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March 29, 2021 **Via Electronic Mail**

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Subject: Comments of the Public Advocates Office on the 2021 Wildfire Mitigation Plan Update of Pacific Gas and Electric Company

Dear Director Thomas Jacobs,

The Public Advocates Office at the California Public Utilities Commission (Cal Advocates) respectfully submits the following comments on the 2021 Wildfire Mitigation Plan Update of Pacific Gas and Electric Company (PG&E). Please contact Nathaniel Skinner (Nathaniel.Skinner@cpuc.ca.gov) or Henry Burton (Henry.Burton@cpuc.ca.gov) with any questions relating to these comments. We respectfully urge the Wildfire Safety Division to adopt the recommendations discussed herein.

Respectfully submitted,

/s/ ***Carolyn Chen***

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I. INTRODUCTION

Pursuant to the Rules of Practice and Procedure of the California Public Utilities Commission (Commission) and Resolution WSD-011, the Public Advocates Office at the California Public Utilities Commission (Cal Advocates) submits these comments on the 2021 Wildfire Mitigation Plan (WMP) Updates submitted by Pacific Gas and Electric Company (PG&E).

Resolution WSD-011, the *Resolution implementing the requirements of Public Utilities Code Sections 8389(d)(1), (2) and (4), related to catastrophic wildfire caused by electrical corporations subject to the Commission's regulatory authority*, established guidelines and a schedule for WMP submissions in 2021. Pursuant to Resolution WSD-011, PG&E and other large investor-owned utilities (IOUs or utilities)[1] submitted 2021 WMP Updates on February 5, 2021 and Supplemental WMP Filings on February 26, 2021.

Resolution WSD-011 permits interested persons to serve opening comments on the large IOUs' 2021 WMPs by March 17, 2021 and reply comments by March 24, 2021. On February 23, 2021, Cal Advocates, Green Power Institute (GPI), Mussey Grade Road Alliance, the Protect Our Communities Foundation, The Utility Reform Network, and Will Abrams requested an extension of the comment deadline to March 29, 2021. On February 26, 2021, the Wildfire Safety Division (WSD) approved the deadline change.

In these comments, Cal Advocates addresses PG&E's 2021 WMP. In a separate document, we address the WMPs of Southern California Edison Company (SCE) and San Diego Gas & Electric Company (SDG&E), and provide technical and procedural recommendations applicable to all utilities.

[1] 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 term "utilities" and the phrase "electrical corporations" interchangeably to refer to the entities that must comply with the wildfire safety provisions of the Public Utilities Code.

II. TABLE OF RECOMMENDATIONS

Item	Utility	Recommendation	Section of these Comments
1	PG&E	The WSD should deny PG&E's 2021 WMP and order substantial revisions.	A
2	PG&E	The WSD should require PG&E to justify the scope of its enhanced vegetation management (EVM) program.	B
3	PG&E	PG&E should intensively focus programs with a narrow scope on high-risk circuit-segments.	C
4	PG&E	The WSD should require PG&E to submit a revised 2021 workplan for EVM, when PG&E submits a revised 2021 WMP following denial.	C.1, C.3
5	PG&E	The WSD should require PG&E to submit a revised 2021 workplan for system hardening, when PG&E submits a revised 2021 WMP following denial.	C.2, C.3
6	PG&E	The WSD should require PG&E to track the quality of work of individual contractors and develop specific action plans to address underperforming contractors.	D
7	PG&E	PG&E should expand quality assurance and quality control of work performed by vendors with a history of flawed work.	D.5
8	PG&E	The WSD should require PG&E to schedule semi-annual internal audits of WMP initiatives that have been worked on by contractors.	D.5
9	PG&E	The WSD should require PG&E to perform annual internal audits of its routine and enhanced vegetation management programs.	E
10	PG&E	The WSD should require PG&E to audit its asset inspections and recordkeeping practices and present corrective actions.	F

11	PG&E	The WSD should require PG&E to publicly serve the causal evaluation from the independent contractor it has hired to examine its distribution intrusive pole inspections.	F
12	PG&E	The WSD should require PG&E to file regular reports on its quality assurance and control (QA/QC) processes for inspections.	G
13	All utilities	The WSD should convene a technical working group to develop best practices for QA/QC of asset and enhanced vegetation management inspections.	G
14	PG&E	The WSD should require PG&E to perform an internal audit of workplace safety and submit a corrective action plan to address the high number of worker injuries related to wildfire mitigation efforts. PG&E should submit a report by September 2021.	H
15	PG&E	PG&E must explain the errors in its original data tables related to worker injuries.	H
16	PG&E	PG&E should explain why its geospatial data shows that it continues to install hazardous expulsion fuses in High Fire-Threat District (HFTD) areas.	I
17	All utilities	The WSD and the Commission should state that the costs of installing non-exempt fuses in HFTD areas are not recoverable from ratepayers.	I
18	PG&E	The WSD should require PG&E to develop and provide a workplan for replacing expulsion fuses in HFTD, when PG&E submits a revised WMP following denial.	J
19	PG&E	The WSD should require PG&E to develop a three-year workplan for fuse replacements, to be submitted with its 2022 WMP submission.	J
20	PG&E	The WSD should require PG&E to develop a workplan to replace small copper conductor across its HFTD, especially on its highest-risk circuit segments within HFTD.	K

21	PG&E	The WSD should require PG&E to track the amount of small copper conductor replaced within HFTD.	K
22	PG&E	The WSD should require PG&E to justify its use of non-composite poles. PG&E should submit the results of this analysis with PG&E's WMP submission in 2022, if not sooner.	L
23	PG&E	The WSD should require PG&E to study the benefits of performing routine climbing inspections of transmission structures below 500 kV in HFTD areas. PG&E should be required to submit a report by September 2021.	M
24	PG&E	PG&E should begin a pilot program of aerial inspections of distribution assets in HFTD areas, while it studies their efficacy.	N
25	PG&E	The WSD should direct PG&E to perform a study to determine the cost and benefit of augmenting its detailed distribution inspections with aerial inspections. PG&E should submit this study with its 2022 WMP submission.	N
26	PG&E	The WSD should require PG&E to investigate why its covered conductor costs are far in excess of SCE's costs and investigate ways to reduce this cost. PG&E should submit the findings when it submits a revised 2021 WMP following denial.	O
27	PG&E	WSD should require PG&E to separately provide costs, miles treated, and risk-spend efficiency (RSE) estimates for each system hardening activity when PG&E submits its revised 2021 WMP following denial.	O
28	PG&E	The WSD should direct PG&E to substantially improve the efficiency of its system hardening programs by the time of its 2022 WMP submission.	O
29	PG&E	The WSD should direct PG&E to justify its information technology (IT) needs.	P

30	PG&E	The WSD should require PG&E to explain why its filings on ignition investigations contradict one another.	Q
31	PG&E	The WSD should require PG&E to review the accuracy of its responses to conditions in its September 2020 Quarterly Report and submit findings when PG&E submits its revised 2021 WMP following denial.	Q
32	PG&E	The WSD should require PG&E to justify and update its RSE calculations.	R
33	PG&E	The WSD should require PG&E to submit RSE scores for programs with significant expenditures in PG&E's WMP, except where RSE estimates will not materially influence decision-making.	R.4
34	PG&E	At present, PG&E, the WSD, and the Commission should not rely on PG&E's current RSE scores to determine or validate resource allocation.	R.5
35	All utilities	The WSD should consider developing its own framework that all utilities must use to calculate risk-spend efficiency estimates.	R.5

III. PG&E

A. The WSD should deny PG&E's 2021 WMP and order substantial revisions.

Our comments begin with a review of PG&E's implementation of its 2020 WMP. This review provides important context for PG&E's 2021 WMP, because a plan is only as good as its execution. PG&E's record in this regard is poor.

PG&E's 2020 wildfire mitigation efforts suffered from serious failures. For the most part, these can be categorized as failures of execution. PG&E's management failed to set priorities, communicate a strategy, and supervise program implementation. This systemic weak management has produced a pattern of safety failures: failure to prioritize mitigation programs according to risk, delayed or missed inspections, inconsistent quality of work, mismanagement of contractors, workers not following procedures, workplace injuries, and other errors. Some of these errors have put the public in danger.

A meaningful evaluation of PG&E's 2021 WMP must address the essential question – does the plan address the fundamental causes of PG&E's past failures? PG&E's 2021 WMP does not. While PG&E's 2021 WMP includes several significant improvements, it does not sufficiently address failures in management oversight, prioritization, recordkeeping, and other issues that contributed to the utility's poor performance in 2020. Because PG&E's WMP does not resolve these central problems, the plan is inadequate and should be denied.

1. Vegetation management.

PG&E's vegetation management activities in 2020 suffered from serious failures related to prioritization and recordkeeping. Several key issues are summarized below and discussed further in sections D.4 and E of these comments.

The California Department of Forestry and Fire Protection (CAL FIRE) has completed its investigation and determined that PG&E's infrastructure ignited the Zogg Fire in September 2020, which killed four people. CAL FIRE has concluded that a tree struck PG&E's lines and

ignited the fire.[2, 3] The ignition of the Zogg Fire in part may be related to incomplete vegetation management work (see Section E).[4] The situation is further complicated by PG&E's conflicting statements on whether specific trees were marked for removal during inspections prior to the fire.[5]

In addition, PG&E did not prioritize its 2019 or 2020 enhanced vegetation management (EVM) to its highest-risk circuit miles.[6] The federal court-appointed Monitor overseeing PG&E's probation (Federal Monitor)[7] and the WSD[8] both highlighted poor EVM prioritization. Cal Advocates' analysis further confirms there was little to no correlation between where PG&E performed EVM in 2020 and the circuit's risk ranking.[9]

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[2] CAL FIRE, *News Release: CAL FIRE Investigators Determine Cause of the Zogg Fire,* March 22, 2021: "After a meticulous and thorough investigation, CAL FIRE has determined that the Zogg Fire was caused by a pine tree contacting electrical distribution lines owned and operated by Pacific Gas and Electric (PG&E) located north of the community of Igo." https://www.fire.ca.gov/media/u2kh4nyd/zogg-fire-press-release.pdf

[3] ABC News, "California's Zogg Fire caused by tree hitting PG&E power lines, Cal Fire says," March 23, 2021, https://abcnews.go.com/US/californias-zogg-fire-caused-tree-hitting-pge-power/story?id=76628527

[4] PG&E, *Response to Order Requesting Information Re Zogg Fire and Order for Further Information Re Zogg Fire*, in U.S. District Court for the Northern District of California case, *U.S.A. v. Pacific Gas & Electric Co.*, Case No. 14-CR-00175-WHA (hereinafter Case No. 14-CR-00175-WHA), Doc. No. 1250, pp. 7-10, October 26, 2020.

See also: U.S. District Judge William Alsup, *Order Requesting Information Re Zogg Fire*, Case No. 14-CR-00175-WHA, Doc. No. 1246, October 12, 2020.

[5] U.S. District Judge William Alsup, *Questions for Follow-Up* (Case No. 14-CR-00175-WHA Doc. No. 1307), February 18, 2020.

[6] "The WSD finds that PG&E is not using the risk scoring in any of the three models provided to the WSD to drive/workplan its EVM initiative activities and therefore appears to not be sufficiently prioritizing or reducing the risk of wildfire ignition while implementing its EVM initiative. While PG&E has noted it has accomplished its WMP goal of completing 1,800 miles of work, the WSD finds that the completed work has not been sufficiently prioritized by risk." Wildfire Safety Division, *Audit of PG&E's Implementation of their Enhanced Vegetation Management Program in 2020*, February 8, 2021.

[7] U.S. District Judge William Alsup, *Order Re Monitor Letter* (Case No. 14-CR-00175-WHA Doc. No. 1247), October 20, 2020, Exhibit A, pp. 1-3.

[8] Wildfire Safety Division, *Audit of PG&E's Implementation of their Enhanced Vegetation Management Program in 2020*, February 8, 2021.

[9] PG&E's responses to Data Request CalAdvocates-PGE-R1810007-33, Question 6, February 2, 2021.

2. Contractor management.

PG&E has persistent problems managing its contractors, from failures to inform contractors of procedures to failures to track and address compliance with PG&E's protocols. Several key issues are summarized here and discussed further in section D of these comments.

PG&E's internal Electric Quality Assurance (EQA) audits in September 2020 uncovered that the utility's contractors who performed intrusive inspections on wood poles were unaware that PG&E had an inspection protocol for intrusive inspections. Instead, the contractors created their own protocol.[10] Additionally, the PG&E personnel responsible for supervising the contractors were unaware of the most recent update to the inspection protocol.[11]

PG&E also does not track how many mistakes each vegetation contractor is responsible for and makes no apparent effort to measure the quality of work performed by individual vegetation management contractors.[12] In one instance, this failure of oversight led to a contractor leaving a tree to grow until it contacted the conductor and the Federal Monitor observed the singed branch on this tree.[13] Other issues include contractors removing trees and performing grading work without permits.[14] In another instance (see section D.3) PG&E

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[10] "The Pole Test & Treat Program procedure … was not utilized by the 7 crews (3-5 individuals) and the supervisors (5) interviewed from both Transmission and Distribution. … TD2325P-01 is the PGE procedure that is required to be followed to ensure adherence to the Pole Test & Treat Program. Osmose and Davey Tree personnel were unaware of TD2325P-01 and two of their supervisors had created their own procedure. PG&E staff responsible for supervising the contractors were unaware of the TD2325P-01 update that occurred on November 15, 2019."

PG&E's responses to Data Request CalAdvocates-PGE-R1810007-32, Question 1, January 27, 2021, Attachment 1 (Confidential). Certain portions of this document are confidential, but the information included here is not.

[11] PG&E's responses to Data Request CalAdvocates-PGE-R1810007-32, Question 1, January 27, 2021, Attachment 1 (Confidential). Certain portions of this document are confidential, but the information included here is not.

[12] Asked about the relative performance of different contractors, PG&E stated "EVM work verification … does not track by exception." Asked if PG&E performed more intensive audits or work verification of a particular contractor, PG&E stated "Generally, PG&E does not distinguish between contractors in performing work verification and [Quality Assurance – Vegetation Management] audit procedures." PG&E's response to Data Request CalAdvocates-PG&E-R1810007-33, Questions 4 and 10, February 2, 2020.

[13] U.S. District Judge William Alsup, *Order Re Monitor Letter* (Case No. 14-CR-00175-WHA Doc. No. 1247), October 20, 2020, Exhibit A, p. 1, 5-11.

[14] PG&E's response to Data Request CalAdvocates-PGE-NonCase-MGN-12142020, Question 3, January 8, 2021.

employed a contractor with a problematic record of environmental non-compliance to perform clean-up work after the Camp and Kincade Fires.[15, 16]

3. Asset inspections.

PG&E has done a poor job prioritizing asset inspections. PG&E has also failed to produce records demonstrating compliance with inspection schedules required by General Orders.[17] Several key issues are summarized below and discussed further in section F of these comments.

Out of 967 transmission towers in the High Fire-Threat District (HFTD) that were scheduled for climbing inspections in 2020,[18] PG&E failed to conduct any climbing inspections before PG&E's internal goal of the end of August 2020.[19] PG&E had aimed to complete these inspections by August 31, 2020 "before peak wildfire season."[20] Even after the Federal Monitor discovered this issue and brought it to the attention of PG&E management, PG&E did not prioritize inspections on towers in the HFTDs.[21] Cal Advocates' discovery on this issue found that PG&E's management provided no strategic guidance to the staff regarding how to sequence inspections.[22]

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[15] PG&E's response to Data Request CalAdvocates-PGE-NonCase-RK-07032020, Questions 3 and 36, August 7, 2020.

[16] ProPublica, "How a PG&E Contractor With a Sketchy Past Made Millions After California's Deadliest Fire," June 30, 2020, https://www.propublica.org/article/how-a-pg-e-contractor-with-a-sketchy-past-made-millions-after-californias-deadliest-fire#969990

[17] Per PG&E's response to Data Requestion CalAdvocates-PGE-R1810007-32, Question 2, January 27, 2021, internal audits by PG&E revealed "41,343 distribution poles assumed to be late based on the recorded pole installation date being greater than 20 years or the absence of the installation date and no corresponding inspection record."

[18] PG&E, *Response to Order Regarding Monitor Letter* (Case No. 14-CR-00175-WHA Doc. No. 1258), November 3, 2020, pp. 3-4.

[19] U.S. District Judge William Alsup, *Order Re Monitor Letter* (Case No. 14-CR-00175-WHA Doc. No. 1247), October 20, 2020, Exhibit A, p. 4.

[20] PG&E's 2020 Wildfire Mitigation Plan set a deadline of December 31, 2020 for these inspections. The August 31 date was PG&E's internal target. PG&E, *Response to Order Regarding Monitor Letter* (Case No. 14-CR-00175-WHA Doc. No. 1258), November 3, 2020, pp. 3-4.

[21] PG&E, *Response to Order Re Monitor Letter*, filed in U.S. District Court for the Northern District of California, November 3, 2020, p. 4.

[22] PG&E's responses to Data Request CalAdvocates-PGE-R1810007-29, Question 4, December 18, 2020.

PG&E has failed to complete many asset inspections. PG&E discovered it could not confirm that it had performed intrusive pole inspections on more than 41,000 poles within the timeframes required by General Order 165.[23] Additionally, in March 2021, about a month after it had filed its 2021 WMP, PG&E sent a letter to the Safety Enforcement Division and the WSD stating that it had neglected to properly identify 24 substations in HFTDs for enhanced inspections.[24]

4. PG&E's 2021 Wildfire Distribution Risk Model significantly changes the risk ranking of its circuit-segments.

For 2021, PG&E is using a new wildfire risk model,[25] which yields significantly different risk scores for each circuit compared to the previous model. The new model does not merely revise the old model; it entirely contradicts it.[26]

Cal Advocates also has concerns related to the validity of the weather models PG&E uses to determine where and when to initiate a PSPS event. These issues are discussed further in Cal Advocates' separate comments on cross-cutting technical issues in wildfire mitigation plans.[27]

5. High projected costs.

PG&E's projected spending on its WMP in 2021 has increased by more than half in the past year.[28, 29] This large difference is unexplained by PG&E. Section O of these comments further discusses PG&E's costs associated with covered conductor, which are projected to cost as much as three times what SCE spends per mile.

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[23] PG&E's response to Data Requestion CalAdvocates-PGE-R1810007-32, Question 2, January 27, 2021.

[24] PG&E's letter to the Safety and Enforcement Division re: PG&E 2019 and 2020 Wildfire Mitigation Plan Update, March 4, 2021.

[25] PG&E's 2021 WMP, pp. 4-5.

[26] PG&E's presentation on Grid Design and System Hardening, slide 4, February 23, 2021.

[27] See *Comments of the Public Advocates Office on the 2021 Wildfire Mitigation Plan Updates of the Large Investor-Owned Utilities*, March 29, 2021, Section V.B.

[28] In its 2020 WMP, PG&E forecast spending $3.19 billion in 2021. In its 2021 WMP Update, PG&E forecasts spending $4.96 billion in 2021. This is an increase of 55.5 percent.

[29] PG&E's responses to Data Request CalAdvocates-PGE-2021WMP-05, Question 2, February 26, 2021; see also PG&E's 2021 WMP, Table 12.

PG&E is not appropriately scoping its mitigation efforts to be feasible, targeted, and effective. As demonstrated by PG&E's failures elsewhere to prioritize its work, PG&E may be failing to accomplish the most impactful work.

PG&E's significant spending increases will likely exacerbate its managerial shortcomings. PG&E is trying to do everything at once, without focus or setting priorities. Until PG&E can demonstrate that its plan is feasible and maximizes safety for both its workers and the public, its 2021 WMP should not be approved.[30]

6. Remedies: The WSD should require PG&E to overhaul its WMP to address the fundamental causes of its recent failures.

PG&E's systemic issues are exemplified by a recent internal audit of its intrusive pole inspection program: "There are no documented controls in place for identifying root cause of human errors, potential rework, and continuous issues."[31]

PG&E's 2021 WMP acknowledges "shortcomings and gaps in several programs" in 2020[32] and commits to some improvements, such as creating a steering committee[33] to determine where wildfire mitigation work occurs and performing quality assurance on 100 percent of vegetation management work in HFTD areas.[34] However, PG&E's 2021 WMP does not meaningfully address the severity of the utility's failures in 2020. Despite the enormous projected cost associated with the 2021 WMP, the WMP does not address the fundamental causes of PG&E's poor oversight of contractors, poor performance in asset inspections, and poor vegetation management.

Many of the issues discussed above and later within these comments were originally brought to light through the efforts of the Federal Monitor, which will no longer have oversight of PG&E after the beginning of 2022. As such, it is critical that stakeholders have confidence in

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[30] *See, e.g.*, Public Utilities Code Sections 8386(a), 8386(c)(3), 8386(c)(13), and 8386(c)(21).

[31] PG&E's responses to Data Request CalAdvocates-PGE-R1810007-32, Question 1, January 27, 2021, Attachment 2 (Confidential). Certain portions of this document are confidential, but the information included here is not.

[32] PG&E's 2021 WMP, p. 2.

[33] PG&E's 2021 WMP, p. 5.

[34] PG&E's 2021 WMP, p. 48.

PG&E's plan and ability to address its 2020 shortcomings through its 2021 WMP after the Federal Monitor's oversight ends.

Possible remedies to PG&E's shortcomings could include expanding or intensifying the routine quality control elements of each wildfire mitigation program, scheduling more frequent program audits by PG&E's Electric Quality Assurance unit and external auditors, closely tracking the performance of contractors, developing an action plan to reduce worker injuries, and providing detailed workplans demonstrating that PG&E is targeting the maximum risk reduction in the most cost-efficient manner.

Therefore, the WSD should deny PG&E's 2021 WMP and direct PG&E to submit a new plan within 90 days. A revamped WMP should intensively focus on the highest-risk circuits first and on improving management oversight.

B. The WSD should require PG&E to justify the scope of its enhanced vegetation management (EVM) program.

PG&E's workplan for the EVM program is not well designed and will not expeditiously reduce risk. PG&E's approach is to treat all distribution lines in HFTDs over a 14-year period, rather than focusing on essential, near term results on the highest-risk circuits.[35]

PG&E's EVM program expands vegetation management of distribution lines beyond the requirements of General Order 95, trimming to clearances wider than the required four-foot radial clearance.[36] This program also assesses the potential of nearby trees to strike the line, and trims or removes these trees as appropriate.[37]

Under the EVM program, PG&E plans to treat 1,800 miles per year in 2021 and 2022.[38] PG&E operates 25,410 circuit miles of distribution line in HFTD,[39] so the EVM program only treats approximately 7.1 percent of HFTD miles per year. PG&E plans to incorporate these enhanced clearances from EVM into routine vegetation management on miles where EVM has been performed, so that the expanded clearances will persist as EVM is performed across HFTD.

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[35] PG&E's response to Data Requests CalAdvocates-PGE-2021WMP-06, Question 10, February 24, 2021, and CalAdvocates-PGE-2021WMP-10, Question 12, March 3, 2021.

[36] PG&E's 2021 WMP, p. 625.

[37] PG&E's 2021 WMP, p. 625.

[38] PG&E's 2021 WMP, Table 12, Program 7.3.5.15 "Remediation of at-risk species," pp. 664-669.

[39] PG&E's 2021 WMP, p. 56.

PG&E plans to continue assessing trees for strike potential by covering about 7.1 percent of HFTD miles per year.[40] Under this schedule, it will take PG&E over 14 years to fully assess all HFTD distribution circuit miles. When asked to explain its reasoning for targeting only 7.1 percent of HFTD per year, PG&E represented that it "set its target based on the allocated budget associated with the EVM program."[41] With this circular explanation, PG&E fails to address *why* it is appropriate to assess only one 14th of its system each year for trees with a risk of striking the lines.

About one-fifth of PG&E's circuit-miles in the HFTDs account for three quarters of the wildfire risk in HFTDs.[42] The other four-fifths of HFTD circuit-miles are relatively low-risk. Therefore, under its current plan, PG&E will spend approximately 11 of the 14 years of the EVM cycle assessing relatively low-risk miles.[43]

The WSD should require PG&E to present a detailed justification for the scope of its EVM program, including why it based the mileage of work planned on the allocated budget instead of risk reduction goals, and why addressing the highest-risk circuit miles essentially every 14 years is a reasonable and effective mitigation measure. The WSD should require PG&E to submit this report within 30 days of the WSD's action statement.[44]

C. The WSD should require PG&E to submit revised 2021 workplans for EVM and system hardening.

PG&E's EVM and system hardening programs target only a small portion of its circuit miles in HFTDs. In 2021, only about seven percent of PG&E's HFTD circuit miles will be

[40] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-10, Question 12, March 3, 2021.

[41] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-06, Question 10, February 24, 2021.

[42] Specifically, per PG&E's 2021 Wildfire Distribution Risk Model for vegetation, 405 circuit segments, totaling approximately 5,200 miles, account for 75 percent of the total risk in HFTD. See the following section for additional detail. Analysis of PG&E's responses to Data Request CalAdvocates-PGE-2021WMP-19, Question 2, March 15, 2021.

[43] Per PG&E's 2021 Wildfire Distribution Risk Model for vegetation, approximately 5,200 miles account for 75 percent of the total risk in HFTD. Per PG&E's 2021 WMP, p. 56, PG&E has approximately 25,410 miles of overhead distribution circuit in HFTD. At 1,800 miles of EVM per year, the riskiest segments would take approximately 5,200/1,800=2.9 years, and the remainder will take approximately (25,410-5,200)/1,800=11.2 years.

[44] Pursuant to Public Utilities Code Section 8386.3(a), the WSD is expected to issue an action statement on PG&E's WMP by May 5, 2021.

treated by EVM, and only about 0.7 percent will be treated with system hardening.[45] In order to make a meaningful impact on system-wide wildfire risk, these limited-scope programs must be carefully targeted to the highest-risk circuit segments.

1. PG&E's EVM planning has improved but is still not sufficiently prioritized by risk.

PG&E's EVM program is not sufficiently targeted to high-risk circuit-segments. PG&E states that it commits to performing at least 80 percent of its 2021 EVM work in the top 20 percent of the risk ranking of circuit segments.[46]

This commitment should be easy to achieve since, as Table 1 shows, only a small fraction of circuit-segments account for the bulk of the vegetation-related risk on PG&E's system.[47, 48] Yet PG&E's EVM workplan does not live up to this commitment: only 68 percent of the work[49] in PG&E's 2021 Certified EVM plan is targeted to the riskiest 20 percent of circuit-miles.[50, 51]

Moreover, just 66 extremely risky circuit-segments account for the top 20 percent of the cumulative risk on PG&E's distribution system. Although PG&E should be intensely focused on these circuit-segments, less than 12 percent of EVM work is targeted at these highest-risk circuit-segments.[52] This is far below PG&E's stated commitment of 80 percent.[53]

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[45] Per page 56 of PG&E's 2021 WMP, PG&E has approximately 25,410 overhead distribution circuit miles in HFTD. Per Table PG&E-7.1-2 on p. 293, PG&E is targeting 1,800 miles for EVM, and 180 miles for system hardening, which amount to approximately 7% and 0.7%, respectively.

[46] PG&E's 2021 WMP, p. 47.

[47] Per a discussion between Cal Advocates and PG&E on March 12, 2021, PG&E ranks its circuits by the attribute "mean_mavf_core_risk," which represents the average risk along the circuit segment as determined by the 2021 Wildfire Distribution Risk Model. PG&E confirmed this understanding in its response to Data Request CalAdvocates-PGE-2021WMP-19, Question 1, March 15, 2021.

[48] Analysis of PG&E's responses to Data Request CalAdvocates-PGE-2021WMP-19, Question 2, March 15, 2021.

[49] PG&E expects to perform 1,263 out of 1,859 miles of EVM on these segments, which is 68 percent.

[50] PG&E's 2021 Certified EVM workplan. PG&E's response to Data Request CalAdvocates-PGE-2021WMP-10, Question 5, March 3, 2021.

[51] PG&E's 2021 Vegetation Risk scores. PG&E's response to Data Request CalAdvocates-PGE-2021WMP-19, Question 2, March 15, 2021.

[52] PG&E expects to perform 217 out of 1,859 miles of EVM on these segments, which is 11.7 percent.

[53] These 66 segments have a cumulative length of only 577 miles. However, even interpreting PG&E's statement to suggest that 80% of EVM miles will be targeted within the 20% of HFTD miles that represent the most risk (approximately 5082 miles), only approximately 68% of EVM miles appears to be

If PG&E were to focus on high-risk circuit segments, it could perform EVM on all 66 circuit-segments that account for the first 20 percent of the cumulative risk. These 66 segments represent 577 overhead circuit-miles, far less than the annual EVM target of 1,800 miles. Instead, PG&E's workplan inexplicably calls for EVM on less than half of these miles in 2021. At minimum, PG&E should be able to treat all of these segments before the 2022 wildfire season).

Table 1
High-risk Circuit-Segments
According to PG&E's Vegetation Risk Scores

	Number of circuit-segments	Number of circuit-miles	Miles with EVM scheduled in 2021	Percentage of EVM workplan
Top 20% of the total vegetation risk	66	577	217	12%
Top 75% of the total vegetation risk	405	5,242	1,263	68%
All distribution circuit-segments in HFTD	3,100	25,410	1,859*	100%
* PG&E intends to perform 1,800 miles of EVM projects in 2021, but the workplan includes 1,859 miles of projects.				

In short, PG&E continues to fail to prioritize risk, just as it did in 2019 and 2020. The Federal Monitor observed that PG&E completed the majority of its 2019 EVM work in relatively low-risk portions of its HFTDs.[54] Similarly, an analysis of PG&E's 2020 EVM work shows that less than a quarter of PG&E's 2020 EVM work was performed in the riskiest 20 percent of circuit-miles as identified by PG&E's 2020 risk model.[55] Although PG&E's 2020 risk model is limited, it is likely that these riskiest 20 percent of circuit-miles represented the overwhelming

targeted within these segments.

[54] Federal Monitor's letter to Judge Alsup, (Case No. 14-CR-00175-WHA Doc. No. 1247-1), p. 2, October 16, 2020.

[55] PG&E performed 23 percent of its EVM work on the riskiest 20 percent of circuit-miles (approximately 5082 miles). Analysis of PG&E's responses to Data Request CalAdvocates-PGE-2021WMP-10, Question 8, March 3, 2021.

majority of the total wildfire risk in HFTD.[56] Therefore, PG&E performed a small fraction of its EVM work in the places its risk model indicated as priorities.

PG&E did not appropriately prioritize its 2019 or 2020 EVM work to the highest-risk circuit segments, and its 2021 workplan still does not appropriately target EVM to maximize risk mitigation.

2. PG&E's system hardening plan does not target the highest-risk HFTD miles.

PG&E's 2021 system hardening workplan[57] poses similar concerns as its EVM plan. The wildfire risk on PG&E's distribution system is heavily concentrated in a few circuit-segments, but PG&E's system hardening plan does not focus on these segments.

PG&E's 2021 system hardening workplan has a limited scope. The workplan includes approximately 284 miles of potential covered conductor and undergrounding work in 2021.[58] PG&E only plans to harden 180 miles in 2021.

[56] PG&E's 2020 risk model only allowed for relative ranking of risk, and did not calculate an absolute risk value, so it is not possible to determine what percentage of the total risk was represented by a given circuit-segment. However, judging by the output from the 2021 Wildfire Distribution Risk Model (and PG&E's presentation at the WMP workshop on February 22-23, 2021), it is likely that the riskiest 20 percent of circuit miles represented a large portion of the total wildfire risk in HFTD.

[57] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-10, Question 6, March 3, 2021.

[58] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-16, Question 5, March 10, 2021. Note, PG&E's system hardening work plan includes an additional 10.6 miles of line removal and remote grid, which was omitted from this analysis.

Table 2 **High-risk Circuit-Segments** **According to PG&E's Equipment Risk Scores**				
	Number of circuit-segments	Number of circuit-miles	Miles with hardening planned in 2021-2022*	Percentage of workplan
Top 20% of the total equipment risk	154	1,292	96	34%
Top 75% of the total equipment risk	758	9,168	197	69%
All distribution circuit-segments in HFTD	3,635	25,410	284	100%
* PG&E intends to perform 180 miles of system hardening projects in 2021 but has identified 284 miles of covered conductor and undergrounding projects.				

When ranked by the average equipment failure risk along each segment, 758 circuit segments (totaling approximately 9,168 circuit miles) account for approximately 75 percent of PG&E's cumulative total equipment risk in HFTD.[59] At PG&E's proposed pace (even if PG&E increases its pace in 2022 as planned),[60] it will take *over 20 years* to harden the high-risk segments.[61] Yet nearly a third of PG&E's proposed covered conductor and undergrounding miles fall outside the high-risk circuit-segments.

To materially reduce wildfire risk, PG&E needs to focus its system hardening efforts on the very riskiest distribution circuit-segments. Unfortunately, PG&E is not doing so. About 5 percent of PG&E's overhead circuit miles in the HFTD account for 20 percent of PG&E's cumulative total equipment-related risk.[62] Yet only about a third of the planned system hardening miles fall within these extremely risky circuit segments.

[59] Analysis of PG&E's response to Data Request CalAdvocates-PGE-2021WMP-19, Question 3, March 15, 2021.

[60] PG&E states that it will harden 470 circuit-miles in 2022. PG&E's 2021 WMP, Table 12.

[61] Approximately 9,168 circuit-miles constitute 75% of PG&E's cumulative total equipment risk in the HFTD. If PG&E performs 180 miles of hardening in 2021 and 470 miles of hardening in each subsequent year, it would complete 9,110 miles in 20 years.

[62] These are the 154 circuit-segments that rank highest according to equipment risk in PG&E's risk model. They encompass 1,292 circuit-miles.

PG&E's system hardening workplan does not primarily target the very highest risk segments. The scope of the program also covers 100 miles more than PG&E will actually treat in 2021, so the precise targeting of the program cannot be accurately assessed at this stage.[63]

3. Remedies: The WSD should require updated 2021 workplans from PG&E.

PG&E has not demonstrated that it is targeting programs with narrow scopes (EVM and system hardening) to high-risk circuit segments. The WSD should require PG&E to provide updated 2021 workplans for its EVM and system hardening initiatives. Additionally, PG&E should be required to explain the apparent discrepancies noted above, to show how it is targeting 80 percent of its EVM work to the riskiest 20 percent of circuit-segments, and how it is targeting system hardening to maximize risk reduction.

The WSD should require PG&E to submit updated workplans for EVM and system hardening, when PG&E submits a revised WMP following denial. PG&E should submit updated workplans on a quarterly basis throughout the rest of the 2020-2022 WMP cycle.

D. The WSD should require PG&E to track the quality of work of individual contractors, and develop specific action plans to address underperforming contractors.

PG&E does not exert meaningful oversight over its contractors. Several PG&E internal audits have revealed that contractors have failed to follow procedures or were unaware of the correct procedures that needed to be followed.[64] In other cases, contractors have performed poor vegetation management work[65] or acted without securing required permits.[66]

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[63] The 284 miles of projects represent the current potential scope of the system hardening program (some of which may occur in 2022).

[64] PG&E's responses to Data Request CalAdvocates-PGE-R1810007-32, Question 1, January 27, 2021, and CalAdvocates-PGE-2021WMP-03, Questions 1 and 6, February 17, 2021.

[65] Federal Monitor's Letter to Judge Alsup (Case No. 14-CR-00175-WHA Doc. No. 1247-1), October 16, 2020, attached as Exhibit A to U.S. District Judge William Alsup's *Order Re Monitor Letter* (Case No. 14-CR-00175-WHA Doc. No. 1247), October 20, 2020.

[66] PG&E's response to Data Request CalAdvocates-PGE-NonCase-MGN-12142020, Question 3, January 8, 2021.

1. Contractors have failed to follow procedures.

PG&E provided Cal Advocates with two audit reports from its internal Electrical Quality Assurance group.[67] Findings from these audit reports revealed that at least thirty crew personnel and five supervisors from the contractors PG&E employed to conduct Pole Test & Treat[68] were unaware of PG&E's procedure (TD 2325P-01) that they were supposed to follow.[69] Two of the five supervisors created their own procedures to follow.[70] PG&E staff responsible for supervising the contractors were also unaware that there had been a revision to the approved procedure on November 15, 2019.[71]

The internal audit turned up similarly troubling flaws in the quality control process for Pole Test & Treat inspections. In this instance, PG&E did not provide a quality control procedure to contractors.[72] The manual created and used by the contractor "did not follow PG&E guidelines."[73] The audit also noted "inconsistent handling of failures due to lack of procedure."[74]

In 2020, two contract crews used the wrong equipment to identify the primary cable and spiked the incorrect cable, failing to follow PG&E's procedures and causing an unplanned outage.[75] In another case, the contract crew did not know the difference between a load-break and dead-break primary elbow,[76] and pulled an energized dead-break elbow from a junction box,

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[67] PG&E's response to Data Request CalAdvocates-PGE-R1810007-32, Question 1, January 27, 2021.

[68] Pole Test and Treat, or PT&T, refers to intrusive pole inspections, per PG&E's 2021 WMP, p. 601.

[69] PG&E's response to Data Request CalAdvocates-PGE-R1810007-32, Question 1, January 27, 2021.

[70] PG&E's response to Data Request CalAdvocates-PGE-R1810007-32, Question 1, January 27, 2021.

[71] PG&E's response to Data Request CalAdvocates-PGE-R1810007-32, Question 1, January 27, 2021.

[72] PG&E's responses to Data Request CalAdvocates-PGE-R1810007-32, Question 1, January 27, 2021, Attachment 2 (Confidential). Certain portions of this document are confidential, but the information included here is not.

[73] PG&E's responses to Data Request CalAdvocates-PGE-R1810007-32, Question 1, January 27, 2021, Attachment 2 (Confidential). Certain portions of this document are confidential, but the information included here is not.

[74] PG&E's responses to Data Request CalAdvocates-PGE-R1810007-32, Question 1, January 27, 2021, Attachment 2 (Confidential). Certain portions of this document are confidential, but the information included here is not.

[75] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-03, Question 6, February 17, 2021.

[76] Dead-break and load-break elbows are types of connectors for underground cable, found in pad-mounted electrical equipment. PG&E's response to Data Request CalAdvocates-PGE-2021WMP-03,

leading to another unplanned outage.[77] In response to these incidents, PG&E stated it "sent a guidance tailboard of the PG&E requirement to all Electric Distribution Contractors" and "PG&E discussed the incident and learnings with all Electric Distribution Contractors. We also sent the attached tailboard communication on Primary [Underground] Separable Terminations."[78] In only one case did PG&E report placing a vendor on a safety stand-down and requiring them to develop a Safety Corrective Action Plan.[79]

In summary, PG&E's response to cases where the vendor was unaware of or did not follow procedures often amounted to a reminder of how procedures should have been followed.[80] In most cases, PG&E did not investigate further into the quality of other work the same vendor had performed, nor require full retraining on the topic.[81] PG&E's responses to these missteps fail to address the root causes of the mistakes.

2. Contractors did not secure required permits.

Following the CZU Lightning Complex Fires in August 2020, PG&E contractors conducted tree clearing vegetation management work in the Santa Cruz area. This work produced a set of implementation failures that exemplify PG&E's ineffective management of contractors.

CAL FIRE, the California Coastal Commission, and the Central Coast Regional Water Quality Control Board sent multiple notices to PG&E stating that the utility had not filed for the appropriate permits for tree removal and grading work, and that PG&E was in violation of regulations for failing to water seasonal roads, contributing to erosion.[82] CAL FIRE's first notice to PG&E on October 30, 2020 stated that over the previous two years, PG&E had filed the required permits for similar work, but had failed to file any in this instance.[83] PG&E objected to

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Question 6, February 17, 2021.

[77] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-03, Question 6, February 17, 2021.

[78] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-03, Question 6, February 17, 2021.

[79] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-03, Question 6, February 17, 2021.

[80] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-03, Question 6, February 17, 2021.

[81] PG&E's response to Data Request CalAdvocates-PGE-R1810007-33, Question 4, February 2, 2021.

[82] PG&E's response to Data Request CalAdvocates-PGE-NonCase-MGN-12142020, Question 3, January 8, 2021.

[83] PG&E's response to Data Request CalAdvocates-PGE-NonCase-MGN-12142020, Question 3, January

the notice of violation, claiming that it was under no obligation to file a utility right-of-way exemption.[84] The dispute remains unresolved.

In addition to failing to secure the proper permits, the contractors trimmed or removed over 6,400 trees that were farther from the nearest PG&E asset than the height of the tree, meaning that the tree could not strike a PG&E asset even if it fell directly toward the line.[85] In over 100 cases, the trimmed tree was more than 1,000 feet from the nearest PG&E asset.[86] PG&E has not explained why it trimmed or removed these trees.[87]

Although the restoration work after the CZU Lightning Complex Fires was not directly related to PG&E's 2020 WMP, it is similar in nature to the vegetation management work that PG&E performs as part of its WMP with some of the same contractors.[88] PG&E's inability to manage post-fire restoration work raises doubts about its ability to effectively manage its WMP programs and contractors.

3. Poor business practices for screening and overseeing contractors.

PG&E's business relationship with Bay Area Concrete demonstrates poor business practices, including inadequate screening of suppliers and weak oversight of contract work. PG&E used the services of Bay Area Concrete and its affiliates to (1) build a slurry disposal center in Paradise, California, to dispose of debris from the 2018 Camp fire, to (2) build a slurry

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8, 2021.

[84] PG&E's response to Data Request CalAdvocates-PGE-NonCase-MGN-12142020, Question 3, January 8, 2021. This issue will be further addressed in a pending complaint proceeding at the Commission, Complaint (C.) 21-01-014.

[85] Cal Advocates' analysis of geospatial data provided in response to Data Request CalAdvocates-PGE-NonCase-MGN-12142020, Question 4, January 8, 2021.

[86] Cal Advocates' analysis of GIS data provided in response to Data Request CalAdvocates-PGE-NonCase-MGN-12142020, question 4, January 8, 2021.

[87] PG&E's response to Data Request CalAdvocates-PGE-NonCase-MGN-02172021, March 2, 2021.

[88] In response to Data Request CalAdvocates-PGE-NonCase-MGN-02172021, Question 2, March 2, 2021, PG&E provided a list of contractors who performed the restoration work after the CZU Lightning Complex Fires. In response to Data Request CalAdvocates-PGE-R1810007-34, Question 1, January 29, 2021, PG&E provided a list of all contractors who performed WMP-related work for the utility from 2018 to 2020. Several contractors appear on both of these lists.

dumpsite in 2019 at a PG&E substation located in Petaluma, California, and to (3) help build a base camp for the 2019 Kincade fire.[89], [90]

First, PG&E's reliance on Bay Area Concrete reveals an insufficient process of screening contractors for ethical standards. Bay Area Concrete had previously operated an "unlicensed dump" that engendered concerns about dust and water pollution.[91] Shortly before Bay Area Concrete started to work for PG&E on the Camp Fire clean-up, the city of Hayward, California, had denied the company a permit to continue operating.[92] With appropriate due diligence, PG&E should have avoided employing this firm.

Second, PG&E showed poor business practices in its relationship with Bay Area Concrete. PG&E did not have a written contract with the supplier for either the Paradise slurry disposal center or the Petaluma slurry dumpsite.[93] The lack of a written contract hinders effective oversight of work performed for PG&E due to unclarity about the expected scope, quality, and price of the work to be performed. Additionally, the lack of a written contract has contributed to disputes between PG&E and its supplier. PG&E disputes the supplier's claim that PG&E agreed to pay for its services.[94]

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[89] ProPublica, "How a PG&E Contractor With a Sketchy Past Made Millions After California's Deadliest Fire," June 30, 2020, https://www.propublica.org/article/how-a-pg-e-contractor-with-a-sketchy-past-made-millions-after-californias-deadliest-fire#969990

See also LegalReader, "PG&E Files Counterclaim in Recycling Company Lawsuit," March 8, 2021, https://www.legalreader.com/pge-files-counterclaim-in-recycling-company-lawsuit/ ; and ProPublica, "Lawsuit Reveals New Allegations Against PG&E Contractor Accused of Fraud" Feb. 26, 2021, https://www.propublica.org/article/lawsuit-reveals-new-allegations-against-pg-e-contractor-accused-of-fraud

[90] PG&E's response to Data Request CalAdvocates-PGE-NonCase-RK-07032020, Questions 3-4, 13-14, and 22-25, August 7-14, 2020.

[91] ProPublica, "How a PG&E Contractor With a Sketchy Past Made Millions After California's Deadliest Fire," June 30, 2020.

[92] ProPublica, "How a PG&E Contractor With a Sketchy Past Made Millions After California's Deadliest Fire," June 30, 2020.

[93] PG&E's response to Data Request CalAdvocates-PGE-NonCase-RK-07032020, Questions 2-5 and 12-15, August 7, 2020.

[94] PG&E's response to Data Request CalAdvocates-PGE-NonCase-RK-07032020, Questions 3 and 13, August 7, 2020.

In sum, PG&E's business relationship with Bay Area Concrete and its affiliates illustrates once again how PG&E has failed to effectively manage and oversee its suppliers.

4. Contractors did not perform high-quality vegetation management.

On October 16, 2020, the Federal Monitor sent a letter to U.S. District Judge William Alsup detailing a number of concerns with PG&E's enhanced vegetation management program. Among other items, the Federal Monitor found a tree contacting a line, which had been marked for removal twice, but never removed.[95] When asked how this had occurred, PG&E stated that a specific pre-inspector working for a vegetation management contractor had failed to follow the proper procedure to create a hazard notification to trigger the removal of the tree.[96] PG&E stated that the pre-inspector's supervisor had also failed to catch the omission.[97]

PG&E responded by holding a mandatory "stand down" to review the Vegetation Management Hazard Notification Procedure with the vendor[98] and reviewing other work performed by the individual pre-inspector. However, PG&E did not bother to review other work supervised by the pre-inspector's supervisor, nor other work performed by the vendor as a whole.[99] This response is insufficient: PG&E made no effort to identify other related problems, or examine the root causes of the problem.

It is notable that PG&E has stated that its work verification process does not track results by vendor.[100] This suggests that PG&E is not properly tracking the quality of work performed by individual contractors, making it unlikely that a vendor's repeated poor performance would be easily discovered.

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[95] Federal Monitor's Letter to Judge Alsup (Case No. 14-CR-00175-WHA Doc. No. 1247-1), pp. 1-2, October 16, 2020.

[96] PG&E's response to Data Request CalAdvocates-PG&E-R1810007-29, Question 1, December 18, 2020.

[97] PG&E's response to Data Request CalAdvocates-PG&E-R1810007-29, Question 1, December 18, 2020.

[98] PG&E's response to Data Request CalAdvocates-PG&E-R1810007-29, Question 1, December 18, 2020.

[99] PG&E's response to Data Request CalAdvocates-PG&E-R1810007-33, Question 4, February 2, 2020.

[100] PG&E's response to Data Request CalAdvocates-PG&E-R1810007-33, Questions 4 and 10, February 2, 2020.

At the PG&E Board of Directors meeting held on October 28, 2020, the Federal Monitor presented on several issues raised in its letter to Judge Alsup on October 16, 2020.[101] However, the minutes of the Board of Directors meeting contain no specific recommendations from the Board to management based on the discussion.[102] While PG&E's 2021 WMP does address its 2020 shortfalls in vegetation management,[103] the failure of the Board to make specific, actionable recommendations to management regarding the deficiencies noted by the Federal Monitor reveals a lack of commitment to improvement.[104]

5. Remedies: The WSD should require PG&E to address its poor contractor oversight.

The WSD should require PG&E to improve its oversight of contractors, including tracking the quality of work of individual contractors, and developing specific action plans to address underperforming contractors. PG&E should provide this action plan when it submits a revised WMP following the denial of its 2021 WMP.

Among other things, PG&E should expand quality control of work performed by vendors with a history of flawed work. Additionally, as part of this effort, the WSD should require PG&E to schedule semi-annual internal audits of WMP initiatives that have been worked on by contractors. The results of these audits should be provided to the WSD and stakeholders.

E. The WSD should require PG&E to perform annual internal audits of its routine and enhanced vegetation management programs.

PG&E is not performing adequate routine vegetation management (VM) or enhanced vegetation management (EVM) work. The Federal Monitor's October 2020 letter noted "a series of process breakdowns" in PG&E's EVM work.[105]

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[101] PG&E's Advice Letter 6068-E, January 29, 2021, Attachment 1, Board of Directors (BOD) and Safety & Nuclear Oversight (SNO) Committee Meeting Minutes, p. Atch1-64.

[102] PG&E's response to Data Request CalAdvocates-PGE-NonCase-AWM-02112021, Question 2, February 26, 2021.

[103] PG&E's 2021 WMP, pp. 46-48.

[104] Cal Advocates previously expressed concern that PG&E's Board of Directors and Safety and Nuclear Oversight Committee had not provided any formal safety recommendations over three meetings in 2019. See Cal Advocates' letter to the Safety and Enforcement Division on December 17, 2019 regarding PG&E's Advice Letter 5700-E.

[105] Federal Monitor's letter to Judge William Alsup (Case No. 14-CR-00175-WHA Doc. No. 1247-1), p.

In one instance, the Federal Monitor observed a tree had been flagged for removal twice but was not removed.[106] PG&E attributes this to an error by the vendor who performed pre-inspection along the circuit segment associated with this tree.[107] However, PG&E never performed EVM work verification on the segment to verify that trees were worked as required by the program,[108] despite claims that PG&E performs work verification on 100 percent of EVM miles.[109] PG&E states that this was because this segment was not actually part of the EVM scope at the time the pre-inspector identified the tree,[110] although this appears to differ from the Federal Monitor's understanding.

The Federal Monitor found multiple other issues with the EVM program:

- In 2019, the majority of PG&E's EVM miles were completed along relatively low-risk portions of its circuits in HFTDs, with 77 percent of the 2019 EVM mileage requiring no EVM tree trimming work.[111]
- In 2020, PG&E performed 1,835 miles of EVM work, of which 14 percent failed work verification the first time.[112]
- Only 23 percent of PG&E's 2020 EVM work was performed in the riskiest 20 percent of circuit miles as identified by PG&E's 2020 risk model, which illustrates a failure to properly allocate resources to risk mitigation.[113]

1-2, October 16, 2020:

> We have attached a finding from an October 4, 2020 inspection, during which we identified a tree that PG&E was supposed to have removed in mid-August, but twice failed to remove, seemingly because of a series of process breakdowns. Following the Monitor team's identification of the tree and immediate escalation to PG&E management, PG&E removed the tree within 24 hours.

[106] Federal Monitor's letter to Judge William Alsup (Case No. 14-CR-00175-WHA Doc. No. 1247-1), p. 1-2, October 16, 2020.

[107] PG&E's response to Data Request CalAdvocates-PGE-R181007-29, Question 1, December 18, 2020.

[108] PG&E's responses to Data Request CalAdvocates-PGE-R181007-33, Question 3, February 2, 2021, and CalAdvocates-PGE-2021WMP-06, Question 15, February 26, 2021.

[109] PG&E's 2020 WMP, updated February 28, 2020, p. 5-191.

[110] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-06, Question 15, February 26, 2021.

[111] Federal Monitor's Letter to Judge Alsup (Case No. 14-CR-00175-WHA Doc. No. 1247-1), October 16, 2020, p. 3.

[112] PG&E's 2021 WMP Supplemental Filing, February 26, 2021, p. 53.

[113] Analysis of PG&E's responses to Data Request CalAdvocates-PGE-2021WMP-10, Question 8, March

The Federal Monitor also observed EVM problems in 2019, with nearly a third of EVM work failing to pass work verification the first time.[114], [115] In fact, the work failed verification because it had not been performed: PG&E sent work verification inspectors to locations where trees had not yet been trimmed.[116]

PG&E's failures in vegetation management work have been implicated in recent catastrophic fires as well. For example, PG&E has admitted to failing to follow-up on removal work on a number of trees flagged for removal following the Carr Fire in 2018.[117] This unfinished work may have contributed to the deadly Zogg Fire in 2020. CAL FIRE has determined that the fire was ignited by a gray pine that was rooted near PG&E's lines.[118], [119], [120] PG&E "believes the Gray Pine of interest may have been identified for removal (but not

3, 2021.

[114] In 2019, 1,761 out of 2,573 miles (or 68 percent) of PG&E's EVM passed work verification on the first attempt. PG&E performed PG&E's 2021 WMP Supplemental Filing, p. 53, February 26, 2021.

[115] Federal Monitor's 2019 Letter to Judge Alsup (Case No. 14-CR-00175-WHA), July 26, 2019, p. 2: "PG&E's contractors are missing numerous trees that should have been identified and worked under applicable regulations and the EVM program. Thus, not only is PG&E falling short of its EVM goals for the year, but the quality of the completed work is questionable."

[116] PG&E's September 2020 WMP Quarterly Report, p. 164; PG&E's response to Data Request CalAdvocates-PGE-R181007-27, Question 3, October 23, 2020.

[117] PG&E, *Response to Request for Follow Up by PG&E Concerning its October 26 Submission* (Case No. 14-CR-00175-WHA Doc. No. 1265), November 18, 2020, pp. 22-26.

[118] CAL FIRE, *News Release: CAL FIRE Investigators Determine Cause of the Zogg Fire,* March 22, 2021: "After a meticulous and thorough investigation, CAL FIRE has determined that the Zogg Fire was caused by a pine tree contacting electrical distribution lines owned and operated by Pacific Gas and Electric (PG&E) located north of the community of Igo." https://www.fire.ca.gov/media/u2kh4nyd/zogg-fire-press-release.pdf

[119] ABC News, "California's Zogg Fire caused by tree hitting PG&E power lines, Cal Fire says," March 23, 2021, https://abcnews.go.com/US/californias-zogg-fire-caused-tree-hitting-pge-power/story?id=76628527

[120] PG&E, *Response to Order Requesting Information Re Zogg Fire and Order for Further Information Re Zogg Fire* (Case No. 14-CR-00175-WHA Doc. No. 1250), October 26, 2020, p. 6; PG&E, *Response to Request for Follow Up by PG&E Concerning its October 26 Submission* (Case No. 14-CR-00175-WHA Doc. No. 1265), November 18, 2020, pp. 21-22.

removed) during restoration efforts following the Carr Fire in 2018."[121, 122] PG&E has made conflicting statements about whether this tree was marked for removal.[123]

These issues, as well as concerns with PG&E's management of contractors who perform vegetation management and other work for the utility (noted in section D), demonstrate faults in PG&E's ability to effectively target and implement its vegetation management programs.

Given the importance of vegetation management in reducing wildfire risk, the WSD should require PG&E to perform annual internal audits to identify all process breakdowns within its routine and enhanced vegetation management programs. This internal audit should specifically identify the underlying causes of the vegetation management flaws identified in the Federal Monitor's letter and include specific corrective actions to mitigate these causes systemwide. Cal Advocates recommends that the WSD require this internal audit of PG&E's programs on an annual cycle and that PG&E promptly share the findings with stakeholders via the service list of R.18-10-007. Within 30 days after the audit, PG&E should be required to submit a corrective action plan for all problems that have been identified.

F. The WSD should require PG&E to audit its asset inspections and recordkeeping practices, and present corrective actions.

PG&E's asset inspections suffered a number of oversights and process breakdowns in 2020. According to the Federal Monitor, PG&E failed to perform all 967 enhanced climbing inspections of 500 kV towers in HFTD prior to peak fire season, despite PG&E's internal goal to complete these inspections by August 31, 2020.[124] Furthermore, the Federal Monitor also found significant shortcomings in asset inspections in 2019:

> The Monitor team found issues likely missed by PG&E's inspectors on approximately 12 percent of the assets our team

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[121] "PG&E currently believes the Gray Pine of interest may have been identified for removal (but not removed) during restoration efforts following the Carr Fire in 2018, based on certain records recently reviewed by PG&E concerning that restoration work." PG&E, *Response to Request for Follow Up by PG&E Concerning its October 26 Submission* (Case No. 14-CR-00175-WHA Doc. No. 1265), November 18, 2020, p. 22.

[122] Judge William Alsup, *Questions for Follow-Up* (Case No. 14-CR-00175-WHA Doc. No. 1307), February 18, 2020, p. 5.

[123] Judge William Alsup, *Questions for Follow-Up* (Case No. 14-CR-00175-WHA Doc. No. 1307), February 18, 2020, pp. 1-2.

[124] Letter from the Federal Monitor to Judge Alsup (Case No. 14-CR-00175-WHA Doc. No. 1247-1), pp. 3-4, October 16, 2020.

> inspected, and [PG&E] inspectors failed to collect basic asset information for PG&E's recordkeeping purposes on approximately one-third of assets inspected.[125]

In PG&E's November 2020 response to the Federal Monitor's findings, PG&E stated, "Due to operational delays associated with digitizing inspection forms for 500 kV towers…these inspections [enhanced climbing inspections of 500kV towers] were not started until early August [2020]."[126] Digitizing forms is not a valid reason to delay critical inspections of high-risk assets given that PG&E could have performed inspections with paper forms.

Moreover, when PG&E finally did begin the climbing inspections of transmission towers in early August, the inspections began outside HFTD rather than in the highest-risk areas, due to a lack of direction provided to the execution team.[127, 128] When asked who was responsible for setting priorities about where to perform the inspections, PG&E acknowledged that the decisions were not guided by risk:

> There was no precise starting point specified for 2020 tower climbing inspections. The in-scope transmission structures were provided to the execution team with no specific physical starting point.[129]

This type of management failure demonstrates PG&E's continued failure to make safety central to its culture. It is inexcusable that PG&E cannot execute inspections based on risk, or even broadly prioritize areas with the greatest risk.

Separate from PG&E's failure to meet its goals for tower climbing inspections, an internal audit by PG&E's Electric Quality Assurance unit in September 2020 revealed that 41,343 distribution poles did not have records demonstrating that intrusive (Pole Test & Treat)

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[125] Letter from the Federal Monitor to Judge Alsup (Case No. 14-CR-00175-WHA Doc. No. 1247-1), p. 3, October 16, 2020.

[126] PG&E, *Response to Order Re Monitor Letter* (Case No. 14-CR-00175-WHA Doc. No. 1258), November 3, 2020, p. 4.

[127] "At that time, the work execution group was not given specific guidance on where to initiate the inspections following the delay, and the decision was made to start in non-HFTD areas where about 60% of the 500 kV towers are located. This was a process breakdown." PG&E, *Response to Order Re Monitor Letter* (Case No. 14-CR-00175-WHA Doc. No. 1258), November 3, 2020, p. 4.

[128] PG&E's response to Data Request CalAdvocates-PG&E-R1810007-29, Question 4, December 18, 2020.

[129] PG&E responses to data request CalAdvocates-PGE-R1810007-29, Question 4, December 18, 2020.

inspections were performed within the last 20 years.[130] PG&E's 2021 WMP states that PG&E actually goes beyond the General Order 165 requirements, and inspects distribution poles every 10 years.[131] However, PG&E was unable to confirm that it has inspection records showing that all poles located with HFTDs had been inspected on either the General Order 165 or PG&E's internal schedule.[132]

Continuing this pattern of failure, PG&E sent a letter to the Safety Enforcement Division and the WSD on March 4, 2021 stating that PG&E had not inspected 24 hydroelectric substations in HFTDs in 2020, and had also failed to perform enhanced inspections of 5 associated poles in the HFTD in 2019 and 2020.[133] These assets were omitted from the scope of the 2020 WMP enhanced inspections.[134] These omissions raise the question of what other assets PG&E failed to include in its enhanced inspection scope.

PG&E's March 4, 2021 letter also states that PG&E did not have complete asset information for certain hydroelectric facility distribution lines,[135] which echoes similar findings by the Federal Monitor (noted above in this section).

These examples – from missed inspections, to an inability to produce inspection records, to failing to collect complete asset information – demonstrate systemic disorganization within PG&E's inspection process.

The WSD should require PG&E shareholders to hire a consultant to perform a full audit of its enhanced inspection processes and scope. PG&E should be required to present a report to the WSD identifying corrective actions that address the causal factors that contributed to the

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[130] Intrusive inspections are required at least every 20 years by General Order 165. PG&E's response to Data Request CalAdvocates-PG&E-R1810007-32, Question 2, January 27, 2021.

[131] PG&E's 2021 WMP, p. 584.

[132] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-09, Question 7, March 4, 2021.

[133] The missed inspections were enhanced, ground-based asset inspections, which PG&E planned to perform on 100 percent of distribution poles in HFTD areas in 2019. The five poles were linked to hydroelectric facilities. This issue is unrelated to the intrusive pole inspections discussed above. See PG&E's letter to the Safety and Enforcement Division re: PG&E 2019 and 2020 Wildfire Mitigation Plan Update, March 4, 2021, p. 4.

[134] PG&E's letter to the Safety and Enforcement Division re: PG&E 2019 and 2020 Wildfire Mitigation Plan Update, March 4, 2021.

[135] PG&E's letter to the Safety and Enforcement Division re: PG&E 2019 and 2020 Wildfire Mitigation Plan Update, March 4, 2021, p. 3.

issues outlined above. Additionally, the WSD should require PG&E to publicly serve (via the service list of R.18-10-007) the causal evaluation and list of recommendations from the independent contractor it has hired to examine its distribution intrusive pole inspections.[136]

G. The WSD should require PG&E to file regular reports on its quality assurance and control processes for inspections.

PG&E uses vague and noncommittal language to describe PG&E's processes for quality assurance and quality control (QA/QC) of distribution and transmission asset inspections.[137] For example, PG&E states:

> Among other things, quality assurance could mean establishing baseline metrics and measures of program performance to highlight outliers in any inspection process step. Quality controls can be established to identify inspection personnel who report abnormally high or low rates of corrective findings in the field. This could also mean identifying inspection personnel who experience abnormal rates of changes of their initial findings (increased or decreased priority of findings, rejection of findings).[138]

Use of language such as "could mean," "can be established," and "could also mean" is not responsive or helpful. It indicates a lack of commitment to a specific, actionable process to ensure that all inspections are performed adequately, and that underperforming inspectors are retrained or removed from inspection work (as appropriate). This vague language also makes it harder to hold PG&E accountable as such weak language could enable PG&E to avoid enforcement if its failures persist.

In addition to using vague language, PG&E is asserting that its QA/QC processes for asset inspections are relatively new. When asked how many times PG&E has implemented controls related to "identifying inspection personnel who experience abnormal rates of changes

[136] PG&E hired an independent contractor to support a causal evaluation to investigate this item and recommend corrective actions. PG&E's response to Data Request CalAdvocates-PGE-2021WMP-09, Question 7, March 4, 2021.

[137] PG&E's 2021 WMP, Section 7.3.4.14, pp. 618-620.

[138] PG&E's 2021 WMP, p. 618, emphasis added.

of their initial findings," PG&E responded that it did not have a procedure in place in 2020.[139] As such, the effectiveness of PG&E's QA/QC controls related to this issue cannot be verified.

PG&E is the only large utility that does not perform quality control in the field for asset inspections. While PG&E performs "inspection work verification sampling and data analysis" to "enable timely corrective interventions,"[140] this quality control process entails only a review of the inspection records (including photos) and does not include a physical reinspection of assets in the field.[141] By contrast, SCE states that it plans to perform QC inspections of completed inspections for 5,000 transmission, distribution, and generation structures in HFTD areas,[142] and SDG&E randomly selects 1.5% of electric inspections to reassess.[143] In a meeting between Cal Advocates and representatives from PG&E, SCE, and SDG&E on March 12, 2021, SCE and SDG&E both clarified that their QC processes include a physical reinspection of the asset.

Detailed and accurate asset inspections are vital to ensure PG&E has up-to-date knowledge of potential failures, early enough to correct them before they can cause an outage or ignition. However, PG&E's stated process to assure the quality of these inspections is vague and largely untested.

The WSD should require PG&E to file a quarterly or semi-annual report detailing any changes to its inspection QA/QC processes. In these reports, PG&E should be required to provide the following:

- The number of inspection personnel (either employee or contractor) who, to date, have reported abnormally high or low rates of corrective findings in the field;
- The number of inspection personnel who, to date, have observed abnormal rates of change of their initial findings;[144]

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[139] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-09, Question 10, March 2, 2021.

[140] PG&E's 2021 WMP, p. 619: "inspection work verification sampling and data analysis seek to rapidly sample and monitor performance to enable timely corrective interventions such as re-training, guidance clarification, and even re-inspection."

[141] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-09, Question 11, March 2, 2021.

[142] SCE's 2021 WMP, p. 184.

[143] SDG&E's 2021 WMP, p. 155.

[144] Per PG&E's response to Data Request CalAdvocates-PGE-2021WMP-09, Question 10, February 25, 2021, PG&E does not yet have specific, objective criteria for what constitutes "abnormal rates of change" in this context. PG&E is developing this metric, with intent to implement it in the second quarter of 2021.

- The number and percentage of inspections (of each type) that failed QC on the first attempt;
- The number of cases in which an inspection QA/QC process has resulted in a re-inspection of assets;
- For each case above, the short-term and long-term corrective actions PG&E has taken to remediate the issue.

The WSD should also convene a technical working group with the three large IOUs and interested stakeholders to develop best practices for QA/QC. This working group should address best practices for asset and enhanced vegetation management inspections, and how the utilities assure the quality of asset inspections and enhanced vegetation management work that has been completed.

H. The WSD should require PG&E to submit a corrective action plan to address the high number of worker injuries related to wildfire mitigation efforts.

PG&E reports a large number of injuries associated with wildfire mitigation activities in 2019 and 2020. In 2019, PG&E had 92 employee or contractor injuries.[145] In 2020, PG&E had one fatality and 95 injuries (72 of which were contractor injuries associated with vegetation management).[146] Per PG&E's comments on WMP Table 5, these numbers represent the number of OSHA-*recordable* injuries, rather than the number of OSHA-*reportable* injuries which is

[145] PG&E's second supplemental response to Data Request CalAdvocates-PGE-2021WMP-07, Question 12, March 26, 2021.

[146] PG&E's 2021 WMP Errata, Tables 4 and 5, March 17, 2021.

what the WSD requested.[147] As OSHA-recordable injuries encompass a broader range of injuries,[148] meaningful comparisons between PG&E and its peer utilities are not possible.[149]

PG&E's original 2021 WMP submission reported inaccurate numbers of injuries and fatalities. PG&E originally reported 53 injuries and 1 fatality in 2019, and 70 injuries in 2020,[150] before correcting these numbers in their March 17, 2021 errata[151] and March 26, 2021 revised data request responses.[152] While correcting the errors in the initial filing of PG&E's 2021 WMP, the errata creates a significant a discrepancy with PG&E's 2020 WMP.[153]

PG&E's measures implemented to reduce injuries are insufficient. PG&E was unable to provide information for the most common contributing factors to injuries due to vegetation management (the largest category by far), stating that PG&E tracks types of incidents rather than contributing factors.[154] Instead, PG&E provided only cursory descriptions of the types or proximate causes of injuries, such as "Cut, Puncture, Scrape, Noc [sic]"[155] or "Fall/Slip/Trip-To

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[147] "PG&E does not generally and centrally track Occupational Safety and Health Administration (OSHA) reportable incidents for contractors." PG&E's 2021 WMP, p. 268.

[148] The wildfire mitigation plan submissions require utilities to report how many employees or contractors suffered "OSHA-reportable" injuries related to wildfire mitigation work. OSHA-reportable injuries are serious, involving inpatient hospitalizations, amputations, loss of an eye, or heart attacks. See 36 Code of Federal Regulations 1904, Subpart E, https://www.osha.gov/laws-regs/regulations/standardnumber/1904/1904.39.

Recordable injuries include: "Any work-related injury or illness that results in loss of consciousness, days away from work, restricted work, or transfer to another job; any work-related injury or illness requiring medical treatment beyond first aid; any work-related diagnosed case of cancer, chronic irreversible diseases, fractured or cracked bones or teeth, and punctured eardrums" and certain other situations. See https://www.osha.gov/recordkeeping.

[149] According to Tables 4 and 5 from their respective WMP submissions, SCE had 5 OSHA-reportable injuries and 1 fatality associated with mitigation activities from 2019 to 2020. SDG&E had no OSHA-reportable injuries or fatalities in 2019 or 2020.

[150] PG&E's 2021 WMP, Tables 4 and 5.

[151] PG&E's 2021 WMP Errata, Tables 4 and 5, March 17, 2021.

[152] PG&E's second supplemental response to Data Request CalAdvocates-PGE-2021WMP-07, Question 12, March 26, 2021.

[153] Per PG&E's Revised 2020 WMP, Table 2, filed February 28, 2020, PG&E reported 1 fatality and 28 injuries associated with wildfire mitigation work in 2019.

[154] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-07, Question 12, March 1, 2021.

[155] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-17, Question 2, March 17, 2021.

Floor/Walkwa [sic]".[156] In 15 cases, the cause of injury was listed as either "NULL" or "Unknown."[157]

Without properly tracking either the immediate causes or the underlying factors that contribute to worker injuries, PG&E's ability to implement effective corrective actions to reduce the possibility of injury during its wildfire mitigation activities is hampered. PG&E's stated measures amount to verifying contractor training records, interviewing vegetation management leadership, and reviewing vendor safety oversight plans.[158] PG&E has not demonstrated that it investigated the causes of injuries that may have been due to unsafe processes and procedures.

PG&E's efforts to ensure worker safety in other wildfire mitigation initiatives are similarly lacking. For the categories of utility inspection and grid hardening, PG&E states it "has not implemented, and does not plan to implement, any measures…to reduce the number of injuries and fatalities associated with [these categories of work] specifically."[159]

PG&E *does* provide a lengthy list of general improvements such as increasing supervisor field time, safe driving campaigns, making heat exhaustion products available, and improving employee and contractor trainings.[160] These mitigations are likely to address general causes of injury such as exertion or falls, but are unlikely to address injuries due to specific circumstances that may arise in different areas of work. Moreover, PG&E's list includes actions taken since the beginning of 2019, so it is unclear whether PG&E has taken any action in response to the large numbers of worker injuries that occurred in 2019 and 2020.

While PG&E has taken some steps to reduce the number of injuries associated with WMP initiatives, the level of detail provided, and the inaccuracies in WMP non-spatial Tables 4 and 5, raise concerns with PG&E's ability to track injuries accurately and to develop effective mitigation strategies.

The WSD should require PG&E to perform an internal audit on worker safety in its vegetation management, asset inspection, and grid hardening programs. The audit should:

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[156] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-17, Question 2, March 17, 2021.

[157] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-17, Question 2, March 17, 2021.

[158] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-07, Question 12, March 1, 2021.

[159] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-17, Questions 1 and 3, March 17, 2021.

[160] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-17, Question 5, March 17, 2021.

- Identify the root causes of these worker injuries;
- Examine why the number rose so sharply from 2019 to 2020;
- Investigate longer-term trends for worker injuries occurring in the course of similar work at PG&E (e.g., vegetation management, asset inspections, and grid rebuilding), even if the work occurred prior to PG&E's first WMP; and
- Identify corrective actions to mitigate any root causes found.

PG&E should also fully explain the errors in its original data tables. The results from these audits should be served via the R.18-10-007 service list by the end of September 2021.

I. The WSD should require PG&E to explain whether and why it continues to install hazardous equipment in HFTD areas.

It appears that PG&E continues to install expulsion fuses, which are considered to be fire hazards, in HFTD areas. The geospatial data PG&E provided with its 2020 Quarter 4 Quarterly Report indicates that 1,529 expulsion fuses were installed in HFTD areas in 2020, and 1,268 were installed in 2019. This is troubling because, as PG&E explains, expulsion fuses have "the potential to spread hot molten metal material which could cause one or more ignitions."[161] Exempt (or non-expulsion) fuses "reduce fire risk."[162]

Meanwhile, PG&E plans to *replace* 1,843 expulsion fuses in HFTD areas in 2020 and 2021.[163] If PG&E's data is accurate, it means that PG&E is installing expulsion fuses in areas with high fire risk even faster than it is removing them due to their fire risk.

While PG&E claims that, "some expulsion fuses have additional safety features, including self-containment capabilities, which enable them to be categorized as exempt," it was unable to state whether any of the 2,797 fuses it has recently installed in the HFTD meet the requirements to be exempt.[164] Contrary to PG&E's assertion, the California Code of Regulations states that only a "current limiting non-expulsion fuse" is considered exempt, which does not appear to allow for any exempt expulsion fuses.[165]

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[161] PG&E's 2021 WMP, p. 486.

[162] PG&E's 2021 WMP, p. 486.

[163] PG&E's 2021 WMP, p. 236.

[164] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-20, Question 2, March 16, 2021.

[165] California Code of Regulations, Title 14, § 1255, "Exemptions to Minimum Clearance Provisions -

Installing new equipment that poses a fire hazard, while PG&E is simultaneously working to remove such equipment, is neither prudent nor just and reasonable. Therefore, the WSD and the Commission should clarify that the costs of installing non-exempt fuses, or replacing recently installed non-exempt fuses, in HFTD areas are not recoverable from ratepayers.

J. The WSD should require PG&E to develop and provide a workplan for replacing expulsion fuses in HFTD.

PG&E forecasts replacing approximately 1,200 non-exempt fuses and other non-exempt equipment in HFTDs in 2021.[166] However, as of March 2021, PG&E does not have a workplan for where these fuse replacements will occur.[167] Without a specific workplan, it is impossible to determine if PG&E is effectively targeting these replacements to maximize their risk reduction.

PG&E has approximately 22,000 expulsion fuses in HFTDs,[168] and forecasts replacing about five percent of them in 2021. At this rate, it will take PG&E nearly two decades to remove all the expulsion fuses from the HFTD. By comparison, Bear Valley Electric Service replaced more expulsion fuses than PG&E in 2020, although PG&E's service territory is two thousand times as large.[169], [170]

Not all of PG&E's circuits in HFTDs have the same risk. As discussed previously, 758 circuit segments account for 75 percent of the total equipment-related wildfire risk in PG&E's

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PRC 4292."

[166] PG&E's 2021 WMP, p. 486.

[167] "As described in Section 7.3.3.7 of the 2021 WMP, PG&E plans to replace approximately 1,200 expulsion fuses with CAL FIRE exempt fuses in 2021. At this time the location of these fuses is being developed." PG&E's response to Data Request CalAdvocates-PGE-2021WMP-15, Question 3, March 9, 2021.

[168] Extracted from the geospatial data PG&E provided with its 2020 Q4 Quarterly Report. Note that PG&E's 2020 WMP states, "PG&E estimates it has roughly over 15,000 non-exempt fuse devices." See PG&E's 2020 WMP, revised on February 28. 2020, p. 3-6.

[169] Bear Valley Electric Service replaced 2,001 expulsion fuses in 2020 and plans to replace the remaining 901 expulsion fuses on its system in 2021. PG&E replaced 643 expulsion fuses in 2020 in the HFTD in 2020 and plans to replace 1,200 in 2021. Bear Valley plans to finish its fuse replacement program in 2021. *See* Bear Valley's 2021 WMP, p. 59; PG&E's 2021 WMP, pp. 358 and 486-487.

[170] Bear Valley Electric Service also has significantly lower unit costs than PG&E. Bear Valley estimates a cost of about $1,800 per fuse replacement, while PG&E estimates $12,500 per fuse. *See* Bear Valley's 2021 WMP, Table 12; PG&E's 2021 WMP, p. 488 and Table 12.

HFTD.[171] While the system hardening model specifically estimates risk associated with *conductor* failure, it is the best approximation for *fuse* risk available at this time.

The WSD should require PG&E to develop and submit a specific workplan for 2021 and 2022 for replacing expulsion fuses in HFTD. PG&E should submit this workplan when it submits a revised 2021 WMP. Additionally, PG&E should be required to develop a three-year workplan for fuse replacements, to be submitted with its 2022 WMP submission.

K. The WSD should require PG&E to develop a workplan to replace small copper conductor across its HFTDs.

In PG&E's September 2020 Quarterly Report, in response to Condition PG&E-2 "Equipment Failure," PG&E stated that a "leading factor" contributing to PG&E's high rate of equipment failures was "the large percentage of small copper conductor found across PG&E's rural service territory."[172, 173] However, in PG&E's Supplemental WMP Filing, PG&E stated, "The quantity of "6 CU" copper conductor removed in relation to [System Hardening Program projects] is not a data point that PG&E specifically maintains and thus the information is not readily available."[174]

Thus, while PG&E states that it knows the mileage of small copper conductor in HFTD,[175] PG&E's response above indicates that the amount of small copper conductor that has been removed in HFTD, or that is planned for removal in HFTDs, is not tracked. Given PG&E's claim that the prevalence of small copper conductor is a "leading factor" in PG&E's equipment failures, it is important for PG&E to track the amount of small copper conductor being replaced within these high-risk areas.

The WSD should require PG&E to track the amount of small copper conductor replaced within HFTDs. PG&E should also be required to develop and provide a workplan to replace

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[171] Analysis of PG&E's 2021 Wildfire Distribution Risk Model for system hardening. PG&E's responses to Data Request CalAdvocates-PGE-2021WMP-19, Question 3, March 15, 2021.

[172] PG&E's September 2020 Quarterly Report, p. 98.

[173] In PG&E's Supplemental Filing from February 26, 2021, in response to Action PGE-27 (Class B), PG&E stated that conductor replacement programs are included in two separate Maintenance Activity Types (MAT). MAT 08W is PG&E's System Hardening Program which is focused on HFTD areas.

[174] PG&E's 2021 WMP Supplemental Filing, p. 36, February 26, 2021.

[175] "Defining small copper conductor as 4, 6 and 8 copper, we have 3,589 miles in Tier 2, Tier 3 and Zone 1 HFTD," PG&E's response to Data Request CalAdvocates-PGE-2021WMP-16, Question 6, March 10, 2021.

small copper conductor in its highest-risk circuit segments within HFTDs within a specified timeframe.

L. The WSD should require PG&E to justify its use of non-composite poles.

PG&E plans on replacing 15,000 wood transmission poles with steel over the next ten years.[176] However, steel poles may not be the safest choice.

SCE is replacing a number of distribution poles with composite poles,[177] which provide "arcing resistance."[178] Laboratories have shown that a current produced on conductor-to-structure contact on a composite pole[179] will significantly lower wildfire ignition risk.[180] The Camp Fire[181] and Kincade Fire[182] were both caused by conductor-to-structure contact on steel

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[176] PG&E's 2021 WMP, p. 567.

[177] "To reduce the risk of fires and fire damage to poles and equipment, when poles need to be replaced in HFRA, SCE replaces them with fire resistant composite poles if the pole supports equipment or is in a woodpecker prone area." SCE's 2021 WMP, p. 211.

[178] SCE's 2021 WMP, p. 211.

[179] At an applied voltage of 240 kV, the leakage current across a four-foot length of a composite pole sample resulted in a maximum current of 54 microamperes. "RS Pole Module Testing and Quality Assurance Overview." RS Technologies Inc., p. 12. Available at https://www.rspoles.com/sites/default/files/resources/Module%20Testing%20and%20Quality%20Assurance%20Overview%20V1.2.pdf.

[180] "With traditional earth-fault detection sensitivity of 5-10 amps on rural powerlines in Victoria, 'branch touching wire' earth faults are certain to produce a fire in worst case conditions. If powerline earth-fault protection systems were to detect and respond to 0.5 Amp faults within two seconds, fire risk in 'branch touching wire' faults in worst case conditions would be reduced tenfold compared to current levels." "Powerline Bushfire Safety Program," pp. 6-7. Available at https://www.energy.vic.gov.au/__data/assets/pdf_file/0022/41719/R_D_Report_-__Marxsen_Consulting_-_Vegetation_conduction_ignition_tests_final_report_15_July_2015_DOC_15_183075_-_external_.PDF Per the above, it can be estimated that a 0.5 Amp (500,000 microamperes) has approximately a 10% of causing an ignition in worse-case conditions. As 54 microamperes is approximately ten thousand times smaller, the likelihood of ignition due to conductor contact with a composite pole is expected to be very low.

[181] "A Summary of the Camp Fire Investigation." Butte County District Attorney, p. 2. Available at https://www.buttecounty.net/Portals/30/CFReport/PGE-THE-CAMP-FIRE-PUBLIC-REPORT.pdf?ver=2020-06-15-190515-977. Per pp. 2-3 of this report, a C-hook supporting an energized line had worn through, allowing the line to contact the tower structure.

[182] Jaxon Van Derbeken. "Kincade Fire Tied to PG&E Failure to Decommission an Unneeded High-Voltage Line." Available at https://www.nbcbayarea.com/news/local/kincade-fire-tied-to-pge-failure-to-decommission-an-unneeded-high-voltage-line/2384828/.

transmission structures, which raises concerns with PG&E's plan to replace wood poles with steel.

PG&E has not explained why it selected steel rather than composite transmission structures. The WSD should review document "WildfireMitigationPlans_DR_CalAdvocates_047-Q03-Atch01_CONF," which PG&E provided confidentially in response to Cal Advocates' question regarding pole materials.[183]

PG&E is also spending over $300 million per year[184] replacing wood *distribution* poles with new wood poles.[185] Wood distribution poles are a fire risk. Canadian utility Manitoba Hydro states that "pole fires are a common cause of electrical outages."[186] PG&E is using an "intumescent mesh covering" to cover some wood poles in Tier 2 and 3 HFTD areas.[187] However, PG&E has provided no evidence that this covering will prevent wildfires caused by wire-to-structure contact.[188] Even if the covering does prevent fires from wire-to-structure contact, PG&E would need to also cover its wood crossarms with this material to significantly reduce the wildfire risk from wire-to-structure contact.[189]

To maximize the safety benefits of PG&E's investment at a time when PG&E is replacing a significant number of poles, the WSD should require PG&E to provide a detailed analysis that shows why the pole materials it has selected are appropriate risk mitigation measures. This analysis should include a complete lifecycle cost-benefit analysis on pole material for both transmission and distribution. PG&E's analysis of pole material should specifically include wood, steel, and composite materials and the risk reduction from conductor-to-structure contact for each material. The WSD should require PG&E to submit the results of this analysis with PG&E's WMP submission in 2022, if not sooner.

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[183] PG&E's confidential response to Data Request CalAdvocates-PGE-2021WMP-13, Question 3, March 9, 2021.

[184] PG&E's 2021 WMP, Table 12.

[185] PG&E's 2021 WMP, p. 484.

[186] "Pole fires." Manitoba Hydro. https://www.hydro.mb.ca/outages/pole_fires/

[187] PG&E's 2021 WMP, p. 484.

[188] PG&E response to Data Request CalAdvocates-PGE-2021WMP-13, Question 1, March 9, 2021.

[189] Crossarms made of wood or metal on a wood or metal structure normally have a current path to ground and, therefore, represent an arcing and fire risk.

M. The WSD should require PG&E to study the benefits of performing routine climbing inspections of transmission structures below 500 kV in HFTD areas.

PG&E annually performs climbing inspections of 500 kV transmission tower structures in HFTD Tier 3, and every 3 years for towers in HFTD Tier 2.[190] All transmission structures, including those below 500 kV, are inspected by ground and aerial inspections.[191] However, only 500 kV structures are subject to regular climbing inspections.[192] Other transmission structures are inspected by climbing inspections only on an "as-triggered" basis, which can include structural concerns, or "to assess a condition that could not be adequately assessed when identified during a detailed ground aerial inspection or patrol."[193]

Two major wildfires in the past three years have been linked to PG&E transmission towers operating below 500 kV: the Camp Fire in 2018 (115 kV tower)[194] and the Kincade Fire in 2019 (230 kV tower).[195] While PG&E states that it performs routine ground and aerial inspections of transmission structures in HFTDs, PG&E's decision to only perform climbing inspections of its highest-voltage towers is at odds with PG&E's record of fires on lower voltage transmission lines.

The WSD should require PG&E to study the efficacy of performing detailed climbing inspections of all transmission structures in HFTDs on a regular schedule. The study should examine alternative schedules, ranging from annual inspections to a five-year cycle. PG&E should also demonstrate the efficacy of alternatives, such as aerial inspections. In particular, PG&E should examine the efficacy of aerial inspections in early detection of the types of failures that led to the Camp and Kincade Fires. PG&E should be required to submit this report by the end of September 2021.

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[190] PG&E's 2021 WMP, p. 583.

[191] PG&E's 2021 WMP, pp. 583-584.

[192] PG&E's 2021 WMP, p. 583.

[193] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-09, Question 15, March 2, 2021.

[194] "A Summary of the Camp Fire Investigation." Butte County District Attorney, p. 2. Available at https://www.buttecounty.net/Portals/30/CFReport/PGE-THE-CAMP-FIRE-PUBLIC-REPORT.pdf?ver=2020-06-15-190515-977.

[195] PG&E's incident report submitted to SED on October 24, 2019.

N. The WSD should require PG&E to study the benefits of performing aerial inspections of distribution assets.

While PG&E utilizes aerial inspections[196] for transmission assets and substations,[197] and for patrol inspections of distribution lines,[198] PG&E's WMP does not provide for the use of aerial inspections for detailed inspections of distribution assets. Aerial inspections (conducted from a drone or helicopter) can detect issues that may not be visible from ground-based detailed inspections, such as woodpecker damage to the top of crossarms, deteriorated electrical connections on top of transformers, or missing/deteriorated insulator pins.[199]

In 2019, SDG&E began a pilot program to determine whether the use of drones could improve or enhance its inspection efforts in HFTDs.[200] An analysis of over 8,000 distribution poles inspected both from a drone and from the ground determined that, on average, drone inspections found 51 percent more issues on the same assets compared to ground inspections.[201] In 2020, the vast majority of SDG&E's critical (level 1) inspection findings in HFTD areas were identified with drone inspections. SDG&E's drone inspections (all in Tier 3 HFTD) identified 132 critical issues,[202] while all other types of inspections in HFTD areas identified 32 such problems.[203]

SCE performs both ground and aerial inspections of its overhead distribution system,[204] and in 2020, aerial inspections accounted for 4,808 level 1 or 2 distribution inspection findings in HFTD areas, compared to 26,604 from ground inspections.[205] Both SDG&E's and SCE's use of

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[196] Per PG&E's 2021 WMP, pp. 589, aerial inspections can refer to inspections performed by drone, helicopter, and aerial-lift-vehicle.

[197] PG&E's 2021 WMP, pp. 583-584.

[198] PG&E's 2021 WMP, p. 652.

[199] SCE's 2021 WMP, p. 238.

[200] SDG&E's 2021 WMP, p. 247.

[201] SDG&E's 2021 WMP, p. 248.

[202] Per SDG&E's 2021 WMP, p. 248, drone inspections of distribution assets found 132 "emergency" issues and 1,823 "priority" issues in 2020.

[203] These are distribution inspections performed in HFTD areas, including patrol inspections, detailed ground inspections on the compliance schedule, and supplemental (more frequent) detailed ground inspections. Per SDG&E's 2021 WMP, Table 1, detailed and patrol inspections found 32 level 1 issues and 1,121 level 2 issues in 2020.

[204] SCE's 2021 WMP, p. 239.

[205] SCE's response to Data Request CalAdvocates-SCE-2021WMP-13, Questions 1 and 2, March 17,

ground and aerial inspections demonstrate that both types together find more level 1 and 2 problems, which should reduce the likelihood of equipment failure resulting in wildfire or other negative consequences.

PG&E should begin piloting aerial inspections while it studies their efficacy. There is significant evidence that aerial inspections provide real value in mitigating equipment hazards, when performed on distribution assets in HFTD areas. When PG&E submits its revised 2021 WMP following denial, PG&E should propose a proof-of-concept aerial inspection program to inspect a subset of distribution assets in high-risk areas. The pilot should be started promptly and designed to gather field data on the efficacy of aerial inspections. PG&E should compare the aerial inspections against detailed ground inspections of the same assets, and report on its findings in its WMP submission in 2022.

The WSD should also direct PG&E to perform a study to determine the cost and benefit of augmenting its detailed distribution inspections with aerial inspections. The study should consider alternative schedules, ranging from annual inspections to a five-year cycle. The WSD should require PG&E to submit this study with its WMP submission in 2022 alongside the results of the pilot program.

O. The WSD should investigate PG&E's covered conductor costs, which are far in excess of SCE's costs.

PG&E's covered conductor costs are much higher than SCE's costs (on a unit basis), and PG&E has not meaningfully explained its high costs. Thus, Cal Advocates is concerned PG&E is not sufficiently efficient in its system hardening.

In 2020, PG&E spent more than twice as much per mile as SCE on its equivalent covered conductor program.[206] It is not clear what contributes to this large cost difference; SCE implies

2021.

[206] In 2020, PG&E spent approximately 2.3 times as much per mile as SCE for covered conductor installation. PG&E spent approximately $439 million on 333 miles of overhead distribution hardening, per PG&E's response to Data Request CalAdvocates-PGE-2021WMP-12, Question 2, March 8. During this same period, SCE spent $546 million on 965 miles of covered conductor installation, per SCE's 2021 WMP, Table 12. These correlate to a per-mile spend of $1.3 million for PG&E and $0.57 million for SCE.

that replacing poles and transformers are part of SCE's covered conductor program,[207] which suggests these ancillary costs would not account for PG&E's significantly higher expenditures.

Looking at forecasts, PG&E plans to spend nearly a billion dollars on covered conductor installations in 2021 to 2022,[208] with an average cost of $1.6 million per mile. This is approximately triple SCE's 2021 projected costs of about $0.54 million per mile.[209] With costs this high, PG&E cannot deliver widespread risk reduction at a reasonable cost. PG&E must reduce its costs so that it can harden a significant fraction of its distribution system.

Additionally, because PG&E's costs exceed SCE's by three-fold, it is critical to ensure that PG&E is efficiently allocating money to address the highest risk circuit-segments. As discussed previously (see section C.2), PG&E's hardening efforts are not effectively targeted at high-risk circuits.

Besides raising questions of efficiency, PG&E's high costs for its system hardening also raise questions about PG&E's managerial effectiveness and decision-making. PG&E must demonstrate that it is capable of effectively managing infrastructure projects to deliver risk reduction speedily and at a reasonable cost.

To this end, the WSD should first require PG&E to separate its data for different types of hardening activities (overhead hardening, line removal, remote grid, and undergrounding).[210] When PG&E submits its revised 2021 WMP (following denial of its present submission), PG&E should provide costs, miles treated, and risk-spend efficiency (RSE) estimates for each activity.

Second, the WSD should require PG&E to investigate what makes PG&E's overhead distribution hardening program significantly more expensive per mile than SCE's covered conductor program and investigate ways to reduce this cost. PG&E should submit the findings of this investigation when it submits its revised 2021 WMP following denial.

Third, the WSD should direct PG&E to substantially improve the efficiency of its system hardening programs by the time of its WMP submission in 2022.

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[207] SCE's 2021 WMP, pp. 210 and 223.

[208] Specifically, PG&E plans to spend $259 million in 2021 and $677 million in 2022, for a total of $936 million. PG&E response to Data Request CalAdvocates-PGE-2021WMP-12, Question 2, March 8, 2021.

[209] SCE's 2021 WMP, Table 12.

[210] PG&E's 2021 WMP, Table 12, program 7.3.3.17.1, "Updates to grid topology to minimize risk of ignition in HFTDs, System Hardening, Distribution" aggregates the costs and the RSEs associated with covered conductor, undergrounding, and remote grids.

P. The WSD should direct PG&E to justify its information technology (IT) needs.

In 2020, PG&E recorded capital and operating expenditures of approximately $113 million in relation to IT needs associated with wildfire mitigation. In 2021, this number is projected to rise to $143 million.[211] These costs account for approximately 60 percent of PG&E's total electric division IT expenditures .[212]

While SDG&E and SCE do not list WMP-related IT costs in a similar manner to PG&E, a sum of all programs under the "Data Governance" category indicates that SDG&E's highest forecast WMP-related IT expenditure from 2021 to 2022 is $22.7 million.[213] SCE's highest forecast is $16.8 million during the same period.[214]

PG&E's WMP-related IT costs appear to be significantly higher (almost $100 million higher) than its peer utilities. The WSD should direct PG&E to explain why its IT needs are so expensive and whether it has considered less costly alternatives (such as using cloud computing services through Amazon Web Services or Microsoft Azure).

Q. The WSD should require PG&E to explain why its filings about ignition investigations contradict one another.

In PG&E's September 2020 Quarterly Report, in response to Condition PG&E-2 Equipment Failure, PG&E stated:

> One reason why we have higher than expected equipment failures is the current protocol for categorizing "initiating events." At this time, when a PG&E first responder is unable to identify the cause for ignition in a timely manner, our reporting standards and requirements direct that the ignition cause is defaulted to equipment failure. In many instances, this designation may not

[211] PG&E's 2021 WMP, Table 12, Program 7.3.7.5 "Other, IT projects to support wildfire mitigation work."

[212] Per PG&E's response to Data Request CalAdvocates-PGE-2021WMP-08, Question 12, February 25, 2021, PG&E's total IT expenditures for the electric division were approximately $188 million in 2020,and are projected to be approximately $223 million in 2021.

[213] SDG&E's 2021 WMP, Table 12, sum of all entries under the category "Data Governance."

[214] SCE's 2021 WMP, Table 12, sum of all entries under the category "Data Governance."

> properly categorize the true cause for ignition, but it remains documented as such.[215]

In PG&E's Supplemental Filing, in response to Action PGE-26 (Class B), PG&E stated that its earlier response to Condition PGE-2 in its September 2020 Quarterly Report required correction, and provided the following:

> PG&E has a detailed process for investigating the cause of every potentially PG&E-attributable ignition event and correcting systems of record when discrepancies are identified. This investigation process and associated systems of record do not have a default for a suspected initiating cause.[216]

PG&E asserts that the statement in its September 2020 Quarterly Report "was written by employees who misunderstood PG&E's ignition investigations process and thus mistakenly included the statement regarding defaulting to equipment failure."[217]

Here, PG&E appears to admit that it assigned inappropriate personnel to write this response. This raises concerns related to the validity of other statements within the September 2020 Quarterly Report and subsequent reports. PG&E should explain how this happened. Alternatively, it is possible that PG&E *did* assign appropriate personnel to respond to the WSD's conditions. This raises the concern that the stated process in the September 2020 Quarterly Report may have been an "unofficial" process followed by some personnel in the field, leading to incorrect classifications of ignition causes.

The WSD should require PG&E to provide a detailed explanation for the difference between its responses in the September 2020 Quarterly Report and its Supplemental Filing. Furthermore, PG&E should investigate whether any field personnel have, in the last three years, followed the process stated in the September 2020 Quarterly Report and assigned ignitions a default cause of "equipment failure" prior to a thorough investigation.

The WSD should also require PG&E to review the accuracy of its other responses to conditions in its September 2020 Quarterly Report. PG&E should correct any mischaracterizations found and provide an affidavit for the accuracy of the rest. PG&E should

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[215] PG&E's September 2020 Quarterly Report, p. 98.

[216] PG&E's 2021 WMP Supplemental Filing, p. 34, February 26, 2021.

[217] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-16 Question 1, March 10, 2021.

submit these supplemental filings when PG&E submits a revised WMP following denial. The WSD must hold PG&E accountable for its failures to provide accurate information to the Commission.

R. The WSD should require PG&E to justify and update its risk-spend efficiency (RSE) calculations.

PG&E included detailed spreadsheets with its 2021 WMP submission with RSE estimates for many of its mitigation initiatives. Cal Advocates has noted a number of erroneous assumptions and irregularities that diminish the accuracy and therefore the usefulness of these calculations. RSEs represent the efficiency of a given program at mitigating risk by estimating the quantifiable amount of risk reduced for each dollar in expenditures related to the program.

Flawed RSEs could contribute to a flawed overall strategy for risk mitigation. For example, it could lead to a utility cutting a useful program. Alternatively, it could result in expanding an ineffective program, which could cause unwarranted charges to ratepayers and contribute to a catastrophic wildfire due to programs addressing less risk than predicted.

1. PG&E's data submissions include multiple errors.

PG&E's rapid earth-fault current limiter pilot was originally reported to have an RSE of 0.06.[218] PG&E later revealed that this RSE score was due to an error in its calculations and the correct value is 104.[219] In PG&E's errata on March 17, 2021, PG&E corrected a number of costs, and updated 12 more RSE values, several of which changed by an order of magnitude or more.[220]

2. Some of PG&E's estimates are based on flawed logic.

PG&E relies on flawed assumptions to estimate effectiveness for maintenance programs and vegetation management. For example, many of PG&E's inspection programs estimate effectiveness based on the number of maintenance tags discovered and remediated:

> The expectation here is that if something is marked as a Priority A, it is unlikely to last through a Priority B tag, which is to be addressed within 90 days. Using that assumption, PG&E estimated

[218] PG&E's 2021 WMP, Table 12, Program 7.3.3.17.4 "Updates to grid topology to minimize risk of ignition in HFTDs, Rapid Earth Current Fault Limiter."

[219] PG&E Response to MGRA_010 Q27, March 2, 2021.

[220] PG&E's 2021 WMP Errata, pp. 19-22, March 17, 2021.

> that something that is tagged with Priority A is expected to fail between the duration of correction between an A and a B tag, or between 30-90 days. As such, a Priority A tag is estimated to fail within 60 days. To annualize this, PG&E estimates that there is a 1.0 – (60/365) = ~84 percent chance of failure. This was conservatively reduced to 70 percent after review with the PG&E team.[221]

In a similar (but inverse) manner, PG&E estimates that Priority B tags have a 38 percent chance of failure, which PG&E then adjusted upward to 50 percent.[222]

When asked to justify the adjustments made to the estimated failure rates of Priority A and B tags, PG&E stated, "subject matter experts… thought 84% could be too high," and "subject matter experts… thought 38% could be too low." In both cases, PG&E stated, "there is no additional evidence to support the revised failure rate."[223]

In addition to lacking supporting evidence, PG&E's estimates are not logical, as PG&E inspects its highest risk assets once per year.[224] If a priority A tag truly would fail within 60 days if un-remediated, then the combination of PG&E's inspection cycles and the "estimated" failure time would imply that PG&E's inspections are unlikely to catch most issues that would be considered priority A before they fail.

Furthermore, for program 7.3.5.2, "Detailed inspections of vegetation around distribution electric lines and equipment," PG&E assumes the probability of an untrimmed tree causing an outage to be 70 percent.[225] When asked to justify this, PG&E explained that it "used the same estimation as with assets and inspections to ensure consistency across how tags are utilized."[226] This assumption is inherently flawed, since vegetation management and asset inspections are completely different programs with different causes of failure.

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[221] PG&E's 2021 WMP, p. 65.

[222] PG&E's 2021 WMP, p. 65.

[223] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-06, Question 4, March 1, 2021.

[224] PG&E's 2021 WMP, pp. 586 and 612.

[225] PG&E's 2021 WMP, attachment 7.3.5_RSE_Input_Template_EO_WLDFR.xlsm.

[226] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-06, Question 6, February 24, 2021.

3. PG&E's program exposures should track the percentage of assets treated annually.

Many of the inputs to PG&E's RSE calculations do not appear to be consistent with definitions in other parts of PG&E's WMP. Table 3 below is a partial list of apparently inconsistent data points in PG&E's RSE calculations. The most severe contradictions appear to occur with program exposure (the fraction of relevant assets that the program reaches each year).[227] PG&E explains that its exposure calculations are "based on the ratio of ignition count targeted by the initiative over the inherent risk (i.e. ignition count absent of this initiative)."[228]

Table 3
A partial list of contradictory data inputs to PG&E's RSE calculations

Input	Location of Input	Reason for Questioning the Accuracy	Location of Reason For Questioning the Accuracy
100% program exposure for crossarm maintenance	PG&E's 2021 WMP Attachments "7.3.3_RSE_Input_Template_EO_WLDFR" sheet "1-Program Exposure"	PG&E states that PG&E conducts bi-annual patrols in HFTD Tier 2 rural areas, which would imply not every crossarm is looked at each year by PG&E.	PG&E's 2021 WMP p. 281
100% program exposure for distribution pole replacement and reinforcement	PG&E's 2021 WMP Attachments "7.3.3_RSE_Input_Template_EO_WLDFR" sheet "1-Program Exposure"	PG&E states that PG&E conducts intrusive pole inspections on a 10-year cycle.	PG&E's 2021 WMP p. 601

[227] Per PG&E's 2021 WMP, attachment 7.3.3_RSE_Input_Template_EO_WLDFR.xlsm, "exposure" is the fraction of the total tranche exposure, to which the program applies. In other words, for a given tranche (e.g., "HFTD - Distribution - Tier 3 – All," the fraction of that tranche to which a given mitigation program applies).

[228] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-06, Question 1, March 1, 2021.

11.1% - 20.4% program exposure for expulsion fuse replacement program in HFTD Tier 2 and 3	PG&E's 2021 WMP Attachments "7.3.3_RSE_Input_Template_EO_WLDFR" sheet "1-Program Exposure"	Per the geospatial data PG&E provided with its 2020 Q4 Quarterly Report, PG&E has over 22,000 expulsion fuses located in the Tier 2 and Tier 3 HFTD areas. In its 2021 WMP, PG&E states that PG&E completed 643 fuse replacements in 2020, plans to complete 1,200 fuse replacements per year in 2021 and 2022. This corresponds to a rough program exposure in HFTD Tier 2 and 3 of 643/15,000 = 3% for 2020, and 1,200/(22,000) = 5.4% for 2021, and 2022.	PG&E 2020 WMP p. 3-6 PG&E 2021 WMP p. 236
Near 100% program exposure for other corrective actions on transmission and distribution in HFTD Tier 2 and 3	PG&E's 2021 WMP Attachments "7.3.3_RSE_Input_Template_EO_WLDFR" sheet "1-Program Exposure"	PG&E performs asset inspections in on a third of its HFTD Tier 2 transmission assets per year. In addition, PG&E patrols HFTD Tier 2 circuit miles bi-annually for distribution in rural areas.	PG&E 2021 WMP pp. 9 and 483

In response to Cal Advocates' data requests, PG&E asserts that there is nothing wrong with its RSE inputs and states that "exposure is not based on inspection cycles."[229] According to PG&E's logic, PG&E's inspection frequency will not change the overall risk reduction. However, this assumption appears to contradict PG&E's own practice of altering its inspection frequency depending on the level of risk in the area.[230]

4. PG&E's WMP is missing RSE calculations.

PG&E did not calculate risk scores for many of its programs. Table 4 lists programs with high capital or operational expenditures projected for 2021, where RSE calculations were not provided.

[229] PG&E's response to Data Request CalAdvocates-PGE-2021WMP-06, Question 1, March 1, 2021.

[230] PG&E inspects assets in HFTD Tier 3 annually, and assets in Tier 2 every three years, PG&E's 2021 WMP, pp. 583-584.

Table 4 **A partial list of PG&E's large programs where RSEs were not calculated**			
Program where RSE Scores Were Not Calculated	**2021 Capital Expenses**	**2021 Operational Expenses**	**Notes**
Transmission System Hardening	$314 million	$0	
Detailed Transmission Vegetation Inspections	$86 million	$101 million	
PSPS Mitigation through Grid Operations	$0	$68 million	
Backup Generation for PSPS Mitigation	$55 million	$1 million	
Transmission Tower Replacement	$40 million	$55 million	
Distribution, Transmission, and Substation: Fire Action Schemes and Technology	Unknown	Unknown	PG&E expects to spend $30 million on this program in 2021.[231] PG&E did provide an RSE range of 0.85-5 in a data request response, which assumes that this unproven, proprietary technology can prevent 95% of fires.[232]
Transmission Circuit Breaker Maintenance	$27 million	$2 million	
Substation Construction for PSPS Mitigation	$22 million	$0	
Legacy Recloser Controller Replacement	$17 million	$0.1 million	

The Commission and WSD must ensure that PG&E is maximizing its risk reduction for the money PG&E allocates. This is especially true for programs such as those listed above, which are not required to satisfy specific regulatory requirements. RSE scores can provide valuable insight into whether implementing these programs is an efficient use of resources.

The WSD should require PG&E to submit RSE scores for programs with significant expenditures in PG&E's WMP, particularly if that program is not designed to meet a specific regulatory requirement. Cal Advocates recommends requiring RSE scores for programs with

[231] PG&E's 2021 WMP, p. 303.

[232] PG&E's supplemental response to Data Request CalAdvocates-PGE-2021WMP-06, Question 2, March 5, 2021.

projected annual expenditures in excess of $5 million. However, it may be reasonable to make exceptions for activities where RSE estimates will not materially influence decision-making. This includes certain activities that must be performed regardless, such as emergency preparedness planning or community outreach related to de-energization events. Likewise, it includes foundational activities that support other programs, such as data governance and risk analysis. In these cases, PG&E should clearly identify the reasoning and justify not performing a RSE.

5. The WSD should require PG&E to justify and update its RSE calculations.

PG&E's estimates of maintenance effectiveness and program exposures, and its decision not to estimate a number of RSEs, all raise significant concerns related to the validity of PG&E's RSE scores. Due to the number and severity of errors, the WSD cannot rely on PG&E's current RSE scores to determine or validate resource allocation.

The WSD should require PG&E to justify each assumption in its RSE calculations, and submit a report on these assumptions. For cases where current data is not available to justify a calculation, PG&E should explain its efforts to collect and analyze the necessary data to improve the RSE estimates. PG&E should submit this report, along with revised RSE calculations in a supplemental filing to its 2021 WMP, including estimates of the RSEs for high-expenditure programs where PG&E has not yet provided an RSE.

As discussed in Cal Advocates' comments on cross-cutting WMP issues, the WSD should also consider developing its own risk calculation framework for all utilities to use, to prevent the type of issues noted in this section.

IV. CONCLUSION

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

Respectfully submitted,

/s/ ***Nathaniel W. Skinner***

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V. Appendix A: WMP cost comparison for large utilities

2021 WMP Spending Forecasts (millions of dollars)			
	Operating Expenses	**Capital Expenditures**	**Total**
PG&E	2,396	2,559	4,955
SCE	596	1,109	1,706
SDG&E	187	459	646