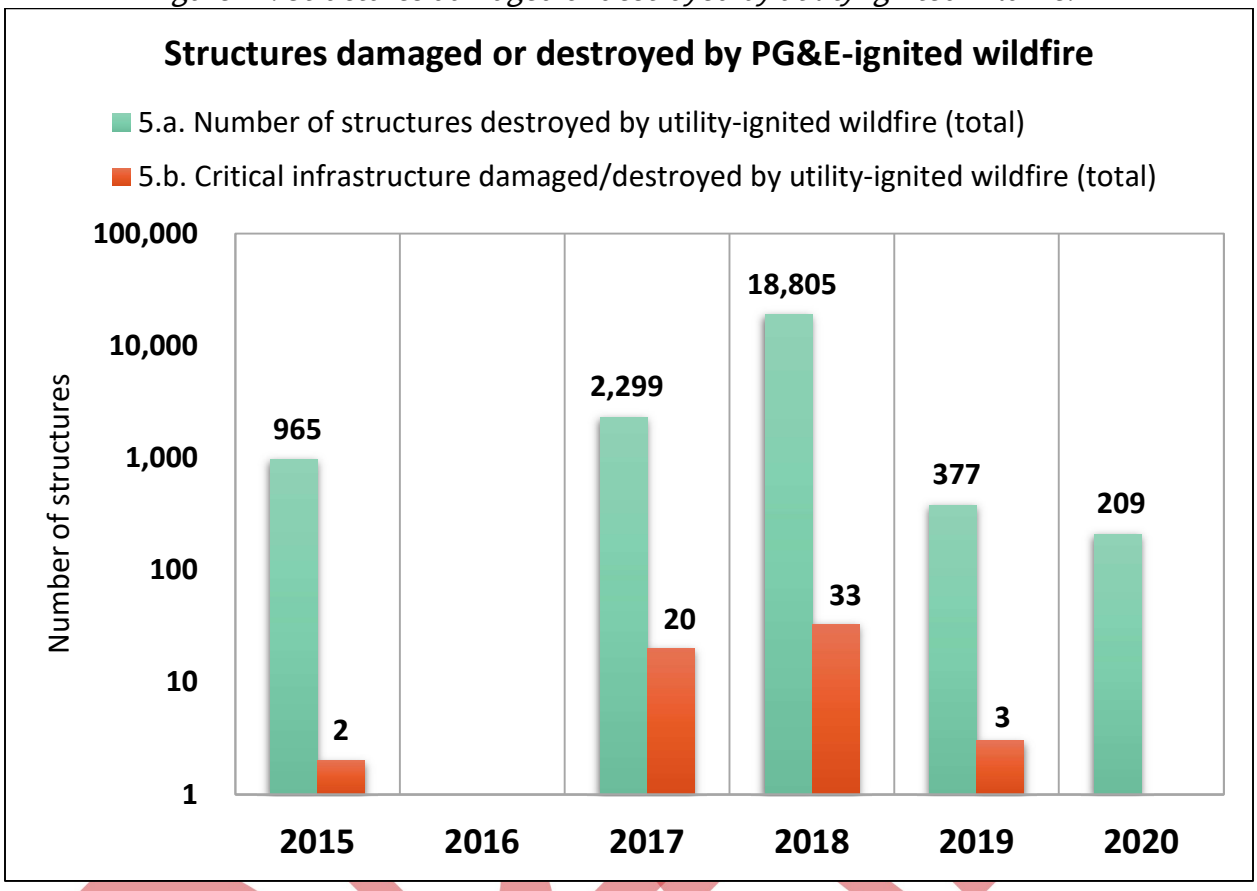
Figure 20: Acreage burned by utility-ignited wildfire. [193]



As shown above, the acres burned from wildfires ignited by PG&E's infrastructure over the six-year reporting period generally follows a normal distribution and indicates a decline since 172,205 acres burned in 2017.

[193] Graph based on data in QDR, Table 2.

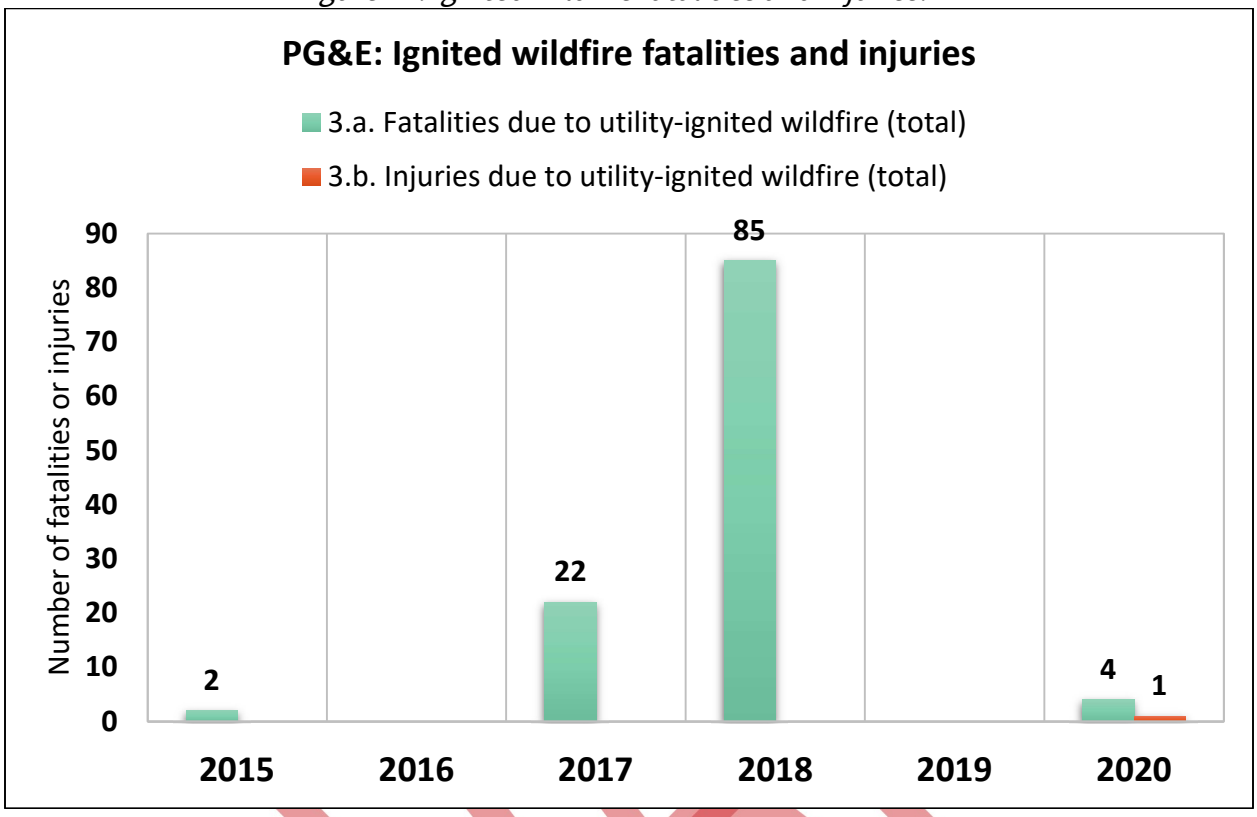
Figure 21: Structures damaged or destroyed by utility-ignited wildfire. [194]



The number of structures and critical infrastructure damaged or destroyed from wildfires related to PG&E's electrical lines and equipment decreased in 2020 compared to the 5-year average from 2015-2019 (4,489 structures and 12 critical infrastructure).

[194] Graph based on data in QDR, Table 2.

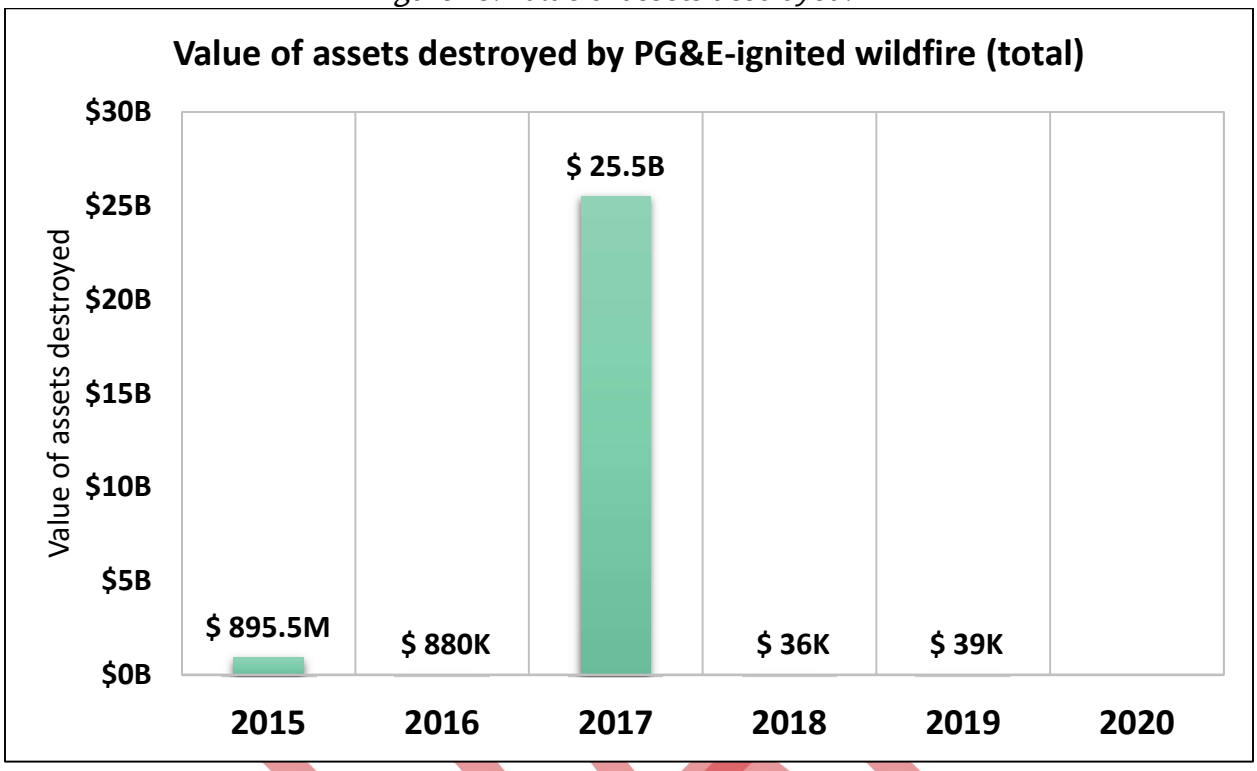
Figure 22: Ignited wildfire fatalities and injuries. [195]



Following the significant loss of life from PG&E-ignited wildfires in 2017 and 2018 that claimed the lives of 107 individuals, a reprieve from such loss of life in 2019 was temporary as there were four fatalities and one injury attributable to PG&E-ignited wildfires in 2020.

[195] Graph based on data in QDR, Table 2.

Figure 23: Value of assets destroyed. [196]



The value of assets destroyed in 2020 was reported as $0. Although it is unlikely that there was $0 in damage given the volume of structures damaged or destroyed, Energy Safety relied upon the data as reported by PG&E in its 2021 Q1 QDR.

5.7 Independent Monitor Findings

The Independent Monitor issued a report on November 19, 2021,[197] in which it noted the following concerns with PG&E's execution of its 2020 wildfire mitigation activities:

- Missed Inspection Targets/Timing.
- Inaccurate Data.
- Program Inefficiencies.

5.7.1 Missed Inspection Targets/Timing

In addition to Energy Safety, the Independent Monitor report made numerous findings related to PG&E missing wildfire mitigation targets in 2020, including:

[196] Graph based on data in QDR, Table 2.
[197] PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021.

- "A 2020 audit indicated there were 41,000 structures with missing or incomplete inspection records."[198]
- "In…2020, PG&E did not meet its inspection targets, which are largely aimed at ensuring that identified priority repairs are made in advance of fire season."[199]
- "PG&E would benefit from additional planning, resource, recordkeeping improvements, and procedural enhancements to ensure it meets all external and internal inspection commitments going forward. These inspections are important because they are part of an integrated wildfire risk-abatement program that cannot function most effectively if one component is lagging."[200]
- "In March 2021, PG&E self-reported to the CPUC that enhanced inspections were not performed on 24 hydroelectric substations. Recordkeeping gaps caused this oversight."[201]

5.7.2: Inaccurate Data

The Independent Monitor report commented on PG&E's issue of inaccurate data related to the 2020 wildfire mitigation activities including:

- "In 2020… the Monitor team conducted an in-field review of a … sample of 94 distribution structures in HFTDs that were inspected by PG&E…. [of which] approximately 48%... had potential exceptions related to field conditions, totaling 75 missed field issues by PG&E inspectors across 45 structures. Approximately 53% of structures had potential exceptions related to recordkeeping, for a total of 60 missed recordkeeping issues by PG&E inspectors across 50 structures."[202]
- "The monitor team continues to observe inconsistent data within PG&E's records systems…. In sum, PG&E's progress in addressing the accuracy and integrity of its VM programs has been slow. Given the history of recordkeeping issues with the Company, improvement here needs to remain a focus and a priority."[203]
- "Traceable, verifiable, accurate, and complete records underpin safe operations, from permitting employees to accurately understand asset health and inform repair

[198] PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021, page 39.
[199] PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021, page 30.
[200] ~~PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021, page 30.~~ Id.
[201] PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021, page 39.
[202] PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021, page 31.
[203] PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021, page 29.

decisions, to ensuring that vegetation issues are appropriately logged, communicated, and remediated. The lack of traceable, verifiable, accurate, and complete records was at the heart of the issues that led to the San Bruno gas explosion..."[204]

5.7.3 Program Inefficiencies

The Independent Monitor identified inefficiencies within PG&E's vegetation management and asset management programs, including:

- The Independent Monitor recommended that PG&E make the vegetation management "procedures, scopes of work, and recordkeeping tools simpler for contractors to understand and…require ongoing annual trainings and rigorous assessments for all pre-inspectors and work verifiers to ensure that hazard tree assessments are performed consistently across HFTDs."[205]
- The Independent Monitor found that there was an increase of 60,000 pending, unresolved electric transmission and distribution tags in 2020.[206] The Independent Monitor identified that PG&E lacked "a clear execution plan to address the increasing backlog in a timely way... Furthermore, conditions that are meant to be addressed within six months per PG&E guidance could sit unmitigated for several years."[207]

5.8 Disposition of 2020 WMP Conditions

In 2020, Energy Safety issued a conditional approval of PG&E'S 2020 WMP. The conditional approval identified the severity of each issue (as set forth below) and set forth required remediations:

1. **Class A** – aspects of the WMP are lacking or flawed.
2. **Class B** – insufficient detail or justification provided in WMP.
3. **Class C** – gaps in baseline or historical data, as required in 2020 WMP Guidelines.

Class A deficiencies were of the highest concern and required electrical corporations to submit a remedial compliance plan (RCP) within 45 days of approval. Class B deficiencies were of moderate concern and required electrical corporations to submit to quarterly

[204] PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021, page 47.
[205] PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021, page 29.
[206] PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021, page 35.
[207] ~~PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021, page 35.~~ Id.

reporting, with the first of such reports being due 90 days after approval. Finally, Class C deficiencies were of least immediate concern and required electrical corporations to submit additional detail and information or otherwise come into compliance in its 2021 annual WMP update. Accordingly, Energy Safety only considers PG&E's resolution of its Class A and Class B conditions in this ARC. Responses to and resolution of Class C deficiencies will be evaluated with respect to Energy Safety's assessment of PG&E's 2021 WMP update.

PG&E timely submitted its RCP and First Quarterly Report (QR) as required by Resolutions WSD-002 and WSD-003. On December 30, 2020, Energy Safety issued its evaluation of the RCP and issued a Notice of Noncompliance. On January 8, 2021, Energy Safety issued its evaluation of the QR and issued a Notice of Noncompliance. Table 20 and Table 21 below provide the conditions and Energy Safety's determination of sufficiency.

PG&E failed to resolve any Class A deficiencies and failed to resolve 23 out of 30 Class B deficiencies within the 2020 WMP compliance period.

Table 20: Class A Deficiencies from PG&E's 2020 WMP

#	Deficiency/ Condition No.	Deficiency Title	Energy Safety Determination
1	Guidance-3	Lack of risk modeling to inform decision-making.	Insufficient
2	PGE-1	PG&E groups initiatives into programs and does not provide granular initiative detail.	Insufficient
3	PGE-3	High incidence of conductor failure.	Insufficient
4	PGE-8	Annual risk ranking is quickly out of date.	Insufficient
5	PGE-15	It is unclear how PG&E classifies findings at the appropriate level.	Insufficient
6	PGE-25	Lack of details in PG&E's WMP on how to address personnel shortages.	Insufficient
7	PGE-26	Effectiveness of increased vegetation clearances.	Insufficient
8	PGE-27	Public safety partner coordination.	Insufficient

Table 21: Class B Deficiencies from PG&E's 2020 WMP

#	Deficiency/ Condition No.	Deficiency Title	Energy Safety Determination
1	Guidance-1	Lack of risk spend efficiency (RSE) information	Insufficient
2	Guidance-2	Lack of alternatives analysis for chosen initiatives	Insufficient
3	Guidance-4	Lack of discussion on PSPS impacts	Insufficient
4	Guidance-5	Aggregation of initiatives into programs	Sufficient
5	Guidance-6	Failure to disaggregate WMP initiatives from standard operations	Sufficient
6	Guidance-7	Lack of detail on effectiveness of "enhanced" inspection programs	Insufficient
7	Guidance-9	Insufficient discussion of pilot programs	Insufficient
8	Guidance-10	Data issues – general	Deferred
9	Guidance-11	Lack of detail on plans to address personnel shortages	Insufficient
10	Guidance-12	Lack of detail on long-term planning	Insufficient
11	PGE-2	Equipment Failure	Insufficient
12	PGE-5	PG&E provides little discussion of how it uses the results of relative risk scoring method.	Insufficient
13	PGE-6	Discrepancy between ignition reduction projections	Sufficient
14	PGE-7	It is not clear if PG&E's line risk scoring sufficiently incorporates all risks that cause ignition and PSPS	Insufficient
15	PGE-9	How PG&E weighs egress as a risk factor	Insufficient
16	PGE-10	PG&E lacks sufficient weather station coverage	Insufficient
17	PGE-11	Including additional relevant reports	Sufficient
18	PGE-12	PG&E's fuse replacement program planned to take 7 years	Insufficient
19	PGE-13	PG&E does not explain how the factors limiting microgrid deployment will impact its microgrid plans	Insufficient
20	PGE-14	Level 3 findings	Insufficient
21	PGE-17	Effectiveness of inspections using infrared technology	Insufficient

#	Deficiency/ Condition No.	Deficiency Title	Energy Safety Determination
22	PGE-18	PG&E does not describe in detail how its hazard tree analysis focuses on at-risk trees	Insufficient
23	PGE-19	Low pass rate on EVM QA	Insufficient
24	PGE-20	PG&E is redistributing resources to focus more on transmission clearances	Insufficient
25	PGE-21	PG&E fails to describe why additional programs for transmission clearances are necessary	Insufficient
26	PGE-22	Some of PG&E's vegetation management inspectors may lack proper certification	Insufficient
27	PGE-23	Vegetation waste and fuel management processes unclear	Insufficient
28	PGE-24	Improving prioritization	Insufficient
29	PGE-28	Lack of justification and detail for PG&E's self-assessed stakeholder engagement capabilities	Sufficient
30	PGE-29	Cooperation and sharing of best practices	Sufficient

6.0 DISCUSSION

Energy Safety considered the totality of the evidence before it in determining whether an electrical corporation substantially complied with its WMP. Energy Safety finds that PG&E failed to substantially comply with its 2020 WMP. PG&E had two systemic issues that hindered its ability to reduce the risk of catastrophic wildfire. PG&E's lack of effective communication with its staff and contractors and poor data governance led to an inability to accurately plan, execute, and track implementation of WMP initiatives. Effective communication and data governance are foundational capabilities and fundamental to any electrical corporation's ability to effectively implement wildfire mitigation measures and mitigate wildfire risk.

Below, Energy Safety presents its assessment of PG&E's performance to each of the evaluation criteria set forth in the Compliance Framework followed by an assessment of the systemic issues. Energy Safety acknowledges that PG&E self-reported missed initiatives and implemented corrective actions to address findings from other entities, including BVNA, the

Independent Monitor, and Energy Safety. Energy Safety supports and encourages this kind of forthright self-reflection and considers PG&E's corrective action responsiveness as essential to its ability to build a culture of continuous improvement. However, the fact remains, the failures during the compliance period and systemic issues identified with PG&E's implementation of its 2020 WMP contributed to its inadequate reduction of wildfire risk and caused real-world consequences.

6.1 Completion of 2020 Initiatives

PG&E failed to meet several qualitative and quantitative targets in its 2020 WMP.[208] Further, Energy Safety finds that PG&E failed to have a strong understanding of whether it had completed initiatives, often reporting conflicting information across reports, and failing to recognize whether it had adequately met initiative targets (e.g., installation of weather stations). The issue of data governance is discussed in more detail in Section 6.4 below.

The missed targets include those that were of high consequence—namely inspections. By its own admission, PG&E failed to inspect its hydroelectric substations and complete enhanced inspections on some of its distribution poles in HFTD Tier 3 areas (i.e., areas of extreme wildfire risk). While the number of missed pole inspections is not the most critical issue, the location of the missed poles is ~~as is~~ the quality of the inspections. The Independent Monitor report (see Section 5.7.2) and the IE ARC (see Section 5.2) confirmed that PG&E's inspections were vulnerable to data governance and quality control issues. Energy Safety also finds that where PG&E did install assets as part of WMP initiatives, it did not always ensure that the installations were completed correctly or were properly functioning. For example, as found by BVNA, weather stations and cameras were at times non-functional, and sectionalizing devices were improperly installed both in terms of location and quality of installation. Given that these issues were found on the small subset of PG&E assets inspected, Energy Safety can infer that it is likely these issues exist across PG&E's service territory.

[208] Energy Safety does not consider initiatives with approved change orders to be missed targets. Further, Energy Safety agrees with PG&E that some missed targets should be deemed substantially complete. For example, PG&E hit a 96 percent restoration rate for PSPS, two percent shy of its stated target of 98 percent. While technically failing to meet the stated target, the shortcoming is not significant, and the relative impact of the missed target is likely to be small.

Finally, as discussed in Section 6.3, in some cases where PG&E met its WMP initiative targets, it failed to deploy those initiatives in the areas of highest risk (see Section 6.2). While PG&E exceeded its target to perform EVM on 1,800 miles, Energy Safety's EVM Audit, found that, in 2020, PG&E completed only 5% of its EVM work on its top 20 highest risk circuits (see Section 5.4.2). PG&E appeared to not be sufficiently prioritizing or reducing the risk of wildfire ignition through its implementation of its EVM initiative.[209]

6.2 Achieving 2020 WMP Objectives

PG&E's 2020 WMP objectives were generally broad and, with few exceptions, lacked specific measurable outcomes. Therefore, almost any action taken by PG&E in 2020 would have resulted in PG&E having fulfilled its objectives as written. Nevertheless, given that 2020 is the base year for the first three-year cycle and is therefore setting the baseline against which to measure PG&E over the three-year plan cycle, Energy Safety found that PG&E fulfilled many of its 2020 WMP objectives. However, PG&E failed to meet its overarching goal of reducing the consequence of catastrophic wildfire on its system. Additionally, as described more in Section 6.3, below, PG&E's failings likely negatively impacted the amount of wildfire risk reduction PG&E was able to achieve.

Energy Safety's analysis of PG&E's performance to its objectives is broken into three sections. Energy Safety discusses objectives set to be achieved before the upcoming (2020) wildfire season. It then presents its analysis on performance prior to the next annual update (2021). First, however, Energy Safety presents its findings on PG&E's performance to its overall stated objective: "the objective of PG&E's Wildfire Mitigation Plan (WMP) for 2020 and beyond is to reduce the risk and consequences of wildfires associated with utility electrical equipment, and thereby avoid catastrophic wildfires across central and northern California."[210]

As described in more detail in Section 6.3, fully evaluating its overarching objective requires hindsight provided by many years of outcome data that both PG&E and Energy Safety presently lack. PG&E implemented a broad suite of initiatives that, in their totality, should have served to reduce wildfire risk and presumably decrease wildfire consequence. However, as is repeatedly demonstrated throughout this report, PG&E failed to properly manage its data in a manner that provided for effective implementation of those initiatives. Moreover, as discussed in Section 5.6.3, PG&E had a substantial backlog of Level 1 issues on its system, all of which posed imminent risk of high potential impacts to safety and reliability. Energy Safety finds that the fatalities, injuries, and structural loss resulting from PG&E reported ignitions

[209] PG&E EVM audit (2021.02.08.evmaudit.pdf (ca.gov)), pages 10-14.
[210] PG&E 2020 WMP, page 4-1.

combined with the presence of systemic data governance issues demonstrate PG&E's failure to achieve the overall objective of its WMP in 2020.

Before the 2020 wildfire season, PG&E committed to the following:

- Continue to reduce wildfire risk through mitigation programs including system hardening and enhanced vegetation management.[211]
- Implement PSPS impact mitigation activities to make each 2020 PSPS event affect one-third fewer customers than it would have in 2019 and to shorten restoration time after high-risk weather clears to 12 daylight hours for nearly all impacted customers.[212]
- Further improve situational awareness and meteorology tools to increase weather forecast granularity and improve targeting of fire risk forecasts and PSPS events.[213]

Energy Safety finds that PG&E's enhanced vegetation management initiative, as implemented, failed to adequately achieve its objective "to reduce wildfire risk." Energy Safety's audit of PG&E's enhanced vegetation management program found that, among other failings, PG&E was not sufficiently prioritizing or reducing the risk of wildfire ignitions in its implementation of its EVM initiative. Energy Safety found that although PG&E accomplished its target of completing 1,800 miles of EVM work, PG&E did not prioritize work on its top 20 riskiest circuits. Energy Safety compared PG&E's various risk models used in 2020 to the circuits with EVM work completed in 2020 and found that PG&E completed less than 5% of its EVM work on its top 20 riskiest circuits (see Section 5.4.2).[214] Energy Safety's risk prioritization analysis also showed that PG&E conducted non-routine vegetation management inspections and trimming less frequently in areas that had a higher risk per circuit mile.

Energy Safety also found in its risk prioritization analysis that one tenth of PG&E's undergrounding and conductor replacement work occurred more than 100 meters from a high-risk circuit or on a circuit with a risk score of zero (see Section 5.5.1). Therefore, while PG&E completed its grid hardening commitment, it could have likely reduced more ~~wildfire~~ risk if all work had been targeted to areas of highest risk per circuit mile. See Section 6.3 for further discussion on wildfire risk.

PG&E was largely successful in achieving its objective to reduce the scope and impact of PSPS from 2019 levels. As shown in Figure 19, PG&E significantly reduced the number of customers impacted by PSPS events, although given PG&E's widespread usage of PSPS in 2019, this

[211] PG&E 2020 WMP, page 4-2.
[212] ~~Id.~~ PG&E 2020 WMP, page 4-2.
[213] Id.
[214] PGE EVM audit: https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsd/2021.02.08.evmaudit.pdf, page 13.

objective set a fairly low bar. As noted in Section 6.1, Energy Safety finds that PG&E had substantially completed its objective to shorten restoration time to 12-daylight hours, achieving an outcome of 96% out of a stated 98% target. PG&E's normalized frequency of PSPS events declined 50% from 2019 to 2020.

With regard to its situational awareness and meteorology objective, in 2020, PG&E increased the concentration of weather stations and cameras across its service territory. However, as noted by BVNA, there were instances where PG&E failed to ensure that these devices were functioning properly. It is critical that PG&E not only deploy, but also maintain devices on its system to achieve intended wildfire risk reductions. Further, PG&E failed to correctly report its progress towards installation of weather stations, which also points to a data governance systemic issue (See Section 6.4). Notwithstanding the issues related to the operability of some situational awareness devices and accuracy of data reporting on progress of initiatives in the situational awareness category, Energy Safety finds that PG&E fulfilled this objective by implementing the situational awareness and meteorology initiatives in its 2020 WMP and reducing the impacts of its PSPS events (See Section 5.6.2).

Before the next annual update (2021), PG&E committed to the following:

- Continue to modify wildfire mitigation programs by incorporating lessons learned throughout the 2020 wildfire season and in response to new regulations, requirements, guidelines, or other changes.[215]
- PG&E will work towards gathering data and performing the analysis necessary to establish modified PSPS criteria for distribution facilities that have been hardened.[216]

PG&E largely achieved its first objective in this category. Although there were serious concerns related to data governance and communication occurring across PG&E's operations, PG&E self-reported many areas of noncompliance and self-identified the causes of some of these lapses, such as the communication failure regarding weather stations. Further, where PG&E or other entities found failings, Energy Safety finds PG&E was responsive and developed corrective actions. PG&E appeared to be growing its understanding of wildfire risk by refining its risk-modeling in 2020, even if it failed to deploy some of its key initiatives based on that understanding of risk. PG&E demonstrated that it is building a self-reflective and learning culture that responds to new information. However, as discussed in Section 6.4, Energy Safety finds there were systemic problems that hindered PG&E's performance.

Energy Safety finds that PG&E fulfilled its second objective by developing "PSPS descoping criteria" for hardened distribution circuit segments to remain energized during a PSPS event (See Section 5.1). This descoping criteria was planned for third party review and evaluation in

[215] ~~Id.~~ PGE EVM audit: https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsd/2021.02.08.evmaudit.pdf, page 13.
[216] Id.

2021.[217] PG&E also completed evaluation of 552 transmission lines in HFTD areas for potential removal from future PSPS event scope.

6.3 Reducing Wildfire Risk

Pursuant to Government Code section 15475.1, Energy Safety's primary objective is to ensure that electrical corporations reduce wildfire risk and comply with energy infrastructure safety measures. Therefore, as stated in the Compliance Framework, Energy Safety's evaluation of PG&E's performance to its 2020 WMP went beyond a check-box exercise of whether PG&E met its initiative targets to instead evaluate whether PG&E's performance in 2020 reduced the risk of PG&E equipment igniting a catastrophic wildfire. As noted in the Compliance Framework, given that 2020 is the first year in a three-year cycle and the benefits of work deployed in 2020 may accrue over time, Energy Safety's evaluation largely focused on establishing baseline measures against which to measure PG&E's performance. However, even with limited data, Energy Safety makes some initial findings about PG&E's ability to reduce wildfire risk on its system in 2020.

Measuring ignitions provided the most direct measure of electrical corporation wildfire risk. Other metrics, such as wire down events and unplanned outages correlated with wildfire risk because some portion of these events will result in ignitions. As presented in Section 5.6.1, a review of normalized ignitions as well as wire down events and unplanned outages from 2015 to 2020 showed a general year over year downward trend. In fact, normalized ignitions in Tier 3 HFTD areas declined 67% over the five-year average as shown in Figure 6. Similarly, normalized ignitions from equipment/facility failure on the distribution system decreased 90% over the five-year average (Figure 8). However, transmission system ignitions in Tier 3 have shown a steady increase in the three-year period since 2017 with 2020 at a 52% increase over 2017 (Figure 10).

Taken alone, these data suggest that PG&E was on a positive trajectory. However, evaluating these metrics in a vacuum fails to capture the consequence of any single ignition. While PG&E had 38% fewer acres burned and 95% fewer structures damaged compared to the five-year average from 2015 through 2019 (Figures 20 and 21), that five-year average is highly skewed due to the 2017 and 2018 wildfire seasons. Regardless of trend, in 2020, PG&E reported 209 structures destroyed, 27 structures damaged, one injury, and four fatalities. Energy Safety finds these outcomes unacceptable.

Analysis revealed other shortcomings may have further hindered PG&E's ability to reduce wildfire risk. For example, as explained in Section 5.6.3, PG&E's asset inspections in 2020 resulted in over 17,000 *more* Level 1 conditions fixed than found on its distribution

[217] PG&E 2021 WMP, page 922.

infrastructure and nearly 200 more Level 1 conditions fixed than found on its transmission infrastructure. Level 1 conditions present an immediate risk of high potential impact to safety or reliability and require immediate corrective action. It appears from the data that, on PG&E's distribution infrastructure, a significant number of high-risk issues (Level 1 conditions) from previous years were potentially not resolved in a timely manner as they were carried over from the previous year(s) and fixed in 2020. That there were so many urgent hazards with significant potential for ignition risk apparently left unresolved is concerning. While Energy Safety acknowledges that PG&E made significant progress in clearing its backlog of Level 1 conditions in 2020, Energy Safety remains concerned that PG&E's backlog of unresolved conditions on its system continued to grow in 2020. As identified by the Independent Monitor, the number of pending unresolved electric transmission and distribution tags (i.e., conditions requiring repair) on PG&E's system increased by 60,000 in 2020.[218] This continued buildup of backlogged, unresolved conditions underscores Energy Safety's assessment that PG&E's ability to mitigate risk on its system is hindered by its lack of timely corrective action to resolve conditions found.

Further, as discussed in PG&E's response to a BVNA finding regarding distribution pole inspections, PG&E reported it has a practice of reinspecting findings within the resolution period mandated in GO 95 and then deferring resolution of the finding.[219] This results in PG&E re-starting the clock on fixing many inspection findings, a practice that is risky at best and one that could have potentially catastrophic consequences at worst.

Finally, as described in more detail in Section 6.4 below, Energy Safety has significant concerns regarding PG&E's inadequate data governance and communication practices, which lead to data conflicts, incorrect information being reported, initiative implementation failings, and misunderstanding of protocols and procedures. These systemic issues increase the likelihood PG&E will miss opportunities to reduce risk on its system and fail to adequately deploy mitigations, which increases the risk of an ignition and, depending on ignition location and time, the risk of a catastrophic wildfire.

6.4 Systemic Issues

To fully evaluate PG&E's compliance with its 2020 WMP, including its initiative targets and objectives, Energy Safety evaluated whether there were systemic issues that hindered PG&E's ability to reduce its wildfire risk. Energy Safety finds that PG&E had two systemic issues during the compliance period—poor data governance and ineffective communications.

[218] PG&E Independent Monitor Report of November 19, 2021. Case 3:14-cr-00175-WHA Document 1524-1 Filed November 23, 2021, page 35.

[219] PGE Response to Data Request 081, Question 3 Supplemental

6.4.1 Data Governance

An analysis of PG&E's performance in 2020 reveals extensive issues with data governance, including poor and inaccurate recordkeeping. Numerous examples support this finding:

- When evaluating PG&E's pole inspections in the HFTD, BVNA found 25 records contained photos that differed from the asset listed in the inspection form.
- BVNA found that two sectionalizing devices were in a different location from what was stated in the records.
- The Independent Monitor's 2020 audit indicated there were 41,000 structures with missing or incomplete inspection records.
- The Independent Monitor found that approximately 53% of structures had potential exceptions related to recordkeeping.
- Regarding PG&E's vegetation management practices, the Independent Monitor observed inconsistent data within PG&E's records systems.
- The Independent Monitor found that PG&E's electric operations "is still playing catch-up to build an accurate system of record that reflects the reality of what is in the field."
- Energy Safety's EVM audit found PG&E used three different prioritization models and that the three data submissions contained inconsistencies and conflicting information.
- Energy Safety's SVM audit revealed PG&E used at least six databases for vegetation management whereas initiative 5.3.5.19 specifically referenced implementation of a central database.
- Energy Safety's evaluation of initiative performance revealed that ~~50~~44% of initiatives analyzed in PG&E's progress reports (QIU, QAL, EC ARC) contained discrepancies. Furthermore, PG&E's reporting methodologies made it difficult to track implementation progress, with PG&E often designating initiatives as qualitative in nature despite having clear quantitative targets.
- PG&E's self-reports and EC ARC reported numerous discrepancies and misunderstandings about progress. For example, PG&E reported pole inspections and weather station implementation as on track despite later finding this to not be the case.
- When explaining its missed inspections of hydroelectric substations, PG&E noted that because of its ~~record-keeping~~recordkeeping practices, specifically that these substations were not classified solely as transmission or distribution assets, they were therefore missed when PG&E developed its inspection plan.

Further, Energy Safety finds that PG&E's reporting revealed pervasive data governance issues throughout its operation, pointing to a systemic issue. Even within PG&E's EVM program, a vegetation management program PG&E considered a "critical"[220] and "important wildfire

[220] 2020 WMP, page 5-176.

safety effort"[221] to reduce vegetation risk, audit findings indicated there were pervasive failures in PG&E's recordkeeping. Energy Safety finds these failures in ~~record-keeping~~recordkeeping hindered PG&E's ability to achieve the objectives of its EVM program by decreasing its efficiency in tracking down accurate records and subsequently updating databases, and re-patrolling lines to ensure compliance with program scope. As a result, Energy Safety finds PG&E cannot accurately demonstrate its progress in light of these issues and inconsistencies.

Further, as discussed in Section 5.5.2, PG&E's poor recordkeeping led it to miss inspections on an entire asset class of substations. The inspections on hydro-electric substations, which were not classified as either distribution or transmission assets, resulted in PG&E's failure to conduct any inspections on these hydro-electric substations in 2020. Similarly, the fact that 17 times as many Level 1 conditions were fixed versus found in 2020 suggests that there was a tremendous backlog of issues that were known to present an imminent risk to the system of high potential impact to safety or reliability that remained unaddressed for a period of time in excess of the requirement.

Energy Safety cannot emphasize enough the importance of accurate recordkeeping and data management to achieving wildfire risk reduction. An electrical corporation must have a foundational capability and ability to accurately track the assets on its system, and it must be able to adequately track deployment of initiatives, identify and track defects, and track remedies to those defects. Effective data governance and communication of protocols and expectations are fundamental to safe operation and reduction of wildfire risk. If an electrical corporation cannot effectively execute these foundational capabilities, its ability to operate its infrastructure safely and mitigate wildfire risk are compromised. To this end, PG&E's continued and persistent failures in tracking, updating, verifying, and reporting accurate data and communication of its protocols undermine PG&E's other efforts to mitigate its wildfire risk.

As noted in the Independent Monitor report, "[i]n PG&E's service territory, the consequences of a single misstep—a missed hazard tree, the failure to replace a corroded C-hook—can be death and destruction. Currently, as reflected by our inspection findings reported above, there are too many missteps."[222] The systemic data governance issues identified by Energy Safety significantly increase the likelihood of PG&E failing to effectively identify and remediate the risks on its infrastructure, as evidenced by PG&E failing to complete inspections on an entire class of assets (i.e., hydro-electric substations) in HFTD areas. Energy Safety finds that PG&E's insufficient data governance hindered its ability to reduce risk and increased the likelihood of negative outcomes in 2020.

6.4.2 Communications and Protocols/Procedures

[221] 2020 WMP, page 5-175.
[222] Independent Monitor Report, page 48.

Energy Safety finds that PG&E had numerous instances of ineffective communications. Examples include:

- In the EVM audit, Energy Safety found that PG&E failed to communicate its use of a new Risk Overlay Model and provided Energy Safety with conflicting information regarding when different risk prioritization models were utilized.
- In the EVM audit, Energy Safety found that PG&E did not adequately communicate with Energy Safety regarding defect resolution, data requests, or large-scale clearing projects.
- In the EVM audit, Energy Safety found that PG&E used inconsistent terminology.
- In the SVM Audit, Energy Safety found instances of multiple protocols and conflicting interpretation of EVM specifications being used by contractors, resulting in the need to reinspect 530 miles in 2021 and conduct remediation work on 31.9 miles after the compliance period.
- In 2020, PG&E had an internal communication breakdown regarding priorities and timing to conduct required distribution pole inspections, resulting in missed inspections for the calendar year.[223]
- PG&E failed to communicate in its 2020 WMP that its internal protocols on enhanced vegetation clearances required a trim to 12-feet only if, at the time of inspection, PG&E determined that the vegetation in question would encroach within a 4-foot radius before the next time of trim. Consequently, PG&E's internal protocols resulted in far different vegetation management practices than those conveyed in the WMP.
- PG&E failed to communicate progress statuses on four initiatives in its 2020 EC ARC and 11 initiatives in its 2020 Q4 QAL.

Effective communication regarding processes, procedures, protocols, expectations, and outcomes is critical to achieving improved safety outcomes. Energy Safety finds that PG&E's systemic communication issues made it difficult for workers to understand what was expected of them. Poor communication amongst company staff prevented PG&E from understanding what was happening on its system. Significantly, these lapses hindered Energy Safety's ability to oversee PG&E's practices, including remedying defects. For these reasons, Energy Safety cannot be confident that PG&E was deploying its initiatives as described or that PG&E accurately communicated standards to its on-the-ground workforce.

7.0 CONCLUSION

After considering all the sources of information before it, Energy Safety finds that PG&E failed to substantially comply with its 2020 WMP during the compliance period. Energy Safety

[223] May 7, 2021 – GO 165 Inspection Letter, Self-Identified WMP Update Letters: https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/GO-165-Inspection-Self-Report.pdf.

acknowledges that PG&E undertook significant efforts to reduce its wildfire risk, and in many instances, PG&E achieved its objectives and targets. However, on balance, PG&E's failure to meet targets highly correlated with risk, failure to meet critical stated objectives, failure to sufficiently address risk on the system, and the persistence of systemic data governance and communication issues demonstrate that PG&E still has significant operational and organizational improvements to make to reduce the risk of its infrastructure causing a catastrophic wildfire. The scope of this final compliance assessment of the 2020 WMP is limited to the 2020 compliance period, January 1 – December 31, 2020. Energy Safety acknowledges that PG&E has taken steps in 2021 and 2022 to address failings identified in this ARC. Energy Safety views PG&E's efforts to identify and take corrective actions transparently and quickly to address 2020 failures as a positive step towards improvement. PG&E's performance over time will demonstrate whether it is successfully reducing the risk of its infrastructure causing a catastrophic wildfire. Energy Safety, through its ongoing compliance assurance activities, is committed to holding PG&E and all electrical corporations to the highest standards in their implementation of their wildfire mitigation plans and ensure they move as quickly and effectively as possible to ultimately achieve the elimination of utility-caused catastrophic wildfires in California.

APPENDIX

LIST OF PUBLIC DOCUMENTS REFERENCED

APPENDIX

In performing this ARC, Energy Safety reviewed the following publicly available records and documents:

1. PG&E 2020 WMP (PG&E 2020 Wildfire Mitigation Plan Report Updated February 28, 2020): https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/2020-Wildfire-Safety-Plan.pdf
2. PG&E 2020 WMP Attachment 1 tables: https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/Attachment-1-Tables-updated.xlsx
3. 2020 WMP Guidelines: https://energysafety.ca.gov/wp-content/uploads/docs/misc/docket/322133494.pdf
4. Resolution M-4852, dated April15,2021: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M377/K568/377568108.PDF#:~:text=RESOLUTION%20M-4852%3A%20PLACING%20PACIFIC%20GAS%20AND%20ELECTRIC%20COMPANY,PROCESS%E2%80%9D%20ADOPTED%20IN%20DECISION%2020-05-053%20decision%20SUMMARY%20with
5. PG&E's Enhanced Vegetation Management Pre-Inspection Procedure: https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/reference-docs/TD-7106P-01.pdf
6. PG&E's Enhanced Oversight and Enforcement Process Corrective Action Plan 90 Day Report Pursuant Resolution M-4852 November 04, 2021: https://www.cpuc.ca.gov/-/media/cpuc-website/industries-and-topics/documents/pge/oversight-and-enforcement/corrective-action-plan_november-90-day-report_110421.pdf
7. PG&E Independent Monitor Report of November 19, 2021: https://www.courthousenews.com/wp-content/uploads/2021/12/pge-monitor-report.pdf
8. CPUC Resolution WSD-002: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M340/K859/340859823.PDF
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