May 26, 2023 **Via Electronic Filing**

Caroline Thomas Jacobs, Director
Office of Energy Infrastructure Safety
California Natural Resources Agency
Sacramento, CA 95184
efiling@energysafety.ca.gov

Subject: **Comments of the Public Advocates Office on the 2023 to 2025 Wildfire Mitigation Plans of the Large Investor-Owned Utilities**

Docket: **2023-2025-WMPs**

Dear Director Thomas Jacobs,

The Public Advocates Office at the California Public Utilities Commission (Cal Advocates) respectfully submits the following comments on the 2023-2025 Wildfire Mitigation Plans of Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE) and San Diego Gas & Electric Company (SDG&E), as well as general wildfire mitigation issues. Please contact Nathaniel Skinner (Nathaniel.Skinner@cpuc.ca.gov), Program Manager, or Henry Burton (Henry.Burton@cpuc.ca.gov), Program and Project Supervisor, with any questions relating to these comments.

We respectfully urge the Office of Energy Infrastructure Safety to adopt the recommendations discussed herein.

Respectfully submitted,

/s/ ***Carolyn Chen***

_____

Carolyn Chen
Attorney

Public Advocates Office
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, California 94102
Telephone: (415) 703-1980
E-mail: Carolyn.Chen@cpuc.ca.gov

Contents

I. INTRODUCTION

Pursuant to the Office of Energy Infrastructure Safety's (Energy Safety) *Final 2023-2025 Wildfire Mitigation Plan Process and Evaluation Guidelines* (2023 WMP Process Guidelines) and *2023 Wildfire Mitigation Plan Schedule*,[1] the Public Advocates Office at the California Public Utilities Commission (Cal Advocates) submits these comments on the 2023 to 2025 Wildfire Mitigation Plans (WMPs) submitted by the large investor-owned utilities (IOUs or utilities).[2]

The 2023-2025 Wildfire Mitigation Plan Technical Guidelines (2023 WMP Technical Guidelines) established templates and substantive requirements for WMP submissions, while the 2023 WMP Process Guidelines established a schedule and review process for WMP submissions in 2023. Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), and San Diego Gas & Electric Company (SDG&E) submitted 2023-2025 WMPs on March 27, 2023.

The 2023 WMP Process Guidelines permit interested persons to file opening comments on the large IOUs' 2023 WMPs by May 26, 2023 and reply comments by June 6, 2023.[3]

In these comments, Cal Advocates addresses the WMPs of PG&E, SCE and SDG&E. We then provide technical recommendations applicable to all utilities.

---

[1] Office of Energy Infrastructure Safety (Energy Safety), *Final 2023-2025 Wildfire Mitigation Plan Process and Evaluation Guidelines*, December 6, 2022; Energy Safety, *2023 Wildfire Mitigation Plan Schedule*, December 7, 2022.

[2] Many of the Public Utilities Code requirements relating to wildfires apply to "electrical corporations." *See, e.g.*, Public Utilities Code Section 8386. These comments use the more common terms "utilities" and "IOUs," and the phrase "electrical corporations" interchangeably to refer to the entities that must comply with the wildfire safety provisions of the Public Utilities Code.

[3] On May 17, 2023, Energy Safety extended the reply comment deadline from June 5 to June 6. See *Extension of the reply comment deadline for the large Investor-Owned Utilities' Wildfire Mitigation Plans*, Energy Safety, May 17, 2023, in docket 2023-2025-WMPs.

II. TABLE OF RECOMMENDATIONS

Item	Utility	Recommendation	Timeframe	Section of these Comments
1	PG&E	Energy Safety should require PG&E to revise and resubmit its WMP to comply with requirements to improve its decision-making process for grid hardening measures (ACI PG&E-22-34).	2023 WMP Revision	III.A.1
2	PG&E	In its revised WMP, PG&E should fully comply with all actions listed in ACI PG&E-22-34, including an analysis of alternatives, incorporating risk-spend efficiency into its decision-making, making localized project-level comparisons, and setting thresholds to determine whether undergrounding is appropriate.	2023 WMP Revision	III.A.1
3	PG&E	Energy Safety should require PG&E to revise its system hardening plans.	2023 WMP Revision	III.A.2
4	PG&E	Energy Safety should require PG&E to submit supplemental information to justify its aggressive focus on undergrounding, including a cost breakdown, a preliminary list of projects for the second tranche of the program, a more granular risk distribution of planned undergrounding miles, and a justification for scaling back covered conductor and REFCL efforts. PG&E should file these supplements in summer 2023 and update them annually in 2024 and 2025.	Summer 2023	III.A.2
5	PG&E	Energy Safety should require PG&E to revise and resubmit its WMP to comply fully with requirements on asset inspection quality (ACI PG&E-22-21).	2023 WMP Revision	III.B.1
6	PG&E	PG&E should outline a detailed plan to improve its inspection quality over its poor performance in 2021 and 2022.	2023 WMP Revision	III.B.1
7	PG&E	PG&E must set acceptable quality levels of at least 95 percent for each year of the 2023-2025 WMP cycle.	2023 WMP Revision	III.B.1

8	PG&E	Energy Safety should lead a comprehensive audit of PG&E's asset inspection and QA/QC programs. Energy Safety should perform this audit in 2023 and develop a report of recommendations by the first quarter of 2024.	Q1 2024	III.B.2
9	PG&E	Alternatively, Energy Safety could require PG&E to pay for an independent auditor to audit its inspection programs.	Q1 2024	III.B.2
10	PG&E	Energy Safety should require PG&E to revise and resubmit its WMP to comply with Energy Safety's directives to rectify overdue maintenance (ACI PGE-22-22).	2023 WMP Revision	III.C.1
11	PG&E	PG&E should make an "all hands on deck" attempt to remediate its full ignition-risk backlog by the end of 2024. PG&E should remediate its full maintenance backlog by the end of 2026.	Q4 2024	III.C.1
12	PG&E	PG&E must resolve all new maintenance tags in compliance with GO 95, Rule 18.	Ongoing	III.C.1
13	PG&E	PG&E should develop a comprehensive resource plan to show how it will eliminate its backlog by the required timeframes. PG&E should submit this plan by early 2024.	Change Order in Q1 2024	III.C.1
14	PG&E	PG&E should demonstrate that it has permanently allocated sufficient financial and material resources to meet asset management needs on an ongoing basis.	Change Order in Q1 2024	III.C.1
15	PG&E	Energy Safety should issue a notice of violation and refer PG&E to the CPUC for enforcement action for failing to comply with GO 95, Rule 18 since at least 2019.	2023	III.C.1
16	PG&E	Energy Safety should require PG&E to develop a comprehensive plan to reduce the scale, scope, frequency, and duration of EPSS outages. PG&E should clearly identify its end goal for the EPSS program, including but not limited to the necessary milestones to achieve this goal.	Change Order in Q1 2024	III.D.1

17	PG&E	PG&E should describe a strategy to mitigate the customer impacts of EPSS, including informing vulnerable customers about the expected, localized risk of EPSS-related outages.	Change Order in Q1 2024	III.D.1
18	PG&E	PG&E should submit its EPSS reduction plan as part of a WMP Change Order in early 2024, with intent to implement its plan before June of 2024.	Change Order in Q1 2024	III.D.1
19	PG&E	Energy Safety should facilitate a comprehensive audit of PG&E's vegetation contractor management. Alternatively, Energy Safety can require PG&E to pay for an independent auditor to audit its vegetation contractor management and report its findings to Energy Safety in early 2024.	Q1 2024	III.E.1
20	PG&E	Energy Safety should require PG&E to more quickly address its remaining EVM Tree Inventory.	2023 WMP Revision	III.E.2
21	PG&E	Energy Safety should require PG&E to revise and resubmit its WMP to provide more information on its EVM tree inventory. PG&E should provide an assessment of the residual risk posed by these trees and a justification for PG&E's proposed pace to reinspect and address these trees.	2023 WMP Revision	III.E.2
22	PG&E	Energy Safety should require PG&E to demonstrate that its new VM programs mitigate as much or more risk than its legacy EVM program.	2023 WMP Revision	III.E.3
23	PG&E	Energy Safety should require PG&E to revise and resubmit its WMP to provide a quantitative analysis of the expected risk reduction from the new transitional vegetation programs compared to its legacy EVM program.	2023 WMP Revision	III.E.3
24	PG&E	Energy Safety should require PG&E to revise and resubmit its WMP to comply with requirements to improve its decision-making process for grid hardening measures (ACI PG&E-22-34).	2023 WMP Revision	III.A.1
25	SCE	Energy Safety should direct SCE to accelerate its efforts to mitigate ignition risks on secondary conductors	2023 WMP Revision	IV.A.1
26	SCE	SCE should prioritize the development and implementation of a predictive model for secondary conductor ignitions.	2023 WMP Revision	IV.A.1

27	SCE	SCE should provide additional reasoning for focusing on measures that primarily address contact from foreign objects rather than equipment failure.	2023 WMP Revision	IV.A.1
28	SCE	Energy Safety should instruct SCE to justify its transition to a mitigation strategy that predominantly focuses on the consequences of wildfires.	2024 WMP Update	IV.B.1
29	SCE	SCE should develop a balanced risk assessment framework that considers both the consequences and the likelihood of ignition.	2024 WMP Update	IV.B.1
30	SCE	Energy Safety should direct SCE to justify its wildfire mitigation strategy for Severe Risk Areas.	2024 WMP Update	IV.B.2
31	SCE	SCE should explain why it is prudent and responsible to allow wildfire risks to persist for several years in Severe Risk Areas before beginning undergrounding projects, instead of using highly effective mitigation measures that are faster to deploy.	2024 WMP Update	IV.B.2
32	SCE	Energy Safety should direct SCE to provide additional information demonstrating the effectiveness of its novel Integrated Wildfire Mitigation Strategy (IWMS) at targeting and prioritizing areas with intolerable risk consequences.	2024 WMP Update	IV.B.3
33	SCE	SCE should present clearer evidence (in data or graphics) demonstrating the results of its consequence-reducing mitigation strategy. In its next WMP, SCE should present an analysis of Integrated Wildfire Mitigation Strategy that separates likelihood and consequence and that accurately reflects the strategy's expected results.	2024 WMP Update	IV.B.3
34	SCE	Energy Safety should direct SCE to submit a revised WMP that provides more detail on SCE’s plan to address maintenance tags that present an ignition risk.	2023 WMP Revision	IV.C.1
35	SCE	Energy Safety should direct SCE to explain how it sets targets for asset inspection types that have a high find rate.	Q3 2023	IV.C.2

36	SCE	SCE should develop a plan to expand its use of X-Ray and LineVue inspections or show why expansion is infeasible.	Q3 2023	IV.C.2
37	SCE	Energy Safety should direct SCE to revise its WMP to provide a plan for addressing its backlog of overdue work orders that demonstrates it has allocated sufficient personnel for the task.	2023 WMP Revision	IV.C.3
38	SCE	Energy Safety should instruct SCE to investigate why work orders have been open up to eleven years, and to reassess the needed remediation actions for long-delayed work orders.	2023 WMP Revision	IV.C.4
39	SCE	Energy Safety should direct SCE to revise its WMP with a detailed plan to promptly close the pending work orders that are at least five years old	2023 WMP Revision	IV.C.4
40	SCE	Energy Safety should require SCE to fully report on its progress, outcomes, and lessons from implementing its Consolidated Inspection Strategy through its completion in 2025.	2024 WMP Update	IV.D.1
41	SCE	Energy Safety should require SCE to resubmit information on its community outreach and engagement with vulnerable customers regarding PSPS	2023 WMP Revision	IV.E.1
42	SCE	SCE should articulate more specific objectives and methods of verification regarding customer and community outreach.	2023 WMP Revision	IV.E.1
43	SCE	Energy Safety should require SCE to resubmit Section 8.5.3 and Table 8-53.	2023 WMP Revision	IV.E.1
44	SDG&E	Energy Safety should require SDG&E to explain why previously planned enhancements to its risk models have not been implemented.	2023 3rd Quarterly Data Report	V.A.1
45	SDG&E	Energy Safety should require clear reporting on the evolution of SDG&E's wildfire risk models. SDG&E should submit these progress reports on an annual basis starting in SDG&E's 2024 WMP submission.	2024 WMP Update	V.A.1

46	SDG&E	Energy Safety should require SDG&E to report on how it is incorporating the Vegetation Risk Index into its WiNGS-Operations model. SDG&E should file this supplemental report by March 7, 2024.	Q1 2024	V.A.2
47	SDG&E	Energy Safety should direct SDG&E to revise its Quality Assurance and Quality Control procedures for distribution asset inspections	2023 WMP Revision	V.B.1
48	SDG&E	SDG&E should rethink its QA/QC process for distribution asset inspections. SDG&E should develop a robust process that can realistically identify mistakes as well as successes.	2023 WMP Revision	V.B.1
49	SDG&E	Energy Safety should direct SDG&E to submit detailed information in its next WMP on its Drone Investigation, Assessment, and Repair program	2024 WMP Update	V.B.2
50	SDG&E	SDG&E should provide specific metrics and updates on the performance of its DIAR program.	2024 WMP Update	V.B.2
51	SDG&E	Energy Safety should require SDG&E to report its ad-hoc vegetation inspections in the same manner as it reports formal vegetation management programs.	2024 WMP Update	V.C.1
52	SDG&E	SDG&E should study and report on whether the additional ad hoc inspections provide a quantifiable risk reduction.	2024 WMP Update	V.C.1
53	SDG&E	Energy Safety should require SDG&E to report in each annual WMP Update on its strategy to identify additional vegetation inspection opportunities and to evaluate the effectiveness of those inspections.	2024 WMP Update	V.C.1
54	SDG&E	Energy Safety should require SDG&E to submit retrospective information on its completed activities, with the Quarterly Data Reports, starting with the third quarter of 2023.	2023 3rd Quarterly Data Report	V.C.1
55	SDG&E	SDG&E should revise its grid hardening strategy for its frequently de-energized circuits.	2023 WMP Revision	V.D.1
56	SDG&E	SDG&E must demonstrate that it is prioritizing its most frequently de-energized circuits to achieve timely PSPS reduction for the customers most at risk.	2023 WMP Revision	V.D.1

57	SDG&E	SDG&E should consider mitigation options other than undergrounding for its frequently de-energized circuits.	2023 WMP Revision	V.D.1
58	SDG&E	Energy Safety should require SDG&E to report in each annual WMP Update on its strategy to mitigate risk on the frequently de-energized circuits, including a workplan, an analysis of alternatives to undergrounding, and a report on how the wildfire and PSPS risk scores of each frequently de-energized circuit have changed.	2024 WMP Update	V.D.1
59	SDG&E	Energy Safety should require SDG&E to submit quarterly progress reports about the frequently de-energized circuits, including mileage of grid hardening completed, unhardened mileage remaining, and updated workplans.	Quarterly Data Reports, starting Q3 2023	V.D.1
60	All utilities	Energy Safety should develop modeling guidelines and standards by 2024 as part of its ongoing Risk Modeling Working Group.	Q4 2023	VI.A.1
61	All utilities	Energy Safety should direct the large utilities to explain how they intend to manage a large expansion of undergrounding.	2024 WMP Update	VI.B.1
62	All utilities	Energy Safety should encourage the IOUs to study the potential resource constraints and challenges related to their undergrounding efforts, and to provide plans to address these concerns in future WMP updates.	2024 WMP Update	VI.B.1
63	All utilities	Energy Safety should develop WMP guidelines for fast-trip programs similar to its guidelines for PSPS.	Q4 2023	VI.C.1
64	All utilities	Energy Safety should require each utility to develop and propose a plan to notify customers when fast-trip settings are enabled on their circuits.	2023 WMP Revision	VI.C.2
65	All utilities	Energy Safety should direct each large utility to develop a plan to mitigate the impact of fast-trip outages on customers and submit it in a revised WMP or a change order by August 2023. The plans should be implemented by October 1, 2023.	2023 WMP Revision	VI.C.2

III. PG&E

A. Grid Design and System Hardening

1. Energy Safety should require PG&E to revise and resubmit its WMP to comply with requirements to improve its decision-making process for grid hardening measures (ACI PG&E-22-34).

In its Final Decision on PG&E's 2022 WMP Update, Energy Safety found that PG&E assigns an unreasonably high priority to undergrounding. Energy Safety required PG&E to conduct a quantitative analysis of alternative mitigation techniques. This included a number of specific actions that PG&E was to address in its 2023 WMP.[4]

The high-level descriptions of PG&E's decision-making process in its 2023 WMP fail to appropriately address the concerns posed by Energy Safety and several intervenors. PG&E's response to these issues demonstrates that it has not performed a comprehensive analysis of alternative mitigations, does not incorporate risk-spend efficiency (RSE)[5] into its decision-making, and overall, continues to assign an unreasonably high priority to undergrounding.

a) PG&E has not performed a comprehensive analysis of alternatives to undergrounding.

As part of the required progress on Energy Safety's *Area for Continued Improvement (ACI) PG&E-22-34*, PG&E was directed to "evaluate *all* alternatives to undergrounding, both as individual mitigations *as well as combinations*, focusing on addressing *location-specific risks*."[6] PG&E's 2023 WMP includes none of these elements. Instead, PG&E's evaluation of alternatives boils down to a broad observation that undergrounding is an extremely effective mitigation.[7]

---

[4] Energy Safety, *Final Decision on 2022 Wildfire Mitigation Plan Update Pacific Gas and Electric Company*, November 10, 2022 (Final Decision on PG&E's 2022 WMP), pp. 184-185.

[5] RSEs are a measure of the amount of risk addressed by a mitigation divided by the cost of the mitigation. Adopted by the Commission in Decision D.21-11-009.

[6] Final Decision on PG&E's 2022 WMP, p. 184 (emphasis added).

[7] "While we still review system hardening projects for possible line removal first, we explained in our 2022 WMP how undergrounding is a more effective mitigation in terms of long-term risk reduction than overhead hardening when line removal is not possible." PG&E, *2023-2025 Wildfire Mitigation Plan WMP R1*, April 6, 2023 (PG&E's 2023 WMP R1), p. 967. As this quote shows, **PG&E's approach to mitigation selection has not materially changed** since PG&E's 2022 WMP, which Energy Safety found was not acceptable.

PG&E has stated on numerous occasions that moving a previously overhead line underground almost completely eliminates the wildfire risk associated with that line.[8] However, as Cal Advocates and other intervenors showed in 2022, undergrounding is substantially more expensive and time-consuming to implement than alternative mitigations.[9] As a result, the risk-spend efficiency (RSE) of undergrounding is substantially lower than alternative mitigations such as covered conductor.[10], [11] PG&E's analysis really does not take these factors into account.

Furthermore, PG&E compares mitigations only on a broad scale. PG&E has provided no evidence that it has evaluated, or ever plans to evaluate, alternatives (including combinations of mitigations) at the project or circuit segment level.[12] A project-level alternatives analysis is critical to address location-specific risks, as required by Energy Safety in Area for Continued Improvement (ACI) PG&E-22-34. Without such a detailed analysis, PG&E fails to provide the information needed to make a reasonable decision on the best mitigation for a location. Instead,

[8] PG&E's 2023 WMP R1, p. 343.

[9] *See, e.g.*:

- *Comments of the Public Advocate's Office on the 2022 Wildfire Mitigation Plan Updates of the Large Investor-Owned Utilities*, April 11, 2022 (Cal Advocates Comments on 2022 WMPs), pp. 13-19;
- *Mussey Grade Road Alliance Comments On 2022 Wildfire Mitigation Plans Of PG&E, SCE, And SDG&E*, April 11, 2022, pp. 72-77;
- *Opening Comments Of The Utility Reform Network On The 2022 Wildfire Mitigation Plans*, April 11, 2022, pp. 4-6.

[10] In each year during the 2023-2025 WMP cycle, the estimated RSE for overhead system hardening is higher than that of undergrounding (response to data request CalAdvocates-PGE-2023WMP-09, question 13, attachment 1). These numbers are questionable – and likely biased *in favor of undergrounding* – as PG&E's forecast unit cost for overhead system hardening in this attachment ranges from $1.56 million per mile to $1.67 million per mile, nearly double PG&E's *actual* unit cost in 2022 of $0.83 million per mile (PG&E's 2023 WMP R1, Table PG&E-22-11-3, p. 903).

[11] PG&E has argued several times, such as in its 2023 General Rate Case proceeding, that RSE alone is not a sufficient metric by which to compare mitigations. This argument has some merit; however, it is equally accurate to argue that mitigation effectiveness alone is not sufficient to compare mitigations. As we discussed in our comments last year, the costs of system hardening are largely passed to ratepayers and, as such, affordability must be a component of any discussion around mitigation selection.

[12] In response to data request TURN-PG&E-1, question 1, PG&E states that PG&E's WMP does not provide a comparison of the RSEs for undergrounding compared to the RSEs of alternative mitigations. PG&E has provided RSEs at the tranche and aggregated level in its 2023 GRC. Cal Advocates notes that neither the tranche nor an "aggregated" level are sufficiently granular to address "location-specific risks."

PG&E has decided in advance that it will resort to overhead hardening only when and if it deems undergrounding to be "infeasible."[13]

Finally, PG&E has not effectively compared undergrounding to *combinations* of mitigations as directed by Energy Safety. Covered conductor is effective at mitigating phase-to-phase faults, while other technology such as rapid earth-fault current limiter (REFCL) is effective at mitigating phase-to-ground faults.[14] The combination of such complementary technologies may result in a highly effective and scalable alternative to undergrounding. In comparison, SCE (which has assessed combinations of mitigations) estimates that the combination of covered conductor and REFCL is highly efficacious at mitigating ignitions from multiple drivers.[15] SCE's approach is notable because it hardened approximately 3,900 miles during the 2020-2022 WMP cycle[16] at a total cost of $2.27 billion.[17] During the same period, PG&E hardened approximately 1,100 miles[18] at a cost of $1.74 billion.[19] Any reasonably thorough comparison between mitigations must make a diligent effort to consider the effectiveness, cost, and implementation time of undergrounding with combined mitigations such as covered conductor, REFCL, and other new technologies. To date, PG&E has not completed such a comprehensive analysis.[20] PG&E's failure to complete this analysis means that, if

---

[13] "Overhead hardening was selected where undergrounding was deemed infeasible for the WDRM v3 selection." PG&E's response to data request CalAdvocates-PGE-2023WMP-03, question 7.

[14] "[Covered conductor] is effective at reducing the ignition drivers associated with contact-from-object (CFO) such as animal or vegetation contact and wire-to-wire faults." SCE's 2023 WMP, p. 252.

"REFCL technology has been found to substantially reduce the energy released in ground faults," SCE's 2023 WMP, p.267.

[15] SCE's 2023 WMP, March 27, 2023, Table SCE 7-06, pp. 207-208.

[16] Sum of covered conductor and undergrounding miles from Quarterly Initiative Updates for quarter 4 of 2020, 2021, and 2022: 1426 miles in 2022, 1510 miles in 2021, 960 miles in 2020.

[17] Sum of 2020-2022 territory-wide costs for covered conductor installation and undergrounding in Table 11 of SCE's quarterly data report for quarter 4 of 2022, filed on February 1, 2023 (SCE's 2022Q4 QDR).

[18] Sum of covered conductor and undergrounding miles from Quarterly Initiative Updates for quarter 4 of 2020, 2021, and 2022: 541 miles in 2022, 234 miles in 2021, 363 miles in 2020 (these numbers include miles hardened as part of Butte County rebuild).

[19] Sum of 2020-2022 territory-wide costs for covered conductor installation and undergrounding in Table 11 of PG&E's quarterly data report for quarter 4 of 2022, revised and filed on March 1, 2023 (PG&E's 2022Q4 QDR).

[20] In response to data request CalAdvocates-PGE-2023WMP-19, question 15, PG&E states that it is actively analyzing the effectiveness of covered conductor in combination with Enhanced Powerline Safety Settings (EPSS), downed conductor detection, and partial voltage detection. PG&E makes no

PG&E's plan is approved as-is, PG&E's customers will pay more money for slower risk reduction than they should, based on PG&E's premise that undergrounding is the only solution to its long-term pattern of failure to properly maintain its assets.

PG&E has not sufficiently evaluated alternatives to undergrounding as directed by Energy Safety. PG&E has not evaluated combinations of mitigations, and PG&E has not evaluated alternatives at a level that addresses location-specific risks. Therefore, PG&E has not complied with Energy Safety's directives in ACI PG&E-22-34.

b) PG&E does not incorporate RSE estimates in its decision-making process.

In the Final Decision on PG&E's 2022 WMP Update, as part of the required progress on ACI PG&E-22-34, Energy Safety directed PG&E to "incorporate RSE estimates and risk model outputs at a project level early in the decision-making process, adjusting both the scope and pace of PG&E's undergrounding program as necessary based on the analyses performed."[21] PG&E's response does not comply. PG&E fails to discuss in its pleadings how or whether RSE estimates result in adjustments to the scope and pace of PG&E's undergrounding program. As a result, PG&E has not complied with Energy Safety's directives in ACI PG&E-22-34.

Instead, PG&E utilizes its "simplified wildfire risk-spend efficiency" (SWRSE) to sequence undergrounding projects.[22] The simplified wildfire risk-spend efficiency takes into account the difficulty of undergrounding in a given location and the wildfire risk associated with that location.[23] PG&E uses this metric to prioritize undergrounding projects, selecting those with the highest simplified wildfire risk-spend efficiency to underground.[24] Crucially, however, this metric is not used to compare or select mitigation alternatives.[25] Thus, PG&E does not use simplified wildfire risk-spend efficiency to determine *whether* to perform undergrounding, only *when*.

---

mention of an equivalent analysis involving REFCL.

[21] Energy Safety, Final Decision on PG&E's 2022 WMP, pp. 184-185.

[22] PG&E's 2023 WMP R1, p. 968.

[23] PG&E's 2023 WMP R1, p. 968.

[24] PG&E's 2023 WMP R1, p. 969.

[25] PG&E's response to data request TURN-PG&E-1, question 1(e).

PG&E claims it "selects the appropriate risk mitigation approach for that circuit which may include undergrounding, remote grid installation, line removal, or overhead hardening."[26] However, in the same breath, PG&E admits that, "since late 2021, PG&E has prioritized undergrounding as the preferred approach to reduce the most system risk."[27] Thus, PG&E has predetermined what the most "appropriate" mitigation is, without regard to cost or implementation time. PG&E's decision-making process first assesses whether undergrounding is feasible,[28] and *only* if it is not, does PG&E consider overhead hardening. At no point in this process are true RSEs utilized to compare and select mitigations; the only RSE involved is PG&E's internal RSE-adjacent metric, which PG&E uses to sequence projects it has already decided to underground.

Finally, a quantitative comparison of RSEs might reasonably result in adjustments to the scope and pace of PG&E's undergrounding plan, as expressed by Energy Safety.[29] Instead, just as it did last year, PG&E defines its program by activity rather than achievement (in this case, miles of undergrounding instead of public safety goals).[30] WMPs should be designed to provide the most benefit to Californians at a reasonable cost and in a reasonable timeframe; arbitrarily choosing to install 10,000 miles of underground cable without a comprehensive analysis of alternatives or use of RSEs does not meet this basic standard.

c) PG&E has not described or justified project thresholds.

As part of the required progress on ACI PG&E-22-34, Energy Safety directed PG&E to "describe and justify the threshold at which projects move forward even as risk prioritization evolves."[31] PG&E's response to the ACI does not comply.

---

[26] PG&E's 2023 WMP R1, p. 344.

[27] PG&E's 2023 WMP R1, p. 344.

[28] PG&E states that undergrounding would not be feasible in "extreme terrain" but does not otherwise clearly define feasibility. PG&E's 2023 WMP R1, p. 340.

[29] "Incorporate RSE estimates and risk model outputs *at a project level* early in the decision-making process, *adjusting both the scope and pace* of PG&E's undergrounding program as necessary based on the analyses performed." Final Decision on PG&E's 2022 WMP, pp. 184-185 (emphasis added).

[30] PG&E has not adjusted the number of miles it intends to underground based on risk reduction goals. Instead, the program's scope is baked into the very name of the program: initiative tracking ID GH-04 is titled "10K Undergrounding." PG&E's 2023 WMP R1, Table 7-3-2, p. 288.

[31] Final Decision on PG&E's 2022 WMP, pp. 184-185.

As discussed in the previous sections, PG&E's decision-making process does not incorporate RSEs, nor has PG&E performed a quantitative analysis of alternatives to undergrounding. While PG&E uses its simplified wildfire risk-spend efficiency metric to sequence undergrounding projects, PG&E has no threshold for determining when a project is removed from undergrounding scope.[32] Despite PG&E's assertion that overhead hardening is selected where undergrounding is deemed infeasible, PG&E has no threshold for what is "infeasible."[33] PG&E has not defined thresholds at which undergrounding projects move forward. Therefore, PG&E has not complied with Energy Safety's directives in ACI-PG&E-22-34.

d) Energy Safety should require PG&E to revise and resubmit its WMP to fully comply with ACI PG&E-22-34.

PG&E has failed to comply with Energy Safety's decision on PG&E's 2022 WMP.[34] Given PG&E's inadequate response to address the substantial scope and expense of its undergrounding program, Energy Safety should direct PG&E to revise and resubmit its 2023 WMP. In its revised WMP, PG&E should fully comply with all actions listed under the required progress of ACI PG&E-22-34. This should involve the following at a minimum:

- PG&E should perform a complete analysis of alternative mitigations, including combinations of mitigations. This analysis should be performed at the project level to address location-specific risks.
- PG&E should revise its system hardening decision-making process to incorporate RSEs of all alternative mitigations, including combinations of mitigations.[35]

---

[32] PG&E's response to data request CalAdvocates-PGE-2023WMP-19, question 11.

[33] PG&E's response to data request CalAdvocates-PGE-2023WMP-19, question 11. Additionally, in response to data request TURN-PG&E-6, question 3, PG&E was asked to define "infeasible," and provides only a qualitative definition: "Typically, locations deemed infeasible would require substantial re-routing of the line or must cross simply non-passable terrain that would impede a potential UG route for the circuit. In these cases, targeted use of OH hardening is considered."

[34] Energy Safety's final decision on PG&E's 2022 WMP Update laid out a variety of requirements for PG&E's 2023-2025 WMP. In this section, we focus on Area for Continued Improvement (ACI) PG&E-22-34.

[35] As a result of the Commission moving from RSEs to a Benefit-Cost ratio, Energy Safety should consider requiring PG&E to incorporate Benefit-Cost ratios into its decision-making instead of RSEs.

- PG&E should calculate these RSEs using realistic estimates of costs and benefits. This analysis should be rooted in empirical evidence (i.e., actual recent costs) and should factor in the likely effects of scale, – that is, the costs and benefits if PG&E were to pursue the project aggressively and at scale, in order to enable an apples-to-apples comparison of alternatives.[36] Scale may increase some costs (for example, it may be difficult to obtain enough skilled labor and heavy equipment to perform undergrounding) while decreasing other costs (e.g., bulk purchasing of materials).
- PG&E should develop *project-level* RSE estimates based on local risks and costs, as Energy Safety has directed.[37]
- PG&E should designate specific thresholds at which undergrounding projects are added to or removed from scope.

If PG&E cannot complete these actions by the end of 2023, PG&E's revised WMP should include a description of PG&E's progress on each of the above items and an expected timeline for completion. PG&E should be required to provide Energy Safety with semi-annual updates on its progress until all actions are complete. Additionally, Energy Safety should identify the specific result (i.e., rejection or revision required) if PG&E's revised WMP fails to comply with ACI PG&E-22-34.

2. Energy Safety should require PG&E to file supplemental information to justify its aggressive focus on undergrounding.

In comments on PG&E's 2022 WMP, Cal Advocates showed that PG&E's ambitious undergrounding plan was insufficiently detailed and highly speculative.[38] Cal Advocates pointed out that PG&E had provided no evidence to support its forecast cost reductions, hadn't shown that it could meet its aggressive pace, and was not sufficiently targeting the riskiest portions of

[36] In response to data request CalAdvocates-PGE-2023WMP-09, question 13, attachment 1, PG&E provided calculations supporting its estimated RSEs. The RSEs in this document cannot be directly compared, since PG&E's forecast unit cost for overhead system hardening in this attachment ranges from $1.56 million per mile to $1.67 million per mile, nearly double PG&E's *actual* unit cost in 2022 of $0.83 million per mile (PG&E's 2023 WMP R1, Table PG&E-22-11-3, p. 903). Per PG&E's response to data request CalAdvocates-PGE-2023WMP-22, question 4, these increased costs are due to "an assumed loss of economies of scale" related to its reduction in overhead hardening miles.

[37] "Incorporate RSE estimates and risk model outputs *at a project level* early in the decision-making process, *adjusting both the scope and pace* of PG&E's undergrounding program as necessary based on the analyses performed." Final Decision on PG&E's 2022 WMP, pp. 184-185 (emphasis added).

[38] Cal Advocates Comments on 2022 WMPs, pp. 13-19.

its service territory. Further analysis by parties to the PG&E Test Year 2023 GRC proceeding resulted in PG&E largely removing the least effective 1,200 miles from its initial plan of 3,300 miles in 2023 through 2026. However, PG&E must do more to focus and prioritize its system hardening including broadening efforts beyond undergrounding.

In 2023, PG&E's costs continue to be speculative. PG&E's prioritization process (using simplified wildfire risk-spend efficiency) may lead PG&E to bypass high risk locations that are difficult to underground. PG&E has already slowed its proposed pace, scaling back its plans by 1,200 miles in the 2023-2026 period.[39] Additionally, PG&E still fails to narrowly target its riskiest circuit segments for undergrounding.

Energy Safety should require PG&E to provide further information to justify its aggressive focus on undergrounding to resolve these concerns.

a) PG&E's undergrounding unit costs remain speculative.

In 2022, PG&E forecast that its undergrounding unit cost would drop to $2.5 million by 2026.[40] Cal Advocates argued that this forecast was speculative and unsupported.[41] One year later, PG&E has revised its estimates and now forecasts a unit cost of $2.78 million per mile in 2026.[42] That represents an 11 percent increase in one year. Yet, even this value is unsupported. PG&E states that its forecasts are not based on any specific calculation; it merely represents a "strategy to reduce unit costs over time."[43] In other words, PG&E's forecasts are not based on a quantitative analysis of prices and supply chains: they are an unsupported projection. PG&E's failure to plan has already resulted in an 11 percent increase in estimated costs.

In the Joint Covered Conductor Report, PG&E estimates its undergrounding costs at approximately $2.51 million per mile.[44] However this estimate is based on actual data from only 76 miles of undergrounding, 46 miles of which were fire rebuilds (which PG&E admits typically

---

[39] "We adjusted the total planned mileage targets between 2023-2026 from approximately 3,300 to 2,100 miles." PG&E's 2023 WMP R1, p. 347.

[40] PG&E's Revised 2022 WMP, Figure PG&E-7.3.3-3, p. 565.

[41] Cal Advocates Comments on 2022 WMPs, pp. 13-14.

[42] PG&E's response to data request CalAdvocates-PGE-2023WMP-09, question 12.

[43] PG&E's response to data request CalAdvocates-PGE-2023WMP-09, question 12.

[44] 2023-2025 WMP Joint IOU Covered Conductor Working Group Report, Table 19, p. 41 (provided with PG&E's 2023 WMP R1 as 2023-03-27_PGE_2023_WMP_R0_Appendix D ACI PG&E-22-11_Atch01).

have a lower unit cost).[45] Notably, less than ten percent of PG&E's undergrounding projects scheduled from now through 2026 are planned as fire rebuilds.[46]

Much of PG&E's projected undergrounding work will be in high fire threat districts (HFTDs), which consist of remote, often uneven or rocky terrain. PG&E does not yet have a set answer as to how it will underground in difficult terrain such as steep or heavily rocky areas.[47] In some cases PG&E states that it may not underground at all, opting instead for "at-grade" construction, which is not discussed in its 2023 WMP.[48] Whatever its methods, PG&E estimates that undergrounding in steep or rocky terrain may cost up to three times as much as in "normal" environments.[49]

Without a clear understanding of the costs associated with undergrounding in these and other complex and remote terrain found in the HFTDs, PG&E's cost forecasts continue to be unreasonably speculative.

b) PG&E does not sufficiently target the riskiest areas.

In the first tranche of its undergrounding plan (approximately 2,100 miles through the end of 2026),[50] PG&E sequences its undergrounding projects using its simplified wildfire risk-spend efficiency metric, which incorporates the risk associated with a line and the difficulty of undergrounding that line. This method results in PG&E delaying undergrounding for some high-risk locations due to feasibility issues.[51]

---

[45] 2023-2025 WMP Joint IOU Covered Conductor Working Group Report, p. 44.

[46] Per PG&E's 2023 WMP R1, Table PG&E-8.1.2-3, p. 349, through 2026 PG&E will underground approximately 2687 miles. Of that, 230 miles will be fire rebuild, or about 8.6 percent.

[47] Discussion during the large IOU workshop on April 27, 2023. PG&E's response to data request CalAdvocates-PGE_2023WMP-22, question 2.

[48] PG&E's response to data request CalAdvocates-PGE_2023WMP-22, question 2.

[49] PG&E's response to data request CalAdvocates-PGE_2023WMP-22, question 2.

[50] PG&E's 2023 WMP R1, p.347

[51] Per PG&E's response to data request CalAdvocates-PGE-2023WMP-17, question 1, PG&E opted not to include at least 6 circuit segments in its first undergrounding tranche due to them having a "lower Wildfire Feasibility Effectiveness (WFE) score." Cal Advocates had identified these circuit segments as high risk, and in some cases, subject to PSPS outages, EPSS outages, or both within the last three years.

In addition, while PG&E claims that 87 percent of its undergrounding portfolio from 2023-2026 will be completed within the top 20 percent of risk-ranked circuit segments,[52] this claim is somewhat misleading. The risk in PG&E's lines is highly concentrated in relatively few miles, so the "top 20 percent" is quite a broad category. The top 20 percent of risk-ranked circuit segments represents nearly 9,000 circuit miles[53] and nearly 80 percent of the total wildfire risk in PG&E's system.[54]

However, PG&E treats the first 9,000 miles as a single "high-risk" category. Figure 1 (below) shows that this is an over-generalization. Miles 0 through 2,000 are substantially riskier than miles 7,000 through 9,000. Thus, although PG&E may perform 87 percent of its undergrounding in these top 9,000 miles, the actual risk mitigated by this work could vary significantly, depending on which miles PG&E targets.

Figure 1 below shows the risk associated with the riskiest 10,000 circuit miles of PG&E's system.

[52] PG&E's 2023 WMP R1, Table PG&E-8.1.2-3, p. 349.

[53] PG&E's response to data request CalAdvocates-PG&E-2023WMP-22, question 11.

[54] Cal Advocates' analysis of the circuit-segment-level output of PG&E's WDRM v3, provided in response to data request CalAdvocates-PG&E-2022WMP-31, question 7.

Analysis method:

1) Sort all circuit segments by "All Composite Mean Risk" such that circuit segments with the highest mean risk were at the top.
2) Multiply the overhead miles for each circuit segment by the "All Composite Mean Risk" associated with that circuit segment as a proxy for total risk in each circuit segment.
3) Sum this total risk proxy across all the top 720 circuit segments and divide by the sum of this total risk proxy across all circuit segments.

Cal Advocates stresses that this analysis is meant as an approximation to illustrate a point.

Figure 1

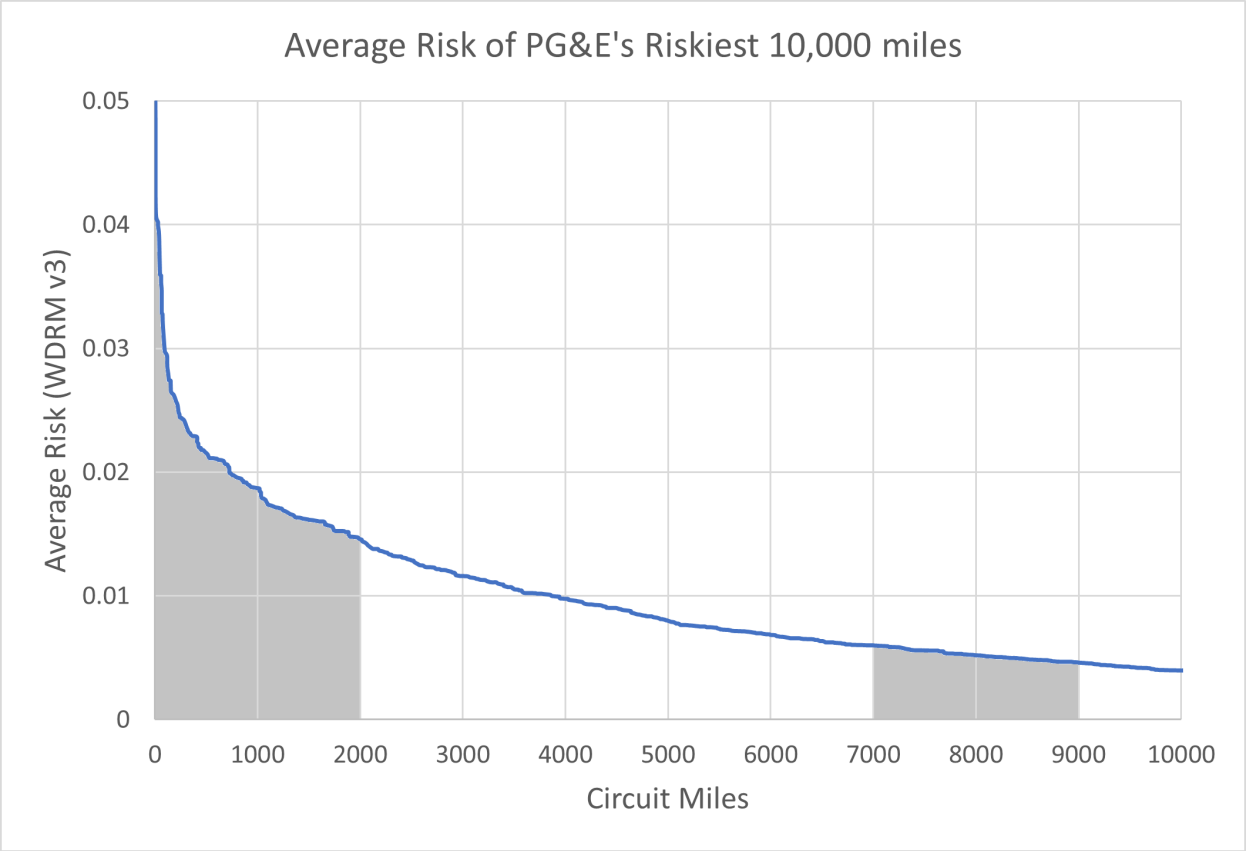

Figure 1. Risk associated with PG&E's riskiest 10,000 circuit miles.[55]

As another example, undergrounding the riskiest 250 miles (approximately 1 percent of the HFTD) would virtually eliminate 5 percent of PG&E's total wildfire risk. [56] It would be prudent for PG&E to include these miles in its first tranche of undergrounding. However, by the end of 2025, due to PG&E's lack of prioritization, only a portion of the highest risk miles in PG&E's service territory will be mitigated.[57]

---

[55] Based on the circuit-segment-level output of PG&E's WDRM v3, provided in response to data request CalAdvocates-PG&E-2022WMP-31, question 7. This figure plots "All Composite Mean Risk" against a cumulative sum of "Circuit Segment OH [overhead] Miles." Note that "All Composite Mean Risk" varies from 0 through 0.1056; however only 1.4 circuit miles have an "All Composite Mean Risk" value greater than 0.05, so the y-axis was truncated at that value for readability.

[56] Per PG&E's 2023 WMP R1, Table 6-5, pp. 197-198, the riskiest 41 circuit segments contain about 250 miles and about 5 percent of PG&E's total system wildfire risk.

[57] Cal Advocates' analysis of PG&E's response to data request CalAdvocates-PGE-2023WMP-13, question 5, attachment 1. At the beginning of 2023, these 41 circuit segments contain 457.3 risk units (accounting for risk reduction due to EPSS). At the end of 2025, PG&E forecasts that that these 41 circuit segments will contain 332.5 risk units, a reduction of 27 percent.

Due to the number of miles and diversity of risk, PG&E's proposal to focus its undergrounding program on the "top 20 percent" allows PG&E to potentially perform a great deal of work on segments with significantly less risk than other segments. Furthermore, PG&E is planning to underground 341 miles (approximately one eighth of all its undergrounding in this period) in the low-risk portion of its service territory that carries the *bottom* 20 percent of PG&E's total wildfire risk.[58]

In addition, while PG&E claims that overhead hardening is selected where undergrounding is infeasible, it has no meaningful or reasonable threshold for what constitutes an "infeasible" undergrounding project. Thus, there is no guarantee that PG&E will install covered conductor or utilize any other mitigations to reduce the risk posed by the high-difficulty but high-risk locations that are deprioritized by PG&E's implementation of its simplified wildfire risk-spend efficiency. Ultimately, PG&E's undergrounding plan is insufficiently targeted to high-risk locations, which will result in substantial ratepayer expenses for sub-optimal wildfire mitigation results.

c) PG&E is imprudently scaling back more immediate and potentially cost-effective alternatives to undergrounding.

As discussed extensively in these comments, PG&E has not performed a comprehensive analysis of alternatives to undergrounding.[59] Though covered conductor is substantially less expensive and quicker to implement,[60] PG&E has scaled down its use of covered conductor[61] in

---

[58] Per PG&E's 2023 WMP R1, Table PG&E-8.1.2-3, p. 349.

Through 2026, 2,346 miles out of 2,687 will be performed in the top 20 percent of risk-ranked circuit segments. This leaves 341 miles that will not be performed in those circuit segments. As Cal Advocates has shown, those 341 miles will address only a minimal amount of the wildfire risk in PG&E's system.

[59] See Section III.A.1 above, regarding PG&E's failure to comply with ACI PG&E-22-34.

[60] In the Joint IOU Covered Conductor Working Group Report, p. 40, PG&E estimates the cost of covered conductor as $0.83 million per mile. On p. 41, PG&E estimates the cost of undergrounding as $2.51 million per mile of underground circuit installed. Moving an overhead line underground increases its length by approximately 1.25x (PG&E's 2023 WMP R1, p. 968), so an equivalent unit cost comparison must be based on the miles of overhead circuit treated. The cost to underground 1 mile of overhead circuit would be $2.51 x 1.25 = $3.14 million per mile. This is nearly four times the cost of covered conductor. Furthermore, as Cal Advocates noted elsewhere in these comments, this estimated unit cost for undergrounding is likely low as it is primarily based on fire rebuild projects.

[61] In 2022, PG&E installed approximately 335 circuit miles of covered conductor (PG&E's 2023 WMP R1, p. 341). PG&E plans to install 110 circuit miles in 2023, then scale down to 50 circuit miles in 2025

favor of undergrounding. PG&E has done this on claims that undergrounding is highly effective at mitigating ignitions.[62] However, this claim ignores the potential effectiveness of covered conductor combined with other mitigations.

For example, SCE has explored the combination of covered conductor and rapid earth-fault current limiter (REFCL) technology, and found the combination to be highly effective at mitigating ignitions.[63] However, PG&E has functionally gutted its REFCL program, reducing its projected spending from $17-18 million annually over this WMP cycle to $0.[64] While PG&E says it will continue testing its existing installation at Calistoga, it currently has no plans to deploy REFCL to any other substations.[65] PG&E's decisions to no longer deploy REFCL are not supported by the evidence, which suggests that REFCL is compatible with 80 percent of PG&E's system,[66] would substantially reduce the ignition risk from line-to-ground faults compared to relying on EPSS,[67] and could potentially keep customers energized through momentary faults, thus minimizing reliability impacts.[68] PG&E estimates the cost of implementing REFCL is approximately $0.15 million per mile – that is, 1/5th of the $0.8 million per mile cost of covered conductor and 1/20th of the $3 million (or more) per mile for

(PG&E's 2023 WMP R1, p. 342).

[62] "Since late 2021, PG&E has prioritized undergrounding as the preferred approach to reduce the most system risk." PG&E's 2023 WMP R1, p. 344.

[63] SCE's 2023 WMP, March 27, 2023, Table SCE 7-06, pp. 207-208.

[64] PG&E's response to data request CalAdvocates-PGE-2023WMP-11, question 5.

[65] PG&E's response to data request CalAdvocates-PGE-2023WMP-11, question 4.

[66] PG&E's response to data request CalAdvocates-PGE-2023WMP-11, question 6.

[67] "The fault energy measured for sustained low impedance faults with REFCL active was fewer than 10 percent of the fault energy with EPSS settings and solid grounding." PG&E's 2023 WMP R1, p. 469.

PG&E also stated that REFCL has "Potential for 90% ignition probability reduction for single line to ground faults." Response to data request SPD_001, question 3.

[68] "The distribution system was able to ride through momentary staged faults." PG&E's 2023 WMP R1, p. 469.

undergrounding.[69], [70] It is reasonable to conclude that strategic application of covered conductor and REFCL could present an effective, prudent, and feasible alternative for high-risk locations where undergrounding would be costly, difficult, or time consuming.

PG&E's decision to accelerate its preferred mitigation, rather than implement REFCL, substantially cuts back on tools that could present a cost-effective alternative to undergrounding. This reduces the data and experience available for PG&E to assess the effectiveness of those alternatives. PG&E's pre-determined decision to use undergrounding above all other measures increases the estimated costs,[71] artificially drives down the cost-effectiveness and viability of the alternatives, and thereby creates a self-serving, circular logic. Perhaps most importantly, it means PG&E may take longer than other utilities to reduce wildfire risk on its system.

d) Energy Safety should require PG&E to revise its system hardening plans.

Energy Safety should require PG&E to revise and resubmit its 2023 WMP to address the numerous concerns with its undergrounding program. This revision should supplement and complement PG&E's revised response to ACI PG&E-22-34. At a minimum, PG&E should do the following:

- Provide a cost breakdown of its 2022 undergrounding miles, disaggregated between fire rebuild and non-fire rebuild. This will provide a more accurate picture of PG&E's current undergrounding costs than the Joint Covered Conductor Report.
- Provide a preliminary list of projects to be completed in the second tranche of its undergrounding program. This will enable Energy Safety

[69] In the Joint IOU Covered Conductor Working Group Report, p. 40, PG&E estimates the cost of covered conductor as $0.83 million per mile. On p. 41, PG&E estimates the cost of undergrounding as $2.51 million per mile of underground circuit installed. Moving an overhead line underground increases its length by approximately 1.25x (PG&E's 2023 WMP R1, p. 968), so an equivalent unit cost comparison must be based on the miles of overhead circuit treated. The cost to underground 1 mile of overhead circuit would be $2.51 x 1.25 = $3.14 million per mile.

[70] "A reasonable assumption would be a REFCL deployment protecting 100 circuit miles with a distribution construction cost of approximately $15,000,000." PG&E's response to data request CalAdvocates-PGE-2023WMP-11, question 8.

[71] "With the reduction in overhead hardening mileage over the WMP period (as compared to prior years), PG&E anticipates an increase in the unit cost of covered conductor installations due to an assumed loss of economies of scale." PG&E's response to data request CalAdvocates-PGE-2023WMP-22, question 4.

and intervenors to assess whether PG&E is unduly delaying high-risk, high-difficulty projects.

- Provide a more granular distribution of its planned undergrounding miles than PG&E's currently preferred measure (the top 20 percent of risk-ranked circuit segments), which does not represent an adequate focus on high-risk locations.[72] PG&E should demonstrate that it is targeting the highest-risk miles in its territory in the early years of its undergrounding program. For example, PG&E should report how many of its 2,100 proposed undergrounding miles will be completed within the riskiest 3,000 miles of PG&E's system.
- Provide a detailed justification for scaling back its covered conductor program.
- Examine the viability of substantially increasing the pace and mileage of covered conductor, particularly with an emphasis on locations that are difficult to underground.
- Provide a detailed justification for scaling back its REFCL program.

PG&E should file these supplements by August 2023 and update them annually in 2024 and 2025. Energy Safety should review these supplements and issue a determination of additional actions for PG&E to take, should it find PG&E's plans inadequate. This may include, for example, pursuing a more balanced approach of covered conductor and undergrounding such that high-risk projects are not stranded due to undergrounding difficulty or supply and personnel limitations. This may also include requiring PG&E to identify 3-5 additional substations suitable for REFCL installations, with a focus on substations that serve high-risk locations that will not be undergrounded in the next three years due to feasibility issues.

B. Asset Management and Inspections

1. Energy Safety should require PG&E to revise and resubmit its WMP to comply fully with requirements on asset inspection quality (ACI PG&E-22-21).

In its Final Decision on PG&E's 2022 WMP Update, Energy Safety found that PG&E was falling behind on its asset inspection quality assurance and quality control (QA/QC)[73] goals

[72] As previously noted, the top 20 percent of circuit segments include nearly 80 percent of PG&E's total wildfire risk.

[73] The requirements for quality assurance and quality control for asset management and inspections are outlined in Energy Safety's *2023-2025 Wildfire Mitigation Plan Technical Guidelines*, December 6,

and directed PG&E to set target pass rates for 2023 of 95 percent or greater.[74] PG&E's 2023 WMP does not comply.

In 2021, PG&E's asset inspections suffered from high failure rates in quality control. At their worst, approximately one third of PG&E's detailed ground inspections of transmission assets in 2021 failed desktop QC review.[75] As shown in Table A below, the pass rates for asset inspection quality control did not significantly improve from 2021 to 2022.

Table A
Comparison of PG&E's Asset Inspection Quality Control Pass Rates

Inspection Type	**Field QC**		**Desktop QC**	
	2021[76]	2022[77]	2021[78]	2022[79]
Distribution: Detailed Inspections	80%	79%	87%	86%
Transmission: Detailed Inspections	91%	81%	67%	92%

In contrast to PG&E, SCE reported QC pass rates in 2022 of 96 to 98 percent for field QC of its detailed distribution and transmission inspections.[80] This means that PG&E's inspectors miss more than five times as many issues as SCE's inspectors.[81]

Energy Safety recognized that PG&E was falling behind its peer utilities, and required PG&E to set acceptable quality levels of 95 percent or greater.[82] Not only has PG&E not

2022, section 8.1.6, pp. 86-87.

[74] Final Decision on PG&E's 2022 WMP, p. 179.

[75] PG&E's response to data request CalAdvocates-PGE-2022WMP-12, questions 2-10.

[76] PG&E's response to data request CalAdvocates-PGE-2022WMP-12, questions 2-10.

[77] PG&E's 2023 WMP R1, Table 8-7-2, p. 446.

[78] PG&E's response to data request CalAdvocates-PGE-2022WMP-12, questions 2-10.

[79] PG&E's 2023 WMP R1, Table 8-7-2, p. 446.

[80] SCE, *2023-2025 Wildfire Mitigation Plan*, March 27, 2023 (SCE's 2023 WMP), Table 8-7, p. 327.

[81] PG&E's field QC failure rate for distribution was 21%; SCE's was 4%. PG&E's field QC failure rate for transmission was 19%; SCE's was 2%. In both cases, SCE's performance is more than five times that of PG&E.

[82] "An AQL of 95% or greater is in line with PG&E's peer utilities." Final Decision on PG&E's 2022

improved its quality pass rates in 2022, it has failed to set any target pass rate for 2023. Instead, PG&E states that "pass rates will be determined each year based on improving performance year over year."[83] This directly violates Energy Safety's requirement that "PG&E must commit to future quantitative goals based on desired outcomes and not actual results."[84]

Energy Safety should require PG&E to revise and resubmit its WMP to fully comply with ACI PG&E-22-21. As part of this revision, PG&E must aggressively target improvement of its asset inspection program and set acceptable quality levels of at least 95 percent for each year of the 2023-2025 WMP cycle. In pursuit of this goal, PG&E should outline a detailed plan to improve its inspection quality over its poor performance in 2021 and 2022. This plan should include specific actions and timelines, should not default to mere promises to incrementally improve training, and should include consequences for failure or non-compliance.[85]

2. Energy Safety should facilitate a comprehensive audit of PG&E's asset inspection and QA/QC programs.

In both 2021 and 2022, Cal Advocates raised important issues related to PG&E's asset inspections. These issues included numerous missed inspections, poor recordkeeping, and poor inspection quality across the entire 2020-2022 WMP period.[86] In addition, PG&E has self-reported a troubling number of failures with its inspection program in recent years.[87] These

---

WMP, p. 223.

[83] PG&E's 2023 WMP R1, Table 8-7-2, p. 446.

[84] Final Decision on PG&E's 2022 WMP, p. 101.

[85] PG&E's 2023 WMP provides vague statements that are not linked to specific goals (such as "additional training") and emphasizes intermediate activities (meetings and discussions) rather than results.

"PG&E addresses findings by: • Revising policies, standards, procedures, checklists, and/or tools; • Additional training; • Weekly stakeholder meeting to communicate the previous weeks findings; • Reviewing the System Inspection QC Dashboard with functional area representatives; and • Discussing findings and trends in daily operating review meetings." PG&E's 2023 WMP R1, p. 445.

[86] *Comments of the Public Advocates Office on the 2021 Wildfire Mitigation Plan Update of Pacific Gas and Electric Company*, March 29, 2021 (Cal Advocates Comments on 2021 WMPs), pp. 27-30.

Cal Advocates Comments on 2022 WMPs, pp. 21-24.

[87] *See, e.g.*:

- PG&E's responses to Data Request CalAdvocates-PGE-R1810007-32, question 1;
- PG&E's letter to the CPUC titled *Safety Issue Notification: Cellon-Treated Wood Poles*, May 7, 2021;
- PG&E's letter to the CPUC titled *Self-Report for Pole Inspections*, October 26, 2022 (provided in

issues paint a picture not of a robust inspection program, but one riddled with flaws and mismanagement.

a) PG&E's asset inspections suffer from poor quality.

In every year of the 2020-2022 WMP period, PG&E's asset inspections suffered from low pass rates in quality control (QC).[88] The Independent Safety Monitor (ISM) has also identified concerns with PG&E's asset inspections, and stated that approximately 20 percent of the structures it audited in 2022 had at least one observation that was not identified by PG&E's inspectors.[89] Key findings that PG&E had missed included damaged poles, improperly placed conductor splices, and vegetation causing strain or abrasion to conductor.[90]

Additionally, PG&E did not report QC pass rates for its aerial transmission inspections. Instead, PG&E merely states that all inspections undergo spot checks for commonly missed items.[91] The most common issue identified during these spot checks included c-hooks.[92] Failed c-hooks (and inspections that missed problems with c-hooks) can have devastating consequences as seen by PG&E's failures that resulted in the 2018 Camp Fire.[93] Without tracking and reporting QC pass rates, it is impossible to determine the extent to which PG&E's aerial inspections continue to miss c-hooks and other critical issues.

---

response to data request CalAdvocates-PGE-2023WMP-14, question 25);

- PG&E's letter to the CPUC titled *Supplemental to the Self-Report for Pole Inspections*, December 22, 2022 (provided in response to data request CalAdvocates-PGE-2023WMP-14, question 26).

[88] 2021 and 2022 are discussed in these comments. For 2020, see Federal Monitor Report of November 19, 2021, Kirkland & Ellis LLP, p 36.the Federal Monitor's report, from 2020, U.S. District Judge William Alsup, *Order Re Monitor Letter (Case No. 14-CR-00175-WHA Doc. No. 1247)*, October 20, 2020, Exhibit A.

[89] Filsinger Energy Partners, *PG&E Independent Safety Monitor Status Update Report*, April 3, 2023 (April 2023 ISM Report), pp. 30-31.

[90] April 2023 ISM Report, p. 30.

[91] PG&E's responses to data requests CalAdvocates-PGE-2023WMP-05, question 3 and CalAdvocates-PGE-2023WMP-10, question 15.

[92] PG&E's response to data request CalAdvocates-PGE-2023WMP-10, question 15.

[93] Envista Forensics, *Root Cause Analyses of the 2017-18 Wildfires found to have been ignited by PG&E & Corrective Action Report*, July 6, 2022, p. 61.

Asset inspections are a critical wildfire mitigation strategy, designed to proactively identify aging or damaged equipment before it fails and causes an ignition. PG&E's deficient inspections may leave thousands of ignition risks unmitigated in the field.

b) PG&E suffers from recordkeeping errors.

It appears that PG&E's counts of inspection findings have fluctuated widely across multiple reports.[94] The table below shows that PG&E has reported strikingly different numbers for the same data points on three occasions: its Quarterly Data Report (QDR) for the fourth quarter of 2021, its QDR for the fourth quarter of 2022, and its response to a recent data request (DR) from Cal Advocates.

[94] PG&E informed Cal Advocates that it had incorrectly reported the number of inspection findings in its most recent quarterly report. PG&E's response to data request CalAdvocates-PGE-2023WMP-21, question 2.

Table B **Comparison of PG&E's Asset Inspection Find Rates**								
Inspection and Finding Type	**2020 Findings**			**2021 Findings**			**2022 Findings**	
	2021 Q4 QDR[95]	**2022 Q4 QDR**[96]	**DR**[97]	**2021 Q4 QDR**	**2022 Q4 QDR**	**DR**	**2022 Q4 QDR**	**DR**
Detailed Level 1	1868	348	889	920	577	1574	798	2242
Patrol Level 1	455	42	44	167	50	48	27	28
Other Level 1	3	4101	3583	3	4424	3435	4290	2862
Detailed Level 2	3035	48,309	55,157	61,799	21,193	60,919	4542	78,625
Patrol Level 2	63	200	167	141	104	130	20	138
Other Level 2	0	10,131	4667	30	12,195	14,655	3031	9627
Detailed Level 3	70,600	13,024	12,854	13,760	823	13,532	107	14,269
Patrol Level 3	177	15	4	12	2	17	0	18
Other Level 3	232	866	395	0	381	1180	70	978

Table B shows that PG&E's data on inspection findings have been inconsistent over time. For instance, the top row shows that PG&E's count of Level 1 inspection findings from Detailed Inspections in 2020 ranged from 348 to 1,868. To be clear, these are three reports of the same data points – the facts did not change, PG&E's data did. The table also shows that PG&E's reports often differ by a factor of 10 or more (for instance, see Level 2 findings from Detailed

[95] Table 1 of PG&E's quarterly data report for quarter 4 of 2021, filed on February 1, 2022 (PG&E's 2021Q4 QDR).

[96] Table 2 of PG&E's 2022Q4 QDR.

[97] Table 2 of PG&E's response to data request CalAdvocates-PGE-2023WMP-21, question 2.

Inspections in 2020 and 2022). This inaccurate reporting raises questions as to how PG&E is tracking its inspection findings and means that neither Energy Safety nor the public has had access to reliable information on PG&E's progress in identifying and repairing issues in its system.

c) PG&E has reported numerous failures related to its intrusive inspection program over the past two years.

During the 2020-2022 WMP period, PG&E experienced at least four failures of its intrusive pole inspection program. These failures include contractors failing to follow procedures,[98] inaccurate measurements of up to half a million cellon-treated poles,[99] a failure to remediate severely deteriorated poles in a timely manner,[100] and visual-only methods used for pole inspections that were supposed to be intrusive.[101] While PG&E self-reported several of these issues, the sheer number of recent and disparate issues with PG&E's intrusive pole inspection program raise questions as to the quality of PG&E's inspection programs as a whole.

d) PG&E is reducing the scope of its asset inspections.

Despite its poor inspection record, PG&E is proposing to reduce the scope of its distribution inspection programs in 2023. PG&E is moving to a risk-focused approach.[102] While a risk-focused approach may be a prudent allocation of resources, the net result is that the number of assets inspected by PG&E annually will decrease substantially.

In the 2020-2022 WMP period, PG&E's strategy was to inspect every distribution asset in its HFTD tier 3 annually, and all other HFTD assets every three years.[103] As a result, PG&E

---

[98] PG&E's responses to Data Request CalAdvocates-PGE-R1810007-32, question 1.

[99] PG&E's letter to the CPUC titled *Safety Issue Notification: Cellon-Treated Wood Poles*, May 7, 2021.

[100] PG&E's letter to the CPUC titled *Self-Report for Pole Inspections*, October 26, 2022 (provided in response to data request CalAdvocates-PGE-2023WMP-14, question 25).

[101] PG&E's letter to the CPUC titled *Supplemental to the Self-Report for Pole Inspections*, December 22, 2022 (provided in response to data request CalAdvocates-PGE-2023WMP-14, question 26).

[102] PG&E's 2023 WMP R1, pp. 400-402.

[103] PG&E's 2021 and 2022 inspections are discussed in PG&E's Revised 2022 WMP, pp. 613-614. PG&E's 2020 inspections are discussed in PG&E's *2020 Wildfire Mitigation Plan Report Updated*, February 28, 2020, p. 5-156.

performed an average of 406,000 inspections annually from 2020 through 2022.[104] In 2023, under PG&E's reduced approach, barely half as many (235,000) distribution assets will undergo detailed inspections.[105] That is a reduction of over 40 percent from the average in 2020-2022.[106]

While a risk-based approach may be a prudent way to allocate limited resources to the highest-risk locations, PG&E's history of poor inspection quality creates doubt as to whether it is appropriate to scale down the number of inspections prior to fixing the inspection program deficiencies identified in this section.

e) Energy Safety should perform a comprehensive audit of PG&E's inspection programs and QA/QC programs.

The issues outlined above raise questions as to the overall quality and robustness of PG&E's asset inspection programs. A deeper look into PG&E's practices and procedures is warranted to ensure that PG&E's asset inspections perform as intended, and as required by GO 165. To this end, Energy Safety should perform a comprehensive audit of all PG&E's asset inspection programs (including inspection QA/QC). Energy Safety should perform this audit in 2023 and develop a report of findings by the end of the first quarter of 2024. Energy Safety should consider consulting with the Safety and Enforcement Division of the California Public Utilities Commission (CPUC) as to the content and structure of this audit.

Alternatively, Energy Safety could require PG&E to pay for an independent auditor[107] to audit its inspection programs and report its findings in early 2024. This audit should be separate from the role of the WMP independent evaluator; while the independent evaluator audits compliance with the WMP overall, this audit would perform a deep dive into one program area. Moreover, this proposed audit would examine the quality and effectiveness of a program area, which is different from the independent evaluator's emphasis on timely completion of goals.

---

[104] Per PG&E's Quarterly Initiative Update (QIU) for quarter 4 of 2020, filed March 31, 2021, PG&E performed 339,728 detailed distribution inspections in 2020. Per PG&E's QIU for quarter 4 of 2021, filed February 1, 2022, PG&E performed 480,749 detailed distribution inspections in 2021. Per Table 1 of PG&E's 2022 Q4 QDR, PG&E performed 398,184 detailed distribution inspections in 2022.

[105] Table 12 of PG&E's 2022Q4 QDR.

[106] PG&E performed an average of 406,220 detailed distribution inspections from 2020 through 2022. The 235,000 forecast in 2023 is a 42 percent reduction.

[107] Any such auditor should be funded by shareholders, as the necessity for these audits is driven by PG&E management's failure to appropriately manage the program.

C. Open Work Orders

1. Energy Safety should require PG&E to revise and resubmit its WMP to comply with Energy Safety's directives to rectify overdue maintenance (ACI PGE-22-22).

In its Final Decision on PG&E's 2022 WMP Update, Energy Safety found that PG&E had not complied with California General Orders (GOs) regarding asset management. Energy Safety directed PG&E to "develop a plan detailing how PG&E will clear the GO repair backlog no later than the end of the 2023-2025 WMP cycle and demonstrating capability to maintain its repair cycle within GO requirements."[108]

PG&E's 2023 WMP provides a substantially similar workplan to the plan that was proposed in its Revised 2022 WMP Update and rejected by Energy Safety: PG&E would clear ignition-risk notifications in High Fire Threat Districts (HFTD) and High Fire Risk Areas (HFRA) by the end of 2029 while not working on non-ignition risk notifications until after 2029 unless they are "opportunistically addressed or included in isolation zone work bundles."[109]

While PG&E is appropriately targeting the highest risk tags first, its proposed pace is unacceptable. PG&E provides quantitative targets for a 10-year plan to address its backlog of open work orders,[110] but qualifies this commitment by stating that it may not, in fact, be able to maintain this already insufficient pace.[111] In 2022, PG&E missed its 2022 WMP target of closing 55,000 open tags, achieving 45,951 tags instead.[112] PG&E cited more A and B tags being created in 2022 than anticipated as the reason for missing their target.[113] PG&E's slow rate of closing tags is extremely concerning because in 2022 PG&E's backlog *increased* by more than 180,000 distribution work orders, with more than 41,000 of those work orders specifically

---

[108] Final Decision on PG&E's 2022 WMP, p. 180.

[109] PG&E's 2023 WMP R1, p. 455.

[110] PG&E's 2023 WMP R1, Table 8.1.7-2, p. 456.

[111] "We expect that we will see more A and B tags during this WMP cycle…Finding more A and B tags could lead to resource challenges because we would prioritize this high priority, urgent work. Redirecting resources to work on A and B tags could require an offset to the number of backlog notifications closed." PG&E's 2023 WMP R1, p. 457.

[112] PG&E's 2022Q4 QDR, Table 1. Initiative 8.1.7, Cell AI37. Note, this target was new as of PG&E's Revised 2022 WMP, July 26, 2022, per Table RN-PG&E-22-05-04, p. 690.

[113] PG&E's 2022Q4 QDR, Table 1. Initiative 8.1.7, Cell AI37.

in their HFTD/HFRA distribution system.[114] The growing backlog continues PG&E's overall worsening trend from previous years.

The chart below shows all PG&E work orders for distribution assets in HFTD areas, categorized by the year the tag was originally created.[115] The blue bars reflect open work orders in HFTD tier 2 areas while the orange bars show tags in HFTD tier 3.

Figure 2

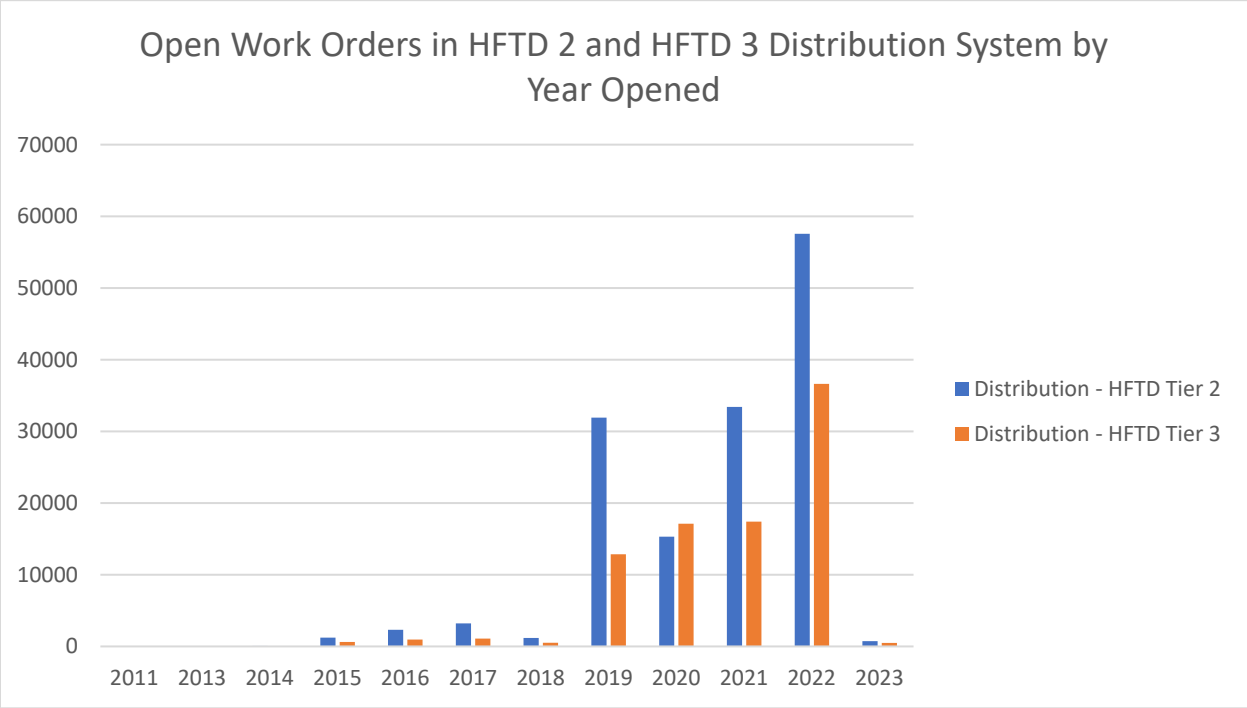

Figure 2. Number of Open Work Orders in HFTD 2 and HFTD 3 by Year Opened as reported in PG&E's QDR for Q1 2023.

As seen in Figure 2 above, PG&E currently has open work orders in its backlog that are located within HFTDs and date back as early as 2011.[116] As the Federal Monitor pointed out in its November 2021 report, even minor issues, left unaddressed, can present an ignition risk.[117] In 2022, PG&E had at least two ignitions connected to open work orders,[118] one of which was

[114] PG&E's 2023 WMP R1, Table 8.1.7-5 and Table 8.1.7-6, p. 458.

[115] The figure shows work orders that remained open as of March 31, 2023. PG&E Quarterly Data Report for Quarter 1 of 2023 (PG&E's 2023Q1 QDR), Table 13.

[116] PG&E Quarterly Data Report for Quarter 1 of 2023 (PG&E's 2023Q1 QDR), Table 13.

[117] Federal Monitor Report of November 19, 2021, Kirkland & Ellis LLP, p. 36.

[118] Response to data request CalAdvocates-PGE-2023WMP-06, question 14.

opened in January 2020 and had an original due date of January 2021. PG&E's extensive backlog and slow proposed rate to resolve open orders presents a growing risk of future ignitions caused by equipment that had been flagged but never addressed.

PG&E has repeatedly stated that its backlog is due to its enhanced, improved inspections.[119] However, this is only partially true. While PG&E's enhanced inspections contributed to the creation of the backlog, PG&E has failed to comply with GO 95 through the 2020-2022 WMP period by making no reasonable efforts to increase its workforce and appropriately allocate resources to come into compliance. Although unforeseen circumstances and external factors could negatively impact PG&E's projected plans to clear its backlog of open orders, this provides even more reason that PG&E should continue ramping up its efforts to the point that they are closing considerably more work orders than they are creating.

Due to PG&E's ongoing failure to achieve a net decrease of open work orders, Energy Safety should require PG&E to revise and resubmit its WMP to address its open maintenance tags. At a minimum, Energy Safety should require the following:

- PG&E should make an "all hands on deck" attempt to remediate its full ignition-risk backlog by the end of 2024, at a minimum. This should include all ignition-risk tags, not just those in the HFTD/HFRA.
- PG&E should remediate its full maintenance backlog by the end of 2026 (the end of PG&E's current general rate case cycle).
- PG&E must resolve *all* new maintenance tags in compliance with Rule 18 of GO 95, rather than choosing to only comply with GO 95 for new HFTD/HFRA ignition risk tags.[120] It is inappropriate for PG&E to pick and choose when it will comply with safety regulations. Energy Safety should refer this matter to the Safety and Enforcement Division as well.
- PG&E should develop a comprehensive resource plan to show how it will eliminate its backlog by the required timeframes and should submit updates every six months to demonstrate it is on track. PG&E should submit this plan as part of a WMP Change Order in early 2024. If PG&E believes that it cannot clear its backlog by the deadline set by Energy Safety, PG&E should detail the full reasons why it has failed to comply with ACI PG&E-22-22.

[119] PG&E's 2023 WMP R1, p. 450.

[120] PG&E's 2023 WMP R1, p. 451.

- Furthermore, PG&E should demonstrate that it has permanently allocated sufficient financial and material resources to meet asset management needs on an ongoing basis. In other words, PG&E should have sufficient skilled personnel, contractors, equipment, and data management tools on hand so that it will be able to address new work orders in a timely manner and maintain a net balance or decrease in open work orders in each year of this WMP cycle.

Cal Advocates' recommendations here are very similar to the recommendations we presented last year.[121] This is because PG&E's imprudent approach to addressing overdue maintenance has not changed. It is unreasonable for Energy Safety to again approve PG&E's 2023 WMP if PG&E again fails to meet the requirements stated above.

Indeed, Energy Safety should issue a notice of violation to PG&E and refer PG&E to the CPUC for enforcement action for failing to comply with GO 95, Rule 18 since at least 2019.

D. Grid Operations

1. Energy Safety should require PG&E to develop a comprehensive plan to substantially reduce the scale, scope, frequency, and duration of EPSS outages.

PG&E's service reliability has materially degraded over the past several years, with a particularly sharp change since PG&E introduced Enhanced Powerline Safety Settings (EPSS) in 2021.[122], [123] PG&E has not made the investments and asset replacements necessary to maintain the integrity of its distribution system. At the root cause level, PG&E's aging and deteriorating distribution assets are contributing to poor service reliability. Therefore, PG&E should develop a comprehensive plan to reduce the impact of EPSS outages on customers.

a) PG&E's reliability has substantially decreased following the introduction of its EPSS program.

By the end of 2022, PG&E's EPSS program was associated with a total of 2,375 outages, which impacted a total of 2,083,985 customer accounts, rivaling the number of customers that

[121] Public Advocates Office Comments on PG&E's Revised 2022 WMP, p. 16.

[122] PG&E Monthly Reports to SED, January 2023 attachment, Summary worksheet (available at https://www.cpuc.ca.gov/industries-and-topics/wildfires/protective-equipment-device-settings)

[123] 2019 PG&E PSPS Post Event Reports (available at https://www.cpuc.ca.gov/consumer-support/psps/utility-company-psps-reports-post-event-and-post-season/archived-psps-post-event-reports-2017-2020).

experienced outages in the poorly executed 2019 Public Safety Power Shutoff (PSPS) events.[124], [125]

Figure 3 below shows the number of PG&E customers who lost power from 2019 through 2022 due to PSPS events and EPSS (or fast-trip) outages. PSPS outages are shown in blue and fast-trip outages are shown in orange.

Figure 3

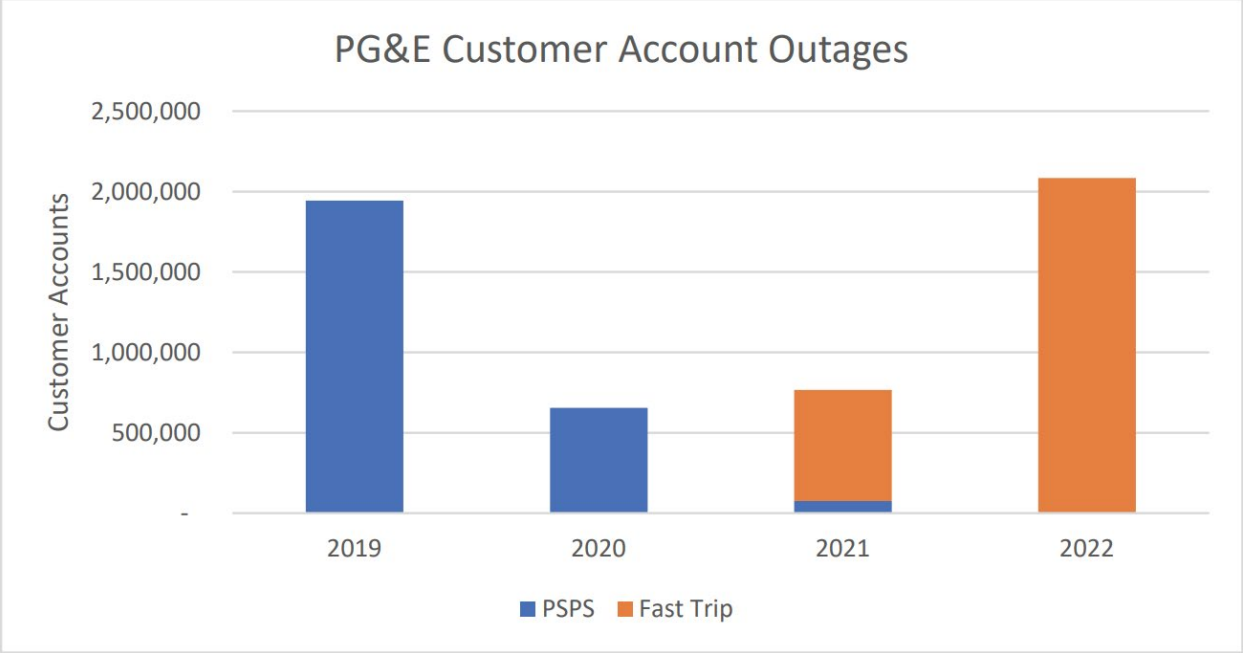

Figure 3. PG&E Customer Account Outages 2019-2022 [126]

The crucial difference, though, is that customers impacted by PSPS outages can prepare due to advance notice, while customers generally cannot prepare for EPSS-related outages. PG&E has become increasingly reliant on EPSS and claims that "EPSS does not cause outages but rather outages may result from a line being quickly de-energized when a tree, vegetation or other foreign debris makes contact with the EPSS-enabled line."[127] However, PG&E's argument

[124] PG&E Monthly Reports to SED, January 2023 attachment, Summary worksheet (available at https://www.cpuc.ca.gov/industries-and-topics/wildfires/protective-equipment-device-settings)

[125] 2019 PG&E PSPS Post Event Reports (available at https://www.cpuc.ca.gov/consumer-support/psps/utility-company-psps-reports-post-event-and-post-season/archived-psps-post-event-reports-2017-2020).

[126] Rulemaking 18-12-005, *Comments Of The Public Advocates Office On The Investor-Owned Utilities' Post-Season Reports For The 2022 Public Safety Power Shutoff Events*, March 21, 2023, p.6.

[127] Response to data request CalAdvocates-PGE-2023WMP-14, question 13.

is flawed. In many cases, transitory vegetation contact can be the proximate cause of an outage, but if the same vegetation contact would not have resulted in an outage without EPSS settings, then EPSS is the ultimate cause of the outage.[128]

In some cases where EPSS is the ultimate cause of the outage, this would be considered a false positive detection, meaning the settings triggered an outage where there was no actual risk of an ignition. PG&E's goal should be to minimize the number of false positives without reducing the mitigative benefits of EPSS. In order to achieve this, PG&E must conduct a more in-depth investigation into the causes of outages where EPSS is enabled.

b) PG&E shows minimal commitment to improving customer reliability.

PG&E projects a two percent reduction in the number of EPSS outages each year from 2023-2025.[129] However, this projection is not supported by any calculations or evidence.[130] PG&E does not project any reduction in the duration of EPSS events over the same period.[131]

Additionally, PG&E is further developing the technological aspects of EPSS to improve its detection capabilities with supplementary technologies like Downed Conductor Detection (DCD) and Partial Voltage Detection (PVD). These technologies are likely to result in an increase in the number of outages by default. Although the ability to detect more faults is beneficial from a safety perspective, it does not address the root causes that drive the need for EPSS to begin with: unsafe infrastructure and vegetation close to the electric lines.

Figure 4, from the April 2023 ISM Report, shows how PG&E's System Average Interruption Duration Index (SAIDI), an indicator of poorer reliability, has increased over the last decade, as capital investment in reliability initiatives has declined. In Figure 4, the SAIDI is shown by the blue line, and investment in reliability is shown in orange.

---

[128] "In an interview with the ISM, PG&E personnel described that the 45.6% "Unknown" cause for EPSS outages in 2022 was approximately 10% higher than what normally is experienced for outages with no cause attribution on these same lines without EPSS enablement. PG&E personnel indicated that the likely causes for most of the "Unknown" EPSS outages are bird, animal, or tree branch contacts where the patrols are unable to find any evidence of such contacts." April 2023 ISM Report, p. 21.

[129] PG&E's 2023 WMP R1, p. 335.

[130] PG&E has stated they do not have any applicable workpapers available. Response to data request CalAdvocates-PGE-2023WMP-10, question 2.

[131] Response to data request CalAdvocates-PGE-2023WMP-10, question 3.

Figure 4

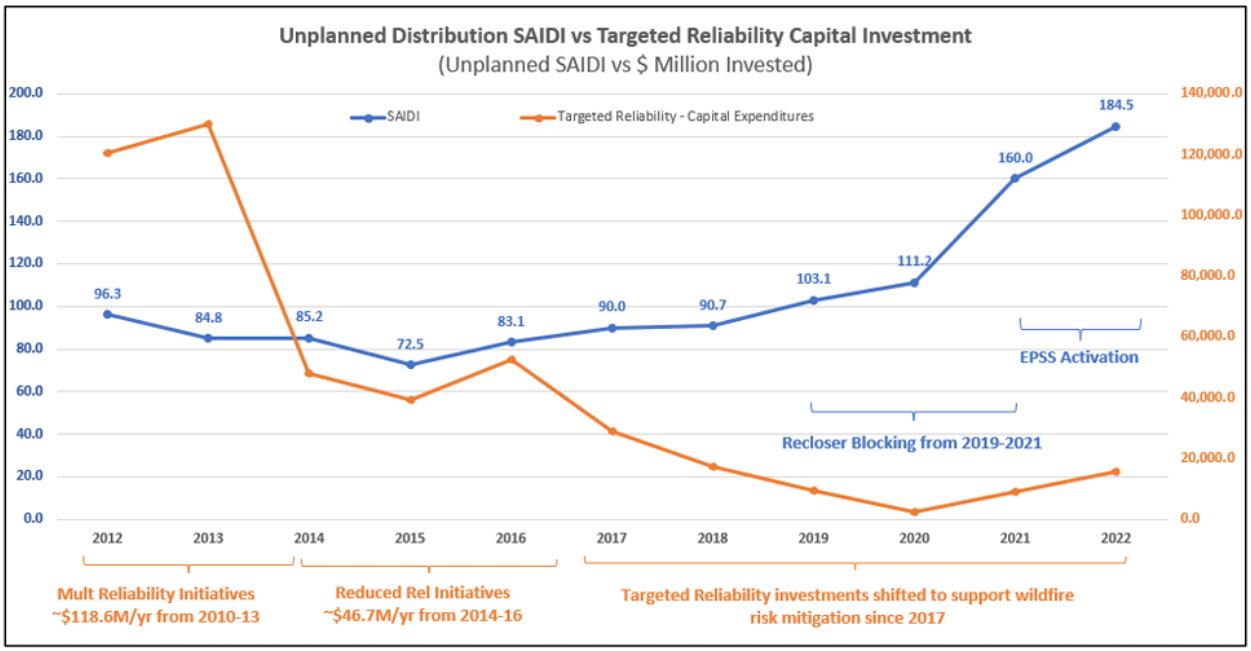

Figure 4. Unplanned Distribution SAIDI vs Reliability Capital Investment [132]

At a circuit level, the SAIDI and the system average interruption frequency index (SAIFI) were more than double in 2022 compared to 2020 for half of all HFTD circuits.[133] Systemwide, SAIDI in 2022 was nearly double that of 2020.[134] This suggests that, contrary to PG&E's claims, widespread implementation of EPSS *does* result in more and longer power outages.

While this decreased reliability does coincide with a steady decline in reportable ignitions since 2017, PG&E will need to shift its strategy to deal with its aging infrastructure and reduce its reliance on EPSS as a major mitigative measure on the most impacted circuits.

[132] April 2023 ISM Report, Figure 1, p. 12.

[133] Comparison of circuit-level SAIDI values provided in response to data requests CalAdvocates-PGE-2021WMP-01, question 4 and CalAdvocates-PGE-2023WMP-03, question 1.

The list of circuits was filtered to include those with 1 mile or more located in the HFTD for a total of 726 circuits in 2022. For 378 of these circuits, the SAIDI in 2022 was more than double that of 2020. For 348 circuits, the SAIFI in 2022 was more than double that of 2020.

[134] Per PG&E's response to data request TURN-PG&E-3, question 1, PG&E's overhead system SAIDI was 88.2 in 2020, 135.5 in 2021, and 155.7 in 2022.

c) PG&E's aging infrastructure raises concerns that the scale, scope, and frequency of EPSS events may increase over time.

The ISM report provides additional information on PG&E's recent history related to proactive measures to maintain the integrity of their system. The ISM contends that a sustainable rate of replacement for PG&E's primary overhead conductors "would be approximately 800 miles per year (80k miles /100 years). In comparison to this guardrail rate, over the past seven years … the miles of proactive replacement of deteriorated conductor have averaged approximately 40 miles per year."[135] PG&E is achieving only five percent of the "guardrail rate" for proactive replacement of deteriorated conductor.

It must be noted that the ISM's estimated "guardrail rate" (i.e., minimum rate of proactive replacements that is sustainable over the long term) is almost certainly too low. For this calculation, the ISM relies on PG&E's targeted age-base of 100 years for overhead primary distribution conductors.[136] This is unrealistic; in its general rate case, PG&E uses an expected service life of 44 years.[137] The ISM's analysis is therefore too generous to PG&E, but its "guardrail rate" may be taken as a lower bound of what is needed to maintain the integrity and safety of PG&E's infrastructure. Nonetheless, PG&E has not come close to achieving this level in recent years.

[135] April 2023 ISM Report, p. 14. This replacement rate is based on an age-base of 100 years for primary overhead conductors.

[136] "For primary overhead conductors, PG&E has established the targeted age-base to maintain as 100 years." April 2023 ISM Report, p. 14.

[137] *Pacific Gas and Electric Company 2023 General Rate Case Exhibit (PG&E-10) Results Of Operations Workpapers Supporting Chapter 11 [Includes November 5, 2021 Errata] Volume 2 Of 5*, November 5, 2021, Table 11-8, page 11-3, line 109. PG&E proposes an average service life of 44 years for distribution plant overhead conductors and devices.

Figure 5

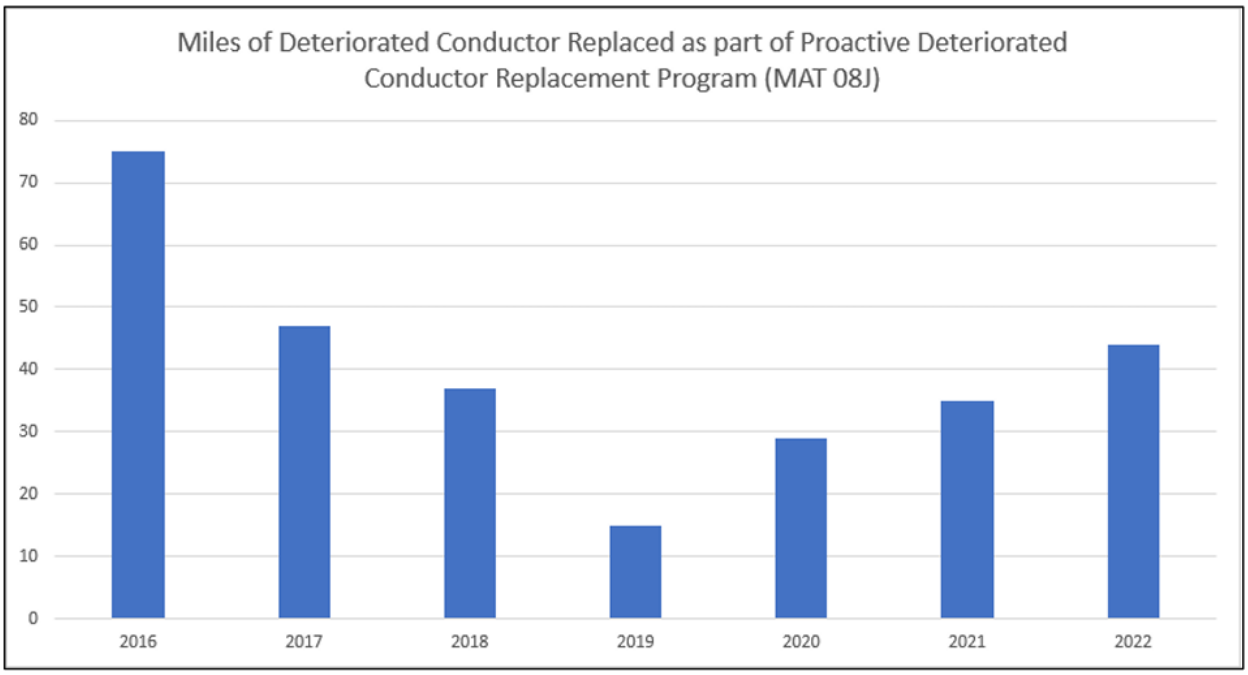

Figure 5. Deteriorated Conductor Miles Replaced[138]

Figure 5 shows that PG&E has not proactively replaced more than 80 miles of deteriorated primary conductor in any year since 2016.

Similarly, the ISM states that, for poles, a "sustainable rate of replacement would be approximately 28,000 poles per year."[139] In contrast, over the past seven years, PG&E averaged approximately 12,000 per year.[140] PG&E has not come close to the "sustainable rate" since 2016. Again, it must be noted that the ISM's estimated "guardrail rate" is almost certainly too low. This rate is based on PG&E's targeted age-base of 80 years for poles;[141] by contrast, in its general rate case, PG&E uses an expected service life of only 44 years.[142]

---

[138] April 2023 ISM Report, Figure 2, p. 14.

[139] April 2023 ISM Report, p. 14.

[140] April 2023 ISM Report, p. 14.

[141] "PG&E has noted that the guardrail approach to asset lifecycle management for primary overhead poles would be to maintain the age of the pole asset base at 80 years." April 2023 ISM Report, p. 14.

[142] *Pacific Gas and Electric Company 2023 General Rate Case Exhibit (PG&E-10) Results Of Operations Workpapers Supporting Chapter 11 [Includes November 5, 2021 Errata] Volume 2 Of 5*, November 5, 2021, Table 11-8, page 11-3, line 108. PG&E proposes an average service life of 44 years for distribution plant poles, towers, and fixtures.

PG&E's aging assets combined with its inadequate efforts to improve its asset inspections mean that we can reasonably expect the number of outages to increase rather than decrease, given similar weather conditions in future years. Functionally speaking, given the unforeseen costs and impacts to Californians, it is unreasonable for PG&E's solution to wildfire prevention to be heavily reliant on the ability to de-energize its system.

Cal Advocates recognizes that EPSS is an important and effective mitigation tool for wildfire prevention. However, it should be regarded generally as a stopgap measure while PG&E addresses the root causes of risk on its deteriorating grid. PG&E's increasing overreliance on EPSS is unacceptable as it only addresses the symptoms without addressing the root causes and fails to give adequate warning to customers that they may lose power for an extended duration. PG&E should develop methods to reduce its reliance on EPSS over time and clearly identify its end goal for the program.

d) Remedy: PG&E should develop a comprehensive plan to reduce the scale, scope, frequency, and duration of EPSS outages throughout the WMP period.

PSPS events have been the subject of much scrutiny by intervenors and regulators. Energy Safety recognizes the detrimental impact PSPS events can have on customers, and in past WMPs, has required require utilities to describe plans "to reduce scale, scope and frequency of PSPS" events.[143] As PG&E relies more and more on EPSS to mitigate the wildfire risk posed by its system, the same concerns apply, and similar remedies should be implemented. Specifically, Energy Safety should require PG&E to develop an analogous comprehensive plan to substantially reduce the scale, scope, frequency, and duration of EPSS outages over the next three years. As part of its comprehensive plan, PG&E should be required to develop methods to reduce its reliance on EPSS over time for the majority of PG&E customers. PG&E should clearly identify its end goal for the program, including but not limited to identifying the necessary milestones to achieve this goal.

As part of its plan, PG&E should also be required to describe a strategy to mitigate the customer impacts of EPSS. Among other things, PG&E should develop an approach to

[143] Energy Safety, *Final 2022 Wildfire Mitigation Plan Update Guidelines Template Office of Energy Infrastructure Safety*, Attachment 2, p. 81.

informing customers (especially Access and Functional Need customers)[144] about the expected, localized risk of EPSS-related outages. This may include notifying customers at the beginning of the wildfire season that their circuit will have EPSS settings enabled, and notifying customers when forecasted weather conditions (e.g., wind) make outages especially likely in the coming days or hours. PG&E should submit its EPSS reduction plan as part of a WMP Change Order in early 2024, with the intent to implement its plan before June 2024.

E. Vegetation Management (VM) and Inspections

1. Energy Safety should facilitate a comprehensive audit of PG&E's vegetation contractor management.

In 2022, PG&E's vegetation contractors were responsible for numerous safety incidents, failed to follow best management practices, failed to comply with PG&E's contractor Code of Conduct, and operated without strong oversight from PG&E.[145] Cal Advocates has observed similar concerns in previous years.[146] The plethora of issues suggest that PG&E does not have robust oversight of its contractors, particularly those associated with its VM programs.

a) VM contractors were responsible for numerous safety incidents in 2022.

In 2022, PG&E experienced over 600 incidents wherein the actions of a VM contractor posed a safety risk to workers or the public.[147] Over a third of these involved a line strike, an injury, or damage to third-party property.[148] At least one contractor is known to have struck a

[144] Work conducted on mitigating PSPS impacts has defined AFN as "Individuals with AFN are unable to use power for devices/equipment for health, safety, and independence due to an unexpected PSPS or are unprepared for a PSPS." *See, e.g.*, Rulemaking 18-12-005, *Pacific Gas And Electric Company's (U 39 E) 2022 Access And Functional Needs (AFN) Plan For Public Safety Power Shutoff (PSPS) Support*, January 31, 2022, p. 1.

[145] Details are in the discussion below.

[146] Cal Advocates Comments on 2021 WMPs, p. 8.

[147] PG&E's response to data request CalAdvocates-PGE-2023WMP-06, question 6, lists 637 such incidents.

[148] PG&E's response to data request CalAdvocates-PGE-2023WMP-06, question 6. Filtered to 221 incidents with the following eight incident labels: "Line Strike," "OSHA Recordable," "Property Damage 3rd Party," "OSHA Recordable, OSHA Reportable, SIF Actual," "NF Property Damage 3rd Party," "Line Strike, Property Damage 3rd Party," "OSHA Recordable, OSHA Reportable," "OSHA Recordable, SIF Potential."

line twice in 2022 and failed to report either incident to PG&E or the CPUC in a timely manner.[149] This constitutes a clear violation of PG&E's contractor code of conduct.[150]

b) VM contractors have not consistently followed PG&E's best management practices.

PG&E states that its VM contractors must adhere to PG&E's Best Management Practices, which are controls set by PG&E to ensure compliance with environmental requirements.[151] In 2022, PG&E formally tracked 352 issues of concern related to potential non-compliances (with regulations or Best Management Practices).[152] Across 2021 and 2022, PG&E found at least 100 cases where EVM contractors did not comply with PG&E's Best Management Practices with regard to vegetation debris in waterways alone.[153] In 2020 and 2021, Cal Fire[154] and local communities[155] alleged that PG&E's contractors had improperly disposed of vegetation slash and debris in watercourses.

c) PG&E is not sufficiently auditing its VM projects.

In 2022, PG&E's internal procedures instructed supervisors to conduct quarterly audits on five different randomly selected VM projects in their area of responsibility.[156] A subsequent internal Vegetation Management Documentation audit performed by PG&E found that only 57

---

[149] CalAdvocates-PGE-NonCase-AWM-02062023, questions 1 and 7. Despite these egregious failures to act in a safe and prudent manner, the contractor in question was still employed by PG&E at the start of 2023. (See PG&E's response to data request CalAdvocates-PGE-NonCase-AWM-02062023, question 17.)

[150] CalAdvocates-PGE-NonCase-AWM-02062023, question 4.

[151] PG&E's response to data request CalAdvocates-PGE-2023WMP-09, question 8.

[152] PG&E's response to data request CalAdvocates-PGE-2023WMP-09, question 8.

[153] PG&E's response to data request CalAdvocates-PGE-2023WMP-09, question 8.

[154] "In several sections of Class III drainage, I observed slash and debris generated by [vegetation management] operations within the watercourses. The slash is required to be either removed or stabilized prior to October 15th per 14 CCR § 916.4(c)(3)." Letter from Cal Fire to PG&E dated October 30, 2020 (provided in response to data request CalAdvocates-PGE-NonCase-MGN-12142020, question 3).

[155] *Humboldt County Issues Stop Work Order, PG&E Removes Contractor on EVM in Sohum After Complaints/Video by Residents*, published in Redheaded Blackbelt on December 16, 2021, available at https://kymkemp.com/2021/12/16/humboldt-county-issues-stop-work-order-pge-removes-contractor-on-evm-in-sohum-after-complaints-video-by-residents/

[156] PG&E, *2022 QAVM Vegetation Management Documentation Audit #762 Final Report*, December 21, 2022, p. 2 (provided in response to data request CalAdvocates-PGE-2023WMP-02, question 6).

percent of these audits were conducted in 2022.[157] In response to this finding, PG&E issued a corrective action to complete these audits, but does not appear to have done anything (such as a root cause analysis) to determine why the audits were not conducted in the first place.[158]

d) PG&E is not maintaining robust communications with its VM contractors.

The Independent Safety Monitor held interviews with various VM contractors for PG&E.[159] In these interviews, contractors reported that they were abruptly instructed to halt work well before the end of 2022, and described a general lack of communication from the PG&E groups charged with making VM decisions.[160] Clear and regular communication is critical to ensure contractors' work is in alignment with PG&E's goals and procedures.

e) Remedy: Energy Safety should audit PG&E's management of its vegetation contractors.

Vegetation contact was responsible for fully half of the ignitions in PG&E's HFTD in 2022.[161] Vegetation represents a major ignition driver, yet the companies performing PG&E's VM work have failed to comply with best practices, have been responsible for numerous safety incidents, and are under insufficient oversight from PG&E.

Given the data documenting PG&E's trouble with VM contractors, Energy Safety should perform an audit of PG&E's contractor management. This audit should examine the following, at a minimum:

- The extent to which PG&E maintains direct oversight of contractors, e.g., through unannounced field audits.
- The safety performance of individual contractors over the past three years to determine whether PG&E is retaining contractors who have consistently failed to comply with PG&E's code of conduct, industry best practices, or California regulations.

---

[157] PG&E, *2022 QAVM Vegetation Management Documentation Audit #762 Final Report*, December 21, 2022, p.2 (provided in response to data request CalAdvocates-PGE-2023WMP-02, question 6).

[158] PG&E, *2022 QAVM Vegetation Management Documentation Audit #762 Final Report*, December 21, 2022, p.11 (provided in response to data request CalAdvocates-PGE-2023WMP-02, question 6).

[159] April 2023 ISM Report, p. 16.

[160] April 2023 ISM Report, pp. 16-17.

[161] Per Table 6 of PG&E's 2022Q4 QDR, PG&E reported 84 ignitions in its distribution system in HFTD in 2022. 43 ignitions were due to vegetation contact.

- Whether and to what extent PG&E implements robust corrective actions to improve the performance of contractors.
- Whether PG&E has a sufficient and flexible "toolkit" of remedies when contractors fail to follow instructions, best practices, or regulations. PG&E needs to have a range of disciplinary or corrective tools that are proportionate to the problem and effective at improving future performance.
- How much ratepayer money has been spent fixing problems caused by repeat offenders.

Alternatively, Energy Safety should require PG&E to pay for an independent auditor to audit its vegetation contractor management and report its findings to Energy Safety in early 2024. This should be separate from the role of the independent evaluator; while the independent evaluator audits compliance with the WMP, this proposed audit would perform a deep dive into one program area.

2. Energy Safety should require PG&E to more quickly address its remaining EVM Tree Inventory.

PG&E's EVM program has been discontinued.[162] At the end of 2022, PG&E had an inventory of 385,000 trees that were identified for work under its EVM program, but had not yet been worked.[163] Of these trees, 209,000 had been identified for removal but had not yet been removed.[164]

To address the inventory of trees, PG&E started its Tree Removal Inventory program, which will reinspect and work through this inventory over the next nine years.[165] PG&E claims that its nine-year plan is based on a "realistically achievable average pace."[166] In the past two years, PG&E worked over 700,000 trees through its EVM program.[167] It is therefore unclear

[162] PG&E's 2023 WMP R1, p. 529.

[163] PG&E's response to data request CalAdvocates-PGE-2023WMP-08, question 2.

[164] PG&E's response to data request CalAdvocates-PGE-2023WMP-08, question 2.

[165] PG&E's response to data request CalAdvocates-PGE-2023WMP-08, question 2.

[166] PG&E anticipates removing 33,000 trees per year. PG&E's response to data request CalAdvocates-PGE-2023WMP-18, question 4.

[167] In 2021, PG&E worked (trimmed or removed) approximately 336,000 trees through its EVM program. In 2022, PG&E worked approximately 396,500. PG&E's response to data request OEIS_004, question 6, revised May 15, 2023.

why PG&E requires nine years to address its remaining EVM inventory, which could reasonably have been worked through in one to two years under EVM.

It is unclear whether PG&E has determined that its EVM program did not substantially reduce risk (thus making it acceptable to take nearly a decade to address these trees) or whether PG&E is allowing a high level of risk to persist in its system for nine years. Also, PG&E has stated that it plans to mitigate the risk associated with these trees through EPSS and its routine VM patrols.[168] However, if this is a reasonable approach, it is unclear why the trees could not be assessed and worked down through the routine VM program much sooner than PG&E's proposed nine years.

Energy Safety should require PG&E to revise and resubmit its WMP to provide more information on its EVM tree inventory. PG&E should be required to provide an assessment of the residual risk posed by these trees and justify its proposed reinspection pace.

3. Energy Safety should require PG&E to demonstrate that its new VM programs mitigate as much or more risk than its legacy EVM program.

PG&E ended its EVM program in 2022 and is replacing it with three transitional vegetation management programs beginning in 2023.[169] These transitional programs are highly limited and will cover only about a quarter of the number of miles in 2023 as PG&E's EVM program covered in 2022.[170] Accordingly, these programs come at a substantially reduced cost.

In 2023, PG&E forecasts spending $331.5 million less (25%) on VM compared to 2022. In 2024, the forecast costs drop by another $24.9 million.[171] PG&E states that these cost

---

[168] PG&E's response to data request CalAdvocates-PGE-2023WMP-08, question 9.

[169] PG&E's new EVM transitional programs are VM for Operational Mitigations, Tree Removal Inventory, and Focused Tree Inspections. PG&E's 2023 WMP R1, pp. 527-529.

[170] In 2022, PG&E performed EVM across 1,924 miles (PG&E's 2023 WMP R1, Table PG&E-1.1.-1, p. 991).

In 2023, PG&E's Vegetation Management for Operational Mitigations will cover approximately 221 miles (PG&E provided pilot CPZ locations in response to data request CalAdvocates-PGE-2023WMP-15, question 8. Cal Advocates pulled the length of these circuit segments from PG&E's WDRM v3 output, provided in response to CalAdvocates-PG&E-2022WMP-31, question 7).

PG&E's Focused Tree Inspections program will cover approximately 300 miles (PG&E's response to data request CalAdvocates-PGE-2023WMP-08, question 4).

PG&E's Tree Removal Inventory is targeted at specific trees identified for work during EVM.

[171] PG&E's response to data request CalAdvocates-PGE-2023WMP-06, question 5.

reductions are due to transitioning EVM to three new programs, reducing the overall amount of VM work as miles are undergrounded, and reducing unit costs through unspecified efficiencies.[172] One of the three new programs is currently in a pilot stage.[173] As PG&E develops and expands these programs, it is reasonable to expect the costs to increase, not further decrease as PG&E forecasts.

PG&E has substantially scaled back its expenses by scaling back the scope of its VM programs. As discussed above, vegetation contact was responsible for half of the ignitions in PG&E's HFTD in 2022.[174] PG&E's decision to end EVM, therefore, is only prudent if the replacement programs provide as much or more risk reduction as EVM. PG&E has not reasonably demonstrated that this is the case.

Energy Safety should require PG&E to revise and resubmit its WMP to provide a quantitative analysis of the expected risk reduction over the 2023-2025 WMP period due to the new transitional vegetation programs compared to its legacy EVM program. PG&E's analysis should focus on a direct comparison of EVM to the new transitional vegetation programs; it should not rely on unscheduled power outages and the routine VM program.[175]

IV. SCE

A. Risk Methodology and Assessment

1. Energy Safety should direct SCE to accelerate its efforts to mitigate ignition risks on secondary conductors.

In its 2023 WMP, Southern California Edison Company (SCE) provides an analysis of secondary conductor ignition events.[176] SCE's analysis reveals a significant increase in ignitions tied to secondary conductor and related components. From 2019 to 2021, the number of ignitions involving secondary conductors surged by over 200 percent.[177] Furthermore, in

[172] PG&E's response to data request CalAdvocates-PGE-2023WMP-15, question 19.

[173] PG&E's response to data request CalAdvocates-PGE-2023WMP-08, questions 2-4.

[174] Per Table 6 of PG&E's 2022Q4 QDR, PG&E reported 84 ignitions in its distribution system in HFTD in 2022. 43 ignitions were due to vegetation contact.

[175] PG&E's response to data request CalAdvocates-PGE-2023WMP-08, question 9.

[176] Southern California Edison's (SCE) 2023 Wildfire Mitigation Plan (WMP), SCE-22-16 Increases in Equipment Related Ignitions, pp. 762-766.

[177] SCE's 2023 WMP, p. 764.

2021, secondary conductors were linked to 30 percent of all CPUC-reportable ignitions within SCE's service territory,[178] and a quarter of the ignitions on secondary conductors occurred in SCE's high fire-risk area (HFRA).[179, 180]

SCE's monitoring of these ignition events shows that the primary cause of ignitions connected to secondary conductor was equipment or facility failure, which accounts for 70 percent of such incidents.[181] Non-vegetation objects coming into contact with the conductors was the second leading cause, contributing to 15 percent of ignitions in 2022.[182] To address the growing issue of ignitions linked to its secondary conductor, SCE enacted three key measures.

First, SCE made enhancements to its inspection procedures, including new questions for inspectors to answer about secondary conductors.[183] These adjustments resulted in a near doubling of corrective notifications for secondary conductors.[184] Additionally, SCE created corrective notifications to replace bare open-wire secondaries (OWS) with multiplex conductors in the HFRA within three years.[185,186] However, SCE' plan does not include weather resistant aluminum (WAL) secondaries, as well as open-wire secondaries outside the HFRA.[187,188]

---

[178] SCE's 2023 WMP, p. 635.

[179] SCE's 2023 WMP, p. 635.

[180] SCE's 2023 WMP, p. 160; The High Fire-Risk Area (HFRA) is SCE's preferred term for its planning area for wildfire mitigation measures. All of SCE's HFRA is consistent with CPUC HFTD maps.

[181] SCE's 2023 WMP, p. 764.

[182] SCE's 2023 WMP, p. 764.

[183] SCE's 2023 WMP, p. 764.

[184] SCE's 2023 WMP, p. 764; Notifications totalled 4,502 in 2021, then increased to 8,322 in 2022.

[185] OWS refers to Open-Wire Secondaries, a method of electric distribution which involves the use of wires without any insulation. This was a common method of electric distribution in the early days but has largely been replaced by other methods due to safety and reliability concerns.

[186]Multiplex conductors refer to the bundled or compacted arrangement of electrically insulated conductors used in electric distribution systems. They offer improved safety, reliability, and efficiency compared to open-wire secondaries.

[187] WAL refers to weather resistant aluminum, a specific type of open-wire secondary conductor made from aluminum that has been covered to resist weathering. It is not an electrically insulated conductor and is treated as bare conductor when installed.

[188] SCE's 2023 WMP, p. 765; "Notifications were created to replace all identified high fire open-wire bare secondaries with multiplex conductor within a three-year timeframe."

Next, SCE updated its covered conductor standard, which requires the replacement of bare open-wire secondaries or weather-resistant aluminum with multiplex secondary conductors.[189] However, this update will only affect new Wildfire Covered Conductor Program (WCCP) installations from 2024 onwards, not projects completed or planned for 2022 and 2023.[190]

In the interim, SCE will focus on enhancing vegetation management and inspection measures. In 2022, SCE inspected and trimmed vegetation around approximately 700 secondary structures and taped connectors on 3,000 secondary structures in the HFRA.[191] In 2023, SCE's plan includes inspecting approximately 1,000 secondary structures, which is less than 0.1% of all distribution structures, and performing necessary trimming to mitigate risks temporarily. [192],[193]

Despite SCE's efforts to decrease ignitions on its secondary distribution system, certain critical areas of concern call for urgent attention. Although SCE's detailed ignition event analysis and the subsequent enhancement of SCE's inspection process are notable, it has not suggested any proactive measures to address the increase in ignitions.

To mitigate the concerning number of ignitions from secondary conductors, SCE must tackle a significant challenge: the absence of a predictive model for secondary conductor failure. Such a model is needed for estimating ignition probability.[194] SCE's decision to only develop a predictive model in 2023 is a delayed response to a problem that has been escalating since 2019.[195]

Likewise, while SCE's efforts to replace outdated secondary conductor with multiplex conductors is a step in the right direction, the pace of this transition is concerning. SCE acknowledges that a significant portion of its secondary system (10 percent) is still equipped

[189] SCE's 2023 WMP, p. 252.

[190] SCE's 2023 WMP, p. 253.

[191] SCE's 2023 WMP, p. 765.

[192] SCE's 2023 WMP, p. 765.

[193] SCE plans to inspect 187,000 distribution structures in its HFRA in 2023.

[194] SCE's 2023 WMP, Table 6-7 – Utility Risk Assessment Improvement Plan, p. 175; "SCE does not have a predictive model specific to secondary conductor."

[195] SCE's 2023 WMP, p. 178.

with outdated and potentially unsafe secondary conductor.[196] SCE's plan to replace outdated secondary conductors with multiplex conductors beginning in 2024 is too long to wait given that this outdated secondary conductor is currently responsible for 25 percent of CPUC-reportable ignitions in SCE's HFRA.[197]

SCE's efforts to reduce ignitions linked to its secondary conductor system lack the urgency and proactivity required to address the problem's potential consequences of sparking a wildfire in the HFRA. SCE needs to prioritize and expedite its actions to ensure a safer secondary distribution system.

Additionally, the interim measures SCE has put in place are mainly targeted at mitigating ignitions that result from foreign objects interacting with the conductor. SCE's secondary conductor mitigation plan does not adequately or reasonably address equipment or facility failure, which was the leading cause of secondary conductor ignitions.[198] Therefore, Energy Safety should direct SCE to take the following actions to promptly mitigate the risk of ignitions linked to its secondary conductor system:

- SCE should prioritize the development and implementation of a predictive model for secondary conductors. This should be treated as an urgent priority, and SCE should report on its progress in future quarterly reports.
- SCE should expedite the replacement of all outdated open wire secondary and weather resistant aluminum secondary conductor in the current 2023 - 2025 WMP cycle. Failure to timely replace outdated wire can lead to ignitions in HFRAs. SCE should report on its progress in future quarterly reports.
- In its 2023 WMP revision, SCE should provide additional reasoning for focusing on interim measures that primarily address contact from foreign objects rather than the main risk observed, which is overwhelmingly equipment failure.

SCE should be required to submit a revised WMP that describes its plan and timeline to implement these recommendations.

[196] SCE's 2023 WMP, p. 253 fn 147.

[197] SCE's 2023 WMP, p. 635.

[198] SCE's 2023 WMP, p. 764; "In 2022, the main driver of secondary ignitions was Equipment/Facility Failure (EFF) (approximately 70%) followed by Contact Foreign Object (CFO) (approximately 15%)."

B. Wildfire Mitigation Strategy Development

1. Energy Safety should direct SCE to justify its transition to a mitigation strategy that predominantly focuses on the consequences of wildfires.

In its 2023 WMP, SCE has implemented an approach to wildfire mitigation strategy it calls the Integrated Wildfire Mitigation Strategy (IWMS).[199] SCE's Integrated Wildfire Mitigation Strategy stratifies circuit segment risk scores into tranches based on various criteria.[200] These criteria encompass wildfire history, egress constraints, elevated fire concern areas, and wildfire consequences. SCE's subject matter experts use both quantitative data and experience-based judgment to allocate mitigation measures to each circuit segment.[201]

In doing so, SCE diverges from a quantitative approach to mitigation strategy, which focuses on both likelihood and consequence.[202] Instead, SCE adopts a more qualitative approach that primarily aims to minimize or eliminate the catastrophic consequences of wildfires. [203] The shift in SCE's mitigation strategy raises concerns and poses potential problems. Cal Advocates also questions whether this change in strategy constitutes an effective and efficient use of ratepayer funds.

Understanding SCE's strategy shift requires a review of its risk assessment process, Multi Attribute Risk Score (MARS).[204] The Multi Attribute Risk Score methodology calculates the probability of ignition (POI) for each asset using machine learning models, considering historical events and risk drivers.[205] After probability of ignition calculations, SCE uses Technosylva's

---

[199] SCE 2023 WMP, Section 6.2.1.2, pp. 101 – 116.

[200] SCE's WMP, Table SCE 6-03, p. 112.

[201] SCE's WMP, p. 114. This phase is called "review and revise":

> Accordingly, SCE performs further due diligence by reviewing the output using SCE's inspection photos, geographic information system (GIS), and Google Maps or Street Views with subject matter experts such as engineers and fire science specialists. These deep dives allow SCE's employees to virtually "walk the line" to determine whether a segment is appropriately categorized.

[202] SCE's WMP, p. 181; "IWMS incorporates additional factors not currently present in the MARS Framework (e.g., egress limitations, SME judgment), which help augment SCE's analysis of risk impacts from these factors at local levels.

[203] SCE's WMP, p. 181.

[204] SCE's WMP, Section 6.2.1.1, pp. 98- 101

[205] SCE's WMP, p. 101:

Wildfire Analyst (WFA) to run "match drop" simulations at and between asset locations, identifying gaps in wildfire consequence maps.[206] The simulations' outcomes are converted into Multi Attribute Risk Scores, which are used to create risk spend efficiency (RSE) values.[207] These values help establish a pre-mitigation risk baseline and measure risk reduction effectiveness.[208]

SCE argues that a purely quantitative mitigation strategy based on RSE and Multi Attribute Risk Scores does not adequately capture SCE's WMP goals.[209] By diverging from quantitative risk assessment methods and concentrating on a novel qualitative approach to mitigation strategy, SCE claims it is better equipped to shield ratepayers from the impacts of catastrophic wildfires.[210]

SCE presents examples of challenges it encounters when relying solely on Multi Attribute Risk Scores to determine mitigation strategy. One such challenge is that assets with low probability of ignition and high wildfire consequences have equivalent Multi Attribute Risk Scores as assets with a high probability of ignition and low wildfire consequences. As SCE acknowledges, this challenge highlights the need for a more nuanced understanding of risk. Moreover, SCE notes that the dynamic nature of probability of ignition (which changes over the life of the asset due to activities like vegetation management, asset repairs, or pole replacements) can complicate mitigation efforts and necessitate a different approach. SCE also explains there are other non-modeling considerations that a Multi Attribute Risk Score does not fully capture, such as egress risk. As a result, SCE does not model egress risk in the traditional sense; instead, SCE uses egress constraint as a factor in the Integrated Wildfire Mitigation Strategy process.[211]

> The modeling tools SCE employs are a series of machine learning algorithms (e.g., random forest, gradient boosting) to derive and calibrate POI estimates for each wildfire risk driver.

[206] SCE's WMP, p. 100:

> SCE performs match-drop wildfire simulations along each of these asset locations to estimate consequences in natural units (e.g., acres burned, buildings impacted, population impacted) associated with an ignition emanating from those assets at their specific geographic locations.

[207] SCE's 2023 WMP, p. 203.

[208] SCE's 2023 WMP, p. 203.

[209] SCE's 2023 WMP, p. 203.

[210] SCE's response to questions during a teleconference with Cal Advocates staff on May 5, 2023.

[211] SCE's response to questions during a teleconference with Cal Advocates staff on May 5, 2023.

In conclusion, Energy Safety should require SCE to provide more justification in its 2024 WMP update, for its transition to a mitigation strategy that is primarily focused on the consequences of wildfires. While it is important to consider the consequences of wildfires and protect ratepayers from their impacts, it is also crucial to ensure that the adopted mitigation strategies are effective, efficient, and based on sound risk assessment principles. SCE should develop a balanced risk assessment framework that considers both the consequences and the likelihood of ignition. This is necessary for the optimal use of ratepayer funds and to minimize the overall risk of wildfires.

2. Energy Safety should direct SCE to justify its wildfire mitigation strategy for Severe Risk Areas.

SCE states that "undergrounding in Severe Risk Areas (SRA), where the threat to lives and property is elevated, is a prudent choice."[212] This response coupled with information presented earlier, suggests that SCE may not be able to make meaningful reductions in overall risk in the Severe Risk Area until 2026 to 2028. This seems inconsistent with SCE's strategy to prioritize circuit segments that pose the greatest hazards to public safety. Considering the potentially devastating consequences of wildfires in Severe Risk Areas, it would seem logical for SCE to focus on these circuit segments in its 2023-2025 WMP rather than waiting until 2026 or later.

Furthermore, because covered conductor projects are cheaper and faster to implement than undergrounding, it would be sensible for SCE to opt for this mitigation strategy in Severe Risk Areas instead of targeted undergrounding.[213] Notably, in recent years, SCE has deployed about 1,300 miles of covered conductor per year on average.[214] At this rate, SCE could harden the entire Severe Risk Areas in two to three years.[215] Covered conductor is effective at preventing ignitions, especially when deployed in conjunction with complementary measures

---

[212] SCE's response to data request CalAdvocates-SCE-2023WMP-8, question 14(a).

[213] SCE's 2023 WMP, Table SCE 7-06, Efficacy of Mitigation Portfolios, p. 207.

[214] SCE installed approximately 960 miles of covered conductor in 2020, 1,500 miles in 2021, and 1,400 miles in 2022. See SCE's 2020, 2021, and 2022 4th Quarter Data Reports.

In total, SCE installed 3,880 miles of covered conductor in the 2020-2022 WMP cycle. See SCE 2023 WMP, Table SCE 1-01: Summary of 2020-2022 Achievements, p. 2.

[215] SCE's Severe Risk Area designation encompasses 2,950 circuit-miles. See SCE's 2023 WMP (errata), Table SCE 6-04: Circuit Miles per IWMS Risk Tranche, p. 114.

such as rapid earth fault current limiters and enhanced inspections. This strategy would result in a more timely and efficient solution for ratepayers. Therefore, SCE should reconsider its current projected timeline and take swifter action to mitigate consequences in Severe Risk Areas.

Cal Advocates agrees that public safety should be SCE's paramount concern, particularly in Severe Risk Areas. Unfortunately, SCE's current strategy and projected timeline seem inconsistent with the urgency and prioritization required for these areas.

In SCE's 2024 WMP update, Energy Safety should require SCE to justify why it is prudent and responsible to allow wildfire risks to persist for several years in Severe Risk Areas with very high wildfire consequences. SCE's current strategy will not even begin addressing the wildfire risk in Severe Risk Areas until 2026 to 2028. In contrast, SCE could address these areas in the current WMP cycle with highly effective mitigation measures that are faster to deploy, which would not only ensure public safety but also provide a more timely and cost-effective mitigation strategy for ratepayers.

3. Energy Safety should direct SCE to provide additional information demonstrating the effectiveness of its novel Integrated Wildfire Mitigation Strategy at targeting and prioritizing areas with intolerable risk consequences.

Although SCE's 2023 WMP presents an overview of the expected risk reduction resulting from its wildfire mitigation activities, the information presented does not reasonably demonstrate the effectiveness of SCE's Integrated Wildfire Mitigation Strategy.[216] SCE's failure to provide detailed evidence showing a decrease in SCE's overall risk casts doubt on the effectiveness of SCE's Integrated Wildfire Mitigation Strategy. SCE must offer more detailed and clear information in order to substantiate the effectiveness of its Integrated Wildfire Mitigation Strategy.

For example, in Section 7.2.2, SCE provides a graph that depicts the overall risk projection for its HFRA from 2023 through 2032.[217] This graph does not demonstrate the efficacy of SCE's new Integrated Wildfire Mitigation Strategy, especially during the years in which SCE plans to harden areas where the wildfires could have the most catastrophic

[216] SCE's 2023 WMP, Section 7.2.2, pp. 221 – 227.

[217] SCE's 2023 WMP, p. 221: Figure 7 -1 – Projected Overall HFRA Risk.

consequences.[218] Instead, the curve indicates an initial sharp decline in overall risk in 2023, followed by a slow decline from 2024 through 2028, until the risk plateaus at a near constant level between 2029 and 2032. This representation is perplexing given SCE's plan to implement a 520-mile targeted underground program between 2026 and 2028 in Severe Risk Areas (SRAs). Given SCE's plans to implement expensive system hardening measures after 2023, one would expect overall risk to decline in these years more dramatically.

In response to this observation, SCE explains that it has already carried out significant risk mitigation in its HFRA,[219] to address the highest-risk circuit segments using covered conductors. SCE further states that Figure 7-1 illustrates the results of these efforts in 2023 and 2024 with the initial steep decline, and emphasizes that covered conductors have a greater impact on overall risk. Indeed, SCE states that "in charts such as Figure 7-1, covered conductor — which SCE has scoped for 2,850 miles over the WMP period — shows a larger impact than targeted undergrounding."[220]

Moreover, the underlying data used to construct Figure 7-1 does not address egress, which is a risk factor considered during the application of SCE's Integrated Wildfire Mitigation Strategy approach.[221] SCE acknowledges that "the calculations for Figure 7-1 use the Multi Attribute Risk Score Framework, which does not account for risk factors such as egress."[222] This is problematic considering that egress plays a significant role in justifying numerous projects from 2026 to 2028.[223]

---

[218] SCE's response to questions during a teleconference with Cal Advocates staff on May 5, 2023.

[219] SCE's 2023 WMP (errata), p. 189; SCE has hardened approximately 51% of its SRA and HCA circuit miles respectively.

[220] SCE's response to data request CalAdvocates-SCE-2023WMP-8, question 10(b).

[221] SCE's 2023 WMP, p. 181:

> IWMS incorporates additional factors not currently present in the MARS Framework (e.g., egress limitations, SME judgment), which help augment SCE's analysis of risk impacts from these factors at local levels.

[222] SCE's response to data request CalAdvocates-SCE-2023WMP-8, question 10(a).

[223] SCE's response to data request CalAdvocates-SCE-2023WMP-8, question 10(b):

> SCE has scoped approximately 520 underground miles for 2026-2028, which will target the undergrounding of lines where factors such as limited egress, terrain or fuel can create conditions that are difficult for most mitigations, except for undergrounding, to address without leaving a substantial amount of residual public safety risk.

Unfortunately, SCE has not provided a supplemental figure to demonstrate how the Integrated Wildfire Mitigation Strategy achieves a reduction in wildfire consequence. Without clear evidence of the benefits of the expenditure, the overall effectiveness of SCE's Integrated Wildfire Mitigation Strategy cannot be appropriately assessed. To enable a more meaningful evaluation of SCE's new Integrated Wildfire Mitigation Strategy, SCE should present clearer evidence (in data and graphics) demonstrating the results of its consequence-reducing mitigation strategy.

In summary, Energy Safety should direct SCE to take the following actions to provide a clearer understanding of its wildfire mitigation strategy:

- Submit a revised Figure 7-1 in its next WMP update that separates risk likelihood and risk consequence, allowing for a more effective demonstration of overall system risk.
- Address concerns in its next WMP update such as egress in its figures and provide a comprehensive representation of its Integrated Wildfire Mitigation Strategy approach that accurately reflects the strategy's expected results.

These actions will ensure that Energy Safety and intervenors such as Cal Advocates can substantiate the effectiveness of Integrated Wildfire Mitigation Strategy and SCE's risk mitigation efforts.

C. Asset Management and Inspections

1. Energy Safety should direct SCE to submit a revised WMP that provides more detail on SCE's plan to address maintenance tags that present an ignition risk.

In its quarterly reports for 2022, SCE reports that many maintenance tags present an ignition risk with "no General Order (GO) 95 exception."[224] Approximately 15,600, or 2 percent, of open work orders are tagged as being an ignition risk without GO 95 exceptions.[225] Nearly 7,000 of these are in an "extreme" HFTD.[226]

SCE's plan to address these maintenance tags, especially those that go back as far as 2006, is not adequately or reasonably described in its WMP. Specifically, while SCE

[224] GO 95 exceptions are maintenance tags that are past due but have a mitigating circumstance permitted by the Commission, such as permitting constraints, third party refusal, and customer access issues. *See,* SCE 2023-2025 WMP, p. 248.

[225] SCE Quarterly Data Report Table 13, Q4 2022.

[226] SCE Quarterly Data Report Table 13, Q4 2022.

acknowledges its backlog of potentially risky maintenance needs,[227] it merely states that it is "implementing new processes and resources" to prevent the occurrence of more past-due notifications.[228] This assertion, absent a specific plan to remediate the open maintenance tags, is unreasonable. Energy Safety should require SCE to submit a revised WMP that provides specific details on SCE's plan to address maintenance tags that are ignition risks, especially those in "extreme" risk HFTDs. SCE should also provide additional detail on how it plans to prevent more maintenance tags from becoming overdue in the future.

2. Energy Safety should direct SCE to explain how it sets targets for asset inspection types that have a high find rate.

In its WMP, SCE describes its implementation of risk-based asset inspections. SCE identifies 87 transmission wire-down events that occurred between 2015 and 2022 that were attributed to transmission conductors and splices. These wire-down incidents caused SCE to identify conductors and splices that have a higher probability of failure.[229]

Among other inspection classes, SCE conducts transmission conductor and splice assessments using X-Ray devices and a technology called LineVue.[230] SCE's LineVue and X-Ray technologies allow inspectors to find anomalies on transmission lines that are not apparent or visible, such as internal degradation due to corrosion or improper installation.[231] SCE notes that the 63 splices it X-rayed revealed four Level 1 maintenance tags (which require immediate action), 20 Level 2 tags, and ten Level 3 tags. Overall, SCE had a 54 percent find rate during these inspections – thus, more than half of inspections revealed problems requiring maintenance.[232]

In 2022, SCE set a target of 75 span inspections, 50 splice inspections, and five conductor samples using LineVue and X-Ray technologies.[233] In 2023, SCE plans to increase the number

[227] SCE 2023-2025 WMP, pp. 756-761.

[228] SCE 2023-2025 WMP, p. 761.

[229] SCE 2023-2025 WMP, p. 305.

[230] SCE 2023-2025 WMP, p. 305.

[231] SCE 2023-2025 WMP, p. 305.

[232] SCE 2023-2025 WMP, p. 309.

[233] SCE 2023-2025 WMP, p. 309.

of splices X-Rayed to 75 and plans to maintain the same targets for span inspection using LineVue. X-Ray and LineVue inspection targets in 2024 and beyond are to be determined pending an engineering analysis.[234] As explained above, these inspection types yielded a very high find rate, as compared to the overall find rate of Level 1 and Level 2 tags of approximately 4.1 percent in transmission detailed inspections.[235] Splice failures can cause wire-down scenarios which are also an ignition risk.[236] This raises the question of why SCE has set such modest goals for these inspection types. In response to discovery, SCE states that its targets are determined by a risk model that accounts for asset age, circuit loading, splice count, conductor type, outage data, and repair notifications.[237] These factors are then combined with a fire consequence score and other factors, including outage coordination,[238] to determine a feasible scope of work that targets the highest risk areas.[239]

Cal Advocates is concerned that the high find rate of X-Ray and LineVue inspections indicates that unsafe or degrading splices may be a much more widespread problem. To address this concern, Cal Advocates recommends that Energy Safety require SCE to explain the various factors it uses to determine inspection targets in more detail, especially those inspection types that have the highest rate of detecting issues that can become safety hazards. SCE should be required to develop a plan to expand its use of X-Ray and LineVue inspections or justify why expansion is infeasible. Energy Safety should direct SCE to make these elaborations in its Quarter 3, 2023 data update.

3. Energy Safety should direct SCE to provide a more comprehensive plan that demonstrates sufficient

[234] SCE 2023-2025 WMP, pp. 244-245.

[235] SCE Quarterly Data Report Table 2, L1 and L2 findings divided by number of transmission assets that received detailed inspected in the timeframe of Q2-3, 2022.

[236] SCE 2023-2025 WMP, p. 305.

[237] SCE's response to data request CalAdvocates-SCE-2023WMP-13, Question 04.

[238] These transmission assessments currently require the line to be taken out of service to conduct.

[239] SCE's response to data request CalAdvocates-SCE-2023WMP-13, Question 04.

personnel allocation to address its backlog of overdue work orders.

SCE states that it prioritizes open work orders based on the severity of the finding and the associated compliance deadline based on HFTD location.[240] However, SCE does not clarify how it is planning to close the work orders.

Table C below shows the annual number of asset work orders that SCE generated in 2020 to 2022, disaggregated by year and HFTD tier.[241]

Table C
Number of asset work orders that SCE generated yearly from 2020-2022

Annual number of asset work orders	2020	2021	2022
Non-HFTD	68,371	102,376	109,338
HFTD Tier 2	23,742	23,653	34,271
HFTD Tier 3	40,472	30,958	47,186
Total	**132,585**	**156,987**	**190,795**
Percentage increase compared to 2020		18%	44%

This table shows that the number of asset work orders that SCE generated increased in 2021 and 2022, compared to year 2020. However, SCE does not keep track of the manpower that it uses to complete and close asset work orders.[242] SCE also does not provide a specific plan to increase, maintain, or decrease the manpower allocated to ensure that it can address all asset work orders in a timely manner,[243] nor any details about its plans to meet work order goals.[244]

[240] SCE's 2023 WMP, section 8.1.7: Open Work Orders.

[241] SCE's response to data request CalAdvocates-SCE-2023WMP-12, question 9.

[242] SCE's response to data request CalAdvocates-SCE-2023WMP-12, question 10: "SCE does not track asset work order data by employee hours accrued because not all notifications are linked to specific work orders."

[243] SCE's response to data request CalAdvocates-SCE-2023WMP-12, question 11: "SCE does not associate or track manpower hours to the completion and closing of asset work orders, however, SCE plans to have sufficient employee resources (both internal and external) to meet work order goals."

[244] SCE's response to data request CalAdvocates-SCE-2023WMP-12, question 11: "SCE does not associate or track manpower hours to the completion and closing of asset work orders, however, SCE plans to have sufficient employee resources (both internal and external) to meet work order goals."

Table D shows the number of overdue asset work orders, categorized by age and HFTD tier.

Table D **Past due asset work orders categorized by days overdue** As of the end of 2022					
HTFD Area	0-30 Days	31-90 Days	91-180 Days	181+ Days	**Total**
Non-HFTD	452	779	613	13,951	**15,795**
HFTD Tier 2	29	82	118	2,646	**2,875**
HFTD Tier 3	419	1,118	937	3,638	**6,112**
Total	**900**	**1,979**	**1,668**	**20,235**	**24,782**
Percentage of total	3.6%	8.0%	6.7%	81.7%	

As the above table shows, more than 81 percent of the overdue work orders are at least 181 days overdue. This suggests that the work orders have been accruing, rather than being slightly delayed for unforeseeable reasons. It is concerning that SCE had 6,112 overdue work orders in HFTD Tier 3 and 2,875 overdue work orders in HFTD Tier 2, at the end of 2022. Allowing overdue work orders to accumulate increases the risk of equipment failure and endangers the public.

Energy Safety should direct SCE to revise its WMP to provide a detailed plan that addresses all resources and due dates for resolving its overdue asset work orders. In particular, SCE should detail how much manpower will be required to address the maintenance backlog and describe how it will dedicate adequate manpower – on an ongoing basis – to timely resolve new asset work orders.

4. Energy Safety should direct SCE to examine and resolve the issue of work orders that have been pending for an extended period.

The accumulation of SCE's overdue work orders has resulted in SCE having pending work orders for extended periods. These maintenance issues can pose an increasing risk after being left unresolved for years, and eventually the work order might need different action than was originally planned.

Table E below shows the count of pending work orders as of the end of 2022, categorized by the year they were created. SCE still has 943 pending work orders that were opened in 2018 or earlier. This includes 36 pending work orders that were opened in 2014 or earlier.[245]

Table E **Count of Pending Work Orders by Year Created** As of the end of 2022	
Year	Count of pending work orders by year created
2011	1
2012	2
2013	11
2014	22
2015	37
2016	31
2017	163
2018	676
2019	818
2020	1,744
2021	14,082
2022	10,053
Total	**27,640**

The fact that SCE has pending work orders that have been open for *up to eleven years* is highly problematic. Energy Safety should direct SCE to investigate why this has occurred and reassess the needed remediation actions for long-delayed work orders. SCE should revise its WMP with a detailed plan that addresses all resources and due dates to promptly address the pending work orders that are at least five years old.

[245] SCE's response to data request CalAdvocates-SCE-2023WMP-12, question 1.

D. Vegetation Management and Inspections

1. Energy Safety should require SCE to report on progress, outcomes, and lessons from its Consolidated Inspection Strategy through its completion in 2025.

SCE's new Consolidated Inspection Strategy for vegetation management represents a significant change in how it approaches the inspection and management of vegetation near its assets. The strategy, which will be implemented in two phases, aims to enhance the effectiveness and efficiency of SCE's vegetation management programs, an approach supported by recommendations from a study conducted by an independent third-party evaluation.[246] This approach highlights certain challenges that need to be resolved to achieve success. Failure to address these issues could result in significant consequences, such as heightened wildfire risks and higher costs for ratepayers.[247]

The first phase of the Consolidated Inspection Strategy, beginning in 2023, will centralize tree inspection schedules for SCE's three largest inspection programs.[248] SCE currently relies on multiple inspection contractors, each focused on a specific program. Under the new strategy, a single inspection contractor will be responsible for inspecting the entire assigned district and conducting vegetation inspections for all three programs simultaneously. SCE contends that the new approach will streamline the scheduling and inspection processes, to allow for better performance and planning flexibility.[249]

The second phase, scheduled to be implemented by 2025, involves transitioning from a grid-based to a circuit-based approach to planning and scheduling vegetation inspections.[250]

---

[246] SCE's 2023 WMP, p. 375 n. 190; "In 2022, on behalf of the Governor's Office, Filsinger Energy Partners (FEP) was brought in to provide oversight and potential enhancement opportunities for SCE's wildfire mitigation strategies."

[247] SCE's 2023 WMP, Table 10-1 – Lessons Learned, p. 648; "Opportunities may exist to integrate and improve vegetation management programs to reduce potential wildfire risk."

[248] SCE's 2023 WMP, p. 392; The three programs are Routine Line Clearing, HTMP, and Dead & Dying Tree Removal.

[249] SCE's 2023 WMP, p. 420:

> SCE anticipates more efficiency in the deployment of contractor resources to execute work because cross-program scope will generally be identified at the same time in one geographical area under the new consolidated inspection strategy.

[250] SCE's 2023 WMP, p. 393; "by 2025, SCE plans to transition inspections for all Vegetation Management programs to a circuit basis, thus completing the consolidated inspection strategy."

This change could enable more efficient allocation of resources and reduced duplication of efforts, ultimately leading to cost savings.

However, the transition to a Consolidated Inspection Strategy may also have negative implications in terms of cost-effectiveness. For example, grid-based inspections currently allow for efficient bundling of geographically adjacent work, which helps maintain a consistent volume of contractor work and timely invoicing.[251] SCE must cautiously avoid duplicative work while transitioning to a circuit-based approach. The different ways of organizing work could lead to redundancy during the transition: workers could perform VM inspections in a grid cell, then later be assigned to inspect a circuit that traverses the same grid cell. SCE has outlined its strategy to prevent overlapping inspections.[252] While SCE's approach seems promising, it should be validated in future WMP cycles.

Lastly, SCE acknowledges that "significant analytical resources are needed to optimize the shift in schedule for individual trees."[253] SCE further explains that it has "not yet confirmed the availability of these resources," and that it is "is in the process of implementing a new work management system."[254] The lack of specificity and certainty surrounding SCE's capability to carry out this transition must be addressed swiftly if SCE is to attain a 2025 implementation deadline. It also heightens concerns regarding the consequences of any potential delays in implementation. In practical terms, if SCE fails to effectively address the challenges described above, it will lead to increased costs for ratepayers.

To address these challenges, Energy Safety should direct SCE to monitor and evaluate the transition from grid-based to circuit-based inspections. In future WMP updates, SCE should report on how it is avoiding duplicative work and maintaining or improving the efficiency of its

---

[251] SCE's response to data request CalAdvocates-SCE-2023WMP-7, question 12:

> The advantage of conducting [vegetation management] inspections on a grid-by-grid basis is that smaller, geographically adjacent bundles of work can be coordinated and measured for completion and invoiced on a more timely basis. This also helps in planning the work to maintain a normalized amount of contractor work volume on a monthly basis.

[252] SCE's response to data request CalAdvocates-SCE-2023WMP-7, question 14:

> To maintain the frequency of inspections and avoid potential overlaps during the transition from grid to circuit/span scheduling in 2025, SCE will perform a refresh of TRI [Tree Risk Index] scores in advance of the 2025 inspection plan.

[253] SCE's response to data request CalAdvocates-SCE-2023WMP-7, question 11.

[254] SCE's response to data request CalAdvocates-SCE-2023WMP-7, question 11.

vegetation management efforts. By addressing challenges proactively, SCE can mitigate risks to ratepayers while maximizing the benefits of the new strategy.

In conclusion, SCE should be encouraged to document and share lessons from implementing the Consolidated Inspection Strategy, which will foster collaborative learning and improvement across the industry.

E. De-energization (Public Safety Power Shutoffs, PSPS)

1. Energy Safety should require SCE to resubmit information on its community outreach and engagement with vulnerable customers regarding PSPS.

In 2022, SCE was the only utility to utilize PSPS to de-energize customers, calling three de-energization events.[255] Although PSPS is now a well-established program, it is still not clear if customer resiliency programs intended to mitigate the adverse impact of de-energization events are reaching all vulnerable customers. These customer resiliency programs help customers prepare for PSPS events and include Critical Care Backup Battery, Self-Generation Incentive Program, and backup battery and portable generation rebates.

During its November 19, 2022 PSPS event, SCE de-energized 5,375 customers.

- SCE de-energized 177 Medical Baseline Allowance Program[256] (MBL) customers, but only 60 MBL customers (34%) availed themselves of customer resiliency benefits.
- SCE de-energized 486 Access and Functional Needs (AFN) customers[257, 258] but only 16 AFN customers (3%) availed themselves of customer resiliency benefits.[259]

---

[255] See Table 9-1 – PSPS Event Statistics and note that only de-energization events are included in their table, "no circuits or customers are de-energized during high-threat events", SCE 2023 WMP, p. 611.

[256] Medical Baseline support services are "for customers who are reliant on electrically operated medical or mobility equipment," SCE 2023 WMP, p. 571.

[257] Access and Functional Needs customers include populations who may have additional needs before, during, and after an incident, individuals needing additional response assistance, or people experiencing homelessness. See SCE's definition of access and functional needs, SCE 2023 WMP, p. 587-588.

[258] SCE's 2022 Post Season Report, p. 3 and p. 5, available at https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/safety-and-enforcement-division/reports/2022-psps-post-season-reports/sce_postsr1_3-1-2023.pdf

[259] SCE's response to data request CalAdvocates-SCE-2023WMP-15a, question 5.

During its November 24, 2022 PSPS De-energization Event, SCE de-energized 10,200 customers.

- SCE de-energized 383 MBL customers but only 147 MBL customers (38%) availed themselves of customer resiliency benefits.
- SCE de-energized 3,408 AFN customers[260] but only 15 AFN customers (0.4%) availed themselves of customer resiliency benefits.[261]

In addition, in the fourth quarter of 2022 during which these events occurred, "211 [California Network][262] provided four meal deliveries, two hotel accommodations, and three deliveries of resiliency items that support the unique needs of households experiencing PSPS."[263] The number of actual accommodations seems low compared to the hundreds of MBL and thousands of AFN customers affected by SCE's PSPS events.

Energy Safety's WMP Technical Guidelines require "Evaluation of the specific challenges and needs during a wildfire or PSPS event of the electrical corporation's AFN customer base [and plans] to address specific needs of the AFN customer base throughout the service territory".[264] While the results of SCE's 2022 PSPS Tracker Survey[265] identifies two

---

[260] SCE's 2022 Post Season Report, p. 4 and p. 5.

[261] SCE's response to data request CalAdvocates-SCE-2023WMP-15a, question 8. Note: SCE states that 3,925 customers participated in 211 services during the November 24, 2022 PSPS event regardless of whether they were ultimately de-energized and regardless of their AFN status.

[262] "211 California Network" refers to SCE's partner organization that gives customers referral services and assistance with transportation, food support or housing accommodations, SCE 2023 WMP, pp. 570-571.

[263] SCE's 2023 AFN Plan, Appendix B, Q4 Quarterly Update to 2022 AFN Plan for PSPS Support, p. 86, available at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M501/K654/501654066.PDF.

[264] 2023-2025 WMP Technical Guidelines, p. 189.

[265] This survey is targeted at customers who had been in scope of a PSPS in the prior year and asks questions about their experience and knowledge surrounding PSPS.

"Challenges and needs as highlighted in the Survey include:

- Concerns on alternate sources of power and the challenges of financial barriers to building resiliency.
- Concerns on the negative impacts to households, including the challenges associated with the inability to use or charge adjustable hospital beds, electric scooters, nebulizers, air conditioners, and Continuous Positive Airway Pressure (CPAP) machines."

SCE 2023 WMP, p. 602.

specific challenges and needs of its AFN customer base, its 2023 WMP does not provide evaluation of or plans to address the challenges SCE's customers have identified. While SCE refers to its AFN Plan and quarterly updates for further details,[266] SCE does not evaluate or provide plans to address these challenges and needs in its 2023 AFN Plan.[267]

SCE has 1.5 million unique customer accounts with AFN,[268] and is planning to collect information by surveying its 1.2 million AFN customers in HFRAs to better understand their needs.[269] SCE is in a unique position to detail its learning experiences from the past year because it was the only utility to de-energize customers. While it is beneficial to survey all AFN customers in its territory going forward, SCE should start addressing the challenges it has already identified.

For these reasons, Energy Safety should require SCE to provide an update of its Section 8.5.3 (Engagement with Access and Functional Needs Populations) and its Table 8-53 (Community Outreach and Engagement Initiative Objectives (3-year plan)) that includes plans to address the identified specific challenges and needs of SCE's AFN customer base, so that progress on these objectives can be tracked and verified as completed. Specifically, SCE should articulate more explicit, specific objectives and methods of verification so that objectives can be verified, and followed up on. For example, one objective is listed as "Actively collaborating with stakeholder networks and partnerships to better understand customer, community and stakeholder specific needs and develop tailored solutions, including AFN." This broad objective is phrased vaguely and noncommittally. Moreover, the Method of Verification refers to two tables,[270] which list names of stakeholders, but do not include any method to verify that SCE has collaborated or gained an understanding of the needs of its customers. Energy Safety should direct SCE to address these shortcomings in the updated Table 8-53.

[266] SCE 2023 WMP, pp. 602-603.

[267] SCE 2023 AFN Plan, pp. 69-70.

[268] SCE 2023 WMP, p. 601.

[269] SCE 2023 AFN Plan, p. 19.

[270] SCE 2023 WMP, p. 552 (Table 8-44, State and Local Agency Collaboration); SCE 2023 WMP, p. 597 (Table 8-59, List of Community Partners).

V. SDG&E

A. Risk Methodology and Assessment

1. Energy Safety should require SDG&E to explain why previously planned enhancements to its risk models have not been implemented.

In its 2022 approval decision, Energy Safety required SDG&E to provide an update on improvements made to its wildfire risk models as part of the "areas for continued improvement and required progress."[271] SDG&E uses two primary wildfire risk models: the Wildfire Next Generation Systems – Planning (WiNGS-Planning) and the Wildfire Next Generation Systems – Operations (WiNGS-Ops).

SDG&E has not fully complied with Energy Safety's direction in the 2022 approval decision. SDG&E filed a WiNGS-Ops Progress Report as part of the 2023 WMP, but no report specifically about enhancements to the WiNGS-Planning model.[272, 273] In its 2022 WMP, SDG&E stated that it intended to significantly expand this risk model, and intended to "explore the use of the WiNGS-Planning risk model to evaluate the effectiveness of vegetation management operations risk models to support future prioritization and implementation of tree trimming."[274] However, in its 2023 WMP filing, SDG&E does not mention this effort, nor provide any update on the planned enhancement. In response to Cal Advocates' discovery request, SDG&E explains that it is no longer continuing with this planned enhancement as the WiNGS-Planning model is "not the best approach for identifying the trees or vegetation management areas that need to be prioritized."[275]

SDG&E's reversal of its plans to expand the uses of the WiNGS-Planning model to include identifying potential areas of vegetation management work is a significant change.[276] To

---

[271] Energy Safety's Final Decision on SDG&E's 2022 Wildfire Mitigation Plan Update, July 5, 2022, p. 121: Area for Continued Improvement SDGE-22-30.

[272] Area for Continued Improvement SDGE-22-30 is ambiguous. The title refers to "Improvements to the WiNGS-Ops and WiNGS-Planning Models," but the text only specifically requires "a progress report on the performance of WiNGS-Ops."

[273] SDG&E's 2023 WMP, Attachment E: WiNGS-Ops Progress Report.

[274] SDG&E's 2022 WMP, p. 286.

[275] SDG&E's response to DR CalAdvocates-SDG&E-2023WMP-07, question 1b, April 10, 2023.

[276] SDG&E's response to DR CalAdvocates-SDG&E-2023WMP-07, question 1b, April 10, 2023 states:

increase transparency, SDG&E should provide thorough explanations of why certain enhancements that were planned in its 2022 WMP, such as to the WiNGS-Planning model, are no longer being implemented. Requiring SDG&E to report on key developments will enable Energy Safety and interested parties to better track how the risk models are developing from one year to the next and whether SDG&E is making appropriate choices about mitigation selection, timing and prioritization. Energy Safety should require SDG&E to file a supplemental report on enhancements that were planned in last year's (2022) WMP that were not implemented in this year's (2023) WMP filing. This report should be filed in conjunction with SDG&E's third quarterly data report of 2023 due on November 1, 2023.

Energy Safety should require that SDG&E's WiNGS-Planning and WiNGS-Ops progress reports explain previously planned enhancements that are discontinued, as well as enhancements that are completed or in progress. SDG&E should submit these progress reports on an annual basis starting in SDG&E's 2024 WMP submission. SDG&E's reporting should include but not be limited to the following:

- Continue to report on enhancements that are being incorporated each year pertaining to the use of WiNGS-Ops in the PSPS decision-making process;
- Explain the reasoning if planned enhancements are discontinued from year to year; and
- Describe any progress SDG&E has made on incorporating vegetation risk or vegetation management prioritization into both risk models.

Since wildfire risk models are fundamental parts of SDG&E's wildfire mitigation planning, Energy Safety should require clear reporting on the evolution of SDG&E's wildfire risk models. This will enable all stakeholders to understand whether SDG&E is making appropriate choices about mitigation selection, timing and prioritization.

The purpose of the WiNGS-Planning model is to identify the best deployment of underground and covered conductor for long term risk strategy. The WiNGS-Planning model includes limited vegetation inventory data points for identifying trees with strike potential based including tree height, which is one of variables to the system during extreme weather conditions.

2. Energy Safety should require SDG&E to report on efforts to incorporate the Vegetation Risk Index into its WiNGS-Operations model.

SDG&E's 2023 WMP states that the utility is exploring the use of the Vegetation Risk Index as a predictive component in the WiNGS-Operations model. This would be an important change from how SDG&E currently uses this tool, which is for situational awareness and purposes other than risk modeling.

As described by SDG&E, the Vegetation Risk Index primarily serves as "a situational awareness tool, not a risk model, that categorizes circuits and transmission lines based on tree species, tree height, tree count, and historical vegetation-related outages."[277] SDG&E also uses the Vegetation Risk Index "to find potential predictors that may be used to anticipate a period of vegetation-related outages,"[278] to help inform SDG&E's de-energization decision-making,[279] and to help vegetation inspectors to identify places where risk levels may be higher and determine if additional vegetation management work is necessary.[280]

In its 2023 WMP, SDG&E seeks to replace the Vegetation Risk Index and implement a predictive component that would be integrated into the WiNGS-Operations risk model. SDG&E states that this Vegetation Risk Index predictive component would assess the likelihood of vegetation-related failures.[281] SDG&E states that it plans on being able to implement the predictive component near the end of 2023.[282]

---

[277] SDG&E's response to DR CalAdvocates-SDG&E-2023WMP-07, question 12a, April 10, 2023.

[278] SDG&E's 2023 WMP, Appendix D: Areas for Continued Improvement, p. 31.

[279] SDG&E's 2023 WMP, p. 416:

> The VRI was developed internally using information from the Vegetation Management database and the Reliability database. The VRI is broken down into high, medium, and low risk. A circuit with a high VRI may require a more conservative wind speed shutoff decision in an extremely high-risk event… If the VRI is low, the decision to deenergize may not be made until the 99th percentile wind is exceeded.

[280] SDG&E's response to DR CalAdvocates-SDG&E-2023WMP-07, question 12a, April 10, 2023:

> Vegetation Management field users will continue to use VRI as an additional tool in conjunction with the data outputs from Logic20/20's model to inform where risk levels are relatively higher, and where additional VM work may be prudent.

[281] SDG&E's 2023 WMP, Appendix D: Areas for Continued Improvement, p. 31.

[282] SDG&E's response to a question during the Large IOU WMP Workshop Day 2, April 28, 2023.

SDG&E has verbally stated that it will conduct sensitivity tests to determine if there is any added value to updating the WiNGS-Operations model with the predictive component.[283] However, SDG&E provides no other details on how the new component will be tested or validated. To address this lack of transparency, Energy Safety should require SDG&E to report the findings of its validation efforts, including findings from the sensitivity analysis. SDG&E should also report on how the new predictive component changes the outputs of SDG&E's wildfire risk models. Requiring SDG&E to provide this data will clarify how the component affects the risk scores of circuits.

Furthermore, any changes to the WiNGS-Operations model should be documented and all findings from internal analyses made available to Energy Safety and interested stakeholders. This is important because changes in risk models can affect the risk score calculations and SDG&E's decisions to de-energize customers. Reporting modifications will enable Energy Safety and other stakeholders to better understand the inputs that contribute to SDG&E's de-energization decision-making.

For these reasons, Energy Safety should require SDG&E to file a supplemental report that summarizes the implementation of the predictive component that will replace the Vegetation Risk Index. SDG&E's supplemental report should:

- Provide all findings of the sensitivity analysis that SDG&E performs to assess the new predictive tree-risk component;
- Provide an update on any changes made to SDG&E's probability modeling for outages or ignitions, as a result of its analysis of the likelihood of vegetation-related failures; and
- Provide a timeline for any planned analyses or improvements related to the likelihood of vegetation-related failures, including SDG&E's reasoning for these future analyses.

Energy Safety should require that SDG&E file this supplemental report by the end of the first quarter (if possible, filed around March 7, 2024, to align with PSPS reports to be filed by the utilities). This timeline provides timely information to stakeholders, while giving SDG&E adequate time to organize the necessary information.

[283] SDG&E's response to a question during the Large IOU WMP Workshop, Day 2, April 28, 2023.

B. Asset Management and Inspections

1. Energy Safety should direct SDG&E to revise its Quality Assurance and Quality Control procedures for distribution asset inspections.

SDG&E conducts a Quality Assurance and Quality Control (QA/QC) program on its asset inspections as "secondary assessments for conditions identified during inspection" to validate the results of an inspection performed.[284] QA/QC programs are a vital way of double checking that maintenance issues have been accurately assessed and repaired. In its QA/QC of distribution detailed inspections, SDG&E selects between 0.5 and 1.5 percent of completed inspections per inspector for audit. If a trend or discrepancy between audit findings and inspection findings is found for any inspector, additional training for that inspector may be required.[285]

Surprisingly, SDG&E states that in 2022 there were no audit findings of its asset inspectors, which amounts to a perfect 100 percent pass rate for its distribution overhead detailed inspections. In fact, in response to discovery, SDG&E states that QA/QC of its detailed distribution program has had a 100 percent accuracy rate with no audit findings for *three years running*.[286]

However, SDG&E's flawless record appears to be an artifact of its recordkeeping procedure. According to SDG&E, inspectors' findings are not validated on the spot by construction supervisors in the field, but rather are assessed in the quarter following the inspection. This lag between field inspection and audits accounts for SDG&E's falsely flawless inspection accuracy. According to SDG&E, "because there is a gap in time between the inspection and audit of the inspection, SDG&E does not define any variances in findings as a failure since it is not possible to determine whether the condition was present at the time of inspection."[287]

---

[284] SDG&E 2023-2025 WMP, p. 226.

[285] SDG&E 2023-2025 WMP, p. 227.

[286] SDG&E's response to data request CalAdvocates-SDGE-2023WMP-13, Question 07.

[287] SDG&E's response to data request CalAdvocates-SDGE-2023WMP-13, Question 07.

In effect, it appears that SDG&E has had no audit findings of its inspection results for the past three years because any difference found between inspection findings and audit results is attributed to damage that occurred during the time gap between inspection and audit. SDG&E's error rate has been zero for years because under SDG&E's criteria, a discrepancy between inspection and audit is impossible. Consequently, it is hard to see any circumstances in which SDG&E would find it necessary to take remedial action such as supplemental training.

SDG&E's QA/QC method for its detailed distribution audits obfuscates potential inspection quality problems and may lead to inaccurate inspections that can cause safety hazards. SDG&E's 100 percent audit pass rate for its detailed distribution inspections is an outlier against PG&E's Field QC of 79 percent and SCE's 96 percent.[288], [289] The comparative difference between IOUs reinforces the fact that SDG&E's perfect success rate is indicative of a rigged QA/QC methodology, rather than an unusually outstanding performance.

To rectify this issue, Cal Advocates recommends Energy Safety require SDG&E to submit a revised WMP that improves its QA/QC process for distribution asset inspections. First, SDG&E should detail why it has not found any errors in its distribution inspections for the past three years. Specifically, SDG&E should report on the types of damages that the inspection found versus what was seen in the audit, with an analysis of whether such damage could plausibly have occurred over the course of a single quarter between inspection and audit (for instance, a broken crossarm could stem from a recent windstorm whereas visible wood pole rot would take much longer to manifest).

Second, SDG&E should rethink its QA/QC process for distribution asset inspections. SDG&E should develop a robust process that can realistically identify mistakes as well as successes. SDG&E should show that its audit sampling rate (currently 0.5 to 1.5 percent of completed inspections, as noted above) is adequate to reveal undetected safety hazards and to identify inspectors whose work is substandard.

Thorough and effective asset inspections are necessary to identify maintenance issues and rectify them before they result in ignitions or other harm to public safety. The improvements to QA/QC described above are essential to ensure that SDG&E's inspectors are receiving

[288] PG&E's 2023 WMP R1, Table 8-7-2, p. 446.

[289] SCE 2023-2025 WMP, p. 327.

appropriate training if they miss potential damage or problems, rather than erroneously attributing problems to factors outside of SDG&E's control.

2. Energy Safety should direct SDG&E to submit detailed information in its next WMP on its Drone Investigation, Assessment, and Repair program.

In 2019, SDG&E implemented its Drone Investigation, Assessment, and Repair (DIAR) program to assist in inspections of its infrastructure.[290] This program has revealed a large number of important maintenance needs. Since implementing the program, SDG&E has seen an approximately five-fold increase in inspection findings and an 11-fold increase in new work orders associated with its DIAR program per thousand circuit miles,[291] including 216 previously undiscovered emergency maintenance items in need of immediate repair.[292]

SDG&E states that beginning in 2023, it expects inspection findings and associated new work orders to return to the levels observed prior to implementation of the DIAR program.[293] This expectation is based on the fact that SDG&E has now completed drone surveys of all of its infrastructure.[294] SDG&E states that it is shifting to a more risk-based inspection pattern for the DIAR program but does not yet have any statistically significant data to predict how inspection findings and work orders will increase or decrease.[295] To forecast future inspection results, SDG&E reverts to the inspection find rate and associated work order creation prior to 2019, but SDG&E lacks recent empirical evidence to support this forecast.[296]

As part of its DIAR program, SDG&E uses an Artificial Intelligence (AI) damage detection model that reviews images and footage of its infrastructure collected by drone inspections.[297] SDG&E states that this damage detection model is 86 percent accurate, but that all of the model's inputs and findings are also reviewed by inspectors to ensure that no damage is

[290] SDG&E 2023-2025 WMP, p. 148.

[291] Specifically, an approximately 383% increase in inspection findings and a 1,000% increase in new work orders.

[292] SDG&E 2023-2025 WMP, p. 148.

[293] SDG&E's 2023-2025 WMP, Figure 8-2.

[294] SDG&E's response to data request CalAdvocates-SDGE-2023WMP-13, Question 05.

[295] SDG&E's response to data request CalAdvocates-SDGE-2023WMP-13, Question 05.

[296] SDG&E's response to data request CalAdvocates-SDGE-2023WMP-13, Question 05.

[297] SDG&E 2023-2025 WMP, p. 195.

missed.[298] If the model misidentifies damaged infrastructure as not damaged, or vice versa, SDG&E's inspectors refer that information back to the machine learning model to better train it to detect damage (or undamaged infrastructure) in future analyses.[299]

Cal Advocates is concerned that the sudden influx of inspection findings and associated new work orders from the DIAR program's inspection of all infrastructure in HFTDs may linger past 2025, the date by which SDG&E says it will complete the asset maintenance needs. If the work orders persist, that will create a backlog of potentially hazardous equipment conditions.

The DIAR program has detected a significant number of maintenance needs, including emergency items at risk of asset failure that were not found in SDG&E's previous routine asset inspections. As SDG&E's DIAR program continues to operate and improve, it may continue to find more maintenance issues necessitating repair than SDG&E predicts. This problem is amplified by the fact that SDG&E provides no concrete assurance that future inspection findings and work orders will return to their historical averages.

To address this concern, Cal Advocates recommends that Energy Safety direct SDG&E to provide specific updates on the performance of its DIAR program in its 2024 WMP submission. SDG&E should again provide the numbers of findings and associated open work tags created by the DIAR program, which will allow for a direct comparison to its current WMP. SDG&E should also provide an update with specific metrics on the following:

- The accuracy of the damage detection model as it continues to evolve (e.g., false-positive, false-negative, true-negative, true-positive),
- Any changes to how human inspectors validate the findings of the model or use the results to update SDG&E's asset risk models, and
- How SDG&E's risk-based use of the DIAR program to conduct inspections has influenced inspection finding numbers and following work orders.

The above recommendations will improve transparency regarding SDG&E's DIAR and QA/QC programs and will allow Energy Safety and stakeholders to better track year over year progress and program development.

[298] SDG&E's response to data request CalAdvocates-SDGE-2023WMP-13, Question 03.

[299] SDG&E's response to data request CalAdvocates-SDGE-2023WMP-13, Question 03.

C. Vegetation Management and Inspections

1. Energy Safety should require SDG&E to report its ad-hoc vegetation inspections in the same manner as it reports on formal programs.

SDG&E's Off-Cycle Patrol Inspections is a vegetation management activity that performs a second annual inspection on trees within the High Fire Threat District (HFTD).[300] The off-cycle patrol activity is based on SDG&E's Vegetation Management Master Schedule; any priority tree work identified during the off-cycle HFTD patrol is expedited as needed.[301] SDG&E made modifications in 2022 to perform and complete the off-cycle HFTD patrols prior to September.

SDG&E's WMP contains little clarity regarding the criteria used to determine when the off-cycle inspections are conducted.[302] According to the WMP, the off-cycle patrols identify all trees within the strike zone to determine which trees may represent a risk to SDG&E's electric lines and require mitigation. SDG&E's inspection includes a "visual 360 hazard assessment of trees from ground level to canopy heights to determine tree health, structural integrity, and environmental conditions."[303] The off-cycle patrol is performed by SDG&E internal staff and by contractors. SDG&E does not report how many individual off-cycle patrol inspections have been conducted. Rather, SDG&E reports on how many Vegetation Management Areas have had off-cycle inspections completed.[304]

SDG&E's 2023 WMP states that a future change to its off-cycle inspection activity within the next five years is to "identify additional and proactive HFTD inspection activity opportunities such as pre-PSPS and adverse weather condition and event patrols."[305] In response to discovery asking when SG&E intends to report these inspection activities formally within the

[300] SDG&E's 2023-2025 WMP, p. 265.

[301] SDG&E's 2023-2025 WMP, p. 266.

[302] SDG&E's 2023-2025 WMP, p. 268.

[303] SDG&E's 2023-2025 WMP, p. 265.

[304] SDG&E's WMP Quarterly Report for Quarter 1 of 2023, Attachment SDGE 2023 Q1 Tables 1-15. See Table 1: Line 38 Cell S.

[305] SDG&E's 2023-2025 WMP, p. 268.

WMP, SDG&E stated "SDG&E anticipates that these additional activities will remain ad-hoc as conditions occur."[306] SDG&E further explains:

> These additional activities are contingent on situational conditions (i.e., storm, [red flag warning], etc.) that could warrant a pre or post event patrol. Frequency of such events are unpredictable, and therefore not subject to specific plan or schedule. However, SDG&E would anticipate always having the resources to perform these ad-hoc events.[307]

SDG&E's ad-hoc approach leads to a concern that SDG&E does not yet and does not intend to comprehensively report on the ad hoc vegetation inspections being implemented. Though SDG&E explains that the frequency is "unpredictable," the inspection activities should be reported after the fact as other programs are, so that SDG&E's mitigation activities are transparent and auditable. Energy Safety should require SDG&E to report all data relevant to the additional activities that occur on a quarterly basis, as part of the Quarterly Data Reports. SDG&E should study and report on whether the additional inspections provide a quantifiable risk reduction. This reporting should include descriptions of the "situational conditions" that occur and the criteria that trigger SDG&E to conduct an inspection.

While Cal Advocates notes this is a future change to SDG&E's vegetation off-cycle inspections, including this information and related data in future WMPs would improve the thoroughness of SDG&E's vegetation program descriptions and clarify how these vegetation inspections operate. This is especially important because SDG&E's current criteria for off-cycle inspections are unclear, as noted above. Ensuring that all programs that SDG&E implements are auditable will aid in transparency to Energy Safety and all interested stakeholders.

Additionally, it would be valuable to gain an understanding of the costs associated with performing these additional inspections. Reporting on the costs associated with conducting these additional inspection activities will allow Energy Safety to determine if SDG&E is achieving a quantifiable risk reduction that is cost-effective. Furthermore, SDG&E should report the type and the timing of inspection performed, which will enable Energy Safety and other stakeholders to determine any emerging best practices on the timing of vegetation inspections leading up to and after severe weather events.

---

[306] SDG&E's response to DR CalAdvocates-SDG&E-2023WMP-08, question 3e, April 12, 2023.

[307] SDG&E's response to DR CalAdvocates-SDG&E-2023WMP-12, question 5a, April, 27, 2023.

For these reasons, Energy Safety should require SDG&E to report on the ad-hoc inspections as a formal program with set criteria, goals, budgeting, and other related details. Energy Safety should require SDG&E to begin reporting on ad-hoc inspection activities as part of SDG&E's 2024 WMP Update. Additionally, Energy Safety should require SDG&E to adhere to the following two separate reporting requirements.

First, Energy Safety should require SDG&E to report in each annual WMP Update on its strategy to identify additional vegetation inspection opportunities in the HFTD. SDG&E's reporting should include but not be limited to the following:

- Description of any efforts to identify new opportunities for vegetation inspections or new inspection techniques;
- Evaluation of effectiveness of newly identified inspection opportunities; and
- Consideration whether to implement these inspections on a permanent basis.

Second, Energy Safety should require SDG&E to submit retrospective information on its completed activities. Providing this information on a quarterly basis with SDG&E's Quarterly Data Reports, starting with the third quarter of 2023, will allow Energy Safety to analyze the success of these ad-hoc inspection opportunities moving forward. SDG&E should include the following information about each of the ad-hoc inspections:

- Number of inspections performed, disaggregated by HFTD tier and calendar month;
- Number of inspections performed, categorized by the reason or trigger for the inspection (e.g.: before, during, or after PSPS; Red Flag Warning; adverse weather conditions; or wildfire); and
- Costs incurred each quarter.

Since off-cycle inspections represent an additional activity within the HFTD, Energy Safety should require additional reporting on any data that is derived from the inspection process. This will enable all stakeholders to understand SDG&E's processes and determine best practices if any, regarding off-cycle vegetation management inspections that can be applied to the other large utilities.

D. De-energization (Public Safety Power Shutoffs (PSPS))

1. Energy Safety should require SDG&E to revise its mitigation plans for frequently de-energized circuits.

a. SDG&E identifies 15 frequently de-energized circuits.

In SDG&E's 2023 WMP, SDG&E identifies fifteen circuits that experienced three or more PSPS events in a calendar year from 2018-2021.[308], [309], [310] Cal Advocates is concerned that SDG&E has not planned adequate mitigation measures in the near future to reduce the impact of PSPS for customers served by these fifteen circuits.

Table F below provides data on the fifteen frequently de-energized circuits and the impact on customers due to PSPS outages.

[308] SDG&E's 2023 WMP, p. 405.

[309] In 2022, SDG&E did not experience a PSPS event, SDG&E's 2023 WMP, pp. 404-405: OEIS Table 9-1: PSPS Event Statistics.

[310] SDG&E's PSPS events have occurred less frequently and been less extensive than those of PG&E and SCE over the past several years, so the burden on customers is not as severe.

Table F **SDG&E's Frequently De-energized Circuits [311]** (2018 - 2022)				
Circuit ID	**Customers Served by the Circuit**	**Number of PSPS Outages**	**Total Customer Shutoffs from all PSPS outages**	**Mitigations planned in 2023-2025 [312]**
222	1,459	7	7,361	N/A
1030	1,303	9	6,068	13.7 miles of strategic undergrounding by 2025
445	969	9	5,593	55.4 miles of strategic undergrounding by 2025
79	889	13	5,482	N/A
157	1,023	7	5,330	N/A
214	882	9	5,218	57.4 miles of strategic undergrounding by 2025
909	423	5	2,341	N/A
215	519	5	2,270	N/A
220	328	7	2,255	9.62 miles of strategic undergrounding by 2025
358	1,153	7	2,123	7.7 miles of strategic undergrounding by 2025
1166	172	7	1,679	N/A
78	120	7	1,633	N/A
1215	144	7	963	20.8 miles of strategic undergrounding by 2025
75	611	6	834	0.1 miles of strategic undergrounding by 2025
441	112	7	625	13.3 miles of strategic undergrounding by 2025

[311] Cal Advocates performed review on SDG&E's response to DR CalAdvocates-SDG&E-2023WMP-09, question 1a and 1b, April 10, 2023 to create Table F.

[312] Cal Advocates notes that "N/A" means "Not Applicable to the 2023-2025 WMP Cycle." SDG&E identified strategic undergrounding as the main WMP measure it plans on implementing to reduce the need for and impact of PSPS. SDG&E has scoped the mitigating work to be conducted from 2026-2032.

b. SDG&E must demonstrate that it is prioritizing its most frequently de-energized circuits to achieve timely PSPS reduction for the customers most at risk.

SDG&E identifies strategic undergrounding as the main wildfire mitigation to be implemented across all of the fifteen frequently de-energized circuits. However, SDG&E's approach may not be the best mitigation strategy for all of SDG&E's frequently de-energized circuits.

First, many of the benefits of SDG&E's planned undergrounding will not be realized until after the 2023-2025 WMP cycle. Indeed, SDG&E states that only two of the fifteen frequently de-energized circuits (circuit ID 358 and 909) will be completely undergrounded within ten years.[313] As a result, customers served by the frequently de-energized circuits will continue to face the likelihood of PSPS events (as well as wildfire risks) for many years to come before SDG&E executes its undergrounding plan.

Next, SDG&E does not provide preliminary work schedules or projections detailing what work is in scope for 2023 or 2024 on the frequently de-energized circuits. Instead, SDG&E provides the total number of miles of strategic undergrounding program to be completed by 2025.[314, 315] As the table above shows, SDG&E plans to complete 178 miles of undergrounding on the frequently de-energized circuits by 2025, which represents half of SDG&E's total planned strategic undergrounding work in this WMP cycle.[316]

---

[313] SDG&E's 2023 WMP, p. 405; and SDG&E's response to CalAdvocates-SDGE-2023WMP-10, question 11a, April 19, 2023:

> "As mentioned in the column "Measure taken, or planned to be taken, to reduce the need for an impact of future PSPS of circuit" of Table 9-2: Frequently De-energized Circuits in Appendix F of the 2023-2025 Wildfire Mitigation Plan, circuits 358 and 909 are in scope to be completely undergrounded by 2032 and 2026, respectively."

[314] SDG&E's 2023 WMP, pp. 405-407: OEIS Table 9-2: Frequently De-energized Circuits.

[315] SDG&E's response to CalAdvocates-SDGE-2023WMP-10, question 11c, April 19, 2023:

> "SDG&E has developed preliminary work schedules that are reflected in the column "Measure taken, or planned to be taken, to reduce the need for an impact of future PSPS of circuit" of Table 9-2: Frequently De-energized Circuits in Appendix F of the 2023-2025 Wildfire Mitigation Plan. Construction schedules beyond 2025 will be developed based on the risk ranking of the segment, and in consideration of permitting, customer, and other challenges detailed elsewhere in the WMP."

[316] SDG&E's annual targets for Strategic Undergrounding are 84 miles in 2023, 125 miles in 2024, and 150 miles in 2025, for a total of 359 miles. SDG&E's 2023 WMP, p. 411: OEIS Table 9-5: PSPS Targets.

Finally, strategic undergrounding remains SDG&E's most expensive system hardening initiative on a per mile basis.[317] Moreover, it is substantially slower to implement than covered conductor or operational mitigation measures (such as fast-trip settings combined with enhanced assets inspections and vegetation management).

In short, SDG&E could deliver results for customers faster and more cheaply if it considered some strategies other than undergrounding. A balanced mix of mitigation strategies is likely more appropriate than relying solely on strategic undergrounding. Because SDG&E is wholly reliant on an undergrounding strategy for these 15 circuits, the customers served by these circuits will continue to experience PSPS events and face wildfire risks for years.

c. Remedies: SDG&E should revise its grid hardening strategy for its frequently de-energized circuits and should report regularly on its progress in mitigating risk.

Energy Safety should require SDG&E to revise its grid hardening strategy for its frequently de-energized circuits, in a revised 2023 WMP. SDG&E should address the lack of specificity in its WMP regarding these circuits, i.e., if there are feasible mitigation other than undergrounding. As currently presented, SDG&E's WMP offers little clarity regarding the level of PSPS reduction that is expected in the near term on the most frequently de-energized circuits. SDG&E should also explain how it prioritizes which of the frequently de-energized circuits will be mitigated first.

SDG&E should annually report on risk score changes for each frequently de-energized circuit as it makes progress on system hardening or other mitigation approaches. This will allow Energy Safety to track SDG&E's mitigation progress and determine if SDG&E is adequately reducing the need for future PSPS events.

SDG&E should also report on how much it has mitigated the need for PSPS on the frequently de-energized circuits compared to the rest of the service territory. This information

[317] SDG&E's 2023 WMP, Appendix D: Areas for Continued Improvement, p. 20.

> Strategic undergrounding provides dual benefits of nearly eliminating wildfire risk and the need for PSPS events in the HFTD. However, the cost of undergrounding is approximately $2.3 million per mile while the cost of converting to covered conductor is $1.4 million per mile.

will allow Energy Safety and stakeholders to determine if SDG&E is addressing the frequently de-energized circuits and prioritizing customer safety.

Energy Safety should require SDG&E to adhere to the following two separate reporting requirements. First, Energy Safety should require SDG&E to report in each annual WMP Update on its strategy to mitigate risk on the frequently de-energized circuits, including:

- A workplan that shows the amount and kind of system hardening and other mitigations that SDG&E intends to perform on each circuit in each of the next three years;
- A discussion of how SDG&E selected mitigation measures for each circuit, including an analysis of alternatives to undergrounding.
- What mitigations have been performed on each of the frequently de-energized circuits in the past year (including system hardening mileage);
- How the wildfire and PSPS risk scores of each frequently de-energized circuit have changed, due to the mitigations that have been completed;
- A ranking or prioritization of these circuits that will guide SDG&E in scheduling its system hardening projects;
- A projected timeline of when SDG&E will finish hardening each of the frequently de-energized circuits, if it plans to do so; and
- A discussion of whether SDG&E is on track to meet its long-term strategic undergrounding targets, and its efforts to ensure it remains on track.

Second, Energy Safety should require SDG&E to submit quarterly progress reports in conjunction with the Quarterly Data Reports. Providing this information on a quarterly basis, starting with the third quarter of 2023, will allow Energy Safety to analyze the success of these projects moving forward. SDG&E should include the following information about each of the frequently de-energized circuits:

- Mileage of strategic undergrounding completed;
- Mileage of other system hardening completed;
- Unhardened overhead circuit-miles remaining on the circuit; and
- Updated system hardening work plans for the current WMP cycle, including planned start and completion dates.

Undergrounding projects are expensive and take time to implement. It is crucial that Energy Safety require detailed reporting from SDG&E to ensure progress is made in a timely manner for customers who are the most at risk of being de-energized. This will enable all

stakeholders to understand SDG&E's prioritization of frequently de-energized circuits that pose as repeat threats to public safety.

VI. GENERAL RECOMMENDATIONS ON TECHNICAL ISSUES

A. Risk Methodology and Assessment

1. Energy Safety should develop modeling guidelines and standards by 2024 as part of its ongoing Risk Modeling Working Group.

In 2021, Energy Safety initiated the Wildfire Risk Modeling Working Group, the stated purpose of which was "bring more consistency across utilities in terms of risk modeling, and determine the most effective and accurate methods, data sets, and analyses for the utilities to utilize in modeling."[318] Since then, Energy Safety has hosted a number of meetings with utility representatives, industry experts, and intervenors, to discuss current and best practices around wildfire risk models.

During the 2020-2022 WMP period, utility risk models grew increasingly sophisticated. However, the methods utilized by the three large utilities have diverged in several key areas, which reduces the consistency across the utilities. For example, though all three large IOUs utilize Technosylva in their consequence models, the use case varies. In 2023, SCE[319] and SDG&E[320] utilize the direct output of Technosylva simulations (e.g., impacted buildings and population) to estimate the consequence of an ignition. In contrast, PG&E utilizes only the flame length and rate of spread from Technosylva simulations to estimate the destructive potential of a wildfire.[321]

Additionally, PG&E's wildfire distribution risk model now estimates the probability of an ignition occurring due to each of 17 different risk drivers.[322] SCE's models incorporate nine failure modes,[323] and SDG&E's models appear to output only a single probability of ignition.[324]

---

[318] Energy Safety presentation at the Wildfire Risk Modeling Workshop on October 5-6, 2021.

[319] SCE's 2023 WMP, March 27, 2023, p. 100.

[320] SDG&E's 2023 WMP, March 27, 2023, p. 71.

[321] PG&E's 2023 WMP R1, Figure PG&E-6.2.2-5, p. 165.

[322] PG&E's 2023 WMP R1, Table PG&E-6.2.1-1, p. 153.

[323] SCE's 2023 WMP, March 27, 2023, Figure SCE 6-20, p. 125.

[324] SDG&E's 2023 WMP, March 27, 2023, Appendix B, p. 2.

While the Risk Modeling Working Group is an important venue to learn from and discuss what the utilities are currently doing, the ongoing divergence in risk model methods may complicate the stated purpose of bringing consistency across utility risk models. Energy Safety should endeavor to develop preliminary modeling guidelines and standards by the end of 2023. Energy Safety should publish these guidelines and standards and solicit public comment for a period of no less than four weeks, after which Energy Safety should finalize the guidelines for use in the 2025 WMP Updates. This will allow a full year for utilities to incorporate the guidelines into their WMPs.

B. Grid Design and System Hardening

1. Energy Safety should direct the large utilities to explain how they intend to manage a large expansion of undergrounding.

California's investor-owned utilities (IOUs) are ramping up programs to underground their electric distribution conductors in areas where the impacts to ratepayers are the most significant.[325], [326], [327] As they scale up these efforts, each utility will require a substantial amount of resources and materials. As a result, they are likely to encounter major obstacles including the lack of qualified contractors, limitations in heavy equipment, as well as supply chain constraints. In fact, at a March 2023 wildfire mitigation conference, a director from PG&E identified supply chain problems associated with components (such as underground vaults) as the greatest challenge that could potentially disrupt the successful execution of PG&E's extensive undergrounding program.[328] The large IOUs, SCE in particular, have not sufficiently addressed how they plan to individually or jointly address[329] the considerable challenges and conflicts that

[325] PG&E's 2023 WMP, Table PG&E-8.1.2-3 - PG&E Undergrounding Workplan 2023 – 2026, p. 348; PG&E's total portfolio underground miles is 2,687 miles through 2026.

[326] SDG&E's 2023 WMP, p.16:

> The Wildfire Next Generation System Planning (WiNGS)-Planning model has incorporated additional inputs and refinements leading to a portfolio of approximately 1,500 miles of strategic undergrounding…to be installed between 2022 and 2032.

[327] SCE's 2023 WMP, Table I-1, 2025 – 2028 Scope of WCCP and TUG for Proposed Plan, p. 753; SCE indicates a total of 580 targeted underground miles by 2028.

[328] Matt Pender, PG&E director, presenter. Presentation on PG&E's 10,000-mile undergrounding program, EUCI Wildfire Mitigation Conference, March 7-8, 2023.

[329] Without violating antitrust or competition laws.

come with a sharp increase in undergrounding electric distribution infrastructure at their forecasted scale.

If the growing demand for key components of the underground electrical distribution system is not properly addressed, it could significantly increase unit costs for undergrounding and lead to unwanted program execution delays. These key components include underground vaults, cables and conduits, junction boxes, underground SCADA switches, and excavation equipment. The challenge is further complicated by the limited number of qualified contractors available.

This unprecedented ramp-up will likely impact California ratepayers negatively, with higher costs, for example. Additionally, supply chain constraints may increase the risk of wildfires due to delayed completion of mitigation projects, further putting the public at risk. To avoid these adverse consequences, it is imperative to effectively plan for demand and supply.

One potential solution is the formation of a working group that includes utilities with large undergrounding programs. This working group could study the supply and demand of these key components, share best practices, and jointly address (without violating antitrust or competition laws) supply chain issues. By working together, California's utilities can each more efficiently manage their resources, identify potential bottlenecks, and ultimately improve the effectiveness of their wildfire mitigation efforts.

Energy Safety should encourage IOUs to study the potential resource constraints and challenges related to their undergrounding efforts, and to provide plans to address these concerns in future WMP updates. By acknowledging the resource constraints and challenges faced by utilities, Energy Safety can help promote a collaborative approach that addresses these issues and ultimately improves the effectiveness of wildfire mitigation efforts.

C. Grid Operations

1. Energy Safety should develop WMP guidelines for fast-trip programs similar to its guidelines for PSPS.

Outages on fast-trip enabled lines are similar to PSPS de-energizations because of their consequences: they have the potential to become extended outages[330] that can cause harm to

[330] In 2022, PG&E had 42 outages that lasted more than one day (one of which lasted 14,133 minutes or almost 10 days), affecting 41,160 customers (including 2,357 MBL customers and 1,590 Life Support

those who rely the most on electricity to stay alive. These types of outages differ from typical outages in normal weather, because the conditions that these settings are enabled on are particularly conducive to starting wildfires.[331] Consequently, the utilities take extra precautions such as disabling automatic reclosing[332] and then patrolling the lines afterward before restoring power.[333]

Energy Safety should update its WMP guidelines for 2024 and beyond to include a section requiring information about the utility's use of fast-trip settings and the resulting impact on customers. This parallels Energy Safety's guidance regarding PSPS:

- Key Fast-Trip Statistics;
- Identification of Frequently De-energized circuits;
- Objectives for Reducing the Scale, Scope and Frequency of Fast-Trip De-energizations;
- Performance Metrics Identified by the Electrical Corporation;
- Protocols on Enabling Fast-Trip Settings;
- Communication Strategy for Enabling Fast-Trip Settings;
- Key Personnel, Qualifications, and Training for Fast-Trip; and
- Planning and Allocation of Resources for Service Restoration for Outages on Lines with Fast-Trip Settings Enabled.

---

customers), PG&E's CPUC EPSS Monthly Outages Report, dated January 17, 2023 Attachment, available at https://www.cpuc.ca.gov/industries-and-topics/wildfires/pacific-gas-and-electric-heightened-equipment-sensitivity-wildfire-mitigation-program

[331] PG&E enables Enhanced Powerline Safety Settings (EPSS) when they forecast an FPI of R3 ("Fire danger is so high that care must be taken using fire-starting equipment") or when there are combinations of high sustained wind, low relative humidity and low 10-hour dead fuel moisture present at FPI of R1 ("Very little or no fire danger") or R2 ("Moderate fire danger"). PG&E's 2023 WMP R1, p. 464.

"SCE enables Fast Curve settings during elevated fire conditions." SCE 2023 2023 WMP, p. 332.

SDG&E enables Sensitive Relay Profile (SRP) settings either "when FPI (WMP.450) has a rating of Extreme or when general conditions warrant a PSPS event." SDG&E 2023 WMP, p. 233.

[332] PG&E disables auto-reclosing on devices where EPSS is enabled "until it is safe to return the device to normal protection settings." PG&E 2023 WMP R1, p. 468. SCE's use of Fast Curve settings includes "the benefits of blocking automatic reclosers." SCE 2023 WMP, p. 333. SDG&E has disabled reclosing in HFTD areas since 2017. SDG&E 2023 WMP, p. 233.

[333] PG&E patrols "the entire EPSS zone of protection…prior to re-energization.", PG&E 2023 WMP R1, p. 465. SCE patrols "prior to re-energization pursuant to SOB 322." SCE 2023 WMP, p. 332. SDG&E performs a complete patrol and step restore for all outages during Extreme FPI or PSPS conditions. SDG&E's response to data request CalAdvocates-SDGE-2023WMP-09, Question 3d.

Fast-trip programs have the potential to cause prolonged outages that could cause harm to electricity-dependent customers. Because of these potential customer harms, fast-trip programs should be considered more similar to PSPS than just another grid-hardening wildfire mitigation tool or standard disabling of reclosers. Fast-trip programs, like PSPS, create adverse impacts on customers that must also be mitigated.

2. Energy Safety should require each utility to develop and propose a plan to notify customers when fast-trip settings are enabled on their circuits.

Since utilities are not required to communicate when an outage occurs on a fast-trip enabled line, customers receive no advance warning to make necessary preparations. When fast-trip settings cause a significant decrease in reliability, the harms to customers can be serious.[334]

As a note, each utility uses a different term for fast-trip settings, and they use the settings in different circumstances, but the underlying technology is similar. PG&E refers to this as Enhanced Powerline Safety Settings (EPSS). SCE refers to it as Fast Curve. SDG&E refers to it as Sensitive Relay Profile (SRP) settings.

All three large utilities state that they do not proactively advise customers about the potential for outages related to fast-trip settings.

- SCE argues that "advance notifications for unplanned repair outages cannot be provided because they occur due to unexpected events, regardless of whether Fast Curve settings are enabled or not."[335]
- SDG&E "does not alter communications to customers when SRP is enabled. Outage response is no different for SRP outages versus non-SRP outages during an event."[336]
- PG&E "offers customers to search for their address. If EPSS settings are enabled, regardless of current outage status, a blue bar will appear at the top of the lookup indicating that EPSS settings are enabled…We do not proactively notify customers directly as EPSS settings are enabled or disabled on a daily basis."[337]

[334] *For Someone Like Me, Power Outages Are Not an Option*, published in Mother Jones on January 22, 2023, available at https://www.motherjones.com/environment/2023/01/power-outages-deadly-elderly-people-disabilities/

[335] SCE's response to data request CalAdvocates-SCE-2023WMP-10, Question 7.

[336] SDG&E's response to data request CalAdvocates-SDGE-2023WMP-09, Question 4.

[337] PG&E's response to data request CalAdvocates-PGE-2023WMP-12, Question 11b.

Regarding PG&E's approach, it is worth noting that not all customers will know that they can look up their address to see if the fast-trip settings are enabled, nor do customers necessarily understand fast-trip technology and its implications.

While it would be unrealistic to require utilities to predict when *all* unplanned outages might occur, it is reasonable to require utilities to inform customers that prolonged and unexpected outages are more likely to occur on circuits with fast-trip settings enabled. Utilities are required to give customers advanced warning of a PSPS event so that those who need to prepare have some time to do so. It is appropriate to make a similar effort to warn customers when outages are likely due to fast-trip settings and weather conditions. Advance notice would give customers a fair opportunity to make at least basic preparations, such as charging devices, obtaining ice for the refrigerator, and getting extra drinking water if they are served by a well and pump.

Cal Advocates recommends that Energy Safety require each large utility to develop a plan to notify customers about the likely impact of outages in their local area. Among other things, each utility should be required to:

- Provide localized information to customers when it enables fast-trip settings. (For instance, "the power lines serving your address will have sensitive settings enabled during severe wildfire season and will have an increased likelihood of outages.")
- Develop a protocol to notify customers when forecast wind conditions make fast-trip outages especially likely in the days or hours ahead. (For instance, "severe winds are likely in your area beginning in 24 hours. In combination with the sensitive settings we use to reduce wildfire risk, these weather conditions make it substantially likely that you will experience a power outage lasting more than 3 hours."[338])
- Provide appropriate context about the predictable impact on service reliability. The utility could compare the recent reliability performance of circuits in the HFTD that did and did not have fast-trip settings enabled. (For instance, "on average, enabling sensitive settings results in X% more outages that last five minutes or longer, and Y% more total outage time while these settings are on, relative to comparable power lines.")

[338] In 2022, the average CAIDI of PG&E's EPSS outages was about 3.35 hours. PG&E's CPUC EPSS Monthly Outages Report, dated January 17, 2023 Attachment, available at https://www.cpuc.ca.gov/industries-and-topics/wildfires/pacific-gas-and-electric-heightened-equipment-sensitivity-wildfire-mitigation-program

- Communicate in lay terminology – for example, using "the power lines that serve you" rather than "your circuit."

Energy Safety should direct each large utility to develop a plan to mitigate the impact of fast-trip outages on customers and submit it in a revised WMP or a change order by August 2023. The plans should be implemented no later than October 1, 2023. Energy Safety should additionally coordinate with the CPUC to ensure that future WMP guidelines conform with fast-trip rules and regulations that may result from Rulemaking 18-12-005.[339]

[339] On March 17, 2023, the CPUC hosted a workshop under Rulemaking 18-12-005 to discuss electric IOU fast trip programs. *Assigned Commissioner's Ruling Addressing July 12, 2022 Motion And Noticing Workshop On Utility Response To Customer Impacts Associated With Fast-Trip Power Outages*, February 2, 2023.

VII. CONCLUSION

Cal Advocates respectfully requests that Energy Safety adopt the recommendations discussed herein.

Respectfully submitted,

/s/ ***Carolyn Chen***

_____

Carolyn Chen
Attorney

Public Advocates Office
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, California 94102
Telephone: (415) 703-1980
E-mail: Carolyn.Chen@cpuc.ca.gov

May 26, 2023