



September 5, 2024

Dear Stakeholders,

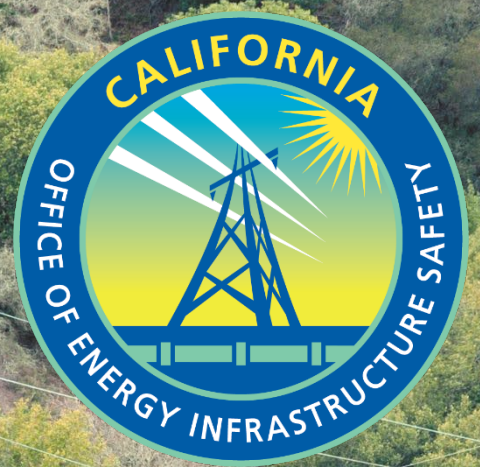
Enclosed is the Office of Energy Infrastructure Safety's Annual Report on Compliance regarding Pacific Gas and Electric Company's execution of its 2021 Wildfire Mitigation Plan.

This Annual Report on Compliance is hereby published as of the date of this letter. Pacific Gas and Electric Company may, if it wishes to do so, file a public response to this Annual Report on Compliance within 14 calendar days of the date of publication. Comments must be submitted to the Office of Energy Infrastructure Safety's E-Filing system in the 2021 Annual Report on Compliance docket.

Sincerely,

Patrick Doherty

Patrick Doherty
Program Manager | Compliance Assurance Division
Electrical Infrastructure Directorate
Office of Energy Infrastructure Safety



OFFICE OF ENERGY INFRASTRUCTURE SAFETY
ANNUAL REPORT ON COMPLIANCE
PACIFIC GAS AND ELECTRIC COMPANY
2021 WILDFIRE MITIGATION PLAN UPDATE

September 2024

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Executive Summary

The Office of Energy Infrastructure Safety (Energy Safety) is charged with completing an annual review of California's electrical corporations' compliance with their approved Wildfire Mitigation Plans (WMP) and WMP Updates. Energy Safety's Annual Reports on Compliance (ARC) are produced 18 months after the electrical corporations complete a self-review of compliance (EC ARC) of their approved plans and an independent evaluator completes their own review of electrical corporation compliance with approved plans.

Energy Safety's evaluation found that overall Pacific Gas and Electric Company (PG&E) had mixed outcomes related to implementation of its 2021 WMP update.

PG&E completed the large majority of its 2021 WMP Update initiatives (132 of 147 or 90%), including seven of the 10 initiatives with the largest allocated expenditure. PG&E also met its 2021 WMP Update objective of reducing the scope and impact of PSPS events.

At the same time, PG&E's normalized ignitions increased in 2021 relative to 2020. The consequences of ignitions attributable to PG&E infrastructure were significant, resulting in the catastrophic Dixie Fire, among other fires. The increase in wildfire activity in 2021 led to an increase in acreage burned, structures destroyed, and value of property destroyed compared to 2020. They also resulted in one fatality and five injuries.

Energy Safety considered all compliance assessments completed with respect to approved 2021 WMP Update, including audits, field inspections, and analysis of data submitted by PG&E to Energy Safety. Energy Safety considered PG&E's self-assessment in its Electrical Corporation Annual Report on Compliance and the findings of its Independent Evaluator. Energy Safety also analyzed metrics related to PG&E's performance including ignition, wire down, outage, and Public Safety Power Shutoff (PSPS) risk during the 2021 WMP Update compliance period.

Energy Safety acknowledges that PG&E undertook significant efforts to reduce its wildfire risk, and in many instances PG&E achieved its 2021 WMP Update initiative targets. PG&E was also responsible for wildfires that led to one fatality, five injuries, large amounts of acreage burned, structures destroyed, and value of property destroyed in 2021. As a result, PG&E failed to meet two of its 2021 WMP Update objectives -- to reduce ignition potential and wildfire spread during the 2021 compliance period. This demonstrates that in 2021 there remained an ongoing need for PG&E to improve its performance and learn from its experiences.

1. Introduction and Background

This Annual Report on Compliance (ARC) presents the Office of Energy Infrastructure Safety's (Energy Safety's) assessment of Pacific Gas and Electric Company's (PG&E's) compliance with its 2021 Wildfire Mitigation Plan (WMP) Update.¹

PG&E submitted its 2021 WMP Update on February 5, 2021.² Energy Safety evaluated the 2021 WMP Update and issued a Corrected Revision Notice on May 7, 2021.³ PG&E submitted its revised 2021 WMP Update on June 3, 2021.⁴ Energy Safety approved PG&E's WMP on September 22, 2021.⁵

1.1 Legal Authority

Energy Safety is responsible for overseeing compliance with electrical corporations' WMPs.⁶ Energy Safety has broad authority to obtain and review information and data and to inspect property, records, and equipment of every electrical corporation in furtherance of its duties, powers, and responsibilities.⁷ In addition to performing an overall assessment of compliance⁸ with the WMP, Energy Safety audits each electrical corporation's vegetation management work for compliance with WMP requirements⁹ and performs other reviews and audits. Energy Safety may rely upon metrics¹⁰ to evaluate WMP Compliance, including performance metrics adopted by the California Public Utilities Commission (CPUC).¹¹ Annually, in consultation with

¹ California Public Utilities Code § 8386.3(c).

² Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report," Feb. 5, 2021. [Online] Available: <https://energysafety.ca.gov/wp-content/uploads/docs/wmp-2021/pge-2021-wmp-update.pdf>.

³ Office of Energy Infrastructure Safety, "Corrected Revision Notice on PG&E's 2021 WMP Update," May 7, 2021. [Online] Available: <https://energysafety.ca.gov/wp-content/uploads/docs/misc/wmp/2021/utility/pge/pge-wmp-revision-notice-correction-clean.pdf>.

⁴ Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021.

⁵ Office of Energy Infrastructure Safety, "Final Action Statement on 2021 Wildfire Mitigation Plan Update." Sep. 22, 2021. [Online] Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51745&shareable=true>

⁶ California Public Utilities Code § 8386.3(c).

⁷ California Government Code § 15475.

⁸ California Public Utilities Code § 8386.3(c)(4).

⁹ California Public Utilities Code § 8386.3(c)(5)(A).

¹⁰ California Public Utilities Code §§ 326(a)(2), 8389(b)(1).

¹¹ California Public Utilities Code § 8389(d)(1).

Energy Safety, the CPUC adopts a wildfire mitigation plan compliance process.¹² The CPUC adopted the 2021 Compliance Process via Resolution M-4860 on December 2, 2021.^{13, 14}

1.2 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.¹⁵

Public Utilities Code section 326(a)(3) requires Energy Safety to 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 an Electrical Corporation Annual Report on Compliance (EC ARC) addressing the electrical corporation's compliance with its plan during the prior calendar year.¹⁶
- 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 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.¹⁷
- 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 WMP. Energy Safety then grants the electrical corporation a reasonable amount of time to correct

¹² California Public Utilities Code § 8389(d)(3).

¹³ California Public Utilities Commission, "Resolution M-4860," Dec. 02, 2021. [Online]. Available: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M428/K722/428722129.PDF>.

¹⁴ Office of Energy Infrastructure Safety, "Compliance Process for 2021 Wildfire Mitigation Plans," Oct. 13, 2021. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/compliance-process/docs/compliance-process-for-2021-wmps.pdf>.

¹⁵ California Public Utilities Commission, "Compliance Operational Protocols," Feb. 16, 2021. p. 1. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsd/2021.02.16-compliance-operational-protocols.pdf>.

¹⁶ California Public Utilities Code § 8386.3(c)(1).

¹⁷ California Public Utilities Code § 8386.3(c)(2)(B)(i).

and eliminate any deficiency specified in the audit.¹⁸ 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.¹⁹

- Within 18 months after the electrical corporation submits its compliance report pursuant to Public Utilities Code section 8386.3(c)(1), Energy Safety must complete its annual compliance review.²⁰ Energy Safety memorializes the findings of its compliance review in this ARC.

¹⁸ California Public Utilities Code § 8386.3(c)(5)(A).

¹⁹ *Id.*

²⁰ California Public Utilities Code § 8386.3(c)(4).

2. ARC Compliance Framework

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. Each electrical corporation is required to construct, maintain, and operate its infrastructure in a manner that will minimize the risk of catastrophic wildfire.²¹

Energy Safety's compliance assessment examines the totality of data and findings before the department. Compliance is the successful implementation of the electrical corporation's stated narratives, actions, targets, outcome metrics, and objectives in the electrical corporation's approved WMP, including providing supporting documentation. Energy Safety aims to ensure WMP implementation through the authorities and requirements outlined in Public Utilities Code sections 8386 – 8389.

Energy Safety considers the following as part of its assessment:

1. Whether the electrical corporation implemented the wildfire mitigation initiatives in its approved WMP, including evaluating whether the electrical corporation funded and performed the commitments stated for each initiative. Further, whether the electrical corporation prioritized completion of work with the highest potential for reducing wildfire risk.²²
2. Whether the electrical corporation achieved or sufficiently progressed its WMP objectives.
3. Wildfire risk reduction, including the performance of the electrical corporation's infrastructure relative to its wildfire risk, as measured by changes in the occurrence of events that correlate to wildfire risk.
4. Whether the electrical corporation made a good faith attempt to achieve its goals and comply with its WMP.
5. Whether the electrical corporation exhibited issues related to its execution, management, or documentation in the implementation of its WMP. This analysis may expand beyond the scope of any single WMP initiative.²³

²¹ Public Utilities Code § 8386(a).

²² Energy Safety evaluates funding data to ensure electrical corporations are dedicating resources to their initiative commitments. Energy Safety does not evaluate whether the cost of implementing each electrical corporation's plan was just and reasonable.

²³ Office of Energy Infrastructure Safety, "Compliance Guidelines," Sep. 2023. p. 16. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=55586&shareable=true>.

3. PG&E's 2021 WMP Update

This section provides a summary of PG&E's commitments in its 2021 WMP Update. This section organizes PG&E's commitments into two major categories:

1. 2021 WMP Update Objectives
2. 2021 WMP Update Initiatives

3.1 2021 WMP Update Objectives

The 2021 WMP Update Guidelines required each electrical corporation to describe the specific objectives of its 2021 WMP Update with respect to the following timeframes: Before the next Annual WMP Update; within the next three years; and within the next 10 years (i.e., long-term planning beyond the three-year cycle).²⁴

In reviewing compliance with PG&E's 2021 WMP Update, Energy Safety considered whether PG&E achieved or sufficiently progressed the objectives it set out to achieve before the next Annual WMP Update.

PG&E's overall objective for the 2021 WMP Update was to reduce the risk and consequences of wildfires associated with utility electrical equipment. To that end, PG&E's stated objectives to achieve before the next Annual WMP Update were:

- Reducing wildfire ignition potential,
- Reducing wildfire spread through enhanced situational awareness, and
- Reducing the impact of Public Safety Power Shutoff (PSPS) events.²⁵

3.2 2021 WMP Update Initiatives

The 2021 WMP Update Guidelines required each electrical corporation to group its discussion of wildfire mitigation initiatives into the 10 categories listed in Table 1 below.

²⁴ California Public Utilities Commission, "Resolution WSD-011 Attachment 2.2: 2021 Wildfire Mitigation Plan Guidelines Template," Nov. 2020. p. 29. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/wmp-2021/attachment-2.2-to-wsd-011-2021-wmp-guidelines-template.pdf>.

²⁵ Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. p. 252.

PG&E's 2021 WMP Update included a total of 118 initiatives with targets,²⁶ allocated across all 11 categories,^{27, 28} which PG&E further subdivided into 147 unique sub-initiatives with targets. For the purposes of this ARC, Energy Safety considers the 147 unique sub-initiatives as PG&E's complete list of 2021 WMP Update initiatives with targets.²⁹

Table 1 below provides a summary of PG&E's allocation of WMP initiatives across categories, its reported planned expenditure in each category for 2021, and the percentage of the planned 2021 WMP Update expenditure per initiatives category.

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).

Table 1: PG&E's 2021 WMP Update Planned Expenditure by Category

| Initiative Category | No. of Initiatives | 2021 Planned Expenditure (\$K) | % Of 2021 WMP Update Planned Budget |
|---|--------------------|--------------------------------|-------------------------------------|
| 1. Risk assessment and mapping | 8 | \$6,841 | 0.14% |
| 2. Situational awareness and forecasting | 25 | \$49,789 | 1.02% |

²⁶ Page 418 of PG&E's WMP states a count of 124 initiatives. Upon review and count of these initiatives in section 7.3 of the WMP, Energy Safety finds there are actually 118 listed initiatives. Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. p. 418.

²⁷ Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. pp. 424-915.

²⁸ The 2021 WMP Update Guidelines provided 10 initiatives categories: 1. Risk assessment and mapping, 2. Situational awareness and forecasting, 3. Grid design and system hardening, 4. Asset management and inspections, 5. Vegetation management and inspections, 6. Grid operations and protocols, 7. Data governance, 8. Resource allocation methodology, 9. Emergency planning and preparedness. 10. Stakeholder cooperation and community engagement. Office of Energy Infrastructure Safety, "Attachment 2.2: 2021 Wildfire Mitigation Plan Guidelines Template," Nov. 2020. p. 43. [Online] Available: <https://energysafety.ca.gov/wp-content/uploads/docs/wmp-2021/attachment-2.2-to-wsd-011-2021-wmp-guidelines-template.pdf>.

²⁹ The 147 sub-initiatives include six initiatives associated with an extraneous "Protocols on Public Safety Power Shutoff" category, and four of these initiatives were not added by PG&E until Quarter 3 and were therefore not discussed in the WMP update or allocated planned expenditure. Pacific Gas and Electric Company, "PG&E 2021 Q2 QIU." Aug. 2, 2021. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51717&shareable=true>.

| Initiative Category | No. of Initiatives | 2021 Planned Expenditure (\$K) | % Of 2021 WMP Update Planned Budget |
|---|--------------------|---------------------------------|-------------------------------------|
| 3. Grid design and system hardening | 37 | \$2,636,461 ³⁰ | 53.88% |
| 4. Asset management and inspections | 15 | \$266,904 | 5.45% |
| 5. Vegetation management and inspections | 23 | \$1,507,398 | 30.80% |
| 6. Grid operations and protocols | 7 | \$192,059 | 3.92% |
| 7. Data governance | 7 | \$147,362 | 3.01% |
| 8. Resource allocation methodology | 3 | \$7,121 | 0.15% |
| 9. Emergency planning and preparedness | 9 | \$26,341 | 0.54% |
| 10. Stakeholder cooperation and community engagement | 7 | \$53,248 | 1.09% |
| 11. Protocols on Public Safety Power Shutoff (PSPS)³¹ | 6 ³² | \$0 | \$0 |
| Total | 147 | \$4,893,524³³ | 100% |

Table 2 below provides an overview of PG&E's planned 2020-2022 WMP expenditure.

³⁰ While Table 3-2 of PG&E's WMP states a planned expenditure of \$2,636,461,000 for grid design and system hardening, the Q4 2020 QDR, which is attached to the WMP, has a planned expenditure of \$2,698,098,000. Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. p. 38.

³¹ PG&E added six additional initiatives of focus under WMP Update Section 8.2 which were tracked throughout the year. These initiatives focus on minimizing public safety risk during high wildfire risk conditions and customer communications.

³² Initiative targets for Protocols on Public Safety Power Shutoff did not have expenditure allocated to them in the 2021 WMP Update. However, PG&E reported and treated these targets as full initiatives within its QIUs. As such, these six initiatives were included within the total initiative count.

³³ For the purposes of this ARC, Energy Safety considers Table 3-2 as PG&E total planned expenditure for 2021. Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. p. 38.

Table 2: PG&E's Planned Expenditure by Year³⁴

| Year | Planned Expenditure (\$K) |
|------------------------------|----------------------------------|
| 2020 | \$4,809,851 |
| 2021 | \$4,893,524 |
| 2022 | \$5,117,490 |
| 2020-2022 Plan Period | \$14,820,865³⁵ |

Table 3 lists the 10 initiatives by highest planned expenditure. The last row in Table 3 shows that the 10 listed initiatives make up 72% of PG&E's total 2021 WMP Update planned expenditure.

Table 3: PG&E's 2021 WMP Update Top 10 Planned Expenditure Initiatives³⁶

| Initiative Number | Initiative | 2021 Planned Expenditure (\$K) | % of WMP Planned Budget |
|-------------------|---|--------------------------------|-------------------------|
| 7.3.5.2 | Detailed inspections of vegetation around distribution electric lines and equipment | \$1,065,059 | 22% |
| 7.3.3.12.3 | Other corrective action, Maintenance, Transmission | \$543,567 | 11% |
| 7.3.3.17.1 | Updates to grid topology to minimize risk of ignition in High Fire Threat Districts | \$338,400 | 7% |

³⁴ Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. p. 37.

³⁵ While Table 3-2 of PG&E's WMP states a total of \$14,832,284,000 for the 2020-2022 plan period, the addition of the 2020, 2021, and 2022 planned expenditures equates to \$14,820,865,000.

³⁶ Pacific Gas and Electric Company, "Wildfire Safety Division Attachment 2.3 Wildfire Mitigation Plan Quarterly Report – Q4 2020 (Table 12)," Feb. 5, 2021.

| Initiative Number | Initiative | 2021 Planned Expenditure (\$K) | % of WMP Planned Budget |
|--------------------------------|---|--------------------------------|-------------------------|
| | (HFTDs), System Hardening, Distribution | | |
| 7.3.3.12.4 | Other corrective action, Maintenance, Distribution | \$323,913 | 6% |
| 7.3.3.17.2³⁷ | Updates to grid topology to minimize risk of ignition in HFTDs, System Hardening, Transmission | \$314,114 | 6% |
| 7.3.3.6 | Distribution pole replacement and reinforcement, including with composite poles | \$304,465 | 6% |
| 7.3.5.3 | Detailed inspections of vegetation around transmission electric lines and equipment | \$187,153 | 4% |
| 7.3.3.11.1³⁸ | 7.3.3.11.1 Mitigation of impact on customers and other residents affected during PSPS event, Generation for PSPS Mitigation | \$150,842 | 3% |
| 7.3.7.5 | 7.3.7.5 Other, Information Technology (IT) projects to support wildfire mitigation work | \$142,763 | 3% |

³⁷ This expenditure is inclusive of initiatives 7.3.3.17.2-1 and 7.3.3.17.2-2.

³⁸ This expenditure is inclusive of initiatives 7.3.3.11.1A – 7.3.3.11.1E.

| Initiative Number | Initiative | 2021 Planned Expenditure (\$K) | % of WMP Planned Budget |
|------------------------------|---|---------------------------------------|--------------------------------|
| 7.3.5.15³⁹ | 7.3.5.15 Remediation of at-risk species | \$136,470 | 3% |
| Total | | \$3,506,746 | 72% |

³⁹ This expenditure is inclusive of initiatives 7.3.5.15-1 and 7.3.5.15-2.

4. Information Sources Used for ARC Assessment

Energy Safety relied upon the following sources of information to conduct its analysis for PG&E's ARC:

- Information provided by PG&E via the EC ARC and quarterly initiative update (QIU).
- Information provided by PG&E's independent evaluator via the IE ARC.
- Findings from Energy Safety field inspections.
- Findings from Energy Safety audits and assessments of PG&E.
- Data submitted to Energy Safety by PG&E, including responses to data requests.⁴⁰
- Information provided by third parties also engaged in assessment activities of PG&E.

This section provides the most relevant information from the sources listed above for the purposes of Energy Safety's assessment of PG&E's compliance with its 2021 WMP Update.

4.1 Electrical Corporation (EC) ARC

4.1.1 Background

Three months after the end of the compliance period, the electrical corporation must submit its own annual report on compliance (known as the EC ARC). The Compliance Operational Protocols outline the minimum requirements and structure for each electrical corporation's 2021 EC ARC.⁴¹ The 2021 EC ARCs must include:

- An assessment of whether the electrical corporation achieved its risk reduction intent by implementing all of its 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 reference where associated corrective actions were incorporated in its most recently submitted WMP.
- A full and complete listing of all Change Orders⁴² and any other operational changes, such as initiative location changes, made to WMP initiatives, with an explanation of

⁴⁰ Energy Safety receives data from the electrical corporation through three main paths: quarterly advice letter/quarterly notification submissions, quarterly data request submissions, and quarterly initiative updates.

⁴¹ California Public Utilities Commission, "Compliance Operational Protocols," Feb. 16, 2021. pp. 10-12. [Online]. Available: <https://energysafety.ca.gov/wp-content/uploads/docs/misc/wsd/2021.02.16-compliance-operational-protocols.pdf>.

⁴² California Public Utilities Commission, "Resolution WSD-002," Jun. 16, 2020. pp. 32-35. [Online]. Available: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M340/K859/340859823.PDF>.

why the changes were necessary, and an assessment of whether the changes achieved the same risk reduction intent.

- Descriptions of all planned WMP initiative expenditures versus actual WMP initiative expenditures and an explanation of any differentials between the planned and actual expenditure.
- A description of whether the implementation of WMP initiatives changed the threshold(s) for triggering a 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.

4.1.2 Relevant Information

PG&E timely submitted its EC ARC on March 31, 2022. In its EC ARC, PG&E did not provide updates regarding all 147 WMP Update initiatives. Instead, PG&E provided a summary of performance for a subset of 53 commitments which it set out to achieve before the next WMP update. For a complete progress update on its 147 initiatives, PG&E refers to its QIU.

PG&E stated that of the subset of 53 commitments, all 53 were completed by the end of 2021.

As previously stated, PG&E did not consistently report on whether it met or missed specific targets for all of its 147 initiatives. As a result, this section does not attempt to further describe missed initiative targets and PG&E's explanation. Additional information from the EC ARC is included in Appendix A and is discussed, as relevant, in Section 5 of this report.

4.2 Independent Evaluator (IE) ARC

4.2.1 Overview

Each year before March 1, Energy Safety, in consultation with the Office of the State Fire Marshal, must publish a list of qualified independent evaluators.⁴³ An electrical corporation must engage an independent evaluator from the list to review and assess its compliance with its approved WMP.⁴⁴ The independent evaluator must issue its IE ARC by July 1 of each year, covering the previous calendar year.⁴⁵ Energy Safety considered the independent evaluator's findings in this ARC. However, the independent evaluator's findings are not binding on Energy Safety's final determination of WMP compliance.⁴⁶

⁴³ Public Utilities Code § 8386.3(c)(2)(A).

⁴⁴ Public Utilities Code § 8386.3(c)(2)(B).

⁴⁵ Public Utilities Code § 8386.3(c)(2)(B).

⁴⁶ Public Utilities Code § 8386.3(c)(2)(B)(ii).

4.2.2 Relevant Information

PG&E selected Bureau Veritas North America, Inc. as the independent evaluator (IE) to assess its compliance with its 2021 WMP Update. Bureau Veritas North America, Inc. issued its IE ARC on June 30, 2022.

The IE evaluated 147 initiatives. Of those, the IE found PG&E noncompliant with three.

Table 4 below provides a summary of the IE's findings. A finding of "Undetermined" means the IE was unable to determine whether PG&E met its WMP target.

Table 4: Summary of PG&E IE ARC Findings

| Finding Category | Number of Initiatives |
|---------------------|-----------------------|
| Compliant | 144 |
| Noncompliant | 3 |
| Undetermined | 0 |
| Total | 147 |

The three initiatives with IE findings of noncompliance are provided below:

- 7.3.3.13 - Pole loading infrastructure hardening and replacement program based on pole loading assessment program
 - IE Finding: PG&E completed 61,710 of 160,000 planned assessments in 2021.⁴⁷
 - PG&E agrees this initiative was delayed. PG&E stated that there were quality issues with its vendor, and so a new contract had to be reviewed to ensure the quality of work.
- 7.3.4.11 - Pole inspections of distribution electric lines and equipment
 - IE Finding: While PG&E completed 1,734,251 out of 1,734,253 planned inspections in 2021, the IE found that a third of the 1,250 sampled inspection

⁴⁷ Bureau Veritas North America, "Final Independent Evaluator Annual Report on Compliance" Jun. 30, 2022. p. 42. [Online]. Available: <https://efiling.energy.ca.gov/eFiling/Getfile.aspx?fileid=52691&shareable=true>.

documents were inaccurate. The IE therefore determined that the initiative target was not truly attained.⁴⁸

- PG&E did not report that it did not perform all the work required by this initiative.
- 7.3.4.13 - Pole loading assessment program to determine safety factor
 - IE Finding: For this initiative, PG&E referred the IE to its work performed under initiative 7.3.3.13, where PG&E only completed 61,710 of 160,000 planned assessments in 2021. The IE determined that PG&E did not meet this initiative target, as PG&E did not provide data showing that the target was met.⁴⁹
 - PG&E agreed that this initiative was delayed. PG&E confirmed there were quality issues with the first vendor, and so a new contract had to be reviewed to ensure the quality of work.

After considering PG&E's response to the IE ARC, Energy Safety agrees with the three IE findings of noncompliance. Those are:

- 7.3.3.13 - Pole loading infrastructure hardening and replacement program based on pole loading assessment program.
- 7.3.4.11 - Pole inspections of distribution electric lines and equipment.
- 7.3.4.13 - Pole loading assessment program to determine safety factor.

Additional information from the IE ARC is discussed, as relevant, in Section 5 of this report.

4.3 Inspections

4.3.1 Overview

Pursuant to Public Utilities Code section 326(a)(3), Energy Safety conducts field inspections of each electrical corporation's infrastructure to ensure WMP compliance. For WMP work performed by an electrical corporation in 2021, Energy Safety conducted field inspections of each electrical corporation's infrastructure to validate WMP compliance and assess infrastructure for deficiencies, errors, or conditions with the potential to increase ignition risk.

In November 2021, Energy Safety transitioned from Inspection Program v1 to Inspection Program v2. Inspections conducted in 2021 under Inspection Program v1 were general

⁴⁸ 427 of 1,250 sampled inspection documents (34%) were found to have inconsistencies between database information and pictures taken in the field, such as inconsistent or missing barcode information. Bureau Veritas North America, "Final Independent Evaluator Annual Report on Compliance" Jun. 30, 2022. p. 43. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52691&shareable=true>.

⁴⁹ Bureau Veritas North America, "Final Independent Evaluator Annual Report on Compliance" Jun. 30, 2022. p. 44. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52691&shareable=true>.

inspections of the electrical corporation's infrastructure. During Inspection Program v1, all findings were issued to the Electrical Corporations as defects. Inspections conducted under Inspection Program v2 are comprised of two types of inspections: WMP inspections and General Wildfire Safety (GWS) Inspections. WMP inspections are specific to WMP initiative completeness and utilize information contained in the electrical corporations' quarterly data report (QDR) submissions. During WMP inspections, Energy Safety ensures that the data reported by the electrical corporation is accurate, that the electrical corporation completed the initiative activity as reported, and that the electrical corporation adhered to the applicable initiative protocols and procedures. If Energy Safety finds inaccurate data, incomplete work, or that the electrical corporation failed to adhere to protocols or procedures, it issues a Notice of Violation (NOV) to the electrical corporation.

GWS inspections assess electrical corporation infrastructure for deficiencies, errors, or conditions with the potential to increase ignition risk. If Energy Safety finds a deficiency, error, or condition with the potential to increase the risk of ignition, a Notice of Defect (NOD)^{50, 51} is issued. An NOD is defined as "A deficiency, error, or condition increasing the risk of ignition posed by electrical lines and equipment."

4.3.2 Relevant Information

Energy Safety performs inspections utilizing an electrical corporation's initiative activity data applicable to the WMP year compliance period. Energy Safety conducted 7,153 inspection activities in PG&E's service territory in 2021.

Under Inspection Program v1, defects found during Energy Safety's inspections generally pertained to poor pole condition, excessive splices on bare conductor, vegetation touching guy wires above the insulator, and insufficient radial vegetation clearances. PG&E timely corrected the defects identified by Energy Safety.

Under Inspection Program v2, defects and violations found during Energy Safety's inspections generally pertained to excessive splices on bare conductor, poor crossarm and pole conditions such as excessive leaning and cracking, Geographic Information System (GIS) data accuracy issues, vegetation touching guy wires above the insulator, radial vegetation clearances, and hazard trees. PG&E timely corrected the defects identified by Energy Safety.

4.4 Audits

4.4.1 Overview

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

⁵⁰ Government Code § 15475.2.

⁵¹ 14 California Code Regulations § 29302(b)(1).

portion"⁵² 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 8386.3(c)(5), Energy Safety conducted an audit of PG&E's compliance with the vegetation management requirements in its 2021 WMP Update.

4.4.2 Relevant Information

On October 20, 2023, Energy Safety issued its SVM Audit for PG&E.⁵³ The purpose of the SVM Audit is to assess whether PG&E met its quantitative commitments and verifiable statements in its 2021 WMP Update related to vegetation management activities.

In the SVM Audit, Energy Safety found that PG&E did not perform the work required for nine of 20 initiatives and required PG&E to perform 12 corrective actions. Energy Safety required PG&E to provide a response in its Corrective Action Plan.

After reviewing PG&E's Corrective Action Plan, on February 2, 2024, Energy Safety issued its SVM Audit Report finding that PG&E provided an acceptable response or Corrective Action for five of the 12 corrective actions.⁵⁴ Energy Safety found that overall, PG&E substantially complied with the substantial portion of the vegetation management requirements in its 2021 WMP Update

The specific findings from Energy Safety's SVM Audit Report are detailed in Appendix B.

4.5 Data

4.5.1 Overview

Energy Safety analyzed performance metrics and other data in assessing PG&E's performance of the work required by its 2021 WMP Update. Energy Safety required each electrical corporation to submit spatial and non-spatial data through QIUs, QDRs, and Quarterly Notifications (QNs).

4.5.2 Relevant Information

Energy Safety analyzed whether PG&E met its 2021 WMP Update quantitative and qualitative initiative targets and analyzed performance of PG&E's infrastructure relative to certain ignition risk and outcome metrics.

- Energy Safety's Initiative Performance Analysis is detailed in Appendix C.

⁵² Public Utilities Code § 8386.3(c)(5)(A).

⁵³ Office of Energy Infrastructure Safety, "2021 WMP Update Substantial Vegetation Management Audit," Oct. 20, 2023. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=55845&shareable=true>.

⁵⁴ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," Feb. 2024. p. 29. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

- Energy Safety's Ignition Risk and Outcomes Metrics Analysis is detailed in Appendix D.
- Findings from those analyses are included, as relevant, in the Discussion section of this report.

4.6 Third-Party Reports

4.6.1 Overview

When available, Energy Safety also utilizes authoritative, third-party reports to inform its compliance assessment. For example, Energy Safety may utilize CPUC and California Department of Forestry and Fire Protection wildfire investigation reports, wildfire activity statistics, and other reports to supplement and corroborate the evidence collected during its compliance assessment of the electrical corporation.

5. Discussion

This section provides Energy Safety's assessment of PG&E's performance in 2021 in relation to each of the evaluation criteria set forth in Energy Safety's Compliance Guidelines:

1. Whether the electrical corporation implemented the wildfire mitigation initiatives in its approved WMP, including evaluating whether the electrical corporation funded and performed the commitments stated for each initiative. Further, whether the electrical corporation prioritized completion of work with the highest potential for reducing wildfire risk.⁵⁵
2. Whether the electrical corporation achieved or sufficiently progressed its WMP objectives.
3. Wildfire risk reduction, including the performance of the electrical corporation's infrastructure relative to its wildfire risk, as measured by changes in the occurrence of events that correlate to wildfire risk.
4. Whether the electrical corporation made a good faith attempt to achieve its goals and comply with its WMP.
5. Whether the electrical corporation exhibited issues related to its execution, management, or documentation in the implementation of its WMP. This analysis may expand beyond the scope of any single WMP initiative.

5.1 Criterion 1: 2021 WMP Update Initiative Implementation

This section considers whether PG&E implemented the wildfire mitigation initiatives in its approved WMP, including evaluating whether PG&E funded and performed the commitments stated for each initiative.

To accomplish this, Energy Safety assessed:

1. Whether PG&E met the quantitative and qualitative targets provided in its 2021 WMP Update, and
2. The extent to which PG&E funded each initiative.

⁵⁵ Energy Safety evaluates funding data to ensure electrical corporations are dedicating resources to their initiative commitments. Energy Safety does not evaluate whether the cost of implementing each electrical corporation's plan was just and reasonable.

5.1.1 Completion of 2021 WMP Update Quantitative and Qualitative Targets

Based on Energy Safety's analysis in conjunction with the department's review of the EC ARC and IE AEC, Energy Safety finds that PG&E substantially met or exceeded its targets for 132 of 147 initiatives. Of those 147, PG&E substantially met or exceeded 35 of 44 quantitative initiative targets,⁵⁶ 95 of 100 qualitative targets, and two of three initiatives with both quantitative and qualitative targets.

Energy Safety's analysis, detailed below, indicates that PG&E did not perform all the work required to meet 11 targets for various initiatives. Furthermore, PG&E did not establish that four other initiative targets were met because PG&E did not report data sufficient to support a conclusion.

Appendix C provides details at the initiative level on Energy Safety's comprehensive assessment of PG&E's performance against its stated initiatives. Unless otherwise stated, information in this subsection is sourced from PG&E's Q4 2021 QIU data.

The following are the 11 initiatives (nine quantitative, one qualitative, and one both quantitative and qualitative) for which PG&E did not substantially meet its targets:

Grid Design and System Hardening

1. Distribution pole replacement and reinforcement, including with composite poles (7.3.3.6):
 - Completed 3,013 of 4,100 reinforcements, a 73% completion rate.
 - PG&E reported that it reinforced 3,013 poles, instead of 4,100 poles as targeted, because less poles required reinforcement in 2021 than originally expected.⁵⁷ However, PG&E did not submit a Change Order request to reflect this adjustment and therefore Energy Safety considers the 2021 WMP Update target to be not met.⁵⁸
2. Generation enablement and deployment (7.3.3.11.1A):
 - In response to Data Request 195, PG&E reported that it was unable to secure a Clean Substation Project candidate site for testing and that the project has been delayed to the year 2024.

⁵⁶ A quantitative target is considered "substantially met" if the result is within 95% of the target.

⁵⁷ Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

⁵⁸ See, e.g., Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," p. 10, Feb. 2024. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true> ("As a preliminary matter, it is not within the electrical corporation's discretion to unilaterally change components of its plan, inclusive of targets, outside of the change order process").

3. Generation for PSPS mitigation (7.3.3.11.1C) (C.02):
 - Under this initiative, PG&E's 2021 WMP Update proposed to develop at least five additional distribution microgrid pre-installed Interconnection Hubs and collaborate with county and local government to ensure local priorities help shape site selection and design where technically feasible.
 - PG&E met its commitment to install five additional pre-installed Interconnection Hubs. However, in response to Data Request 195, PG&E provided documentation of coordination with local stakeholders, including the Placer County Water Authority, El Dorado County officials, the Middletown Rancheria of Pomo Indians of California, as well as the Butte County Sheriff's Office dated in 2020. PG&E's response also stated that the relevant outreach was completed as "discussions with stakeholders" in 2020. These responses did not demonstrate that PG&E collaborated with these stakeholders in 2021, and therefore Energy Safety does not consider this initiative to have been met.
4. Pole loading infrastructure hardening and replacement program based on pole loading assessment program (7.3.3.13):
 - Completed 61,723 of 161,000 pole loading calculations, a 38% completion rate.
 - PG&E reported that there were quality issues with the first vendor, and so a new contract had to be reviewed to ensure the quality of work. PG&E reported that the new vendor onboarded additional resources to increase production, but that the status of the initiative was delayed as of the end of 2021.⁵⁹

Asset Management and Inspections

5. Patrol inspections of distribution electric lines and equipment (7.3.4.11):
 - PG&E reported completing 1,183,849 of 1,181,000 inspections targeted under this initiative, a 100% completion rate.⁶⁰
 - The IE reported that 427 of 1,250 sampled inspection documents (34%) were found to have inconsistencies, such as inconsistent barcode information,⁶¹ and this finding leads Energy Safety to conclude that this initiative target should not be considered met despite the 100% completion rate.
6. Patrol inspections of transmission electric lines and equipment (7.3.4.12):
 - Completed 131,063 of 191,000 inspections, a 69% completion rate.
 - PG&E reported that it either miscalculated or misinterpreted the forecasted number of inspections in its 2021 WMP Update and stated that there were only

⁵⁹ Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

⁶⁰ Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

⁶¹ Bureau Veritas North America, "Final Independent Evaluator Annual Report on Compliance" Jun. 30, 2022. p. 43. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52691&shareable=true>.

approximately 150,000 assets possible to inspect.⁶² PG&E internally revised the target to 124,495 inspections, and exceeded that internal target, however PG&E did not submit a Change Order request to reflect this adjustment and therefore Energy Safety considers the 2021 WMP Update target to be not met.

7. Pole loading assessment program to determine safety factor (7.3.4.13):
 - For this initiative, PG&E did not report discrete work conducted solely for purpose of this initiative, and instead referred to its work performed under initiative 7.3.3.13 (Pole loading infrastructure hardening and replacement program based on pole loading assessment program) as supporting its goals for this initiative.⁶³ In any event, PG&E only completed 61,710 of 160,000 planned assessments in 2021, which resulted in a 38% completion rate.

Vegetation Management and Inspections

8. Detailed inspections of vegetation around transmission electric lines and equipment: formal documentation of prioritization of Integrated Vegetation Management (IVM) projects (7.3.5.3):
 - Completed 218 of 200 target miles, a 109% completion rate.
 - Energy Safety's SVM Audit Report found that this initiative was not met as PG&E did not demonstrate that 1) PG&E conducted onsite lopping, scattering, and chipping for fuel treatment, and 2) PG&E prioritized work based off vegetation age, which were both commitments PG&E made regarding how it would implement this initiative in its WMP.⁶⁴ This finding leads Energy Safety to conclude that this initiative target should not be considered met despite the 109% completion rate.
9. Substation inspections, distribution (7.3.5.17.1):
 - Completed 439 of 439 substation inspections, a 100% completion rate.
 - Energy Safety's SVM Audit Report found that 194 of the 439 inspections were completed from July to October 2020, and not within the November 15, 2020 to November 15, 2021 timeframe established by the 2021 WMP Update.⁶⁵ The SVM Audit Report found PG&E's corrective action plan responses on this initiative

⁶² Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

⁶³ In its Q4 QIU, PG&E reported that work under this initiative "is interconnected with the Pole loading hardening and replacement program (7.3.3.13)" and reported work on this initiative as "delayed" as of December 31, 2021. Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

⁶⁴ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," p. 20, Feb. 2024. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

⁶⁵ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," pp. 10-20, Feb. 2024. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

insufficient,⁶⁶ and this finding leads Energy Safety to conclude that this initiative target should not be considered met despite the 100% completion rate.

10. Substation inspections, transmission (7.3.5.17.2):

- PG&E's 2021 WMP Update committed to complete 41 inspections of electric transmission substations not within or adjacent to Tier 2 and Tier 3 HFTD areas between November 15, 2020 and November 15, 2021.⁶⁷ In its QIU, PG&E reported that it completed all of these inspections as of December 31, 2021.⁶⁸
- Energy Safety's SVM Audit Report stated that 19 of 41 inspections were completed prior to the November 15, 2020 through November 15, 2021 period established by the 2021 WMP Update. The SVM Audit Report found PG&E's corrective action plan responses on this initiative insufficient,⁶⁹ and this finding leads Energy Safety to conclude that this initiative target should not be considered met despite the 100% completion rate.

11. Substation vegetation management, distribution (7.3.5.18.1):

- Completed 166 of a 2021 WMP Update target of 176 substation maintenance operations, a 94% completion rate.
- In its QIU, PG&E reported that it reduced its target under this initiative to 170 in Q2 "due to listing substations with two or more switchyard as one location" and that 166 substation maintenance operations were completed by the end of Q2. PG&E stated that "the remaining 4 locations were unable to be completed because they have been delayed by the coastal development permit process, which has now lasted for over a full year."⁷⁰

⁶⁶ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," pp. 20-21, Feb. 2024. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

⁶⁷ Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. p. 743 (fn 94) ("PG&E's planned inspection timeframe for all assets is November 15 of the prior year through November 15 of the current year (i.e., 11/15/20-11/15/21 for the 2021 plan year) however delays including inaccessible facilities, sensitive environments or other limitations may delay some inspections for the current plan year by a few weeks, but still ensuring completion by the end of the end of the calendar year (i.e., 12/31/21)," and p. 746 ("In 2021, PG&E will inspect 41 [electric transmission] Substations not within a Tier 2 or 3 HFTD to achieve defensible space and fuel reduction beyond Tier 2 and Tier 3 HFTD").

⁶⁸ Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

⁶⁹ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," p. 13, Feb. 2024. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

⁷⁰ Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

- Energy Safety's SVM Audit Report found PG&E's corrective action plan responses on this issue to be insufficient.⁷¹
- PG&E did not submit a Change Order request to reflect its adjusted target, and given the findings from the SVM Audit Report, Energy Safety determines that this initiative's target has not been met.

Below are four initiatives for which Energy Safety was unable to determine compliance due primarily to PG&E's failure to provide data adequate to support a finding:

Vegetation Management and Inspections

1. Other discretionary inspection of transmission electric lines and equipment (7.3.5.10)
2. Patrol inspections of vegetation around transmission electric lines and equipment (7.3.5.12)
3. Removal and remediation of trees with strike potential to electric lines and equipment (7.3.5.16)
4. Vegetation management to achieve clearances around electric lines and equipment (7.3.5.20)

Overall, PG&E completed or substantially completed 90% of its 2021 WMP Update initiatives. Therefore, Energy Safety finds that PG&E completed a majority of its 2021 WMP Update initiatives.

5.1.2 2021 WMP Update Initiative Funding

Energy Safety evaluated the extent to which PG&E funded its initiative targets in its 2021 WMP Update, utilizing data from PG&E's EC ARC and IE ARC.

Each EC ARC includes descriptions of all planned WMP initiative expenditure versus actual expenditure and an explanation of any differences between the planned and actual expenditure.⁷²

PG&E did not provide expenditures (Planned vs. Actual) for all of its initiatives consistent with what is required by the Compliance Operational Protocols. As such, based on the EC ARC, Energy Safety was unable to analyze planned versus actual expenditure in the aggregate, and for certain individual initiatives.

Each IE ARC also includes a determination of whether the electrical corporation failed to fund any activities included in its WMP. In Table 25 of the IE ARC, PG&E was found to have an actual

⁷¹ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," pp. 14-15, Feb. 2024. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

⁷² California Public Utilities Commission, "Compliance Operational Protocols," Feb. 16, 2021. pp. 10-12. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52615&shareable=true>.

2021 expenditure of \$4,797,380,000 compared to its 2021 WMP Update planned expenditure of \$4,893,524,000. This is an expenditure of \$96,144,000 less than planned, or around 2% of the total projected expenditure.⁷³

Of the 19 total instances of significantly lower expenditure found by the IE (defined as having a total variance of more than \$10 million), one was associated with two initiatives Energy Safety concludes were not met. Initiative 7.3.3.11.1, which is inclusive of the planned expenditure for the five initiatives 7.3.3.11.1A-7.3.3.11.1E, had a capital under expenditure of \$30,809,310, or 65% less than planned. PG&E's explanation of this under expenditure was the Community Microgrid Enablement Program having a longer lead time, fewer substations being in scope for PSPS events, and fewer microgrids being in scope for infrastructure work. As described above in Section 5.1.1 and in Appendix C, Energy Safety concludes that initiatives 7.3.3.11.1A and 7.3.3.11.1C were not met.

While the initiatives identified above represent instances where PG&E did not meet or exceed its targets and expended less than forecast, Energy Safety did not find evidence of PG&E systematically failing to fund its planned initiatives. In terms of significance of completed initiatives relative to expenditure, PG&E completed targets for seven of the 10 initiatives evaluated with the largest planned expenditure.

5.2 Criterion 2: 2021 WMP Update Objectives

This section considers whether PG&E achieved or sufficiently progressed its 2021 WMP Update objectives.

PG&E's specific objectives for its 2021 WMP Update year (i.e., before the next Annual WMP Update) were:

- Objective 1: Reduce wildfire ignition potential.
- Objective 2: Reduce wildfire spread through enhanced situational awareness.
- Objective 3: Reduce the impact of PSPS events.

PG&E's performance relative to these objectives is discussed below.

5.2.1 Objective 1: Reduce wildfire ignition potential

PG&E's objective of reducing wildfire ignition potential was to be achieved through major initiatives that include vegetation management, inspections and repairs of electric facilities, a

⁷³ Energy Safety's initiative funding analysis deferred to using PG&E's approved 2021 WMP Update planned expenditure as opposed to the planned expenditure in the IE ARC. Bureau Veritas North America, "Final Independent Evaluator Annual Report on Compliance," Jun. 30, 2022. p. 107. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52691&shareable=true>.

system hardening program that upgrades transmission and distribution assets, and a system automation program that enhances visibility into and control of the system.⁷⁴

Carrying out Vegetation Management:

In its SVM Audit Report, Energy Safety found that PG&E substantially complied with the substantial portion of the vegetation management requirements in its 2021 WMP Update.⁷⁵

Within that report, Energy Safety found that PG&E did not complete, or did not provide sufficient information to determine completion for, a number of its vegetation management requirements in its 2021 WMP Update. PG&E identified 20 initiatives for the 2021 compliance period.⁷⁶ Of these 20 initiatives, Energy Safety found that PG&E substantially completed several of these initiatives, including but not limited to:

- Inspected 216 miles of a target of 200 miles of transmission right of way.
- Performed over 95% of routine and mid-cycle LiDAR transmission inspections.

PG&E missed targets for four significant vegetation management initiatives regarding substation management and substation inspections, for which PG&E either did not complete the required number of inspections within a specified timeframe or did not accurately forecast the number of inspections to complete for 2021. While these misses were by relatively narrow margins, or involved issues with timing of vegetation management activities rather than the activities themselves, they reflect that fact that PG&E's record keeping and data tracking did not allow for verification of work performed pursuant to PG&E's 2021 WMP Update.

In addition, there were four initiatives PG&E considered to be part of its Vegetation Management and Inspections activities for which PG&E did not provide adequate progress updates.⁷⁷ In these instances, the information provided by PG&E lacked the requisite detail to verify whether all work was performed.

Inspections and Repairs of Facilities:

⁷⁴ Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. p. 252 and Figure PG&E-5.2-1.

⁷⁵ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," p. 29, Feb. 2024. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

⁷⁶ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," p. 2, Feb. 2024. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

⁷⁷ These are initiatives 7.3.5.10, 7.3.5.12, 7.3.5.16, and 7.3.5.20. In each of these cases, Energy Safety's SVM Audit determined that PG&E did not perform the work required for them. Office of Energy Infrastructure Safety, "2021 Substantial Vegetation Management Audit, Pacific Gas and Electric Company," Oct. 2023, [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=55845&shareable=true>.

Energy Safety finds that PG&E sufficiently executed 2021 WMP Update initiative targets related to asset inspections and repair operations for its facilities in 2021.

PG&E completed 80% of its initiative targets related to asset management and inspections, but it did not meet targets for three of the 15 initiative targets. For two of these initiatives, PG&E did not complete a specified number of inspections between the stipulated time frames. For the third incomplete initiative, PG&E reported it miscalculated the targeted number of maintenance operations needed and amended its targets without going through a Change Order process.

Carrying out System Hardening:

Energy Safety finds that PG&E sufficiently executed 2021 WMP Update initiative targets related to grid hardening activities in 2021.

Within its Grid Design and System Hardening activities, PG&E identified 37 initiative targets for the 2021 compliance period. Of these 37 initiative targets, PG&E substantially completed 33 (89%), including but not limited to:

- 11,400 of 11,400 maintenance inspections of capacitors.
- 1,429 of 1,200 replacements of expulsion fuses.
- 269 of 250 installations of automated sectionalizing devices.
- 71 of 70 installations of automatic reclosers.
- 15,465 of 15,000 replacements of surge arrestors.

PG&E missed targets for four significant Grid Design and System Hardening initiatives, including distribution pole reinforcement, pole loading calculations, PSPS mitigation collaboration with local government, and finding a candidate site for the Clean Substation Project.

System Automation Program to Enhance Visibility Into/Control of the System:

Energy Safety finds that PG&E sufficiently executed 2021 WMP Update initiative targets related to system automation in 2021.

PG&E completed both of its initiative targets related to the installation of system automation equipment. PG&E reported the replacement of all remaining distribution line legacy 4C controllers still within Tier 2 and Tier 3 HFTD areas by the end of 2021. PG&E also reported the completion of its goal to install 70 sets of single phase reclosers, installing 71 by the end of 2021.

Overall, Energy Safety finds that PG&E sufficiently advanced some of the 2021 WMP Update initiative targets related to Objective 1. This progress at the initiative level should also be considered within the context of ignition and outcome metrics for 2021. PG&E's normalized ignitions increased in 2021 compared to 2020, as discussed in more detail in Section 5.3.1 below.

5.2.2 Objective 2: Reduce wildfire spread through enhanced situational awareness

PG&E's objective of reducing wildfire spread through enhanced situational awareness was to be achieved through monitoring of high-fire risk areas, enabling earlier detection and warning of wildfires, and more effective response by fire crews. PG&E also highlighted the importance of its Wildfire Safety Operations Center (WSOC) in monitoring for fire ignitions in real time, leveraging weather information, wildfire camera data, and publicly available weather information, as well as first responder and local and state data.⁷⁸

Improvements to Situational Awareness:

Within its Situational Awareness and Forecasting activities, PG&E identified 24 initiatives for the 2021 compliance period. Of these 24 initiatives, PG&E substantially completed, and in some cases exceeded, associated targets. These included improvements to PG&E's three areas of focus:

- Monitoring of high-fire risk areas
 - 158 of 135 installations of wildfire cameras in Tier 2 and Tier 3 areas.
 - Implemented Partial Voltage Detection capabilities to phase meters in HFTD and non-HFTD areas.
- Enabling earlier detection and warning of wildfires
 - 308 of 300 installations of weather stations to support situational awareness.
 - Development of a weather-station specific gust model based on machine-learning and statistical techniques.
 - Adjustment of public seven-day forecast to provide more clarity around the potential for a PSPS event by county.
 - Creation of a Diablo seasonal wind report based on AI and machine learning for a longer lead-time of incoming events.
 - Deployment of Early Fault Detection (EFD) on 25 locations and Distribution Fault Anticipation (DFA) on 16 locations for fault detection and anticipation.
- More effective response by fire crews
 - Maintained Safety and Infrastructure Protection Team staffing levels to support fire prevention activities.
 - Expanded the Active Incidents Dashboard to incorporate new data streams, streamline escalation, and expand the number of users.

⁷⁸ Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. p. 253.

Overall, Energy Safety finds that PG&E sufficiently advanced its 2021 WMP Update initiative targets related to Objective 2. Similarly to the discussion in Objective 1, progress in this area should also be considered within the context of overall outcomes. In 2021 there was one wildfire-related fatality and five injuries. Also in 2021, there was a significant increase in acreage burned, structures destroyed, and value of property destroyed due to PG&E wildfires compared to 2020. This increase is discussed in more detail in Section 5.3.2 below.

5.2.3 Objective 3: Reduce the impact of PSPS events

PG&E's objective of reducing the scale and impact of PSPS events was to be achieved by making them shorter, smaller, and smarter. The intent of "shorter" is to reduce the outage time after the weather has been cleared, "smaller" refers to reducing the number of customers impacted by each event given the event's weather footprint, and "smarter" referring to reducing the impact to customers and communities that are de-energized, along with executing PSPS with excellence.⁷⁹

In 2021, PG&E implemented procedures to respond to all outages in HFTDs as emergency responses, supporting shorter duration of PSPS events. As discussed in Section 5.3.1, PG&E's normalized length of PSPS events in 2021 declined compared to 2020 and the peak in 2019. In 2021, PG&E reported 5.5 million hours of customer interruption from PSPS events. In 2019 this number was 159 million, and in 2020 it was 30 million.

As discussed in Section 5.3.1, PG&E's normalized scope (or circuit events) of PSPS events in 2021 declined compared to 2020 and the peak in 2019. In 2021, PG&E reported 538 circuit events. In 2019 this number was 3,190, and in 2020 it was 1,082.

Finally, PG&E implemented an initiative to mitigate the impacts on de-energized customers during PSPS events, including continued use of its Disability Disaster Access and Resources Program and the Portable Battery Program. As discussed in Section 5.3.1, PG&E's normalized critical infrastructure impacted by PSPS events (measure by locations impacted multiplied by hours offline) in 2021 declined compared to 2020 and the peak in 2019. In 2021, PG&E reported a score of 51,151 for critical infrastructure impact. In 2019 this number was 810,941, and in 2020 it was 421,807.

Energy Safety finds that in 2021 PG&E reduced the amount of customer hours affected by PSPS events, reduced the impact scope of PSPS events, and reduced the impact to deenergized communities from PSPS events.

Therefore, Energy Safety finds that PG&E sufficiently advanced Objective 3.

⁷⁹ Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. p. 253.

5.3 Criterion 3: Wildfire Risk Reduction and Performance

This section considers the performance of PG&E's infrastructure relative to its wildfire risk, as measured by changes in the occurrence of events that correlate to wildfire risk.

To accomplish this, Energy Safety:

- Performed a trend and year-over-year analysis on Ignition Risk Metrics.
- Performed a trend and year-over-year analysis on Outcome Metrics.

Unless otherwise stated, Energy Safety relied on data from PG&E's final QDR for 2021 to develop the analysis described in this subsection of the ARC.⁸⁰

5.3.1 Ignition Risk Metric Analysis

Ignition data analysis can provide the most direct measure of electrical corporation wildfire risk for a given year. Other metrics, such as wire down events and unplanned outages, can be instructive as well, as they correlate with wildfire risk because some portion of these events will result in ignitions.

Energy Safety conducted a detailed analysis of PG&E's performance relative to these metrics over the 2015-to-2021 time horizon. That analysis is available in Appendix D. The most salient takeaways from that analysis are provided below.

Energy Safety normalizes ignitions by Red Flag Warning Overhead Circuit Mile Days (RFWOCMD) to depict wildfire risk normalized for the size of fire weather events in an electrical corporation's service territory. Use of this metric allows for comparisons across electrical corporations and enables assessment of performance in 2021 relative to trends from 2015 to 2020.

PG&E had a total count of 480 ignitions in 2021, which was a decrease from 512 ignitions in 2020 and lower than the average of 487 ignitions in the preceding six years. PG&E's normalized ignitions in 2021, however, increased compared to 2020 by approximately 66% and were similar to the six-year average.

In looking at other metrics that also correlate with risk, in 2021 PG&E's normalized wire down events, unplanned outages, and vegetation-caused outages increased across its distribution infrastructure compared to 2020. For the transmission infrastructure there was a decrease in

⁸⁰ See Pacific Gas and Electric Company, "Wildfire Safety Division Attachment 2.3 Wildfire Mitigation Plan Quarterly report - Q4 2021 (Table 2)," Mar. 18, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52187&shareable=true>.

normalized outages but an increase in normalized wire down events and vegetation-caused outages.

When analyzing the risk drivers of PG&E's normalized ignitions, Energy Safety observed increases in contact from vegetation ignitions as compared to PG&E's historical six-year average from 2015 through 2020.

Regarding PSPS risk, compared to 2020, PG&E saw a decrease in the normalized scope, duration, and critical infrastructure impact of PSPS events. The normalized scope of PSPS events fell from 1,082 to 538, while the normalized duration decreased from 30 million to 5.5 million customer hours. The only metric in which PG&E experienced a normalized increase was the frequency of PSPS events, which rose from eight to 11.

5.3.2 Outcome Metric Analysis

Analyses of outcome metrics demonstrated significant overall damage resulting from PG&E-ignited wildfires in 2021. As reported by PG&E, in 2021, 964,000 acres were burned, 1,329 structures were destroyed, and \$577.1 million⁸¹ in damage due to wildfire were incurred. These represent significant increases compared to 2020, which had 59,300 acres burned, 206 structures destroyed, and \$368 million⁸² in damage due to wildfire. In 2021 there was one wildfire-related fatality and five injuries. In 2020 there were four fatalities and one injury.

The primary driver of this significant increase in acres burned, structures destroyed, and value of damage was the catastrophic Dixie Fire. The California Department of Forestry and Fire Protection determined that the fire was caused by a tree contacting electrical distribution lines owned and operated by PG&E. At the time, the Dixie Fire was the largest single (non-complex) wildfire in California history. The Dixie Fire eventually burned 963,309 acres, destroyed 1,311 structures, damaged 94 structures, and caused four injuries.⁸³

5.3.3 Discussion

In light of the expected climate change-driven extreme weather events, and likely year to year fluctuations, the increase in normalized ignitions observed in PG&E's territory underscores the importance of effective and timely wildfire mitigation planning and execution.

⁸¹ This dollar amount comes from PG&E's second revision to its Q4 2023 QDR submission (Table 2, Row 125), as this information was not present in PG&E's final QDR for 2021. Energy Safety assumes the reference to "577,100" in the Q4 2023 QDR submission is to thousands of dollars, bringing the total damage figure to \$577.1 million. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56510&shareable=true>.

⁸² *Id.*

⁸³ California Public Utilities Commission, Safety Enforcement Division, "Incident Investigation Report on the Dixie Fire," Oct. 9, 2023. [Online]. Available: <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/safety-and-enforcement-division/investigations-wildfires/dixie-fire-investigation-report.pdf>.

The wildfires caused by PG&E's system in 2021 highlight the continuing need for PG&E to improve its performance and decrease the risk posed by its system to California. Even though PG&E met most of its 2021 WMP Update initiative targets, the continuation of catastrophic wildfires sparked by PG&E's system in 2021 show that there is much more work to be done.

Energy Safety will continue to monitor ignitions and wildfire consequence over the course of the 2020-2022 WMP cycle compliance reviews.

5.4 Criterion 4: Satisfaction of 2021 WMP Update Goals

This section considers whether PG&E made a good faith attempt to achieve its goals and comply with its WMP.

The goal of the WMP is to reduce the risk of catastrophic wildfires caused by utility infrastructure. Based on a review of the evidence presented in this ARC, Energy Safety finds that PG&E made a good faith effort to comply with its WMP.

PG&E met or exceeded 90% of its 2021 WMP Update initiative targets. These initiatives are intended to have the effect of lowering the risk of utility-caused ignitions. Energy Safety recognizes the effort taken by PG&E to complete the majority of its 2021 targets.

As referenced in Table 3 above, in terms of significance of completed initiatives relative to expenditure, PG&E completed targets for seven of the top 10 initiatives by expenditure.

5.5 Criterion 5: Execution, Management, and Documentation

This section considers whether PG&E exhibited issues related to its execution, management, or documentation in the implementation of its WMP.

To accomplish this, Energy Safety undertook a holistic evaluation of all relevant information sources and assessments, including field verifications, for any systemic failings that may have hindered PG&E's ability to reduce the risk of igniting a catastrophic wildfire. Such failings could contribute to increased risk on the system even if WMP targets are achieved.

Energy Safety identified data governance and overall reporting issues in the 2021 WMP Update compliance period. Throughout the QIU, PG&E made numerous changes to initiative targets compared to those in the approved 2021 WMP Update.

For example, in its 2021 WMP Update PG&E set a target of 4,100 poles for reinforcement under initiative 7.3.3.6. In its quarterly reporting, PG&E reaffirmed that it had identified "at least 4,100 poles for replacement" in 2021, but did not maintain fidelity to the target for this initiative:

- The Q1 2021 QIU reported that 498 poles had been reinforced so far in 2021, without mention of any need to adjust the target of 4,100.
- The Q2 2021 QIU reported that 1,054 poles had been reinforced so far in 2021, without mention of any need to adjust the target of 4,100.
- The Q3 2021 QIU reported that approximately 1,900 poles had been reinforced so far in 2021, but that “PG&E will not meet the original forecast of 4,100 poles to be reinforced in 2021. However, because the volume of poles requiring reinforcement is less than forecast, this is not a missed target.”
- The Q4 2021 QIU reported that 3,012 poles had been reinforced in 2021, and argued that because pole reinforcements are “demand-driven work” there is “always the possibility that the forecast will not be reached.”⁸⁴

PG&E followed a similar pattern for initiative 7.3.3.9.1. The original 2021 WMP Update target for this initiative was to replace all remaining 84 distribution line legacy 4C controllers in Tier 2 and Tier 3 HFTD areas. In the Q1 2021 QIU, PG&E explained that four were already replaced in 2020 and had not yet been counted, which in PG&E's view meant that the 2021 target could be unilaterally reduced to 80. In the Q2 2021 QIU, PG&E stated one additional location was brought into scope after further HFRA review, meaning that the target could be increased to 81. In the Q4 QIU and EC ARC, PG&E claimed to have completed this initiative after replacing 81 out of 81 controllers. No Change Order Request was submitted to adjust the target from 84 to 80, and then finally to 81.

Another example pertains to initiatives 7.3.3.12.1-1, 7.3.3.12.1-2, 7.3.3.12.2-1, and 7.3.3.12.2-2. These four initiatives related to animal abatement and enhanced inspections at distribution and transmission substations. In all four 2021 QIUs, at least one of these initiatives' targets was changed for various reasons. Targets were also changed between the initiatives as substations throughout the year were reclassified to and from distribution and transmission substations. As an illustration, the goal for initiative 7.3.3.12.2-1 was to complete animal abatement at five identified transmission substations. Firstly, two distribution substations from 7.3.3.12.1-1 were reclassified as transmission substations in Q1 2021, but PG&E kept the target at five and stated the status of the other two were “TBD.” Then, PG&E stated that one of the five locations had work cancelled due to being transferred to a different jurisdiction, reducing the target to four. Finally, PG&E increased the goal to six after deciding that the two previously identified distribution substations would be completed in 2021. Similar patterns followed for all four of these initiatives and is another example of confusion in PG&E's 2021 reporting.

Of the 147 initiative targets included in PG&E's 2021 WMP Update and tracked by Energy Safety, PG&E only reported on 53 commitments in its EC ARC and reported on the remainder only via its QIU reporting. In many instances, PG&E classified certain initiatives with quantitative targets as qualitative, providing narrative updates that reduced transparency in

⁸⁴ Pacific Gas and Electric Company, “Quarterly Initiative Update - Q4 2021,” Feb. 1, 2022.

reporting. Additionally, PG&E's EC ARC did not appropriately provide progress on all expenditures.

Consistency and clarity of information is vital to ensuring that wildfire mitigation efforts can be effectively implemented, and that Energy Safety and stakeholders have a clear understanding of PG&E's plans, commitments, and progress. Energy Safety cannot overemphasize the importance of accurate recordkeeping and data management to achieving wildfire risk reduction.

6. Conclusion

Overall, PG&E had mixed outcomes related to implementation of its 2021 WMP Update. It completed 132 of 147 (90%) of its 2021 WMP Update initiative targets, including seven of the top 10 initiatives with the largest allocated expenditure. PG&E also met its 2021 WMP Update objective to minimize the impacts to customers from PSPS impacts. The normalized scope, duration, and impact of PSPS events decreased in 2021 from 2020 and the peak in 2019.

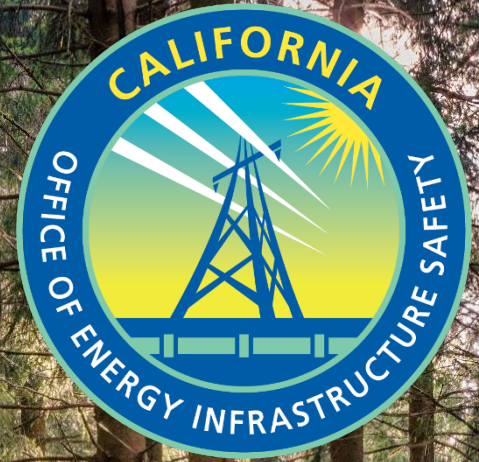
While PG&E met the majority of its 2021 WMP Update initiative targets and one of its objectives, normalized ignitions increased in 2021 relative to 2020. The consequences of these ignitions were significant in 2021, resulting in the catastrophic Dixie Fire, the Mule Fire, and the Brewer Fire. In 2021 there was one wildfire-related fatality and five injuries. The increase in wildfire activity in 2021 also led to an increase in acreage burned, structures destroyed, and value of property destroyed compared to 2020. They also resulted in one fatality and five injuries. As a result of this increase in wildfire activity, PG&E failed to meet its 2021 WMP Update objectives to reduce wildfire ignition potential and reduce wildfire spread. PG&E also had challenges with data governance and reporting.

Energy Safety acknowledges that PG&E undertook significant efforts to reduce its wildfire risk, and in many instances PG&E achieved its 2021 WMP Update initiative targets. PG&E was also responsible for wildfires that led to one wildfire-related fatality, five injuries, large amounts of acreage burned, structures destroyed, and value of property destroyed in 2021. As a result, PG&E failed to meet two of its overarching 2021 WMP Update objectives to reduce ignition potential and wildfire spread. This evidences that there is still a need for PG&E to improve its performance and learn from its experiences.

Energy Safety will continue to monitor PG&E's implementation of its ongoing wildfire mitigation activities and push PG&E to improve its ability to ultimately achieve the elimination of utility-caused catastrophic wildfires in California.

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1. Appendix A

1.1 Electrical Corporation ARC

PG&E timely submitted its EC ARC on March 31, 2022. While PG&E's EC ARC included the five components required by Energy Safety, not all components were fully completed. For example, PG&E's EC ARC did not include a summary of the 147 initiatives it outlined in its 2021 WMP Update and instead referred to the QIU for discussion of a majority of its initiatives.¹ PG&E's EC ARC primarily focused on 53 commitments for 53 initiatives which PG&E deemed as significant for 2021, even though its 2021 WMP Update established other targets which were monitored in the QIU. Similarly, the EC ARC did not report an analysis of planned vs. actual 2021 WMP Update initiative expenditure for all initiatives, and instead discussed initiatives for which there was a variance of expenditure exceeding certain thresholds. Despite these omissions, the subsections below attempt to summarize relevant portions of PG&E's EC ARC.

1.1.1 Achievement of Risk Reduction

In its EC ARC, each electrical corporation is required to provide an assessment of whether the electrical corporation achieved its risk reduction intent by implementing all of its approved 2021 WMP Update initiatives, i.e., the degree to which initiative activities have reduced ignition probabilities. If the electrical corporation failed to achieve the intended risk reduction, it must provide a detailed explanation of why and a reference to where associated corrective actions are incorporated into its most recently submitted WMP.

PG&E did not determine whether its intended risk reduction was met by implementing all 147 approved WMP initiative targets. PG&E's 2021 EC ARC stated that it identified and tracked 53 commitments that contributed towards an overall goal of reducing wildfire ignition potential and provided a summary of 2021 performance for these 53 commitments.

PG&E stated that of its 53 commitments, all 53 were completed by the end of the year. However, PG&E reported that three of the commitments did not meet intra-year deadlines even though their end-of-year deadlines were met. These three commitments were:

1. Distribution High Fire Threat District (HFTD) Inspections (7.3.4.1) (D.01) - The 2021 WMP Update had an original target of 402,000 poles to be inspected by July 31, 2021. PG&E completed this original goal but identified additional poles that should have been inspected after this date. The target was updated to 477,309 through an

¹ Pacific Gas and Electric Company, "Annual Report on Compliance for 2021 Wildfire Mitigation Plan," Mar. 31, 2022. p. 3. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52226&shareable=true>.

approved Change Order on November 1, 2021. By December 31, 2021, PG&E inspected 480,749 poles under this commitment.²

2. Transmission HFTD Inspections (7.3.4.2) (D.03) - The 2021 WMP Update had an original target of 24,092 structure inspections by July 31, 2021. PG&E completed this original goal but identified additional structures that should have been inspected after this date. This target was updated to 26,810 through a Change Order on November 1, 2021. By December 31, 2021, PG&E inspected 26,826 structures under this commitment.³
3. Trained Workforce for Service Restoration (7.3.9.1) (I.02) – The 2021 WMP Update had an original target of completing five training activities with specific milestone dates for each. While four were completed timely, one was not completed by the target date of June 30, 2021. By November 17, 2021, PG&E had completed this training for all required personnel.⁴

PG&E stated that these changes achieved the same, or in some cases better, risk reduction as compared to the initial 2021 WMP Update initiatives.

In addition to its summary of 2021 performance for the 53 commitments, PG&E provided a table of its actual performance against targets for 21 quantitative commitments⁵ across the following WMP initiative categories.

- Situational Awareness and Forecasting:
 - Enhancements to weather station project (installations and optimizations), 308 out of 300 (103% complete)
 - HD cameras, 153 out of 135 (113% complete)
- Grid Design and System Hardening:
 - Public Safety Power Shutoff (PSPS) mitigation – temporary distribution microgrids, 5 out of 5 (100% complete)
 - PSPS mitigation – substation distribution microgrids, 9 out of 8 (113% complete)
 - Emergency back-up generation – PG&E service & materials distribution centers, 32 out of 23 (139% complete)

² Pacific Gas and Electric Company, “Annual Report on Compliance for 2021 Wildfire Mitigation Plan,” Mar. 31, 2022. p. 4. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52226&shareable=true>.

³ Pacific Gas and Electric Company, “Annual Report on Compliance for 2021 Wildfire Mitigation Plan,” Mar. 31, 2022. pp. 4-5. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52226&shareable=true>.

⁴ Pacific Gas and Electric Company, “Annual Report on Compliance for 2021 Wildfire Mitigation Plan,” Mar. 31, 2022. p. 5. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52226&shareable=true>.

⁵ Pacific Gas and Electric Company, “Annual Report on Compliance for 2021 Wildfire Mitigation Plan,” Mar. 31, 2022. p. 2. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52226&shareable=true>.

- Remote grid, 1 out of 1 (100% complete)
- Distribution sectionalizing (automated devices), 269 out of 250 (108% complete)
- Transmission switches, 41 out of 29 (131% complete)
- Distribution line legacy 4C controllers, 81 out of 81 (100% complete)
- Fuse savers (single phase reclosers), 71 out of 70 (101% complete)
- Expulsion fuse replacement (non-exempt equipment), 1,429 out of 1,200 (119% complete)
- Surge arrester replacements, 15,000 out of 15,465 (103% complete)
- System hardening (line miles), 210 out of 180 (117% complete)
- Butte County rebuild (lines miles undergrounded), 24 out of 23 (104% complete)
- System hardening – transmission conductor, 104 out of 92 (113% complete)
- Asset Management and Inspections:
 - Distribution HFTD inspections (poles), 480,749 out of 480,749 (100% complete)
 - Substation HFTD inspections (substations), 142 out of 142 (100% complete)
 - Transmission HFTD inspections (structures), 26,826 out of 26,826 (100% complete)
 - Infrared inspections of transmission electric lines and equipment, 4,211 out of 4,215 (100% complete)⁶
- Vegetation Management and Inspections:
 - Enhanced Vegetation Management (EVM) (line miles), 1,983 out of 1,800 (110% complete)
 - Vegetation Management (VM) transmission right of way expansion, 218 out of 200 (109% complete)

As a result of completing these 53 commitments, PG&E stated its efforts resulted in a reduction in total ignitions caused by electrical infrastructure in 2021 compared to the previous three-year average. PG&E submitted a figure, showing that in 2021 reportable ignitions in High Fire Threat Districts were around 13% lower than the previous 3-year average.⁷

⁶ PG&E stated that it did not complete four miles of line due to the lines being de-energized in 2021.

⁷ Pacific Gas and Electric Company, "Annual Report on Compliance for 2021 Wildfire Mitigation Plan," Mar. 31, 2022. p. 3. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52226&shareable=true>

1.1.2 Planned vs Actual WMP Update Initiative Expenditures

In its EC ARC, each electrical corporation is required to provide descriptions of all WMP initiative planned expenditure versus WMP initiative actual expenditure and an explanation of any differences between the planned and actual expenditure.

PG&E did not provide expenditures (Planned vs. Actual) for all its initiatives consistent with what is required in the Compliance Operational Protocols. As such, based on the information reported in the EC ARC, there is insufficient information for Energy Safety to analyze total planned versus actual expenditure, or planned versus actual expenditures for each initiative.

Through EC ARC Attachment 1,⁸ PG&E provided a summary of initiatives for which capital or operational expenditures varied by more than \$10 million and constituted a greater than 20% change in an initiative's planned total expenditure. This attachment did not include any information for other initiatives.

Below is a summary of initiatives where actual capital expenditure was lower than planned, as well as PG&E's explanation for the lower expenditure.

- Distribution PSPS sectionalizing (7.3.3.8.1) (C.06) – The decrease in expenditure from the forecast was a result of a change in the cost allocation between this initiative and 7.3.3.8.3.
- Transmission switches (7.3.3.8.2) (C.07) - Actual costs were more precise for transmission sectionalizing devices.
- Mitigation of impact on customers and other residents affected during PSPS event (7.3.3.11.1)⁹ - Community Microgrid Enablement Program had a longer lead time, fewer substations were in scope for PSPS events, and fewer microgrids were in scope for infrastructure work.
- Emergency back-up generation – PG&E services centers & materials distribution centers (7.3.3.11.3) (C.04) - The decrease in expenditure from the forecast was a result of a successful bidding process.
- Transformers maintenance and replacement (7.3.3.14) - The decrease in expenditure from the forecast was a result of realignment of maintenance codes and realignment of substation work.
- Updates to grid topology to minimize risk of ignitions in HFTDs (7.3.3.17.2)¹⁰ - Actual costs were more precise for transmission system hardening.
- Rapid earth fault current limiter pilot (7.3.3.17.4) (C.10) - The decrease in expenditure from the forecast was due to a realignment of where construction would be occurring.

⁸ Pacific Gas and Electric Company, "PG&E's ARC for 2021 WMP Attachment 1: Variance Explanations," Mar. 31, 2022. [Online.] Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52227&shareable=true>.

⁹ This expenditure is inclusive of initiatives 7.3.3.11.1A – 7.3.3.11.1E.

¹⁰ This expenditure is inclusive of initiatives 7.3.3.17.2-1 and 7.3.3.17.2-2.

- VM transmission right of way expansion (7.3.5.3) (E.03) - The decrease in expenditure from the forecast was due to a change in the way costs were categorized for Right of Way expansion projects.
- Aviation support (7.3.6.7) – Delays in the project plan for new airplane hangar work.
- Other, Information Technology (IT) projects to support wildfire mitigation work (7.3.7.5) - IT projects cost less than expected.

Below is a summary of initiatives where actual operational expenditure was lower than planned, as well as PG&E's explanation for the lower expenditure.

- VM community and environmental engagement (7.3.5.1) (E.02) - Costs were more centralized under initiatives 7.3.5.2 and 7.3.5.3.
- Light Detection and Ranging (LiDAR) inspections of transmission electric lines and equipment (7.3.5.8) - The decrease in expenditure from the forecast was due to clerical errors in projecting costs.
- Quality assurance/quality control of vegetation inspections (7.3.5.13) - The decrease in expenditure from the forecast was due to a realignment of costs under this initiative with others.
- Remediation of at-risk species (7.3.5.15)¹¹ - The decrease in expenditure from the forecast was due to a realignment of costs under this initiative with others.
- Protocol for PSPS re-energization (7.3.6.4)¹² - The decrease in expenditure from the forecast was due to costs for community resource preparedness, helicopter, customer care PSPS non-events, battery and generator rebates, electric vehicle programs, and corporate communications were moved to other initiatives.
- PSPS events and mitigation of PSPS impacts (7.3.6.5)¹³ - The decrease in expenditure from the forecast was due to an overestimation of PSPS events.
- IT projects to support wildfire mitigation work (7.3.7.5) - The decrease in expenditure from the forecast was due to IT projects costing less than expected.

¹¹ This expenditure is inclusive of initiatives 7.3.5.15-1 and 7.3.5.15-2.

¹² PG&E specifically notes this variation stems from its distribution projects under this initiative, not the transmission projects.

¹³ PG&E specifically notes this variation stems from its distribution projects under this initiative, not the transmission projects.

2. Appendix B

2.1 Substantial Vegetation Management Audit

On October 20, 2023, Energy Safety issued its SVM Audit and Audit Report for PG&E.¹⁴ In the SVM Audit, Energy Safety assessed whether PG&E met its quantitative commitments and verifiable statements in its 2021 WMP Update related to vegetation management. To perform this assessment, Energy Safety reviewed available information and, where necessary, requested additional documentation from PG&E. Energy Safety found that PG&E performed the work required for 11 of its 20 vegetation management initiatives, and required PG&E to provide a response in its Corrective Action Plan on nine vegetation management initiatives where work was not fully performed by PG&E.¹⁵

After reviewing PG&E's Corrective Action Plan, on February 2, 2024, Energy Safety issued its SVM Audit Report finding that PG&E sufficiently some, but not all, of the corrective actions spelled out in the SVM Audit.¹⁶ Nevertheless, Energy Safety found that PG&E substantially complied with the substantial portion of the vegetation management requirements in its 2021 WMP Update.

The findings from Energy Safety's SVM Audit Report are detailed in Table 1 below.

Table 1: Energy Safety's Findings from PG&E 2021 SVM Audit Report of WMP Vegetation Management Initiatives

| 2021 WMP Update Initiative Number | 2021 WMP Update Initiative Name | Determination |
|-----------------------------------|---|--------------------|
| 7.3.5.1 | Additional Efforts to Manage Community and Environmental Impacts | All Work Performed |
| 7.3.5.2 | Detailed Inspections of Vegetation Around Distribution Electric Lines and Equipment | All Work Performed |

¹⁴ Office of Energy Infrastructure Safety, "2021 WMP Substantial Vegetation Management Audit" Oct. 20, 2023. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=55845&shareable=true>.

¹⁵ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," p. 23. Feb. 2024. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

¹⁶ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," Feb. 2024. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

| 2021 WMP Update Initiative Number | 2021 WMP Update Initiative Name | Determination |
|-----------------------------------|--|--|
| 7.3.5.3 | Detailed Inspections of Vegetation Around Distribution Electric Lines and Equipment: LiDAR Target | Sufficient Corrective Action Response |
| 7.3.5.3 | Detailed Inspections of Vegetation Around Transmission Electric Lines and Equipment: Treated vegetation via chipping or lopping | Did not perform all work |
| 7.3.5.3 | Detailed Inspections of Vegetation Around Transmission Electric Lines and Equipment: Formal documentation of prioritization of Integrated Vegetation Management (IVM) projects | Did not perform all work |
| 7.3.5.4 | Emergency Response Vegetation Management Due to Red Flag Warning or Other Urgent Conditions | All Work Performed |
| 7.3.5.5 | Fuel Management and Reduction of “Slash” from VM Activities | All Work Performed |
| 7.3.5.6 | Improvement of Inspections | All Work Performed |
| 7.3.5.7 | LiDAR Inspections of Vegetation Around Distribution Electric Lines and Equipment | All Work Performed |
| 7.3.5.8 | LiDAR Inspections of Vegetation Around Transmission Electric Lines and Equipment | All Work Performed |
| 7.3.5.9 | Other Discretionary Inspection of Vegetation Around Distribution Electric Lines and Equipment, Beyond Inspections Mandated by Rules and Regulations | All Work Performed |

| 2021 WMP Update Initiative Number | 2021 WMP Update Initiative Name | Determination |
|-----------------------------------|---|--|
| 7.3.5.10 | Other Discretionary Inspection of Vegetation Around Transmission Electric Lines and Equipment, Beyond Inspections Mandated by Rules and Regulations | Did not perform all work¹⁷ |
| 7.3.5.11 | Patrol Inspections of Vegetation Around Distribution Electric Lines and Equipment | All Work Performed |
| 7.3.5.12 | Patrol Inspections of Vegetation Around Transmission Electric Lines and Equipment | Did not perform all work¹⁸ |
| 7.3.5.13 | Quality Assurance/Quality Control of Inspections | All Work Performed |
| 7.3.5.14 | Recruiting and Training of Vegetation Management Personnel: did not add program-specific courses for Transmission VM program. | Sufficient Corrective Action Response |
| 7.3.5.14 | Recruiting and Training of Vegetation Management Personnel: did not meet the requirement for the month six audit and instead completed the month six audit in month nine. | Sufficient Corrective Action Response |
| 7.3.5.15 | Remediation of At-Risk Species | All Work Performed |

¹⁷ PG&E's 2021 WMP Update referred to initiative 7.3.5.3 for work applicable to initiative 7.3.5.10. Energy Safety's analysis found that PG&E did not perform all required work for initiative 7.3.5.3. Therefore, the audit determined that PG&E did not perform all required work for initiative 7.3.5.10. Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. p. 717.

¹⁸ PG&E's 2021 WMP Update referred to initiative 7.3.5.3 for work applicable to initiative 7.3.5.12. Energy Safety's analysis found that PG&E did not perform all required work for initiative 7.3.5.3. Therefore, the audit determined that PG&E did not perform all required work for initiative 7.3.5.12. Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. p. 719.

| 2021 WMP Update Initiative Number | 2021 WMP Update Initiative Name | Determination |
|-----------------------------------|---|--|
| 7.3.5.16 | Removal and Remediation of Trees with Strike Potential to Electric Lines and Equipment | Did not perform all work¹⁹ |
| 7.3.5.17 | Substation Inspections: did not meet the inspection targets for electric distribution Substations within or adjacent to Tier 2 and Tier 3 High Fire Threat District | Did not perform all work |
| 7.3.5.17 | Substation Inspections: did not meet the inspection targets for electric distribution substations not within or adjacent to Tier 2 and Tier 3 HFTD. | Did not perform all work |
| 7.3.5.17 | Substation Inspections: did not meet the inspection targets for electric transmission substations not within or adjacent to Tier 2 and Tier 3 HFTD. | Did not perform all work |
| 7.3.5.18 | Substation Vegetation Management | Did not perform all work |
| 7.3.5.18 | Substation Vegetation Management | All Work Performed |
| 7.3.5.19 | Vegetation Inventory System | All Work Performed |
| 7.3.5.20 | Vegetation Management to Achieve Clearances Around Electric Lines and Equipment | Did not perform all work²⁰ |

¹⁹ PG&E's 2021 WMP Update referred to initiatives 7.3.5.2 and 7.3.5.3 for work applicable to initiative 7.3.5.16. Energy Safety's analysis found that PG&E did not perform all the work required for initiative 7.3.5.3. Therefore, the audit determined that PG&E did not perform all required work for initiative 7.3.5.16. Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. p. 741.

²⁰ Under initiative 7.3.5.20 in PG&E's 2021 WMP Update, PG&E referred to initiative 7.3.5.2 and 7.3.5.3. Energy Safety's analysis found that PG&E did not perform all required work for initiative 7.3.5.3. Therefore, the audit determined that PG&E did not perform all required work for initiative 7.3.5.20. Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. p. 754.

3. Appendix C

3.1 Initiative Performance

Energy Safety assessed whether PG&E achieved its 2021 WMP Update qualitative and quantitative commitments through multiple analyses and information sources.

Energy Safety verified compliance with qualitative and quantitative commitments within PG&E's 2021 WMP Update for its System Hardening and Vegetation Management initiatives. For each electrical corporation, the initiatives for compliance verification comprised >60% of the total WMP Update Proposed Expenditures.

Energy Safety also analyzed PG&E's Q4 2021 QIU submission from March 31, 2021, PG&E's EC ARC, and PG&E's Q4 2021 QN to assess whether PG&E achieved its 2021 WMP Update qualitative and quantitative initiative commitments.

3.1.1 2021 Quarterly Reporting Initiative Performance Analysis

PG&E submitted three of its 2021 QIUs. The QIUs contained 147 initiatives, as shown in Table 2 below. Of PG&E's 147 total WMP initiatives, 44 contained quantitative targets, 100 qualitative or unspecified targets, and three contained both quantitative and qualitative targets. By comparison, PG&E's 2021 WMP Update contained 118 initiatives, many of which were disaggregated into multiple sub-initiatives to account for those with multiple targets assigned to them. This resulted in a total of 147 initiative targets.

PG&E characterized 53 initiatives as "commitments" within its 2021 WMP Update and assigned distinct commitment numbers to these (e.g., initiative 7.3.3.7 was assigned commitment number "C.11"). As discussed in Appendix A, while these 53 commitments were the primary focus of discussion within PG&E's EC ARC, Energy Safety considers these no different than other initiative targets for purposes of WMP compliance tracking. For the purposes of this ARC, Energy Safety considers all 147 initiative targets in its assessment of PG&E's compliance with its 2021 WMP Update.

Table 2: PG&E's Reported Number of 2021 WMP Update Initiatives with Quantitative and Qualitative Targets

| PG&E's 2021 WMP Update Initiatives (QIU data) | Numbers |
|--|---------|
| Initiatives with Quantitative Targets | 44 |
| Initiatives with Qualitative or Unspecified Targets | 100 |

| | |
|---|-----|
| Initiatives with both Quantitative and Qualitative Targets | 3 |
| Total Initiatives | 147 |

3.1.2 Initiative Performance Results

Results for Initiatives with Quantitative Targets

PG&E's QIU indicated that PG&E either met, substantially met, or exceeded the targets for 35 of its 44 initiatives (or 80%) with quantitative targets. Table 3 summarizes the initiatives with exclusively quantitative targets.

Of nine initiatives for which PG&E failed to meet its quantitative targets, its average progress was approximately 37% below its targets.

Table 3 below identifies performance against targets for all quantitative initiatives. Bold target values represent initiatives where Energy Safety finds that the target was not met.

Table 3: Initiatives with only Quantitative Targets

| Initiative Number | Initiative Name | Target Units | WMP Target | Reported Actual Progress in QIU | Reported Actual Progress in QN ²¹ | Reported Actual Progress in EC ARC |
|---------------------------|---|-------------------|------------|---------------------------------|--|------------------------------------|
| 7.3.2.1.3-1 (B.04) | Enhancements to Weather Station Project | Weather Stations | 300 | 308 ²² | Completed | 308 |
| 7.3.2.1.4 (B.16) | Wildfire Cameras | Cameras Installed | 135 | 153 ²³ | Completed | 153 |

²¹ Pacific Gas and Electric Company "Quarterly Notification for Fourth Quarter 2021," Feb 1, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52008&shareable=true>.

²² Though PG&E reported 308 stations completed, the Independent Evaluator (IE) found 13 stations, or 4.4%, to be potentially non-operational. Despite this, Energy Safety finds this initiative to be in substantial compliance as it would have fallen within 95% of target. Bureau Veritas North America, "Final Independent Evaluator Annual Report on Compliance," Jun. 30, 2022. p. 21. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52691&shareable=true>.

²³ The IE found 6 cameras, or 3.9%, to have an unconfirmed operational status. Despite this, Energy Safety finds this initiative to be in substantial compliance as it would have fallen within 95% of target. Bureau Veritas North America, "Final Independent Evaluator Annual Report on Compliance," Jun. 30, 2022. p. 22. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52691&shareable=true>.

| Initiative Number | Initiative Name | Target Units | WMP Target | Reported Actual Progress in QIU | Reported Actual Progress in QN ²¹ | Reported Actual Progress in EC ARC |
|-------------------|--|--|--|---|--|------------------------------------|
| 7.3.2.2.1 | Electric Transmission SEL T400L | SEL T400L Relay Installations | 5 | 5 | Not Reported | Not Reported |
| 7.3.2.2.2 (B.08) | SmartMeter Partial Voltage Detection | Phase Meters | 3 | 3 | Completed | 3 |
| 7.3.2.2.4 (B.09) | Sensor IQ Pilot Deployment | Sensor IQ Deployments | 500,000 | 515,445 | Completed | 515,445 |
| 7.3.2.5 (B.12) | Safety and Infrastructure Protection Team Staffing | Staff Members (Crews and Engines) | 40 | 40 | Completed | 40 |
| 7.3.3.1 | Capacitor Maintenance and Replacement Program | Inspections | 11,400 | 11,400 | Not Reported | Not Reported |
| 7.3.3.6 | Distribution Pole Replacement and Reinforcement, Including with Composite Poles | Pole Replacements and Pole Reinforcements | 9,800 or more Replacements and 4,100 or more Reinforcements | 16,359 Replacements and 3,013 Reinforcements ²⁴ | Not Reported | Not Reported |
| 7.3.3.7 (C.11) | Expulsion Fuse Replacement | Fuses | 1,200 | 1,429 | Completed | 1,429 |

²⁴ PG&E reported that the forecasted poles reinforced were not reached due to the demand-driven nature of the project. However, PG&E did not properly file a Change Order to decrease the expected number of reinforcements for 2021. Based on the progress reported, Energy Safety finds PG&E did not meet its targets on this initiative. Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

| Initiative Number | Initiative Name | Target Units | WMP Target | Reported Actual Progress in QIU | Reported Actual Progress in QN ²¹ | Reported Actual Progress in EC ARC |
|----------------------------|---|---|------------------|---------------------------------|--|------------------------------------|
| 7.3.3.8.1 (C.06) | Distribution PSPS Sectionalizing | Automated Sectionalizing Devices | 250 | 269 | Completed | 269 |
| 7.3.3.8.2 (C.07) | Transmission Switches | SCADA Switches | 29 | 41 | Completed | 41 |
| 7.3.3.8.3 (C.01) | Assess Motorized Switch Operator (MSO) Switches | MSO Devices | 48 ²⁵ | 50 | Completed | 50 |
| 7.3.3.9.1 (C.08) | Distribution Line Legacy 4C Controllers | Distribution Line Legacy 4C Controllers | 84 ²⁶ | 81 | Completed | 81 |
| 7.3.3.9.2 (C.09) | Fuse Savers | Reclosers | 70 | 71 | Completed | 71 |
| 7.3.3.11.1 B (C.03) | Generation for PSPS Mitigation | Substation Distribution Microgrids | 8 | 9 | Completed | 9 |
| 7.3.3.11.2 | Substation Activities to Enable Reduction of PSPS Impacts | SCADA Installations | 1 | 1 | Not Reported | Not Reported |

²⁵ The WMP Update originally did not have a quantitative target. This was updated to 48 MSO devices through a Change Order on November 1, 2021. Energy Safety approved this Change Order. Office of Energy Infrastructure Safety, "Wildfire Mitigation Change Order Decision," Apr. 11, 2022. p. 3. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52258&shareable=true>.

²⁶ PG&E reported that it found four distribution line legacy 4C controllers were already replaced in 2020. It also reported that updated HFRA analysis brought one more additional location into scope. As such, it adjusted the 2021 target to 81 units. Even without the adjustment, Energy Safety finds this initiative to be in substantial compliance as it was within 95% of target. Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

| Initiative Number | Initiative Name | Target Units | WMP Target | Reported Actual Progress in QIU | Reported Actual Progress in QN ²¹ | Reported Actual Progress in EC ARC |
|--------------------------|--|------------------|------------------|---------------------------------|--|------------------------------------|
| 7.3.3.11.3 (C.04) | Emergency Back-up Generation – PG&E Service Centers & Materials Distribution Centers | Centers Equipped | 23 | 37 | Completed | 32 |
| 7.3.3.12.1-1 | Distribution Substations – Animal Abatement | Substations | 38 | 27 ²⁷ | Not Reported | Not Reported |
| 7.3.3.12.1-2 | Distribution Substations - Repairs and Replacements from Enhanced Inspections | Inspections | 57 ²⁸ | 56 | Not Reported | Not Reported |
| 7.3.3.12.2-1 | Transmission Substations – Animal Abatement | Substations | 5 ²⁹ | 6 | Not Reported | Not Reported |

²⁷ PG&E reported that it found seven substations were already completed in 2020. It also reported that two locations were reclassified as transmission sites and that two other locations already had equipment replaced from substation rebuild projects. As such, it adjusted the 2021 target to 27 substations. Energy Safety accepts this explanation, as all work was completed by 2021, but finds a Change Order should have been submitted to support this adjustment. PG&E Pacific Gas and Electric Company, “Quarterly Initiative Update - Q4 2021,” Feb. 1, 2022.

²⁸ PG&E reported that two planned inspections were canceled based on a realignment of the annual inspection plan. It also reported that one planned inspection was added based on this realignment. As such, it adjusted the 2021 target to 56 inspections. Even without the adjustment, Energy Safety finds this initiative to be in substantial compliance as it was within 95% of target. PG&E Pacific Gas and Electric Company, “Quarterly Initiative Update - Q4 2021,” Feb. 1, 2022.

²⁹ PG&E reported that two locations originally classified as distribution sites were reclassified as transmission sites. It also reported that one project was canceled due to being transferred to Power House jurisdiction. As such, it adjusted the 2021 target to six substations. PG&E Pacific Gas and Electric Company, “Quarterly Initiative Update - Q4 2021,” Feb. 1, 2022.

| Initiative Number | Initiative Name | Target Units | WMP Target | Reported Actual Progress in QIU | Reported Actual Progress in QN ²¹ | Reported Actual Progress in EC ARC |
|---------------------|---|-------------------|------------------|---------------------------------|--|------------------------------------|
| 7.3.3.12.2-2 | Transmission Substations - Repairs and Replacements from Enhanced Inspections | Inspections | 22 ³⁰ | 64 | Not Reported | Not Reported |
| 7.3.3.13 | Pole Loading Infrastructure Hardening and Replacement Program Based on Pole Loading Assessment Program | Poles | 160,000 | 61,723 | Not Reported | Not Reported |
| 7.3.3.15 | Transmission Tower Maintenance and Replacement | Tags | 4,000 | 5,770 | Not Reported | Not Reported |
| 7.3.3.17.2-1 (C.15) | System Hardening - Transmission Conductor | Miles | 92 | 103 | Completed | 103.8 |
| 7.3.3.17.2-2 | System Hardening - Transmission Wood Pole Replacement | Pole Replacements | 1,500 | 1,841 | Not Reported | Not Reported |

³⁰ PG&E reported five planned inspections were added based on a realignment of the annual inspection plan. It also reported that 37 hydro switchyards were added based on this realignment. As such, it adjusted the 2021 target to 64 inspections. PG&E Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

| Initiative Number | Initiative Name | Target Units | WMP Target | Reported Actual Progress in QIU | Reported Actual Progress in QN ²¹ | Reported Actual Progress in EC ARC |
|--------------------------|--|---------------------|---|---------------------------------|--|------------------------------------|
| 7.3.3.17.3 (C.12) | Surge Arrestor Replacements | Surge Arrestors | 15,000 | 15,465 ³¹ | Completed | 15,465 |
| 7.3.3.17.5 (C.05) | Remote Grid | Remote Grids | 1 | 1 | Completed | 1 |
| 7.3.3.17.6 (C.14) | Butte County Rebuild | Miles Undergrounded | 23 | 23.6 | Completed | 23.64 |
| 7.3.4.1 (D.01) | Distribution HFTD Inspections (poles) | Inspections | 477,309 ³² | 480,745 | Delayed / Completed Late | 480,749 |
| 7.3.4.2 (D.03) | Transmission HFTD Inspections (Structures) | Inspections | 26,810 ³³ | 26,826 | Delayed / Completed Late | Delayed / Completed Late |
| 7.3.4.4 | Infrared Inspections of Distribution Lines and Equipment | Inspections | 1/3 of the HFTD Area Circuits ³⁴ | 10,093 | Not Reported | Not Reported |

³¹ Two sampled locations, or 0.6%, were either not in compliance or not located by the IE. Energy Safety still finds this initiative to be in substantial compliance. Bureau Veritas North America, "Final Independent Evaluator Annual Report on Compliance," Jun. 30, 2022. p. 21. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52691&shareable=true>.

³² The WMP Update had an original target of 402,000. This target was updated to 477,309 through a Change Order on November 1, 2021. Energy Safety approved this Change Order. Office of Energy Infrastructure Safety, "Wildfire Mitigation Change Order Decision," Apr. 11, 2022. p. 3. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52258&shareable=true>.

³³ The WMP Update had an original target of 24,092. This target was updated to 26,810 through a Change Order on November 1, 2021. Energy Safety approved this Change Order. Office of Energy Infrastructure Safety, "Wildfire Mitigation Change Order Decision," Apr. 11, 2022. p. 3. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52258&shareable=true>.

³⁴ PG&E did not provide a quantitative target for this initiative, stating it would complete approximately one-third of the HFTD area circuits. PG&E stated it completed this goal with 10,093 miles. PG&E should ensure consistent measurement of its quantitative and qualitative targets and progress.

| Initiative Number | Initiative Name | Target Units | WMP Target | Reported Actual Progress in QIU | Reported Actual Progress in QN ²¹ | Reported Actual Progress in EC ARC |
|-------------------|---|--------------|---------------------|---------------------------------|--|------------------------------------|
| 7.3.4.5 (D.04) | Infrared Inspections of Transmission Electric Lines and Equipment | Inspections | 7,582 ³⁵ | 7,587 | Completed | 4,211.19 |
| 7.3.4.11 | Patrol Inspections of Distribution Electric Lines and Equipment | Inspections | 1,181,000 | 1,183,849 ³⁶ | Not Reported | Not Reported |
| 7.3.4.12 | Patrol Inspections of Transmission Electric Lines and Equipment | Inspections | 191,000 | 131,063 ³⁷ | Not Reported | Not Reported |
| 7.3.4.13 | Pole Loading Assessment Program to Determine Safety Factor | Poles | 160,000 | 61,710 | Not Reported | Not Reported |
| 7.3.4.15 (D.02) | Substation HFTD Inspections | Inspections | 142 | 142 | Completed | 142 |

³⁵ The WMP Update had an original target of approximately 8,000 inspection miles. This target was updated to 7,582 through a Change Order on November 1, 2021. Energy Safety approved this Change Order. Office of Energy Infrastructure Safety, "Wildfire Mitigation Change Order Decision," Apr. 11, 2022. p. 3. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52258&shareable=true>.

³⁶ 34% of randomly sampled inspections by the IE were found to be inaccurate due to missing bar code information. As such, the IE and Energy Safety cannot find compliance for this initiative. Bureau Veritas North America, "Final Independent Evaluator Annual Report on Compliance," Jun. 30, 2022. p. 44. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52691&shareable=true>.

³⁷ PG&E reported it miscalculated the forecasted number of inspections in 2021, and stated 124,495 is the target. However, PG&E did not properly file a Change Order to decrease the number of inspections for 2021. As such, Energy Safety finds this adjustment too large, and cannot find compliance for this initiative. Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

| Initiative Number | Initiative Name | Target Units | WMP Target | Reported Actual Progress in QIU | Reported Actual Progress in QN ²¹ | Reported Actual Progress in EC ARC |
|-------------------|--|------------------------|---|---|--|------------------------------------|
| 7.3.5.3 (E.03) | VM Transmission Right of Way Expansion | Miles | 200 ³⁸ | 218 | Completed | 218 ³⁹ |
| 7.3.5.8 | LiDAR Inspections of Transmission Electric Lines and Equipment | Inspections | 96-100% Routine Inspections and 80-100% Mid-cycle Inspections ⁴⁰ | 100% Routine Inspections and 100% Mid-Cycle Inspections | Not Reported | Not Reported |
| 7.3.5.15-1 (E.01) | EVM | Miles | 1,800 | 1,983 ⁴¹ | Completed | 1,983 |
| 7.3.5.17.1 | Substation Inspections, Distribution | Substation Inspections | 439 | 439 ⁴² | Not Reported | Not Reported |

³⁸ In the WMP, PG&E also refers to its LiDAR inspections for transmission assets within this initiative. This is encompassed within initiative 7.3.5.8.

³⁹ While the quantitative target for this initiative appears to have been met, Energy Safety's SVM Audit Report found this initiative not to be met for 1) not being able to prove that PG&E conducted onsite lopping, scattering, and chipping for fuel treatment, and 2) not being able to prove that PG&E prioritized work based off vegetation age.

⁴⁰ In its QIUs, PG&E stated that the routine inspections were originally planned for 18,820 miles but was reduced in Q1 to 17,880 miles due to the annual update to ETGIS data. By Q4, PG&E stated it completed 100% of these 17,880 miles. PG&E did not state a numerical goal for its mid-cycle inspections, but claimed it reached 100% of its goal and patrolled 1,333 miles. PG&E Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

⁴¹ The IE reported that 13% of poles within a sample of 191 line miles were found to be noncompliant due to vegetation encroachment. Assuming this 13% error rate holds true for the reported population of completed miles, PG&E is presumably compliant with approximately 1,725 line miles, or 96% of target. Based on this assessment, Energy Safety finds PG&E substantially compliant but makes note of issues with quality of work conducted based on IE findings. Bureau Veritas North America, "Final Independent Evaluator Annual Report on Compliance," Jun. 30, 2022. pp. 29-30. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52691&shareable=true>.

⁴² While PG&E completed the proper number of inspections, Energy Safety's SVM audit report revealed that 194 inspections were completed *before* November 2020, which is outside the time range stipulated in the WMP of November 2020 – November 2021. As such, Energy Safety finds PG&E not compliant in for this initiative. Office of

| Initiative Number | Initiative Name | Target Units | WMP Target | Reported Actual Progress in QIU | Reported Actual Progress in QN ²¹ | Reported Actual Progress in EC ARC |
|-------------------|--|------------------------|-------------------|---------------------------------|--|------------------------------------|
| 7.3.5.17.2 | Substation Inspections, Transmission | Substation Inspections | 139 | 184 ⁴³ | Not Reported | Not Reported |
| 7.3.5.18.1 | Substation Vegetation Management, Distribution | Substation Maintenance | 176 ⁴⁴ | 166 | Not Reported | Not Reported |
| 7.3.5.18.2 | Substation Vegetation Management, Transmission | Substation Maintenance | 109 ⁴⁵ | 142 | Not Reported | Not Reported |

Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," Feb. 2024. p. 11. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

⁴³ Per PG&E's WMP, of the 139 targeted inspections, 41 were to be completed for transmission substations not within or adjacent to Tier 2 and Tier 3 HFTD between November 15, 2020 and November 15, 2021. However, based Energy Safety's SVM audit found that 18 of the 41 substations were inspected *before* November 2020. In response to a data request for the SVM audit, PG&E stated that it began the inspections early due to environmental concerns, property owner issues, and permitting. While Energy Safety understands the rationale for conducting inspections early, PG&E was aware of its early inspections when it committed to the timeline specified in the approved WMP. Furthermore, PG&E should engage in programmatic annual inspections, and avoid resorting to conducting multiple cycles of annual inspections in one year alone. Energy Safety finds PG&E not compliant in for this initiative. Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," Feb. 2024. pp. 12-13. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

⁴⁴ PG&E reported it adjusted its substation target to 170 due to the realignment of the annual inspection plan and double counting. Four were not completed due to permitting issues. PG&E did not properly file a Change Order to decrease the number of inspections for 2021. Energy Safety finds PG&E non-compliant with this initiative and makes note of inadequate recordkeeping and WMP Quality Control practices. Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

⁴⁵ PG&E reported 33 maintenance operations were added based on a realignment of the annual inspection plan. As such, it adjusted the 2021 target to 142 maintenance operations. PG&E Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

| Initiative Number | Initiative Name | Target Units | WMP Target | Reported Actual Progress in QIU | Reported Actual Progress in QN ²¹ | Reported Actual Progress in EC ARC |
|---------------------|---|--------------|--------------------------------------|--------------------------------------|--|--------------------------------------|
| 7.3.9.1-1 (1.01) | Staffing to Support Service Restoration | Staff Hired | 40 Linemen And 100 Apprentices | 41 Linemen And 123 Apprentices | Completed | 41 Linemen And 123 Apprentices |

Results for Initiatives with Qualitative Targets

In its 2021 Quarter 4 QIU, PG&E reported that it had completed 100 of 100 (100%) 2021 WMP Update initiatives with qualitative targets. However, after cross-analysis with the QIU, QN, EC ARC, and data requests, Energy Safety has identified several qualitative initiatives which either had unspecified targets, did not reach their targets, or had noteworthy inconsistencies.

Based on this review, Energy Safety concludes that PG&E failed to meet or exceed the targets for one of 100 initiatives with qualitative targets. Additionally, Energy Safety noted several instances in which PG&E did not establish clear targets in the WMP, resulting in Energy Safety's inability to confirm whether PG&E ultimately complied with four of 100 initiatives with qualitative targets.

To reach these conclusions, Energy Safety compared PG&E's 2021 WMP Update qualitative targets to actual reported progress in the QIU, QN, EC ARC, and other data requests as available. Initiatives for which Energy Safety determined that targets (as defined by PG&E in its 2021 WMP Update) were not met are described below.

- Generation enablement and deployment (7.3.3.11.1A) – PG&E stated in its WMP several qualitative goals for this initiative. One goal was to establish at least one Clean Substation Project candidate site for testing and demonstration in 2021. In 2021, PG&E submitted a Request for Offer for the Clean Substation Microgrid Pilot but was unable to secure a candidate site for testing. As such, this project was delayed. Energy Safety finds PG&E non-compliant for this initiative.

PG&E reported the following initiatives in the 2021 WMP Update as individual initiatives, and also reported these initiatives separately within the QIU. However, in its QIU PG&E refers to work conducted under other WMP initiatives to support a finding that work was complete for these initiatives, and Energy Safety has previously determined that portions of that work were inadequate. As such, Energy Safety cannot make an independent determination on whether work under these initiatives was completed for the reasons stated below.

- Other discretionary inspection of transmission electric lines and equipment (7.3.5.10) – PG&E did not establish a clear target for this initiative yet reported it as “Complete” in its QIU. In the WMP, this initiative points to detailed inspections of vegetation around transmission electric lines and equipment under section 7.3.5.3. Although it reported this initiative as “Complete” in its QIU, PG&E did not provide a meaningful update to substantiate the types of discretionary inspections conducted and whether such inspections aligned to established targets. Furthermore, even if work under WMP initiative 7.3.5.3 was meant to fully support work under this initiative, Energy Safety’s SVM Audit Report found two elements of PG&E’s work under initiative 7.3.5.3 to be insufficient.⁴⁶ Therefore, Energy Safety does not have adequate information to determine if the 2021 WMP Update work on this initiative was completed in an appropriate fashion.
- Patrol inspections of vegetation around transmission electric lines and equipment (7.3.5.12) – In the 2021 WMP Update, PG&E points to detailed inspections of vegetation around transmission electric lines and equipment under initiative 7.3.5.3 as the work that would support this initiative. In its QIU, however, PG&E reported completing an internal target for miles inspected under this initiative. Energy Safety’s SVM Audit Report found two elements of PG&E’s work under initiative 7.3.5.3 to be insufficient, and without further reporting from PG&E on how work under 7.3.5.3 supported work under initiative 7.3.5.12, Energy Safety does not have adequate information to determine if the 2021 WMP Update work under initiative 7.3.5.12 was completed in an appropriate fashion.⁴⁷
- Removal and remediation of trees with strike potential to electric lines and equipment (7.3.5.16) – PG&E did not establish a clear target for this initiative in its WMP yet reported it as “Complete” in its QIU. In the WMP, this initiative refers to other initiatives (7.3.5.2, 7.3.5.3, and 7.3.5.13) for information regarding efforts to identify and remove hazard trees. Neither of these initiatives establishes a transparent target for removal and remediation of trees with strike potential. In the QIU, PG&E stated that PG&E does not perform a separate effort to identify, remove and remediate trees with strike potential, and that this is a risk that inspectors assess and take action to resolve as part of other vegetation management activities. PG&E noted that tree remediation targets are determined after inspections are 100% complete. PG&E reported that in 2021 it conducted a total of 297,040 trims or removals for distribution and 325,801 for transmission. Energy Safety’s SVM Audit Report found two elements of PG&E’s work under initiative 7.3.5.3 to be insufficient, and without further reporting from PG&E on how work under 7.3.5.3 supported work under initiative 7.3.5.16, Energy

⁴⁶ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," p. 20. Feb. 2024. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

⁴⁷ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," p. 20. Feb. 2024. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

Safety does not have adequate information to determine if the 2021 WMP Update work was completed in an appropriate fashion.⁴⁸

- Vegetation management to achieve clearances around electric lines and equipment (7.3.5.20) – PG&E did not establish a clear target for this initiative yet reported it as “Complete” in its QIU, with actual progress reported simply as “See Initiative 7.3.5.2 and 7.3.5.3.” In the WMP, this initiative refers to other initiatives (7.3.5.2 and 7.3.5.3) for information regarding efforts to achieve clearances around electric lines and equipment. Energy Safety’s SVM Audit Report found two elements of PG&E’s work under initiative 7.3.5.3 to be insufficient, and without further reporting from PG&E on how work under 7.3.5.3 supported work under initiative 7.3.5.20, Energy Safety does not have adequate information to determine if the 2021 WMP Update work was completed in an appropriate fashion.⁴⁹

Energy Safety also had observations regarding the following qualitative initiatives with targets met.

- Distribution Fault Anticipation (DFA) technology and Early Fault Detection (EFD) (7.3.2.2.3) – PG&E stated in its WMP that 2021 is the start of a ramped-up mass deployment of DFA and EFD. It stated that across several general rate case cycles, it plans to deploy sensors on 600-800 circuits, mitigating 28,000 total line miles. Within the QIU, PG&E reported it completed project design for these programs. It started deployment on 25 locations (on 2 circuits) for EFD and 16 locations for DFA. Energy Safety finds PG&E compliant for this initiative but notes a lack of intermediary quantitative goals for tracking sensor deployments.
- Trained workforce for service restoration (7.3.9.1) (I.02) – PG&E stated in its WMP that this initiative included five activities with specific milestone dates for each activity. One activity had a targeted completion date of June 30, 2021. However, PG&E was not able to fully complete this training until November 17, 2021. All other trainings were achieved by the respective target dates. Energy Safety finds PG&E compliant for this initiative given that it ultimately completed its trainings prior to the conclusion of the 2021 WMP Update compliance period.

Results for Initiatives with Quantitative and Qualitative Targets

Energy Safety identified three initiatives with both quantitative and qualitative targets as originally described with PG&E’s 2021 WMP Update. Energy Safety relied on PG&E’s QIU, QN, EC ARC, and data request responses to evaluate PG&E’s reporting on its initiative

⁴⁸ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," p. 20. Feb. 2024. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

⁴⁹ Office of Energy Infrastructure Safety, "Report on 2021 Substantial Vegetation Management Audit Report Pacific Gas and Electric Company," p. 20. Feb. 2024. [Online]. Available:

<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56263&shareable=true>.

performance.

In its 2021 Q4 QIU, PG&E reported that three initiatives were completed. However, Energy Safety found that PG&E completed two of the three initiatives.

Table 4 below identifies performance against targets for all initiatives with quantitative and qualitative targets. Bold target values represent initiatives where Energy Safety finds that the target was not met.

Table 4: Initiatives with Quantitative and Qualitative Targets

| Initiative Number | Initiative Name | WMP Quantitative Target | Reported Quantitative Progress | WMP Qualitative Target | Reported Qualitative Progress |
|---------------------------|---------------------------------------|--|--|--|---|
| 7.3.3.11.1C (C.02) | Generation for PSPS Mitigation | 5 Temporary Distribution Microgrids | 5 Temporary Distribution Microgrids | Collaborate with county and local government to ensure local priorities help shape site selection and design. | PG&E did not provide evidence of collaboration with local government in 2021. Instead, documentation provided was dated 2020.⁵⁰ |
| 7.3.3.17.1 (C.13) | System Hardening (Distribution) | 180 Miles | 210.5 Miles | Switch from REAX Engineering to Technosylva for its Wildfire Consequence Modelling tool. | Completed successfully |
| 7.3.3.12.3 | Transmission Maintenance | 8,900 Notifications | Approximately 13,840 Notifications | Complete ignition-related notifications in HFTD areas | Completed successfully |

⁵⁰ In response to Data Request 195, PG&E provided documentation of coordination with local stakeholders, including Placer County Water Authority, El Dorado County officials, County Supervisors, Office of Emergency Service, Sheriff, and Middletown Rancheria of Pomo Indians of California, as well as Butte County Sheriff's Office. These documents were all dated in 2020, which does not show PG&E's commitment to collaborate with these stakeholders in 2021.

| Initiative Number | Initiative Name | WMP Quantitative Target | Reported Quantitative Progress | WMP Qualitative Target | Reported Qualitative Progress |
|-------------------|-----------------|-------------------------|--------------------------------|---|-------------------------------|
| | | | | found before 2020 and identify new urgent priority notifications from 2021. | |

3.1.3 2021 Grid Design and System Hardening Initiatives Analysis

PG&E's Grid Design and System Hardening initiatives represented 59% of PG&E's total planned expenditure for its 2021 WMP Update.⁵¹

Energy Safety assessed whether PG&E met its quantitative and qualitative commitments in its 2021 WMP Update for its Grid Design and System Hardening (Section 7.3.3)⁵² initiatives. To perform this assessment, Energy Safety reviewed available information and, where necessary, requested additional documentation from PG&E.

Energy Safety found that PG&E met its quantitative targets and implemented its verifiable statements for 21 out of the 24 Grid Design and System Hardening initiative commitments reviewed, as detailed in Table 5 below.

Table 5: Energy Safety's Analysis of PG&E's 2021 WMP Update Grid Design and System Hardening Initiatives

| Initiative Number and Name | 2021 WMP Update Quantitative Target | 2021 Actual Reported | 2021 WMP Update Qualitative Target | 2021 Actual Reported | Method of Verification | Energy Safety Finding |
|--|-------------------------------------|--------------------------|------------------------------------|----------------------|------------------------|-----------------------|
| 7.3.3.6 Distribution Pole Replacement and Reinforcement, | 9,800 pole replacements and | 16,359 pole replacements | N/A | N/A | QIU | Commitment not met |

⁵¹ Pacific Gas and Electric Company, "Wildfire Safety Division Attachment 2.3 Wildfire Mitigation Plan Quarterly report - Q4 2021 (Table 12)," Mar. 18, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52187&shareable=true>.

⁵² Pacific Gas and Electric Company, "Pacific Gas and Electric Company 2021 Wildfire Mitigation Plan Report – Revised," Jun. 3, 2021. pp. 520-631.

| Initiative Number and Name | 2021 WMP Update Quantitative Target | 2021 Actual Reported | 2021 WMP Update Qualitative Target | 2021 Actual Reported | Method of Verification | Energy Safety Finding |
|---|--|--|------------------------------------|--|------------------------|-----------------------|
| Including with Composite Poles | 4,100 pole reinforcements | and 3,013 pole reinforcements | | | | |
| 7.3.3.7 (C.11) Expulsion Fuse Replacement | 1,200 fuses | 1,429 fuses | N/A | N/A | QIU, QN, EC ARC | Commitment met |
| 7.3.3.8.1 (C.06) Distribution PSPS Sectionalizing | 250 automated sectionalizing devices | 269 automated sectionalizing devices | N/A | N/A | QIU, QN, EC ARC | Commitment met |
| 7.3.3.8.2 (C.07) Transmission Switches | 29 Supervisory Control and Data Acquisition (SCADA) switches | 41 SCADA switches | N/A | N/A | QIU, QN, EC ARC | Commitment met |
| 7.3.3.9.1 (C.08) Distribution Line Legacy 4C Controllers | 84 distribution line legacy 4C controllers ⁵³ | 81 distribution line legacy 4C controllers | N/A | N/A | QIU, QN, EC ARC | Commitment met |
| 7.3.3.9.2 (C.09) Fuse Savers | 8 single phase reclosers (fuse savers) | 9 single phase reclosers (fuse savers) | N/A | N/A | QIU, QN, EC ARC | Commitment met |
| 7.3.3.11.1A Generation | N/A | N/A | Expand the pool of contractors and | Expanded pool of contractors, piloted non- | Data Request | Commitment met |

⁵³ PG&E reported in its QIU that it found four distribution line legacy 4C controllers were already replaced in 2020. It also reported that updated HFRA analysis brought one more additional location into scope. As such, it adjusted the 2021 target to 81 units. Even without the adjustment, Energy Safety finds this initiative to be in substantial compliance. Pacific Gas and Electric Company, "Quarterly Initiative Update - Q4 2021," Feb. 1, 2022.

| Initiative Number and Name | 2021 WMP Update Quantitative Target | 2021 Actual Reported | 2021 WMP Update Qualitative Target | 2021 Actual Reported | Method of Verification | Energy Safety Finding |
|---|-------------------------------------|----------------------|---|--|------------------------|-----------------------|
| Enablement and Deployment | | | technologies for the development of microgrids, pilot viable non-diesel technologies, and explore opportunities to build a portfolio of non-fossil solutions. | diesel technologies, and explored non-fossil solutions. | | |
| 7.3.3.11.1A Generation Enablement and Deployment | N/A | N/A | Establish the new Generation Enablement and Development team. | Established the new Generation Enablement and Development team. | Data Request | Commitment Met |
| 7.3.3.11.1A Generation Enablement and Deployment | N/A | N/A | Procure and deploy Temporary Generation system wide across the four workstreams prior to the start of the 2021 PSPS season. | Procured and deployed Temporary Generation system wide across the four workstreams prior to the start of the 2021 PSPS season. | Data Request | Commitment Met |
| 7.3.3.11.1A Generation | N/A | N/A | Work closely with stakeholders, vendors, | Worked closely with stakeholders, vendors, | Data Request | Commitment Met |

| Initiative Number and Name | 2021 WMP Update Quantitative Target | 2021 Actual Reported | 2021 WMP Update Qualitative Target | 2021 Actual Reported | Method of Verification | Energy Safety Finding |
|---|---|---|--|--|---------------------------------|---------------------------|
| Enablement and Deployment | | | and regulators to ensure a transition to a cleaner TG fleet. | and regulators to ensure a transition to a cleaner TG fleet. | | |
| 7.3.3.11.1A Generation Enablement and Deployment | Establish at least one Clean Substation Project candidate site for testing and work to deploy the project if bids meet CPUC established cost-effectiveness criteria. | Not complete. Project moved to 2024 due inability to acquire candidate site. | N/A | N/A | Data Request | Commitment Not Met |
| 7.3.3.11.1B (C.03) Generation for PSPS Mitigation (Substation Distribution Microgrids) | 8 additional substations to receive temporary generation (TG) for 2021 PSPS mitigation. | 9 additional substations received TG for 2021 PSPS mitigation. | N/A | N/A | Data Request, QN, EC ARC | Commitment Met |
| 7.3.3.11.1C (C.02) Generation for PSPS Mitigation (Temporary Distribution Microgrids) | 5 additional Distribution Temporary Microgrids Pre-installed Interconnection Hubs (PIH). | 5 additional Distribution Temporary Microgrids PIH installed. | In 2021, PG&E plans to continue to support critical customers with backup power support. | Completed successfully. | Data Request, QN, EC ARC | Commitment Met |
| 7.3.3.11.1C (C.02) Generation for PSPS Mitigation (Temporary | N/A | N/A | Collaborate with county and local government to ensure | Documentation provided showed a lack of | Data Request, QN, EC ARC | Commitment Not Met |

| Initiative Number and Name | 2021 WMP Update Quantitative Target | 2021 Actual Reported | 2021 WMP Update Qualitative Target | 2021 Actual Reported | Method of Verification | Energy Safety Finding |
|---|-------------------------------------|----------------------|---|---|--------------------------|-----------------------|
| Distribution Microgrids) | | | local priorities help shape site selection and design. | evidence of work from 2021—all was dated to 2020. | | |
| 7.3.3.11.1C (C.02) Generation for PSPS Mitigation (Temporary Distribution Microgrids) | N/A | N/A | In 2021, PG&E will continue evaluating additions or changes to our indoor CRC portfolio. | Completed successfully. | Data Request, QN, EC ARC | Commitment Met |
| 7.3.3.11.3 (C.04) Emergency Back-up Generation – PG&E Service Centers & Materials Distribution Centers | 23 centers equipped | 32 centers equipped | N/A | N/A | QIU, QN, EC ARC | Commitment Met |
| 7.3.3.12.3 Transmission Maintenance | 8,900 notifications | 13,789 notifications | Complete ignition-related notifications in HFTD areas found before 2020 and identify new urgent priority notifications from 2021. | Completed successfully. | Data Request | Commitment Met |

| Initiative Number and Name | 2021 WMP Update Quantitative Target | 2021 Actual Reported | 2021 WMP Update Qualitative Target | 2021 Actual Reported | Method of Verification | Energy Safety Finding |
|--|---|--|---|-------------------------|--------------------------|-----------------------|
| 7.3.3.12.4 Distribution Maintenance | N/A | N/A | Evaluating integrating the 2021 Wildfire Distribution Risk Model results into maintenance programs to allow prioritization of notifications by wildfire risk. | Completed successfully. | Data Request | Commitment Met |
| 7.3.3.17.1 (C.13) System Hardening (Distribution) | 180 miles, including: 80% of those miles as highest risk miles and 10% undergrounded or have asset removal over a 3 year period from 2021-2023. | 210.5 miles, including: 139.5 miles within its highest risk miles, 40.1 miles of undergrounding, and 23.3 miles of asset line removal in 2021. | Switch from REAX Engineering to Technosylva for its Wildfire Consequence Modelling tool. | Completed successfully. | Data Request, QN, EC ARC | Commitment Met |
| 7.3.3.17.2-1 (C.15) System Hardening – Transmission Conductor | 92.2 transmission line conductor miles hardened | 103.8 transmission line conductor miles hardened | N/A | N/A | Data Request, QN, EC ARC | Commitment Met |
| 7.3.3.17.2-2 System Hardening – Transmission | 1,500 wood poles replaced with steel | 2,038 wood poles replaced with steel | N/A | N/A | Data Request | Commitment Met |

| Initiative Number and Name | 2021 WMP Update Quantitative Target | 2021 Actual Reported | 2021 WMP Update Qualitative Target | 2021 Actual Reported | Method of Verification | Energy Safety Finding |
|------------------------------|-------------------------------------|----------------------|------------------------------------|----------------------|------------------------|-----------------------|
| Wood Pole Replacement | | | | | | |

4. Appendix D

4.1 Ignition Risk and Outcomes Metrics

Energy Safety assessed the performance of PG&E's infrastructure relative to its wildfire risk, as measured by changes in the occurrence of events that correlate to wildfire risk.

Energy Safety requires electrical corporations to report data, such as ignitions in the HFTD, that help Energy Safety assess whether an electrical corporation reduced its wildfire risk while also reducing its reliance on PSPS. In 2021, Energy Safety evaluated each electrical corporation's performance metric data by conducting the following analyses:

1. For Ignition Risk Metrics:
 - a. A trend analysis of performance metrics from 2015-2021.
 - b. A year-over-year analysis of performance metrics from 2020-2021.
2. For Outcome Metrics:
 - a. A trend analysis of performance metrics from 2015-2021.
 - b. A year-over-year analysis of performance metrics from 2020-2021.

For this analysis, Energy Safety relied on data reported in PG&E's 2021 WMP Update and its March 18, 2022, QDR submission.

4.1.1 Ignition Risk Metrics

Energy Safety reviewed the ignition risk metrics PG&E reported in its March 18, 2022, QDR submission,⁵⁴ including:

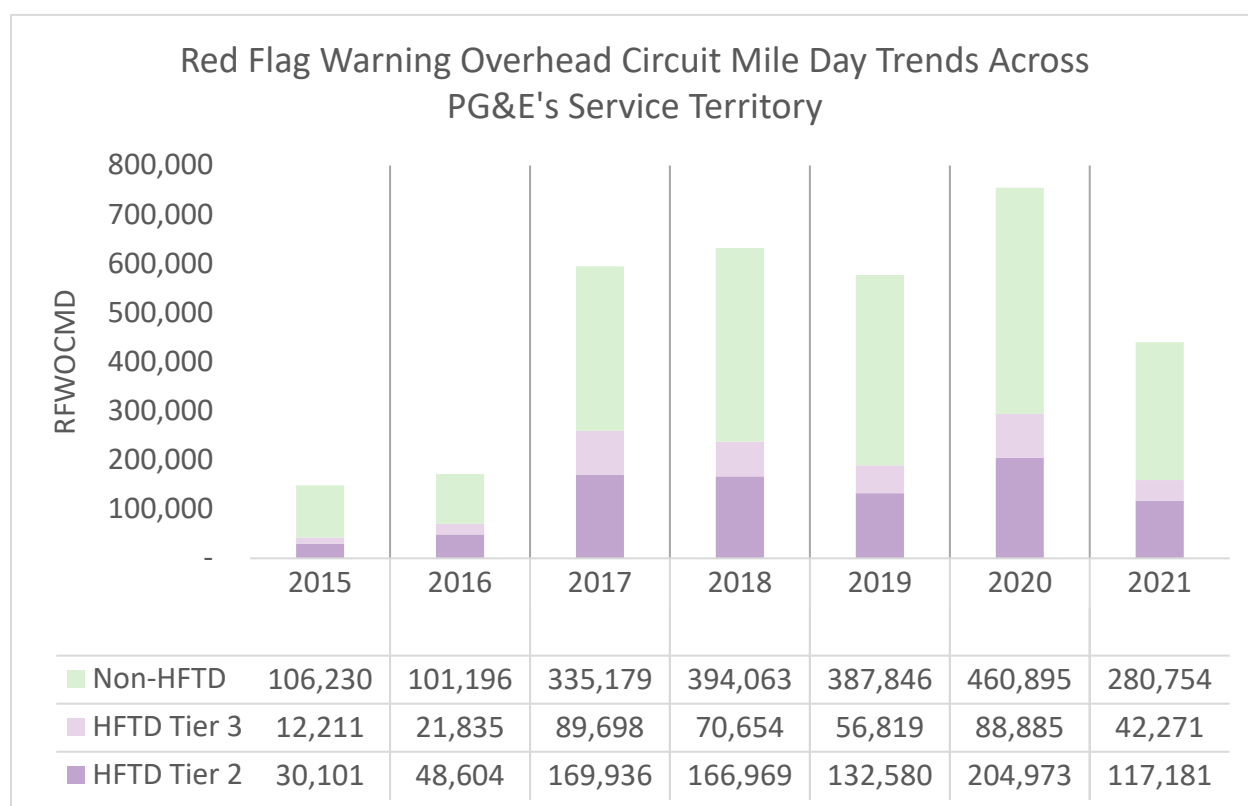
1. **Ignitions** – incidents in which electrical corporation infrastructure was involved
2. **Wire down events** – incidents in which overhead electrical lines fall to the ground or land on objects
3. **Vegetation-caused outages** – outages experienced in which the cause was determined to be vegetation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

⁵⁴ Pacific Gas and Electric Company, "Wildfire Safety Division Attachment 2.3 Wildfire Mitigation Plan Quarterly report - Q4 2021 (Table 7.1, Table 7.2)," Mar. 18, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52187&shareable=true>.

For applicable metrics, Energy Safety normalized each electrical corporation’s data using the unit “Red Flag Warning Overhead Circuit Mile Days” (RFWOCMD). Energy Safety uses RFWOCMD for overhead assets to depict wildfire risk normalized for the size of fire weather events in an electrical corporation’s service territory. Use of this metric allows for comparisons across reporting years of varying weather conditions and enables assessment of performance in 2021 relative to previous trends from 2015 through 2020.

As shown in Figure 1 below, PG&E has seen variability in RFWOCMDs since 2015 with an increase from 2015 through 2018, an uptick again in 2020, and a decline in 2021.

Figure 1: Variances in Extreme Fire Weather Across PG&E Territory from 2015-2021 by HFTD location



4.1.2 Ignition Data Analysis

PG&E had a similar count of total ignitions on its system in 2021 compared to both 2020 and to the six-year average from 2015-2020. 2021 did, however, represent an increase in ignitions compared to 2020 when normalized by RFWOCMD.

Figure 2 shows the ignitions across PG&E’s service territory normalized by the total RFWOCMD for each year delineated by location (i.e., Tier 3 HFTD areas, Tier 2 HFTD areas, and non-HFTD areas).

Figure 2: PG&E Ignitions from 2015-2021 Normalized by Ignitions in HFTD Tiers/ Total RFWOCMD

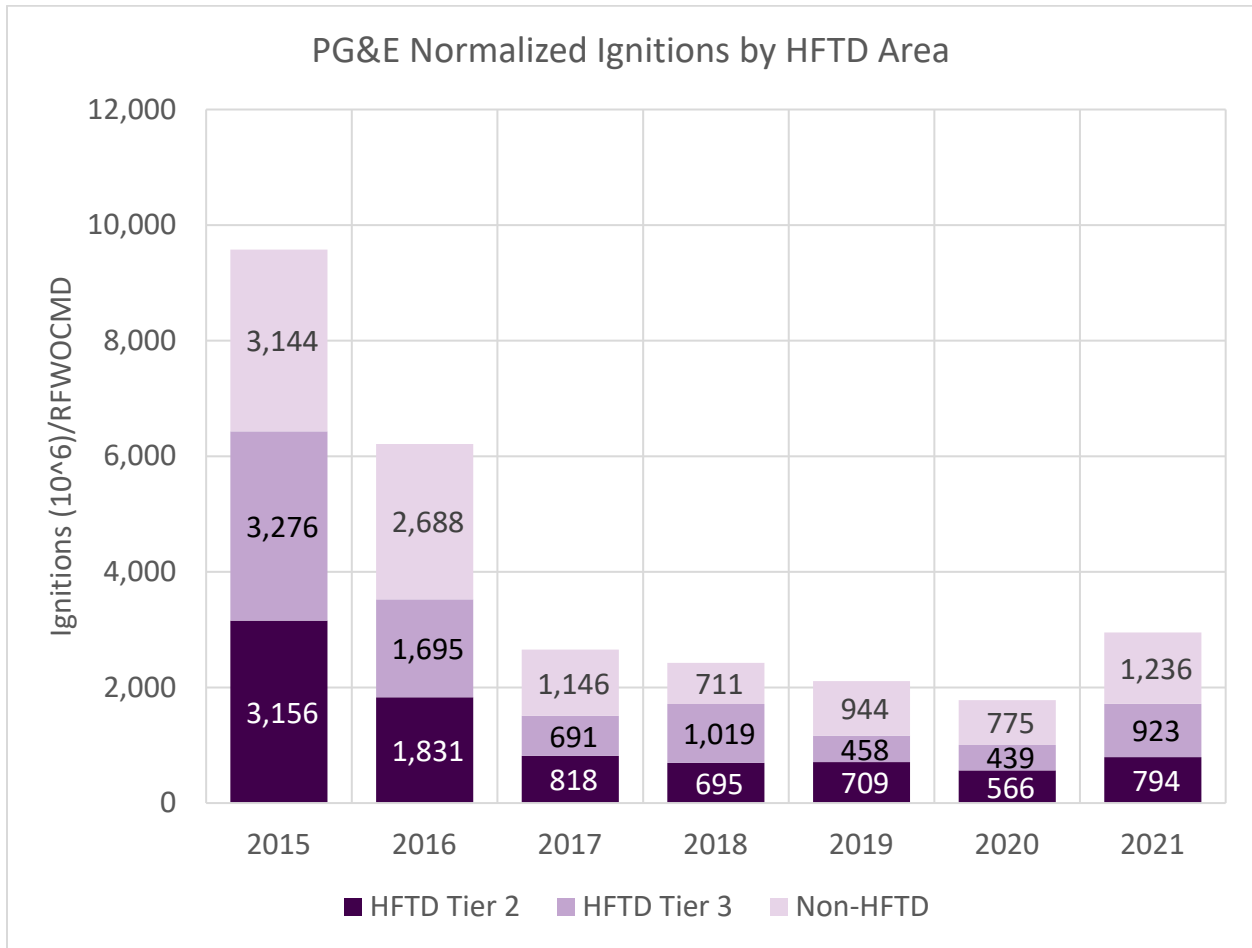


Table 6 shows a time series of PG&E utility-related ignitions since 2015. For 2021, the total ignitions of 480 was slightly below the 6-year average of 487 ignitions. Most (96%) of utility-related ignitions occurred on the distribution infrastructure.

Table 6: PG&E Count of Utility Related Ignitions (2015-2021)⁵⁵

| Description | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 6 Year Avg (2015-2020) |
|---------------------|------|------|------|------|------|------|------|---------------------------|
| Distribution | 458 | 382 | 561 | 442 | 461 | 485 | 466 | 465 |
| Transmission | 13 | 16 | 25 | 26 | 25 | 27 | 14 | 22 |
| Total | 471 | 398 | 586 | 468 | 486 | 512 | 480 | 487 |

The following four figures show drivers of PG&E normalized ignitions during the 2015 to 2021 period broken out by asset classification and HFTD location (i.e., Tier 3 and Tier 2). The first two figures show ignitions on the distribution system and the second two figures show ignitions on the transmission system.

As shown in the figures below, with few exceptions, contact from vegetation was generally the top driver of PG&E's normalized ignitions in Tier 2 and Tier 3 HFTD areas on its distribution system from 2015 through 2021. Contacts from vegetation increased between 2020 and 2021 in Tier 2 and Tier 3 HFTD areas on its distribution system.

⁵⁵ Pacific Gas and Electric Company, "Wildfire Safety Division Attachment 2.3 Wildfire Mitigation Plan Quarterly report - Q4 2021 (Table 7.1 and Table 7.2)," Mar. 18, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52187&shareable=true>.

Figure 3: PG&E Distribution Ignitions in Tier 3 HFTD Areas from 2015-2021 Normalized by RFWOCMD in Tier 3 Only Broken out by Risk Driver

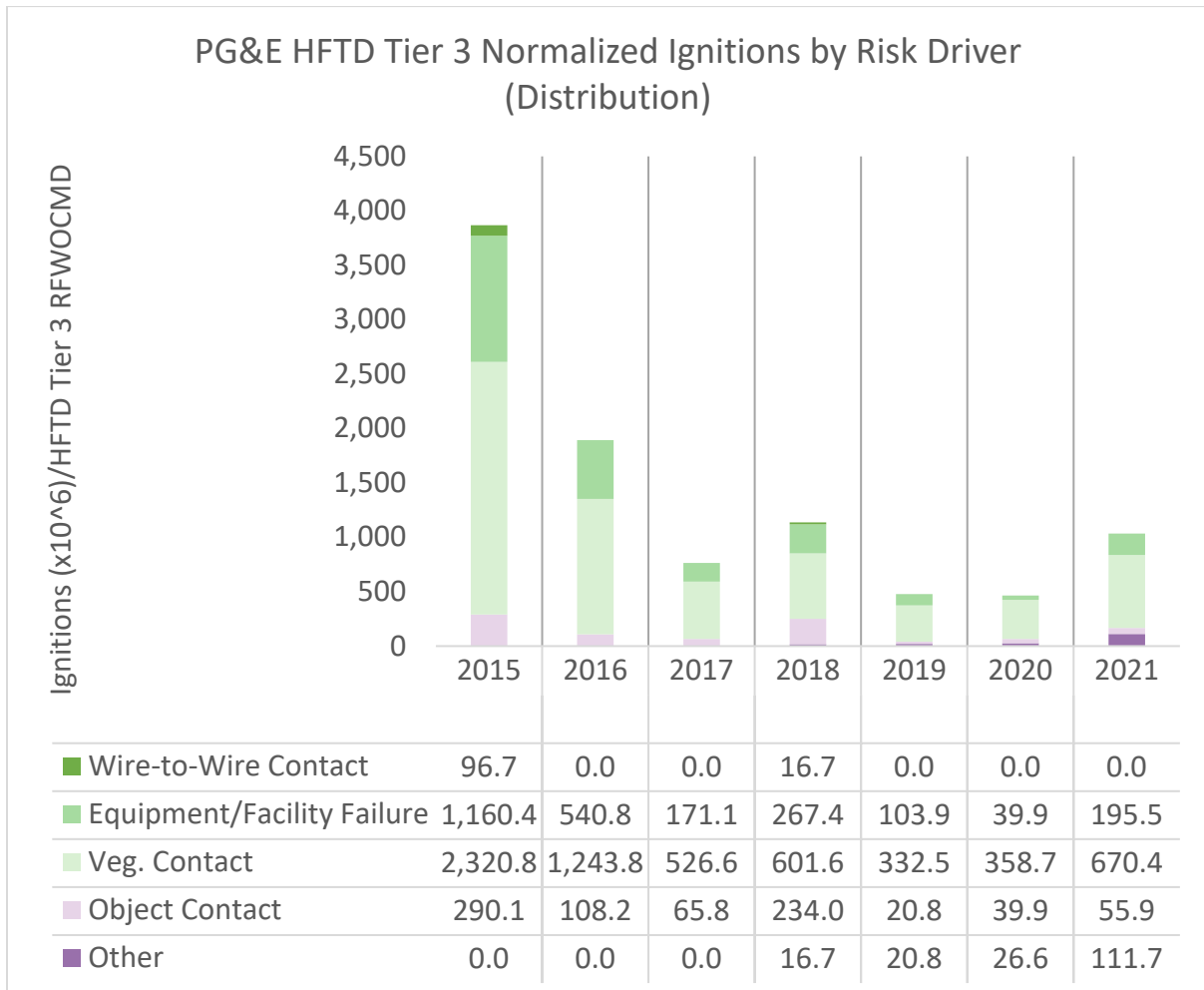


Figure 4: PG&E Distribution Ignitions in Tier 2 HFTD Areas from 2015-2021 Normalized by RFWOCMD in Tier 2 Only Broken out by Risk Driver

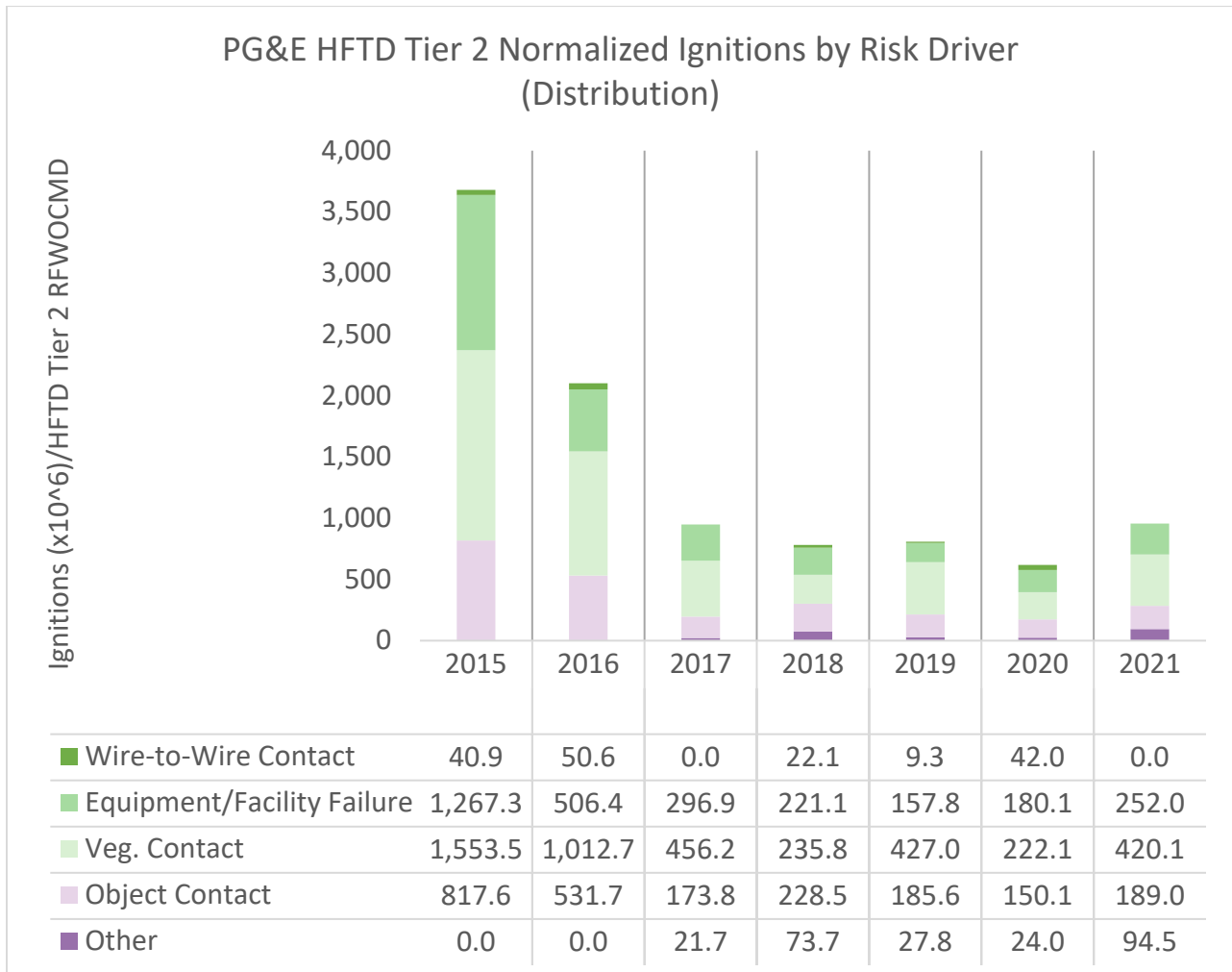
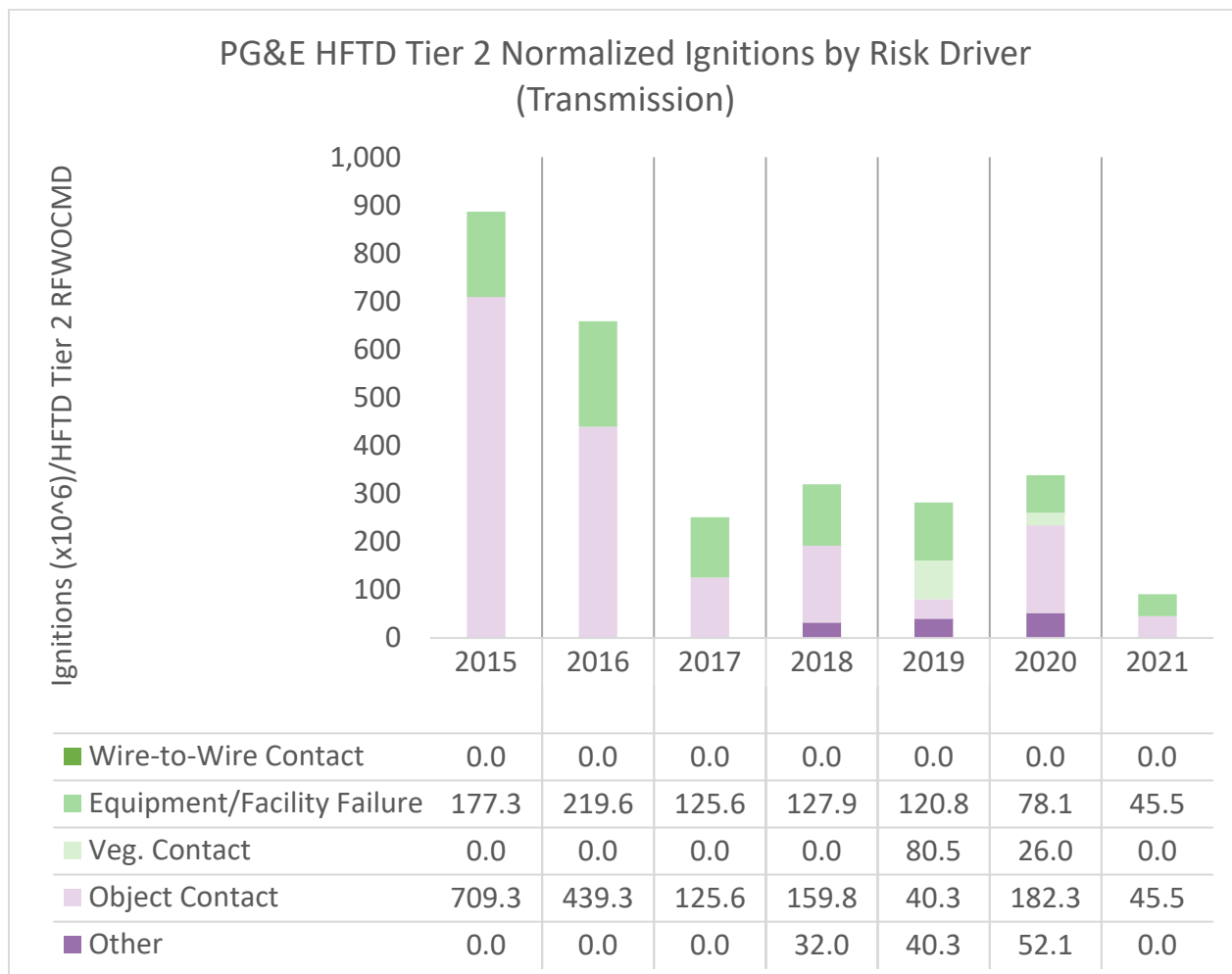


Figure 6: PG&E Transmission Ignitions in Tier 2 HFTD Areas from 2015-2021 Normalized by RFWOCMD Tier 2 Only Broken out by Risk Driver



4.1.2.1 Wire Down Data Analysis

QDR Table 7.1, metrics 1 through 16 include data on PG&E’s distribution and transmission wire-down events from 2015 through 2021, which are normalized for RFWOCMD and plotted below in Figure 7. PG&E’s overall normalized wire-down events trended down over the 2015 through 2020 period with the exception of a slight uptick in 2019. However, normalized wire-down events increased by 54% in 2021 compared to the previous six-year average, driven by distribution wire down events.

Figure 7: PG&E Total Wire Down Events from 2015-2021 Normalized by RFWOCMD

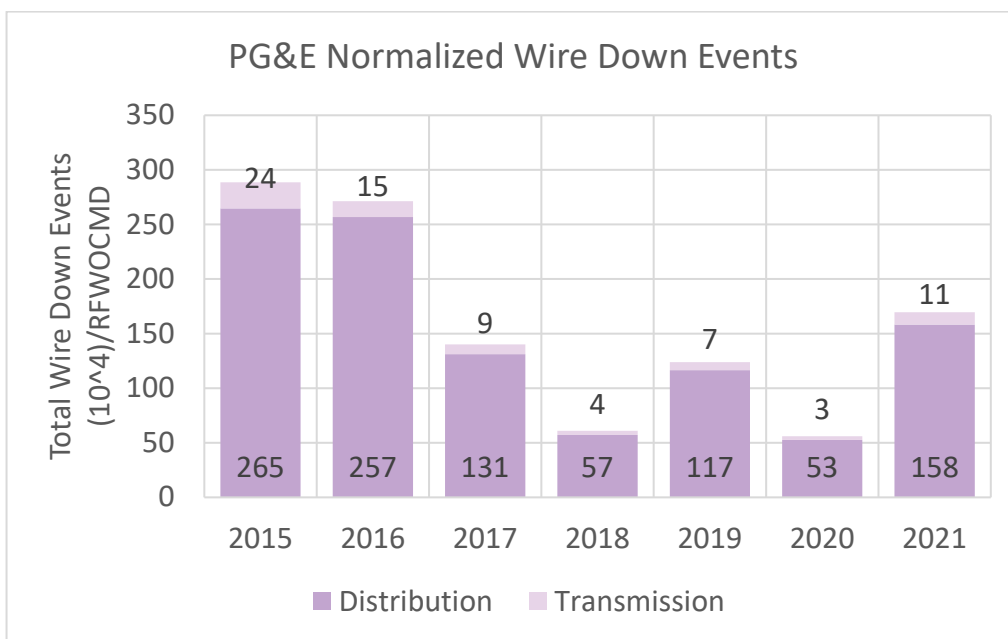


Table 7 shows the absolute count of PG&E wire-down events since 2015. For 2021, total wire down events were higher than in 2020 and compared to the 6-year average. Nearly all of the wire down events occurred on the distribution system.

Table 7: PG&E Count of Wire Down Events (2015-2021) ⁵⁶

| Description | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 6 Year Avg (2015-2020) |
|---------------------|-------|-------|-------|-------|-------|-------|-------|------------------------|
| Distribution | 3,215 | 3,600 | 6,379 | 2,950 | 5,500 | 3,249 | 5,692 | 4,148 |
| Transmission | 65 | 46 | 96 | 44 | 77 | 45 | 91 | 62 |
| Total | 3,280 | 3,646 | 6,475 | 2,994 | 5,577 | 3,294 | 5,783 | 4,211 |

⁵⁶ Pacific Gas and Electric Company, “Wildfire Safety Division Attachment 2.3 Wildfire Mitigation Plan Quarterly report - Q4 2021 (Table 7.2),” Mar. 18, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52187&shareable=true>.

4.1.2.2 Outage Data Analysis

QDR Table 7.1, metrics 17 through 32 include data on distribution and transmission outages of all cause types from 2015 through 2021. Figure 8 depicts PG&E's distribution and transmission outages normalized for RFWOCMD. In 2021, normalized outages increased to their highest levels since 2016.

Figure 8: Outages from 2015-2021 Normalized by RFWOCMD

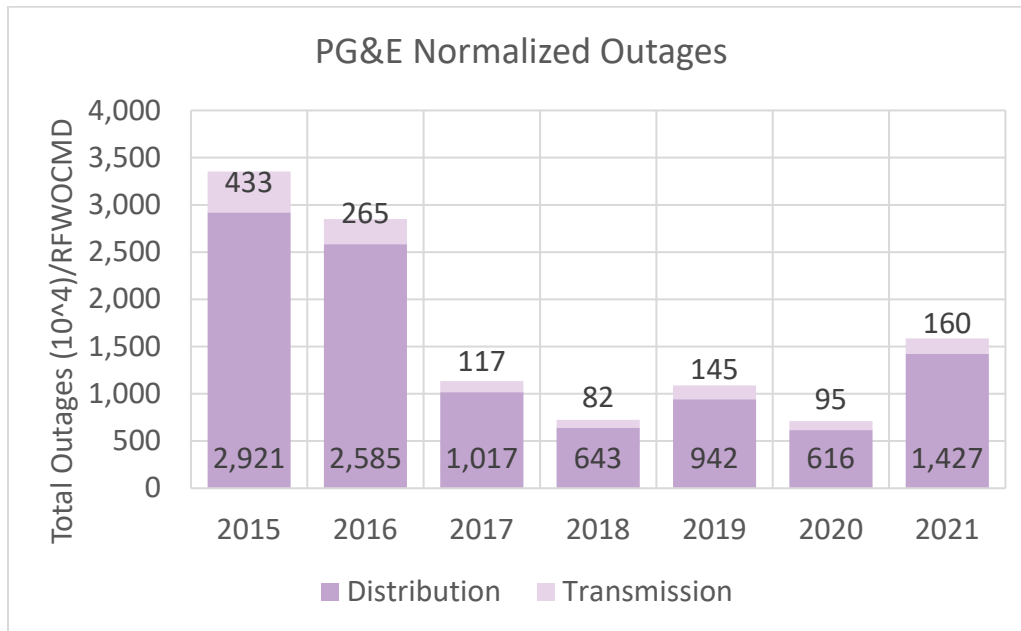


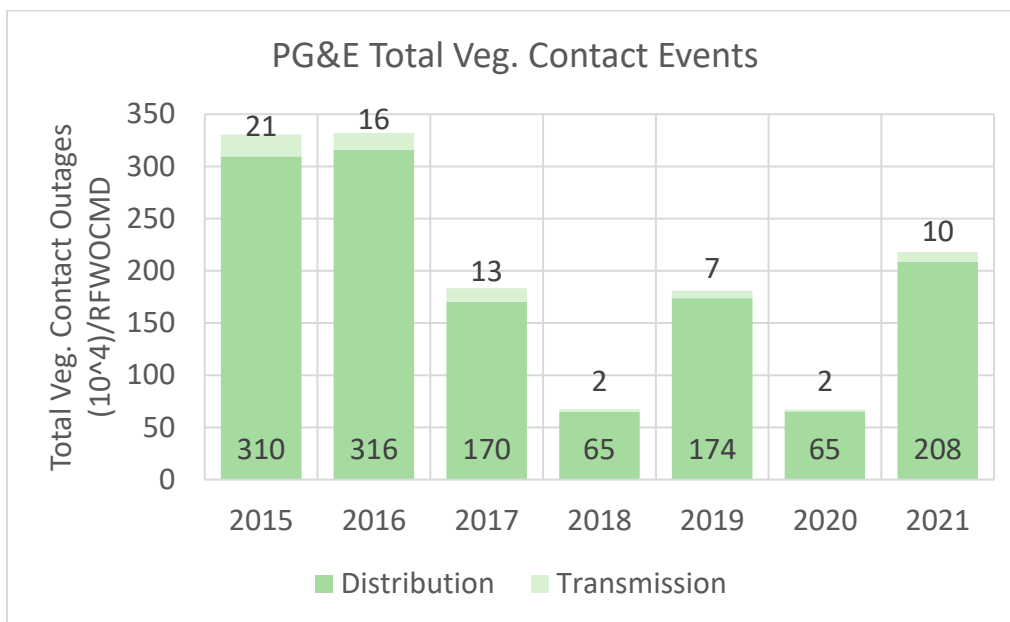
Table 8 show a time series of PG&E outages since 2015. For 2021, total outages of 52,597 were 29% above the 6-year average of 40,648 outages. Most outages, or 97%, occurred on the distribution infrastructure.

Table 8: PG&E Count of Outages (2015-2021) ⁵⁷

| Description | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 6 Year Avg (2015-2020) |
|---------------------|--------|--------|--------|--------|--------|--------|--------|------------------------|
| Distribution | 35,465 | 36,244 | 49,442 | 33,185 | 44,452 | 38,026 | 51,308 | 39,469 |
| Transmission | 1,178 | 834 | 1,269 | 944 | 1,537 | 1,312 | 1,289 | 1,179 |
| Total | 36,643 | 37,078 | 50,711 | 34,129 | 45,989 | 39,338 | 52,597 | 40,648 |

Figure 9 below plots PG&E’s distribution and transmission vegetation contact-caused outages normalized for RFWOCMD. Normalized outages due to vegetation contact has varied year to year since 2017 and do not show a clear trend. In 2021, as compared to the six-year average from 2015 through 2020, PG&E’s normalized total outages due to vegetation contact increased by 125%.

Figure 9: Outages from Vegetation Contacts for 2015-2021 Normalized by RFWOCMD



⁵⁷ Pacific Gas and Electric Company, “Wildfire Safety Division Attachment 2.3 Wildfire Mitigation Plan Quarterly report - Q4 2021 (Table 7.1 and Table 7.2),” Mar. 18, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52187&shareable=true>.

4.1.2.3 PSPS Data Analysis

While useful as a wildfire mitigation measure, PSPS events impact customers. As such, electrical corporations must strive to minimize the duration, scope, and frequency of PSPS events. For most electrical corporations, broad use of PSPS as a wildfire mitigation measure did not occur until 2018.

PG&E reported data on its use of PSPS events and other PSPS metrics in Table 11 of its QDR. Again, Energy Safety applied the RFWOCMD metric as a normalizing parameter. All the figures below show an increase in usage and impact of PSPS events from 2015 to 2019 and then steady declines through 2021. In 2021, all of the normalized PSPS metrics declined compared to 2019 as follows:

- As shown in Figure 10, normalized frequency of PSPS events, where de-energization occurred, decreased from 14 in 2019 to 11 in 2021.
- As shown in Figure 11, normalized scope of PSPS events decreased from 3,190 circuit events in 2019 to 538 circuit events in 2021.
- As shown in Figure 12, normalized PSPS event duration decreased from 159 million customer hours in 2019 to 5.5 million customer hours in 2021.
- As shown in Figure 13, normalized critical infrastructure locations impacted, measured as locations per hour multiplied by hours offline, decreased from 810,941 in 2019 to 51,151 in 2021.⁵⁸

⁵⁸ Pacific Gas and Electric Company, "Wildfire Safety Division Attachment 2.3 Wildfire Mitigation Plan Quarterly report - Q4 2021 (Table 11)," Mar. 18, 2022. [Online]. Available: <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52187&shareable=true>.

Figure 10: Normalized Frequency of PSPS Events (2015-2021)

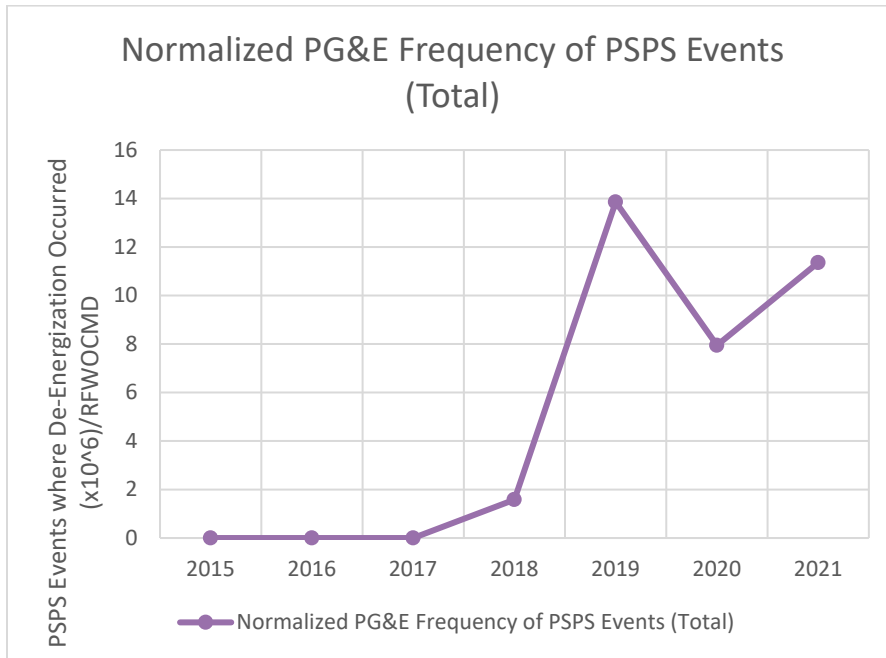


Figure 11: Normalized Scope of PSPS Events (2015-2021)

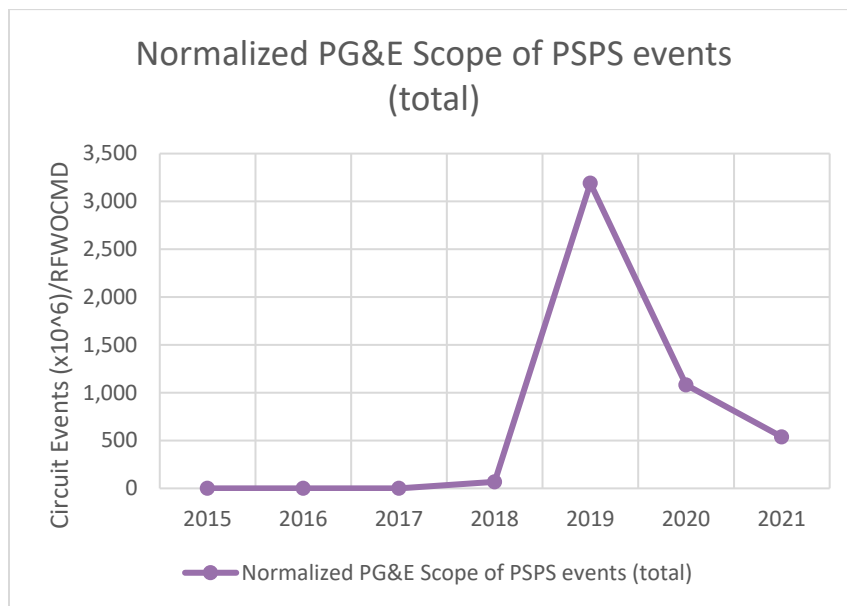


Figure 12: Normalized Duration of PSPS Events

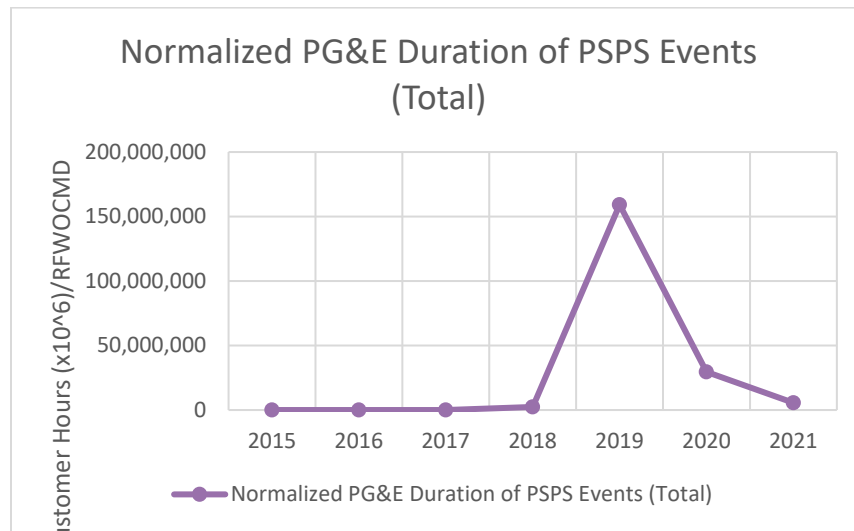
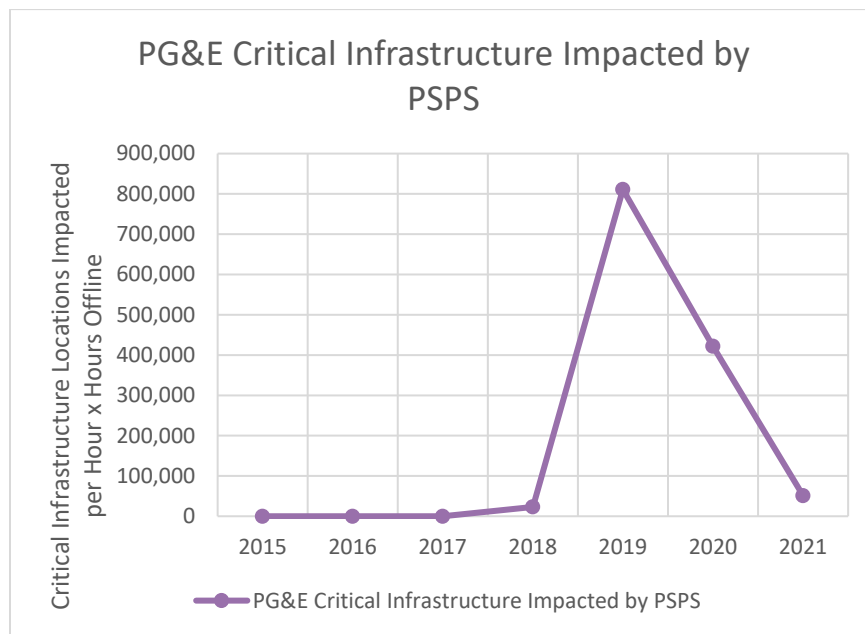


Figure 13: Normalized Critical Infrastructure Impacted due to PSPS (2015-2021)



4.1.3 Outcome Metrics

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

1. Acres burned
2. Structures damaged/destroyed

- 3. Injuries/fatalities
- 4. Value of assets destroyed

Table 9 below provides Energy Safety’s assessment of PG&E’s short and long-term outcome patterns.

Table 9: PG&E Outcome Metrics Observations

| Description |
|---|
| Short-Term Patterns, 2020 – 2021 |
| <ul style="list-style-type: none"> • More than 964,000 acres burned in 2021 compared to 59,300 in 2020, caused largely by the Dixie Fire. • 1,329 structures burned in 2021, an increase from 206 in 2020. • In 2021 there was one fatality and five injuries. In 2020 there were four fatalities and one injury. • The value damage due to wildfire was \$577.1 million in 2021, an increase from \$169 million in 2020. |
| Long-Term Patterns, 2015 – 2021 |
| <ul style="list-style-type: none"> • From 2015-2021, acres burned have been 72,149; 2,727; 206,226; 166,282; 82,027; 59,300; and 964,212 respectively. • From 2015-2021, fatalities per year have been 2, 0, 22, 85, 0, 4, and 1 respectively. For the same years, reported injuries have been 0, 2, 1, 0, 4, 1, and 5 respectively. • From 2015-2021, the number of structures destroyed have been 965, 0, 2,575, 18,806, 374, 206, and 1,329 respectively. • From 2015-2021, as reported in PG&E’s 2021 Q4 QIU and 2023 Q4 QDR, the value of assets destroyed have been \$911 million, \$2.4 million, \$25,500 million, \$1.49 million, \$35.275 million, \$368 million, and \$775 million, respectively. |