Wildfire Mitigation Plan Action Statement:
PacifiCorp

Wildfire Safety Division

Draft Action Statement on PacifiCorp's 2021 Wildfire Mitigation Plan Update

June 2021

WSD-017 - Attachment A

Contents

Introduction and Background

This Action Statement represents the assessment of the California Public Utilities Commission's (CPUC) Wildfire Safety Division (WSD)[1] on the 2021 Wildfire Mitigation Plan (WMP or Plan) of PacifiCorp (PC or the utility).[2] This Plan is an update for the comprehensive 2020-2022 plan submitted by PC in 2020. PC submitted its 2021 WMP Update on March 5, 2021, in response to guidelines provided by the WSD.[3] Assembly Bill (AB) 1054[4] mandates that the WSD complete its evaluation of WMPs within three months of submission, unless the WSD issues an extension.[5]

PacifiCorp's 2021 WMP Update is approved.

1. Legal Authority

In 2018, following the devastating wildfires in 2016 and 2017, the California Legislature passed several bills increasing oversight of the electrical corporations' efforts to reduce utility-related wildfires.[6] AB 1054 created the WSD at the CPUC and tasked it with reviewing annual WMPs submitted by electrical corporations under the CPUC's jurisdiction. As of July 2021, the WSD will become the Office of Energy Infrastructure Safety (Energy Safety) within the California Natural Resources Agency (CNRA).[7]

The main regulatory vehicle for the WSD to evaluate electrical corporations' wildfire risk reduction efforts is the WMP, which was first introduced in Senate Bill (SB) 1028[8] and further defined in SB 901,[9] AB 1054, and AB 111. Investor-owned electrical corporations (hereafter referred to as "utilities") are required to submit WMPs assessing their level of wildfire risk and providing plans for wildfire risk reduction. The CPUC evaluated the utilities' first WMPs under the SB 901 framework in 2019.[10]

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[1] Because the WSD is transitioning to the Office of Energy Infrastructure Safety (Energy Safety) on July 1, 2021, any references herein to WSD actions that post-date this transition should be interpreted as actions for which Energy Safety will take responsibility. Section 10 of the associated Resolution provides further detail on the transition of the WSD to Energy Safety.

[2] In this document references to Pacific Power refer to the subsidiary of PacifiCorp that serves California.

[3] The Commission approved 2021 WMP guidelines in Resolution WSD-011.

[4] Stats. of 2019, Ch. 79.

[5] Pub. Util. Code § 8386.3(a).

[6] In this document "utility" should be understood to mean "electrical corporation."

[7] *See* AB 111, Stats. of 2019, Ch. 81.

[8] Stats. of 2016, Ch. 598.

[9] Stats. of 2018, Ch. 626.

[10] See Rulemaking (R.) 18-10-007.

AB 1054 and AB 111 transferred responsibility for evaluation and approval or denial of WMPs to the WSD; AB 1054 provides, "After approval by the division, the commission shall ratify the action of the division."[11] The WSD must ensure utility wildfire mitigation efforts sufficiently address increasing utility wildfire risk. To support its efforts, the WSD developed a long-term strategic roadmap, Reducing Utility-Related Wildfire Risk (2020).[12] This strategic roadmap informs the WSD's work in updating the WMP process and guidelines and the WSD's evaluation of the WMPs.

2. Multi-Year Plan Process

In February and March of 2020, the utilities[13] submitted their three-year 2020-2022 WMPs. The WSD conducted its evaluation and either approved, conditionally approved, or denied the Plans. In the case of conditional approval, the WSD identified items missing or incomplete in the Plans on a scale of severity, with Class A Deficiencies representing issues that required resolution through a Remedial Compliance Plan (RCP).[14] The 2020 Class B Deficiencies required resolution through Quarterly Reports,[15] and Class C Deficiencies were to be resolved in the 2021 WMP Update.

In 2020, the WSD issued a conditional approval of PC's WMP. PC submitted its RCP[16] to resolve Class A Deficiencies on July 27, 2020. WSD released its evaluation[17] of PC's RCP on December 30, 2020, and provided direction to address "insufficient" responses in PC's updated 2021

[11] Pub. Util. Code § 8386.3(a).

[12] The Wildfire Safety Division's strategic roadmap Reducing Utility-Related Wildfire Risk (2020) (accessed March 4, 2021): https://www.cpuc.ca.gov/WSD/roadmap/

[13] Here we refer to all utilities that submitted a WMP in 2020: Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), PacifiCorp, Bear Valley Electric Service, Inc. (BVES), Liberty Utilities, Trans Bay Cable, LLC, and Horizon West Transmission, LLC; hereafter in this Action Statement "utilities" refers to the three large utilities, SDG&E, PG&E, and SCE, unless otherwise specified.

[14] An RCP "must present all missing information and/or articulate the electrical corporation's plan, including proposed timeline, to bring the electrical corporation's WMP into compliance." *See* Resolution WSD-002 at 17.

[15] "Class B issues are of moderate concern and require reporting on a quarterly basis by the electrical corporation to provide missing data or update its progress in a quarterly report." *See* Resolution WSD-002 at 18.

[16] PC's Remedial Compliance Plan of July 27, 2020 (accessed March 2, 2021): https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/WSD/R.18-10-007%20PacifiCorp%20Remedial%20Compliance%20Plan%20(7-27-20).pdf

[17] The WSD's evaluation of PC's Remedial Compliance Plan, issued December 30, 2020 (accessed May 12, 2021): https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/WSD/PacifiCorp%20RCP%20Action%20Statement%2020201230.pdf

Plan.[18] PC submitted its first Quarterly Report on September 9, 2020, to resolve 2020 Class B Deficiencies.[19] The WSD released its draft evaluation of PC's Quarterly Report on January 21, 2021, and also issued direction to address "insufficient" responses in its 2021 WMP Update.[20]

3. 2021 Evaluation Process

On November 16, 2020, the CPUC adopted updated WMP requirements (Guidelines) and procedures for the 2021 WMP Plan Year pursuant to Public Utilities Code (Pub. Util. Code) Section 8389(d).[21] The updates to the 2021 WMP Guidelines are intended to streamline the reporting and evaluation process. Pursuant to the adopted Guidelines, large utilities submitted 2021 WMP Updates on February 5, 2021; small and multi-jurisdictional utilities (SMJUs) and independent transmission operators (ITOs) submitted 2021 WMP Updates on March 5, 2021.

The 2021 WMP submissions are updates of the 2020-2022 WMPs and are intended to show progress since 2020 and report changes from the 2020 WMP. Importantly for 2021, the WSD amended its review process and will no longer issue conditional approvals. Instead, where the WSD found critical issues with 2021 submissions, the WSD issued a Revision Notice requiring the utility to remedy such issues prior to completion of the 2021 WMP Update evaluation. Upon receipt of the utility's response to the Revision Notice, the WSD could determine that the response was sufficient to warrant approval, although additional ongoing reporting or other conditions may be required, or the response was insufficient such that denial of the WMP is warranted due to the utility inadequately reducing wildfire risk and its potential impact to public safety.

The WSD evaluated 2021 WMP Updates according to the following factors:

- Completeness: The WMP is complete and comprehensively responds to the WMP statutory requirements and WMP Guidelines.

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[19] PC's Quarterly Report of September 9, 2021 (accessed May 12, 2021): ftp://ftp.cpuc.ca.gov/WMP/QuarterlyReports/2020/PacifiCorp%20First%20Quarterly%20Report%20on%202020%20WMP%209-9-2020.pdf.
Subsequent Quarterly Reports addressing conditions requiring ongoing reporting will be evaluated as part of utilities' 2021 WMP Updates.

[20] The WSD's draft evaluation of PC's first Quarterly Report, issued on January 21, 2021 (accessed May 12, 2021): https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/WSD/PacifiCorp%20QR%20Action%20Statement.pdf.
The WSD issued an extension to the large investor-owned utilities to respond to insufficient Quarterly Reports until February 26, 2021.

[21] Seehttps://www.cpuc.ca.gov/wildfiremitigationplans/ for adopted 2021 WMP Guidelines.

- Technical feasibility and effectiveness: Initiatives proposed in the WMP are technically feasible and are effective in addressing the risks that exist in the utility's service territory.
- Resource use efficiency: Initiatives are an efficient use of utility resources and focus on achieving the greatest risk reduction at the lowest cost.
- Demonstrated year-over-year progress: The utility has demonstrated sufficient progress on objectives and program targets reported in the prior annual WMP.
- Forward-looking growth: The utility demonstrates a clear action plan to continue reducing utility-related wildfires and the scale, scope, and frequency of Public Safety Power Shutoff (PSPS) events.[22] In addition, the utility is sufficiently focused on long-term strategies to build the overall maturity of its wildfire mitigation capabilities while reducing reliance on shorter-term strategies such as PSPS and vegetation management.

To conduct its assessment, the WSD relied upon PC's WMP submission and subsequent updates, responses to Revision Notices, if any, input from California Department of Forestry and Fire Protection (CAL FIRE), input from the Wildfire Safety Advisory Board (WSAB), public comments, responses to the WSD's data requests, utility-reported data, and utility responses to the Utility Maturity Survey.

Upon completion of its review, the WSD determined whether each utility's 2021 WMP Update should either be:

- Approved (approval may include the requirement to address certain issues in the utility's subsequent WMP and/or through existing ongoing reporting processes), or,
- Denied (the utility does not have an approved WMP for 2021 and must reapply for approval in 2022).

4. Cost Recovery

This document does not approve costs attributable to WMPs, as statute requires electrical corporations to seek cost recovery and prove all expenditures are just and reasonable at a future time in their General Rate Cases (GRC) or an appropriate application. Nothing in this Action Statement nor CPUC's Resolution should be construed as approval of any WMP-related costs.[23]

[22] A Public Safety Power Shutoff (PSPS) event, also called a de-energization event, is when a utility proactively and temporarily cuts power to electric lines that may fail in certain weather conditions in specific areas to reduce electric facility-caused fire risk.

[23] The WSD's approval and the Commission's ratification do not relieve the electrical corporation from any and all otherwise applicable permitting, ratemaking, or other legal and regulatory obligations.

1. Summary of key findings

Pursuant to Pub. Util. Code Section 8386.3(a), this Action Statement is the totality of the WSD's review of PC's 2021 WMP Update. PC's 2021 WMP Update is approved.

1.1. Areas of Significant Progress

The WSD finds that PC has made significant progress over the past year and/or has matured in its mitigation strategies for future years in the following areas:

- PC has made advancements in its risk-assessment methodology, implementing its new Localized Risk Assessment Model (LRAM). PC has piloted incorporating CalAdapt climate data into the LRAM to analyze the projected climate forecasts and identify how its fire weather risk score will change by 2030. PC plans to continue to integrate this climate data projection into its model for long-term wildfire mitigation strategies.
- PC has improved its asset inspections protocol, increasing the frequency of inspections in areas of high fire risk, heightening the priority when finding a problem relating to wildfire risk, and piloting new technologies to assist in enhanced visual inspections.
- PC has implemented an electronic planning and tracking system for vegetation inspections, a significant improvement from its previous paper-based system.
- PC has made improvements to its PSPS protocol, added new PSPS forecasting criteria to better measure the impacts of short-term drying on fuels, and is subdividing PSPS primary zones into smaller areas, which is expected to limit the geographical scope of any future PSPS events. PC has also added a meteorologist and emergency manager[24] to its wildfire mitigation staff and created a dedicated PSPS webpage for customer outreach and communication.

1.2. Revision Notices

The WSD did not issue a Revision Notice to PC in this WMP Update review cycle.

1.3. Key Areas for Improvement and Remedies

The WSD evaluated 2021 WMP Updates with a particular focus on how the utility's chosen mitigations and strategies will drive down the risk of utility-related wildfires as well as the scale, scope, and frequency of PSPS events. The WSD approves PC's 2021 WMP Update; however, the WSD finds that PC must focus over the next year on the following areas set forth in Table 1 below. While continued progress toward maturity is important in all areas of a utility's WMP, the WSD finds these areas to be key for PC to continue to drive down utility-related wildfire risk. The WSD expects PC to take action to address these key areas and report on progress

[24] Joint IOUs Workshop on 2020 Public Safety Power Shutoff Events, held on March 29, 2021.

made over the year in a Progress Report due by 5:00 p.m. on November 1, 2021, and in its 2022 WMP Update. The WSD will closely monitor progress in each of these areas over the coming year.

In addition to Table 1 below summarizing key areas for improvement, each key focus area and any required follow-up are denoted by a table in the respective detailed evaluation section.

Table 1: Key areas for improvement and remedies.

Utility-#	Issue title	Issue description	Remedies required and alternative timeline if applicable
PC-1	Failure to follow format for Section 7.3.b, subparts 1-5, of 2021 WMP Guidelines	PC does not follow the format for Section 7.3.b of the 2021 WMP Guidelines for all of the mitigation initiatives provided in its 2021 WMP Update. Specifically, PC omits the subpart 1-5 headers, along with some the corresponding details, from many of its mitigation initiative discussions. This makes it difficult to identify key information, such as "Progress on initiative" or "Future improvements to initiative".	PC must include and address all components of the WMP Guidelines Section 7.3.b "Detailed information on mitigation initiatives by category and activity," including all subparts 1-5, for each of its initiatives. PC must follow and address all other WMP Guidelines components in its future submissions.
PC-2	Lack of consistency in approach to wildfire risk modeling across utilities	The utilities do not have a consistent approach to wildfire risk modeling. For example, in their wildfire risk models, utilities use different types of data, use their individual data sets in different ways, and use different third-party vendors. The WSD recognizes that the utilities have differing service territory characteristics, differing data availability, and are at different stages in developing their wildfire risk models. However,	The utilities[25] must collaborate through a working group facilitated by Energy Safety[26] to develop a more consistent statewide approach to wildfire risk modeling. After the WSD completes its evaluation of all the utilities' 2021 WMP Updates, it will provide additional detail on the specifics of this working group.

		the utilities face similar enough circumstances that there should be some level of consistency in their approaches to wildfire risk modeling statewide.	A working group to address wildfire risk modeling will allow for: 1. Collaboration among the utilities; 2. Stakeholder and academic expert input; and 3. Increased transparency.
PC-3	GIS and non-spatial data discrepancy	PC's weather station GIS data does not match the non-spatial data included in its 2021 WMP Update, nor does it match the numbers provided in response to a data request (see Appendix 10.2 for more information). PC reports that it completed installation of ten weather stations in 2019 and two in 2020, which brings its current total to twelve. However, PC's GIS weather station data, submitted as part of its 2021 WMP Update, only includes ten GIS data points.	PC must provide complete, accurate, and the most current information, including GIS data, pertaining to all of its program targets and performance.

[25] Here "utilities" refers to SDG&E and Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), PacifiCorp, Bear Valley Electric Service, Inc. (BVES), and Liberty Utilities; although this may not be the case every time "utilities" is used through the document.

[26] The WSD is transitioning to the Office of Energy Infrastructure Safety (Energy Safety) on July 1, 2021.

PC-4	Limited evidence to support the effectiveness of covered conductor	The rationale to support the selection of covered conductor as a preferred initiative to mitigate wildfire risk lacks consistency among the utilities, leading some utilities to potentially expedite covered conductor deployment without first demonstrating a full understanding of its long-term risk reduction and cost-effectiveness. The utilities' current covered conductor pilot efforts are limited in scope[27] and therefore fail to provide a full basis for understanding how covered conductor will perform in the field. Additionally, utilities justify covered conductor installation by alluding to reduced PSPS risk but fail to provide adequate comparison to other initiatives' ability to reduce PSPS risk.	The utilities[28] must coordinate to develop a consistent approach to evaluating the long-term risk reduction and cost- effectiveness of covered conductor deployment, including: 1. The effectiveness of covered conductor in the field in comparison to alternative initiatives. 2. How covered conductor installation compares to other initiatives in its potential to reduce PSPS risk.
PC-5	Reconductoring projects not prioritized based on wildfire risk	PC states that it is replacing small diameter copper and iron conductors "throughout PacifiCorp's California service territory" instead	PC must demonstrate that its copper and iron reconductoring projects prioritize locations with the highest wildfire risk,

[27] Limited in terms of mileage installed, time elapsed since initial installation, or both.

[28] Here "utilities" refers to SDG&E and Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), PacifiCorp, Bear Valley Electric Service, Inc. (BVES), and Liberty Utilities; although this may not be the case every time "utilities" is used through the document.

		of focusing on areas of highest risk.	both in scope and timing.
PC-6	No separate process for replacing expulsion fuses and tracking progress	PC does not currently have a separate method established for replacing expulsion fuses and tracking these replacements.	PC must demonstrate that its current methods are adequate for tracking and assessing the need for expulsion fuse replacements. If its methods are not sufficient, PC must enhance its current operations to properly identify, analyze, and track expulsion fuse replacements.
PC-7	Limited explanation for how initiatives reduce PSPS impacts	PC fails to explain how initiatives will reduce PSPS impacts despite selecting some initiatives (such as covered conductor installation) specifically to reduce PSPS risk.	PC must clearly explain how all initiatives reduce scale and scope of PSPS.
PC-8	Lack of details on automatic recloser settings and associated wildfire risk reduction	PC fails to provide the actual recloser settings utilized during heightened wildfire risk.	PC must: 1. Provide the automatic recloser settings described on p. 173 of its 2021 WMP Update, including: a. The "more restrictive system operating procedures" used; and b. The thresholds of heightened wildfire risk for initiating the

			procedures described in (a). 2. Provide a timeline for when it intends to develop a metric demonstrating the effectiveness of using automatic reclosers, as described on p. 94 of its 2021 WMP Update.
PC-9	Inadequate justification of initiative-selection process	PC does not provide any risk-spend efficiency (RSE) estimates for its mitigation initiatives. Without the quantified risk reduction values, PC's qualitative approach to justify the initiative-selection process is insufficient and lacks transparency.	PC must include the quantified, risk reduction outputs from its recently developed risk model to elaborate on its decision-making process to include a thorough overview of the initiative-selection procedure. The overview must show the rankings of the decision-making factors (i.e., compliance-based activities, geographic wildfire tiers, operation efficiencies, etc.) and pinpoint where quantified, risk reduction values and RSE estimates are considered in the initiative-selection process. The WSD recommends a cascading, dynamic "if-then" style flowchart to accomplish this prioritization requirement.

PC-10	Inadequate approach to PSPS	PC's 2021 WMP Update lacks specific short-term PSPS reduction commitments, sufficient justification, and mitigation initiative targets, apart from covered conductor.	PC must: 1) Acknowledge that, based on its own triggering criteria, it is subject to risk of PSPS in the near-term and describe its vision for reducing potential use of PSPS next fire season, normalized for changes in weather;[29] 2) Provide a firm commitment to a quantifiable reduction in risk of a) frequency, b) scope (i.e., customers impacted), and c) duration of PSPS events during the plan term, including timelines for achieving these reductions; and 3) Identify which initiatives in its 2021 WMP Update are contributing to the goals in (2) above.

In addition to the key areas for improvement listed in Table 1 above, the WSD lists additional issues for continued improvement to increase the maturity of PC's wildfire mitigation capabilities in the evaluation sections below. These additional issues are denoted by bullet points. The WSD expects PC to take action to address these issues and report on progress made over the year in its 2022 WMP Update.

[29]PSPS metrics requested via the WMP Guidelines have been purposefully designed to address changes in weather year over year in order to provide data for comparative analysis across utilities and years. They therefore already use normalized metrics that take into consideration changing weather conditions. For instance, PSPS duration in customer hours (normalized) reflects "Customer hours of PSPS per Red Flag Warning overhead circuit mile day." The expectation is that the utilities show how their other mitigation initiatives reduce their need to use PSPS as a tactic.

1.4. Maturity Model Evaluation

The Wildfire Safety Division introduced a maturity model (the Utility Wildfire Mitigation Maturity Model) in 2020, providing a method to assess utility wildfire risk reduction capabilities and examine the relative maturity of individual wildfire mitigation programs. In 2020, the utilities completed a survey setting a baseline for maturity as well as anticipated progress over the three-year plan period. In 2021, the utilities again completed the survey, enabling the WSD to monitor progress and ascertain potential improvements to maturity based on progress to date.

The WSD makes the following key findings regarding PC's maturity progress in 2021:

- PC self-reports steady growth in Risk Assessment and Mapping,[30] a category that saw a significant increase in spend in 2020 (comparing planned spend to actual spend).[31] Compared to its peers, PC is reporting higher growth and planned spend (per circuit mile) in this category over the 2020-2022 WMP cycle.
- In contrast, PC shows no growth in the Asset Management and Inspections category from its initial projection and reports a 34% decrease in spend in 2020 (between planned and actual). PC's Grid Operations and Protocols category tells a similar story, with no growth from its initial 2020 maturity score to its projected end score (by 2023), along with a 100% decrease in spend in 2020 (between planned and actual) and zero spend projected for the remainder of the WMP cycle.
- There are inconsistencies between maturity scores and spend in PC's Emergency Planning and Preparedness and Resource Allocation Methodology categories. PC reports no cycle spend in either of these categories, yet projects maturity growth over the WMP cycle, including its highest self-reported maturity (and highest possible score of a 4.00 by the end of the WMP cycle) for Emergency Planning and Preparedness. PC was asked about the Emergency Planning and Preparedness discrepancy in a phone call with WSD staff and followed-up with a written response (see Appendix 10.2).

2. Wildfire Safety Advisory Board Input

The Wildfire Safety Advisory Board (WSAB) provided recommendations on the 2021 WMP Updates of PC, Bear Valley Electric Service, Inc. (BVES) and Liberty Utilities, LLC. (Liberty) on May 13, 2021.[32] The WSD has considered the WSAB's recommendations and incorporates its

[30] PacifiCorp 2021 Maturity Survey.

[31] PacifiCorp 2021 WMP Update, Table 12.

[32] The WSAB's "Recommendations on the 2021 Wildfire Mitigation Plan Updates of Small and Multi-Jurisdictional Utilities," approved May 12, 2021, and issued May 13, 2021, can be read here:

Footnote continued on next page.

input throughout this Action Statement. The WSAB's recommendations on the small and multi-jurisdictional utilities focused on the following areas:

- Risk Assessment, Mapping & Resource Allocation;
- Vegetation Management: Inspections, Strategies and Pilots;
- System Design and Management: Grid Hardening, Operations, Inspections, and Emerging Technology;
- Emergency Planning and Communication: Emergency Preparedness, Stakeholder Cooperation, and Community Engagement.

3. Public and Stakeholder Comment

The following individuals and organizations submitted comments by April 14, 2021, and reply comments by April 21, 2021, on PC's 2021 WMP Update:

- Green Power Institute (GPI)
- Public Advocates Office at the Public Utilities Commission (Cal Advocates)
- Rural County Representatives of California (RCRC)

The WSD has evaluated comments and incorporates the following stakeholder input into this Action Statement:

- PC should provide all information required by the WMP Guidelines in sufficient detail to allow the WSD to effectively evaluate its initiatives (GPI).
- If it is not yet doing so, PC should consider conducting fuel sampling to support its efforts at determining fuel moisture content (GPI, RCRC).
- More information is needed about PC's initiatives' potential to reduce the risk of PSPS, particularly covered conductor installation (GPI).
- PC's 2021 WMP Update lacks detail on its automatic recloser operations (Cal Advocates).

4. Discussion

The following sections discuss in detail PC's 2021 WMP Update, including progress over the past year, issues, and remedies to address by the next annual submission.

https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/WSD/Draft%20SMJU%20Recommendations%204-30-21.pdf

4.1. Introductory sections of the WMP

The first two sections of the WMP Guidelines[33] require the utility to report basic information regarding persons responsible for executing the plan and adherence to statutory requirements. Section 1 requires contact information (telephone and email) for the executive with overall responsibility and the specific program owners. In addition, all experts consulted in preparation of the WMP must be cited by name and include their relevant background/credentials. Contact information and names may be submitted in a redacted file.

Section 2 requires the utility to specify where each of the 22 requirements from Section 8386(c) of the Public Utilities Code are satisfied. Each utility shall both affirm that the WMP addresses each requirement AND cite the section and page number where it is more fully described.

PC minimally satisfied all 22 requirements from Section 8386(c) of the Public Utilities Code.

Issues and Remedies

While the WSD did not identify key areas for improvement in the introductory sections of PC's 2021 WMP Update, the WSD finds the following issues and associated remedies. The WSD expects PC to take action to address these issues and report on progress made over the year in its 2022 WMP Update.

The WSD finds issues associated with six of the statutory WMP requirements:

- ISSUE: Requirement 5 (Section 4.1 of PC's 2021 WMP Update), PC did not provide an adequate discussion of how performance against 2020 metrics has informed the plan.
    - REMEDY: In its 2022 WMP Update, PC must provide more details on lessons learned from the 2021 WMP Update, with a particular focus on how performance against metrics used has informed its 2022 WMP Update.

- ISSUE: Requirement 8 (Section 7.3.5 of PC's 2021 WMP Update), multiple mitigation initiatives in this section are either missing required information (e.g., 7.3.5.14), refer to other sections of PC's 2021 WMP Update (e.g., 7.3.5.8), and/or include very brief descriptions (e.g., 7.3.5.17 and 7.3.5.18).
    - REMEDY: See PC-1.
    - REMEDY: PC must provide required information for each mitigation initiative in the appropriate WMP section, without exclusively referring to other sections, initiatives, or to outside documents.

[33] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, pp. 14-21 (accessed May 27, 2021): https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

- ISSUE: Requirement 9 (Section 7.3.4 of PC's 2021 WMP Update), PC exhibits similar issues to those stated in Requirement 8, above.
    - REMEDY: See PC-1.
    - REMEDY: PC must provide required information for each mitigation initiative in the appropriate WMP section, without exclusively referring to other sections, initiatives, or to outside documents.
- ISSUE: Requirement 11 (Section 4.3 of PC's 2021 WMP Update), a prioritized list of wildfire risks and drivers was not clearly evident in PC's 2021 WMP Update. It was provided in response to a data request (see Appendix 10.2).
    - REMEDY: PC must provide a table with a *prioritized* list of wildfire risks and drivers and the rationale for prioritization.
- ISSUE: Requirement 15 (Sections 5.4 and 7.3.8 of PC's 2021 WMP Update), PC does not sufficiently discuss the adequacy of its service restoration workforce in its 2021 WMP Update. PC did provide additional details on service restoration personnel in response to a question asked in a phone call with WSD staff (see Appendix 10.2); however, these details should still be provided in the WMP.
    - REMEDY: PC must discuss the type and number of personnel classifications it employs and the number of contractors in place for service restoration.

4.2. Actuals and planned spending for Mitigation Plan

The WMP Guidelines[34] require utilities to report a summary of WMP expenditures, planned and actual, for the current WMP cycle. This also includes an estimated annual increase in costs to the ratepayer due to utility-related wildfires and wildfire mitigation activities.[35] The WMP Guidelines require that ratepayer impact calculations are clearly shown to demonstrate how each value was derived. Nothing in the request for such information should be construed as approval of any such expenditure, which is left to the CPUC pursuant to Pub. Util. Code Section 8386.4(b).

- The WSD identified discrepancies between the numbers provided in the "Summary of WMP Expenditures" tables (Tables 3-1 and 3-2)[36] and those in Table 12 of PC's 2021 WMP Update. These discrepancies, due to calculation and copy-and-paste errors, were

[34] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, pp. 22-24 (accessed May 27, 2021):
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

[35] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, Section 3.2 "Summary of ratepayer impact," p. 23 (accessed June 2, 2021):
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

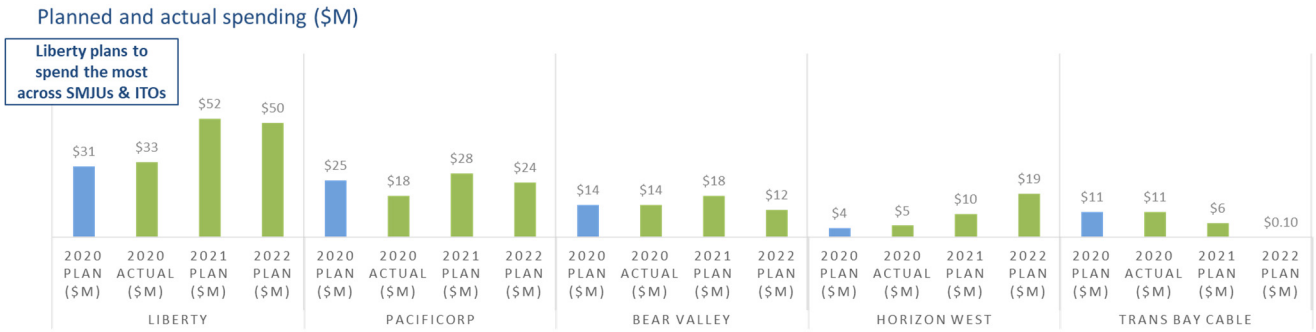
[36] PacifiCorp 2021 WMP Update, pp. 23-24.

reconciled in response to a data request[37] (see Appendix 10.2 for more information). The numbers that follow are reflective of these corrections.

- PC shows a 26% decrease between its total 2020 planned spend and 2020 actual spend ($24,708,000 to $18,202,000).
- In five mitigation categories, PC shows an increase in spend in 2020 (between planned and actual):
    - Risk Assessment and Mapping ($25,000 to $186,000 [644% increase])
    - Situational Awareness and Forecasting ($278,000 to $1,209,000 [335% increase])
    - Vegetation Management and Inspections ($5,783,000 to $6,999,000 [21% increase])
    - Data Governance ($0 to $181,000 [100% increase])
    - Stakeholder Cooperation and Community Engagement ($0 to $36,000 [100% increase])
- In three mitigation categories, PC shows a decrease in spend in 2020 (between planned and actual):
    - Grid Design and System Hardening ($15,403,000 to $8,788,000 [43% decrease])
    - Asset Management and Inspections ($1,219,000 to $803,000 [34% decrease])
    - Grid Operations and Protocols ($2,000,000 to $0 [100% decrease])
- PC reports $0 spend in three initiative categories across the 2020-2022 WMP cycle:
    - Grid Operations and Protocols
    - Resource Allocation Methodology
    - Emergency Planning and Preparedness
- PC's total planned spend for the 2020-2022 WMP cycle is the lowest of the three SMJUs.
- Per circuit mile and by category, PC's total WMP cycle planned spend is less than its peers in all mitigation categories except Risk Assessment and Mapping.
- Consistent with its SMJU peers, PC's top three spend categories are (1) Grid Design and System Hardening, (2) Vegetation Management and Inspections, and (3) Asset Management and Inspections.
- PC's top five initiatives account for approximately 91% of its total planned spend, roughly 44% of which is allocated for covered conductor installation.
- PC does not project a cumulative increase in cost to ratepayers due to utility-ignited wildfire mitigation activities.

Figures:

[37] PacifiCorp DR 2apr2021 Questions 5-6, received April 6, 2021.



	2020 Plan ($M)	2020 Actual ($M)	2021 Plan ($M)	2022 Plan ($M)	Total WMP Cycle Planned Spend ($M)	Normalized WMP cycle spend per overhead circuit mile ($M)
Liberty	$31	$33	$52	$50	$136	$0.09
PacifiCorp	$25	$18	$28	$24	$70	$.02
Bear Valley	$14	$14	$18	$12	$43	$0.1
Horizon West	$4	$5	$10	$19	$33	$1,650
Trans Bay Cable	$11	$11	$6	$0.1	$17	$0[1]

Source: Tables 3-1 and 12 of 2021 utility WMP Updates
Note: In the 2021 WMP updates for Liberty, PacifiCorp, and Bear Valley, Table 3-1 did not match the totals from Table 12 exactly. The totals from Table 12 are used here for those utilities, in the 2020 Actual, 2021 Plan, 2022 Plan and Total WMP Cycle Planned Spend columns. The 2020 Plan columns are taken from Tables 3-1 in 2021 utility WMP Updates.
1. TransBay Cable does not have any overhead circuit miles

Horizon West only reported .02 OH circuit miles in their WMP

Figure 4.2a: Overview of total WMP spend, SMJUs.

4.3. Lessons learned and risk trends

This section of the WMP Guidelines[38] requires utilities to report how their plans have evolved since 2020 based on lessons learned, current risk trends, and research conducted. This section also requires utilities to report on potential future learnings through proposed and ongoing research.

Utilities must describe how the utility assesses wildfire risk in terms of ignition probability and estimated wildfire consequence using Commission adopted risk assessment requirements (for large electrical corporations) from the General Rate Case (GRC) Safety Model and Assessment Proceeding (S-MAP) and Risk Assessment Mitigation Phase (RAMP) Proceeding at a minimum. The utility may additionally include other assessments of wildfire risk. The utility must:

1. Describe how it monitors and accounts for the contribution of weather and fuel to ignition probability and wildfire consequence.
2. Identify any areas where the Commission's HFTD should be modified.
3. Explain any "high fire threat" areas the utility considers that differ from Commission-adopted HFTD, and why such areas are so classified.

[38] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, pp. 24-29 (accessed May 27, 2021):
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

4. Rank trends anticipated to have the greatest impact on ignition probability and wildfire consequence.

PC provided all required information on lessons learned, current risk trends, and research conducted.

- To monitor and account for the contribution of weather and fuel to ignition probability and wildfire consequence, PC evaluates variables for fuel indicators, sustained wind, and other weather influencers (e.g., Fosberg Fire Weather Index) that serve a similar function as a Fire Potential Index. In 2020, PC also incorporated Vapor Pressure Deficit (VPD) into its forecasting to improve the reliability of the Keetch-Byram Drought Index (KBDI) and measure both short- and long-term drying. PC has also outfitted most of its weather stations with fuel moisture sensors as another method for measuring of fuel dryness.[39]

- PC used the Localized Risk Assessment Model (LRAM) to evaluate areas outside of the Commission-adopted HFTD and identify any aspects of HFTD that should be modified or adopted. Based on its LRAM fire/climate scores, PC determined two areas that may be candidates for consideration within the HFTD – Crescent City toward Klamath Glen and Montague.[40]

- PC analyzes its outage data, from both planned and fault events, to estimate ignition probability drivers and identify the frequency, duration, and cause of outages experienced on energized circuits. Although a ranked list of wildfire risks and drivers was not clearly evident in PC's 2021 WMP Update, it was provided in response to a data request (see Appendix 10.2).

- PC presents the lessons learned, results, and discussions on 11 pilot programs that are a part of its Research Strategy. A few are described below:

    - PC is further along than its peer utilities in incorporating climate change projections in its risk assessment. PC has piloted incorporating the CalAdapt climate data to analyze the projected climate forecasts and identify how its fire weather risk score will change by 2030. PC plans to continue to integrate this climate data projection into its model for long-term wildfire mitigation strategies.

    - In 2020, PC also implemented a new method for tracking vegetation management activities as a result of its "Pilot 5-Vegetation Management

[39] PacifiCorp 2021 WMP Update, Section 4.2.

[40] PacifiCorp 2021 WMP Update, pp. 37-39.

Database Pilot Program." This is an improvement from the utility's previous method which relied on paper forms, maps, and other documents. The new database system is centralized, and incorporates GPS locations from field work, providing more spatial granularity.

- One of PC's completed pilot projects is its "Pilot 2-LiDAR Pole Loading Assessment," which uses light detection and ranging (LiDAR) point data and 3D depictions of pole assets to identify pole loading concerns. Lines are identified based on fire risk, historic fault rates, and inspection results, and are then flown over with LiDAR. Data collected in the process is incorporated into strength modeling programs (PLS-Cadd) to calculate loading capacity and identify poles and pole lines in need of replacement and/or strengthening. PC incorporated the pilot results into its pole replacement initiative. PC is currently evaluating additional applications for integrating the technology into other asset strategies.

4.4. Inputs to the plan and directional vision for WMP

This section of the WMP Guidelines[41] requires the utility to rank and discuss trends anticipated to exhibit the greatest impact on ignition probability and wildfire consequence within the utility's service territory over the next 10 years. First, utilities must set forth objectives over the following timeframes: before the upcoming wildfire season, before the next annual update, within the next 3 years, and within the next 10 years. Second and more practically, utilities must report the current and planned qualifications of their workforce they expect in order to meet these objectives.

Goal, objectives, and program targets:

The goal of the WMP is shared across WSD and all utilities: documented reductions in the number of ignitions caused by utility actions or equipment and minimization of the societal consequences (with specific consideration of the impact on Access and Functional Needs populations and marginalized communities) of both wildfires and the mitigations employed to reduce them, including PSPS.

The WMP Guidelines[42] require utilities to provide their objectives which are unique to each utility and reflect its 1, 3, and 10-year projections of progress toward the WMP goal. The WMP Guidelines also require utilities to report their unique program targets, which are quantifiable

[41] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, pp. 29-31(accessed May 27, 2021):
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

[42] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, pp. 29-30 (accessed May 27, 2021):
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

measurements of activity identified in WMPs and subsequent updates used to show progress toward reaching the objectives, such as number of trees trimmed or miles of power lines hardened.

- PC's overarching WMP objective is to mitigate wildfire risk within its service territory by applying a broad range of solutions, "in the form of situational awareness, inspection and correction, focused and timely vegetation management, operational acuity and strategic system hardening."[43]
- PC presents its 1, 3, and 10-year wildfire mitigation goals in Section 7.1 of the 2021 WMP Update[44]. Although this information was not contained in the appropriate WMP section per the Guidelines, it was referenced and found in the Mitigation Initiatives section (7.1). Some of PC's 1 and 3-year goals include:
    - **By June 1, 2021:**
        - Situational awareness and forecasting: calibrating and integrating of existing 12 weather stations and installation of an additional nine stations
        - Grid design and system hardening: re-prioritizing programs based on risk modeling evolution
        - Asset management and inspections: completing 2021 planned inspections with the HFTD
        - Vegetation management and inspections: completing incremental Tier 3 visual vegetation inspections within the HFTD; piloting new electronic planning, mapping, and record keeping system regarding vegetation management within the HFTD
        - Grid operations and protocols: reviewing existing operating protocols and ensuring preparedness for 2021 fire season
        - Stakeholder cooperation and community engagement: improving the customer and community-facing forecast of the PSPS website status tool
    - **By September 1, 2021:**
        - Situational awareness and forecasting: completing installation of an additional 11 weather stations
        - Grid design and system hardening: planning corrective work identified through the pole loading infrastructure hardening program
        - Asset management and inspections: constructing and commissioning 11 additional transmission and distribution system automation devices to meet the program target of 27 in 2021

[43] PacifiCorp 2021 WMP Update, p. 96.

[44] PacifiCorp 2021 WMP Update, pp. 114-119.

- Vegetation management and inspections: reviewing 2021 fire season operating protocols and evaluating areas for improvement in 2022; leveraging data analytics to evaluate the impact of alarm-based high impedance fault detection observed through the 2021 fire season
- Grid operations and protocols: leveraging data analytics to evaluate the impact of alarm-based high impedance fault detection observed through the 2021 fire season
- Stakeholder cooperation and community engagement: Continuing to partner with public safety partners in communities throughout California regarding wildfire and PSPS preparedness

- **Before 2022 WMP Update:**
  - Situational awareness and forecasting: completing installation and integration of the weather stations included in the 2021 plan
  - Asset management and inspections: completing the 2021 planned inspections within entire California territory (not just HFTD)
  - Vegetation management and inspections: evaluating and preparing to implement a new tree density inventory system within the HFTD to inform risk assessment and prioritization of efforts; evaluating continued use of the newly piloted electronic planning, mapping, and record keeping system regarding vegetation management within the HFTD; and establishing a longer-term strategy for using LiDAR as it pertains to vegetation management and inspections applications
  - Grid operations and protocols: reviewing existing operating protocols and ensuring preparedness for 2022 fire season
- **Within the next three years:**
  - Situational awareness and forecasting: evaluating benefits and costs of distribution fault anticipation (DFA) technology in normal system operations
  - Grid design and system hardening: completing entire 2020-2022 WMP cycle system hardening program scope per Table 12 and additional work or scope developed in 2023
  - Asset management and inspections: evaluating potential incorporation of risk assessment software solutions to inform asset management and inspections programs and augment existing risk-based decision-making framework
  - Vegetation management and inspections: incorporating lessons learned though tree density inventory system analytics to inform risk assessment and prioritization of efforts (if implemented); evaluating overall workforce management strategies and structures to augment existing programs; and incorporating lessons learned from pilot projects and fully

implementing new electronic planning, mapping, and record keeping system regarding vegetation management within the HFTD
    - Stakeholder cooperation and community engagement: incorporating three years of data, enhanced real time weather monitoring capability, and system hardening progress to evaluate PSPS methodology and protocols and reduce the potential scope or impact of PSPS events
- In Section 5.3, PC lists and describes its program targets and metrics from the last five years, highlighting 2019 and 2020 performance as well as 2021 and 2022 projections. Some of PC's projected program targets in Table 5.43-5-1 of its 2021 WMP Update were corrected in a data request (see Appendix 10.2 for more information).

Issues and Remedies:

- ISSUE: PC's 10-year plan is still lacking quantitative goal benchmarks, an explanation of how it intends to track progress of goals (in the absence of benchmarks), as well as a list of activities with metrics for tracking progress of benchmarks. This issue was previously determined and deemed Insufficient in the WSD's Draft Evaluation of PacifiCorp's Quarterly Report of January 21, 2021.[45] In its 2021 WMP Update, PC states, "At this time, it is challenging to set additional specific goals on a 10-year planning horizon, except to the extent that certain programs can be delivered within the WMP term."[46] This is inadequate as long-term goals and vision are an important part of wildfire mitigation planning.
    - REMEDY: In its 2022 WMP Update, PC must identify and detail quantitative goal benchmarks or provide an explanation of how it intends to track progress of goals in the absence of benchmarks, *and* provide a list of activities with metrics for tracking progress of benchmarks.

Workforce planning:

This subsection of the WMP Guidelines[47] requires utilities to report their worker qualifications and training practices regarding utility-related wildfire and PSPS mitigation for workers in mitigation-related roles including:

1. Vegetation inspections
2. Vegetation management projects
3. Asset inspections

[45] Wildfire Safety Division Draft Evaluation of PacifiCorp's First Quarterly Report, Guidance-12.

[46] PacifiCorp 2021 WMP Update, pp. 118-119.

[47] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, pp. 30-31 (accessed May 27, 2021):
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

4. Grid hardening
5. Risk event inspection

PC provided all information required regarding worker qualifications within each of the required roles.

- PC provides the worker titles, minimum qualifications, and full-time employee (FTE) percentages by role for each of the mitigation-related roles listed above, with the exception of risk even inspection. PC states that it currently has not developed a dedicated risk event inspection workforce, but rather, "this role has been fulfilled by a combination of field inspectors, field engineers, foresters and journeymen linemen who pass the baton through the risk event inspection process."[48]
- The WSD gained further details and information on PC's Vegetation Management recruitment and training program via a data request[49] (see Appendix 10.2 for more information).
- PC has also added a meteorologist and emergency manager to its wildfire mitigation staff.

4.5. Metrics and underlying data

The WMP Guidelines[50] require utilities to report metrics and program targets as follows:

- *Progress metrics* that track how much utility wildfire mitigation activity has managed to change the conditions of a utility's wildfire risk exposure in terms of drivers of ignition probability.
- *Outcome metrics* that measure the performance of a utility and its service territory in terms of both leading and lagging indicators of wildfire risk, PSPS risk, and other direct and indirect consequences of wildfire and PSPS, including the potential unintended consequences of wildfire mitigation work.
- *Program targets* measure tracking of proposed wildfire mitigation activities used to show progress toward a utility's specific objectives.[51] Program targets track the utility's pace of completing activities as laid out in the WMPs but do not track the efficacy of those activities. The primary use of these program targets in 2021 will be to gauge utility follow-through on existing WMPs.

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[48] PacifiCorp 2021 WMP Update, p. 103.

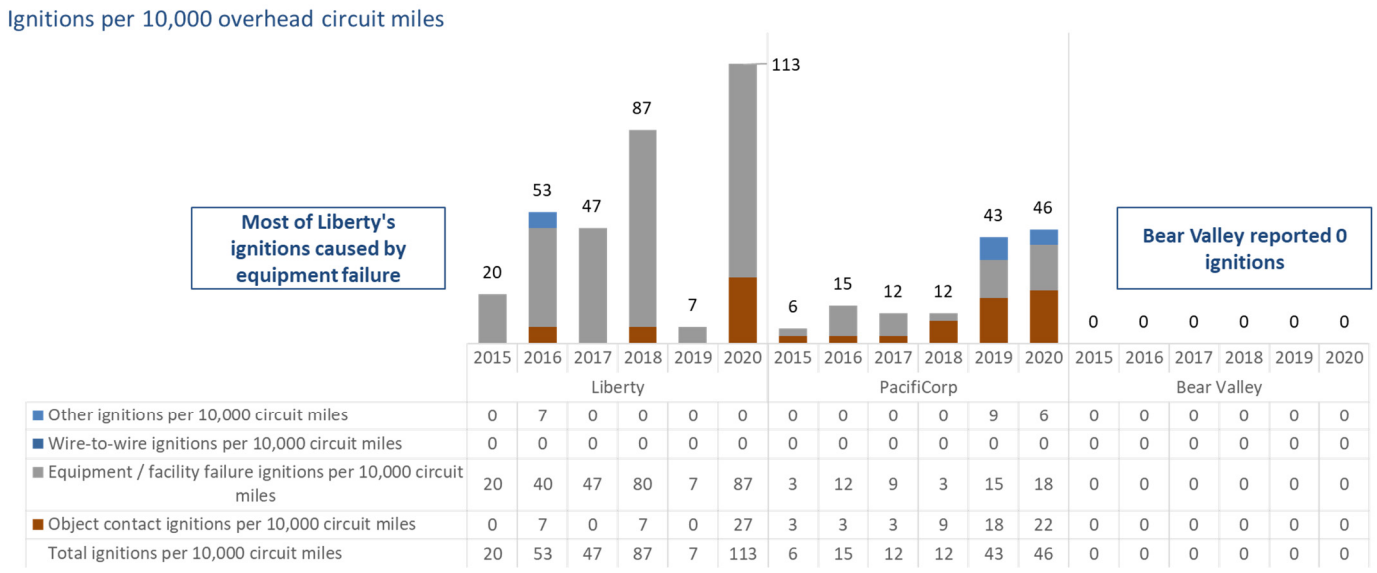
[49] PacifiCorp DR 20apr2021, Question 3, received April 23, 2021.

[50] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, pp. 32-41 (accessed May 27, 2021):
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

[51] Objectives are unique to each utility and reflect the 1, 3, and 10-year projections of progress toward the WMP goal. See section 5.4 for review of the utility's objectives.

This section also requires utilities to provide several geographic information system (GIS) files detailing spatial information about their service territory and performance, including recent weather patterns, location of recent ignitions, area and duration of PSPS events, location of lines and assets, geographic and population characteristics, and location of planned initiatives.

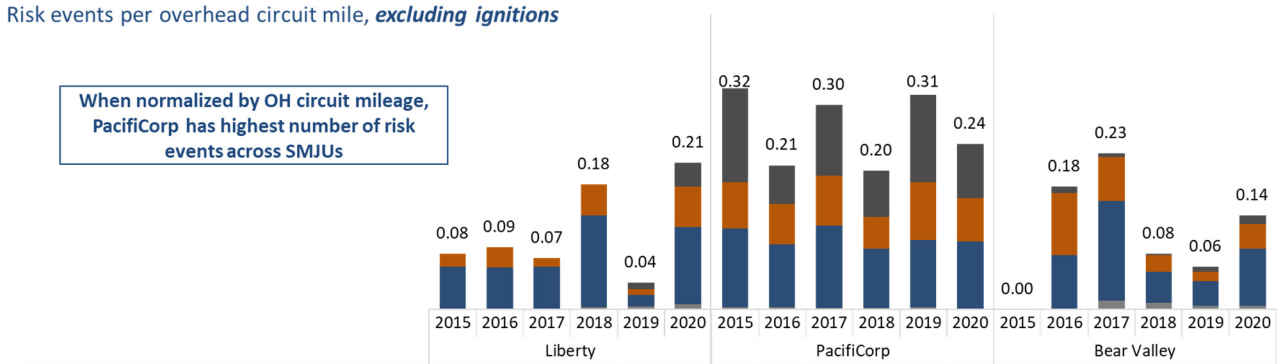
- See the Data Governance section for a detailed review of the utility's progress and shortcomings in its Quarterly Data Reports.



	Liberty						PacifiCorp						Bear Valley					
	2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020
Other ignitions per 10,000 circuit miles	0	7	0	0	0	0	0	0	0	0	9	6	0	0	0	0	0	0
Wire-to-wire ignitions per 10,000 circuit miles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Equipment / facility failure ignitions per 10,000 circuit miles	20	40	47	80	7	87	3	12	9	3	15	18	0	0	0	0	0	0
Object contact ignitions per 10,000 circuit miles	0	7	0	7	0	27	3	3	3	9	18	22	0	0	0	0	0	0
Total ignitions per 10,000 circuit miles	20	53	47	87	7	113	6	15	12	12	43	46	0	0	0	0	0	0

Source: Tables 8 and 7.1 from utility 2021 WMP Updates
Note: The total number of ignitions for each year was normalized using the 2020 reported overhead circuit miles for each utility, in their 2021 WMPs.

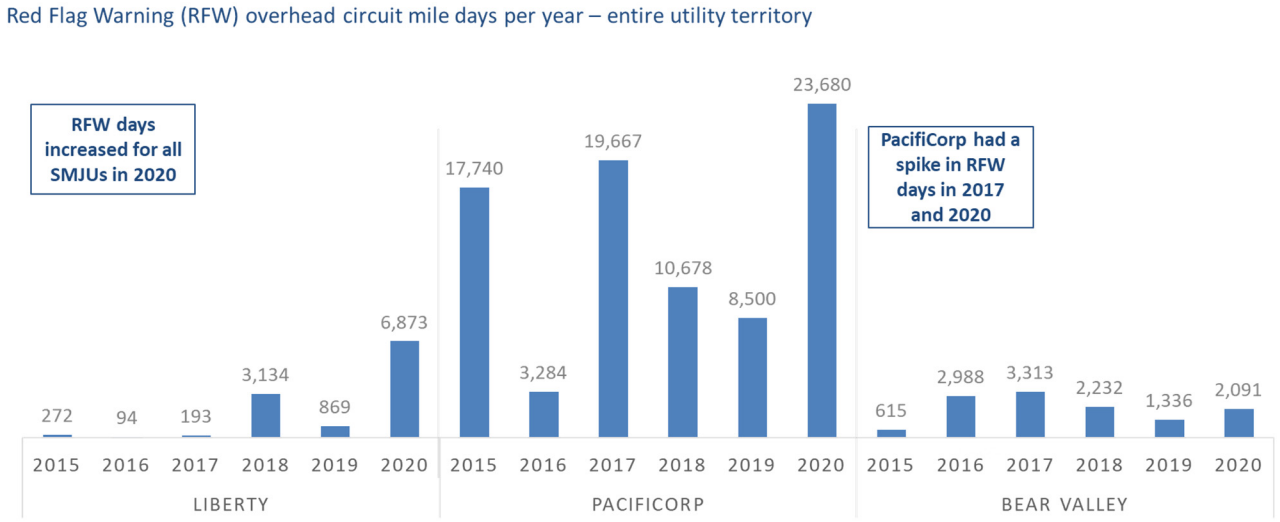
Figure 4.5.a: Number of ignitions per 10,000 overhead circuit miles.



	Liberty						PacifiCorp						Bear Valley					
	2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020
Other events per overhead circuit mile	0.00	0.00	0.00	0.00	0.01	0.03	0.14	0.06	0.10	0.07	0.13	0.08	0.00	0.01	0.00	0.00	0.01	0.01
Contact from object risk events per overhead circuit mile	0.02	0.03	0.01	0.05	0.01	0.06	0.07	0.06	0.07	0.05	0.08	0.06	0.00	0.09	0.06	0.02	0.01	0.04
Equipment/facility failure risk events per overhead circuit mile	0.06	0.06	0.06	0.13	0.02	0.11	0.11	0.09	0.12	0.08	0.10	0.10	0.00	0.08	0.14	0.05	0.04	0.08
Wire to wire risk events per overhead circuit mile	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
Total risk events per overhead circuit mile	0.08	0.09	0.07	0.18	0.04	0.21	0.32	0.21	0.30	0.20	0.31	0.24	0.00	0.18	0.23	0.08	0.06	0.14

Source: Risk events from Table 7.1 of utility 2021 WMP Updates, overhead circuit miles from Table 8 of utility 2021 WMP Updates
Note: A risk event is defined as an event with probability of ignition, including wires down, contacts with objects, line slap, events with evidence of heat generation, and other events that cause sparking or have the potential to cause ignition.

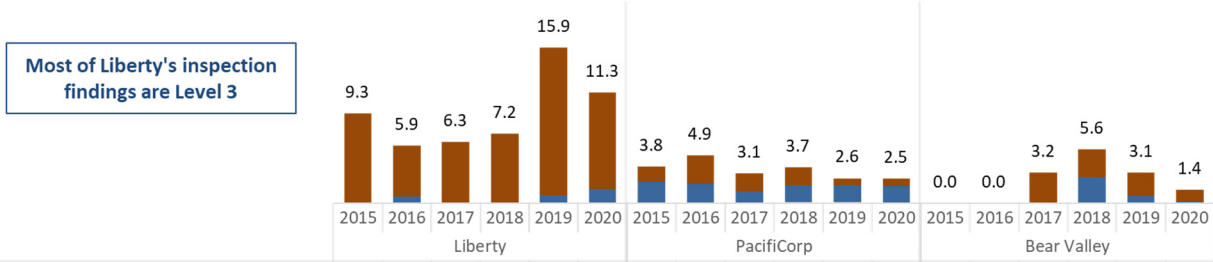
Figure 4.5.b: Risk events per overhead circuit mile.



Source: Table 6 of 2021 utility WMP Updates.
Sum of overhead circuit miles of utility grid subject to Red Flag Warning each day within a given time period, calculated as the number of overhead circuit miles that were under an RFW multiplied by the number of days those circuit miles were under said RFW.

Figure 4.5.c: Red Flag Warning (RFW) overhead circuit mile days per year.

Level 1, 2, and 3 asset inspection findings for transmission and distribution, per circuit mile inspected



	Liberty						PacifiCorp						Bear Valley					
	2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020	2015	2016	2017	2018	2019	2020
Level 3 asset inspection findings, transmission and distribution per circuit mile inspected	9.3	5.2	6.3	7.1	15.1	9.9	1.6	2.9	1.8	1.9	0.7	0.8	0.0	0.0	3.2	2.9	2.3	1.2
Level 2 asset inspection findings, transmission and distribution per circuit mile inspected	0.0	0.7	0.0	0.1	0.8	1.4	2.2	1.9	1.2	1.6	1.8	1.7	0.0	0.0	0.0	2.7	0.8	0.2
Level 1 asset inspection findings, transmission and distribution per circuit mile inspected	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total inspection findings, transmission and distribution per circuit mile inspected	9.3	5.9	6.3	7.2	15.9	11.3	3.8	4.9	3.1	3.7	2.6	2.5	0.0	0.0	3.2	5.6	3.1	1.4

Source: Inspection findings from Table 1 of utility 2021 WMP Updates
Note: A Level 1 finding is an immediate safety and/or reliability risk with high probability for significant impact. A Level 2 finding is a variable (non-immediate high to low safety and/or reliability risk. A Level 3 finding is an acceptable safety and/or reliability risk.

Figure 4.5.d: Asset inspection findings per circuit mile inspected.

5. Mitigation initiatives and maturity evaluation

This section of the WMP Guidelines[52] is the heart of the plan and requires the utility to describe each mitigation initiative it will undertake to reduce the risk of catastrophic wildfire. The utility is also required to self-report its current and projected progress to mitigate wildfire risk effectively,[53] a capability referred to in this document as "maturity" and measured by the WSD Utility Wildfire Mitigation Maturity Model ("Maturity Model"). Utility maturity is measured across the same categories used to report mitigation initiatives listed below, allowing WSD to evaluate a utility's reported and projected maturity in wildfire mitigation in the context of its corresponding current and planned initiatives. The ten maturity and mitigation initiative categories are listed below, with further details in Appendix 10.3:

1) Risk assessment and mapping
2) Situational awareness and forecasting
3) Grid design and system hardening
4) Asset management and inspections
5) Vegetation management and inspections
6) Grid operations and operating protocols
7) Data governance
8) Resource allocation methodology
9) Emergency planning and preparedness
10) Stakeholder cooperation and community engagement

Key Areas for Improvement and Remedies

The WSD finds that PC must focus on the following areas as significant to reducing utility-related wildfire risk:

[52] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, pp. 42-46 (accessed May 27, 2021):
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

[53] Utilities that submitted a WMP were required to complete a survey in which they answered specific questions which assessed their existing and future wildfire mitigation practices across 52 capabilities at the time of submission and at the end of the three-year plan horizon. The 52 capabilities are mapped to the same ten categories identified for mitigation initiatives. The results of the survey can be found in Attachment 11.1. The most recent survey for each utility can be found on the WSD website here: https://www.cpuc.ca.gov/wildfiremitigationplans/.

Utility-#	Issue title	Issue description	Remedies required
PC-1	Failure to follow format for Section 7.3.b, subparts 1-5, of 2021 WMP Guidelines	PC does not follow the format for Section 7.3.b of the 2021 WMP Guidelines for all of the mitigation initiatives provided in its 2021 WMP Update. Specifically, PC omits the subpart 1-5 headers, along with some the corresponding details, from many of its mitigation initiative discussions. This makes it difficult to identify key information, such as "Progress on initiative" or "Future improvements to initiative".	PC must include and address all components of the WMP Guidelines Section 7.3.b "Detailed information on mitigation initiatives by category and activity," including all subparts 1-5, for each of its initiatives. PC must follow and address all other WMP Guidelines components in its future submissions.

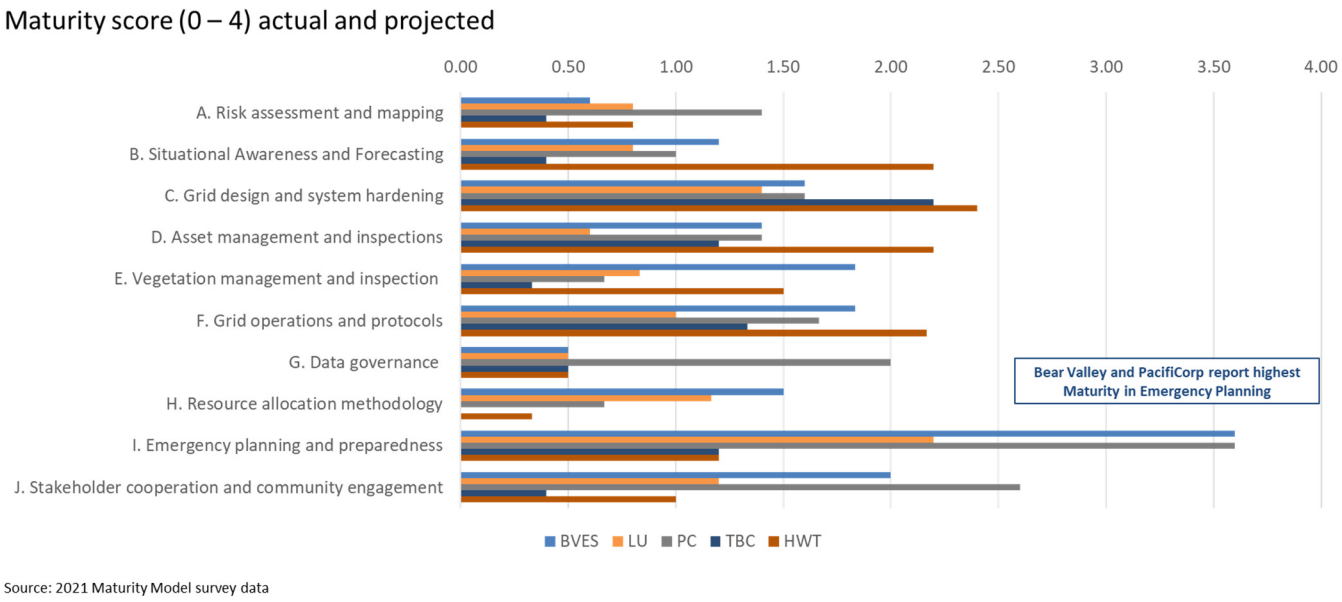
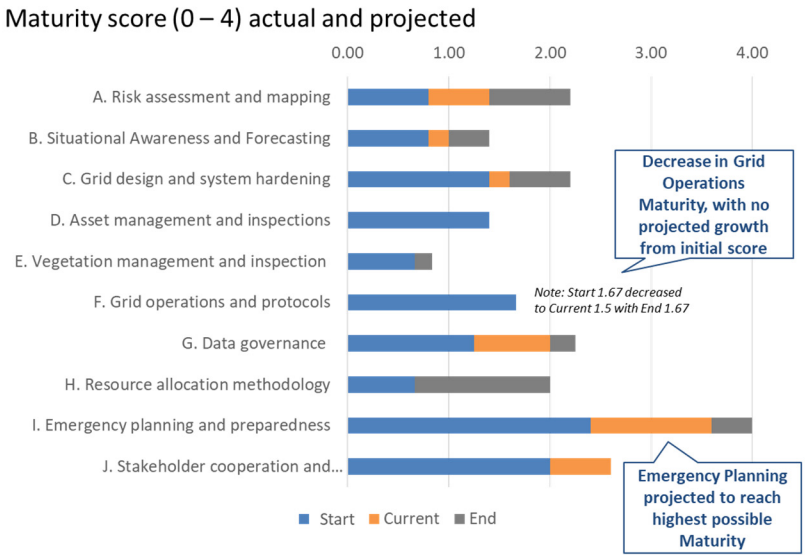


Figure 5.a: Self-reported maturity by category, SMJUs and ITOs.



Projected growth through WMP cycle in Maturity by Category: PacifiCorp

Category	Scores Start	Current	End
A. Risk assessment and mapping	0.80	1.40	2.20
B. Situational Awareness and Forecasting	0.80	1.00	1.40
C. Grid design and system hardening	1.40	1.60	2.20
D. Asset management and inspections	1.40	1.40	1.40
E. Vegetation management and inspection	0.67	0.67	0.83
F. Grid operations and protocols	1.67	1.50	1.67
G. Data governance	1.25	2.00	2.25
H. Resource allocation methodology	0.67	0.67	2.00
I. Emergency planning and preparedness	2.40	3.60	4.00
J. Stakeholder cooperation and community engagement	2.00	2.60	2.60

Figure 5.b: Projected growth through WMP cycle in maturity by category, PacifiCorp.

Below, WSD evaluates PC's initiatives across the ten categories in the context of its maturity model survey scores.

5.1. Risk Assessment and Mapping

Introduction

This section of the WMP Guidelines[54] requires the utility to discuss the risk assessment and mapping initiatives implemented to minimize the risk of its causing wildfires. Utilities must describe initiatives related to equipment maps and modelling of overall wildfire risk, ignition probability, wildfire consequence, risk-reduction impact, match-drop simulations,[55] and climate/weather-driven risks. This section also requires the utility to provide data on spending, miles of infrastructure treated, spend per treated line mile, ignition probability drivers targeted, projected risk reduction achieved from implementing the initiative, and other (i.e., non-ignition) risk drivers addressed by the initiative.

[54] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, pp. 43-44 (accessed May 27, 2021):
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

[55] Simulations of the potential wildfire consequences of ignitions that occur along electric lines and equipment effectively showing the potential consequences if an ignition or "match was dropped" at a specific point in a utility's territory.

The parameters of risk assessment (discussed here) and resource allocation (discussed later in the "Resource Allocation Methodology" section) to reduce wildfire risk derive from the S-MAP and RAMP proceedings for the utility GRC (D.18-12-014).

The risk modelling conducted should ultimately inform the RSE analyses discussed in category 8, resource allocation methodology.

Overview

The WSD finds that PC has made progress in risk assessment and mapping and finds this section of PC's 2021 WMP Update to be sufficient.

Progress over the past year

The WSD finds that PC has made the following progress:

- PC improved its risk assessment and mapping capabilities from the last submission of its WMP in 2020 by developing its Localized Risk Assessment Model (LRAM) to inform a more risk-based decision-making process. Previously the utility was using the CPUC's HFTD Map tier designations to inform inspections, vegetation management, and prioritizing hardening efforts.
- PC is still using the Integrated Utility Threat Index (iUTI) data set from the CPUC's HFTD Map as a baseline for its relative risk score. However, the utility has broken down its circuits into segments by isolation devices, referencing them as Zones of Protection (ZOP). PC also integrated combined risk layers, mathematically weighing factors based on the risk of each ZOP. This should improve the granularity of PC's risk assessment to a circuit segment level.
- The risk data sets include tree canopy, vegetation-related outage, historic utility fault locations, damaged or failed equipment from short circuits, ignition data, and half-weighted arc energy data to gauge ignition risk.
- PC is further along than its peer utilities in incorporating climate change projections in its risk assessment. The utility extracted the averages for climate projections for temperature, precipitation, wind, and rainfall from four different CalAdapt models (HadGEM2-ES, CANESM2, CRNM-CM5, MIROC5) as inputs in to its Fosberg Index and KBDI. This analysis gives the utility the ability to forecast the KBDI, Fosberg Index, and combined fire risk score out until 2030. These indices are what PC also uses for PSPS and mitigation deployment decision-making.
- PC in comparison to its peer utilities was much more transparent in its Wildfire Mitigation Plan Update in the information it provided about its Risk Assessment and Mapping initiatives and was the only utility of the SMJUs to incorporate climate change projections in its risk assessment.

PC has room for improvement in the following areas:

- While PC's Risk Assessment initiatives have improved, it does not incorporate asset health and condition into its modeling. It also omits consideration of different equipment types in its modeling.
- PC is unable to provide risk-spend efficiency (RSE) values for its initiatives. PC has confirmed that it expects to produce them by mid-2021 with the use of its LRAM[56] (see issue PC-9 in Section 5.8).
- PC's LRAM is currently only applicable to the utility's distribution circuits, it does not apply to transmission circuits.
- With the limited number of weather stations deployed in PC's territory and lack of installations in 2020 it is unclear whether the climate information from the weather stations is providing enough granularity when assessing the utility's weather risk.

Key Areas for Improvement and Remedies

The WSD finds that PC must focus on the following areas as significant to reducing utility-related wildfire risk:

[56] PacifiCorp 2021 WMP Update, p. 72.

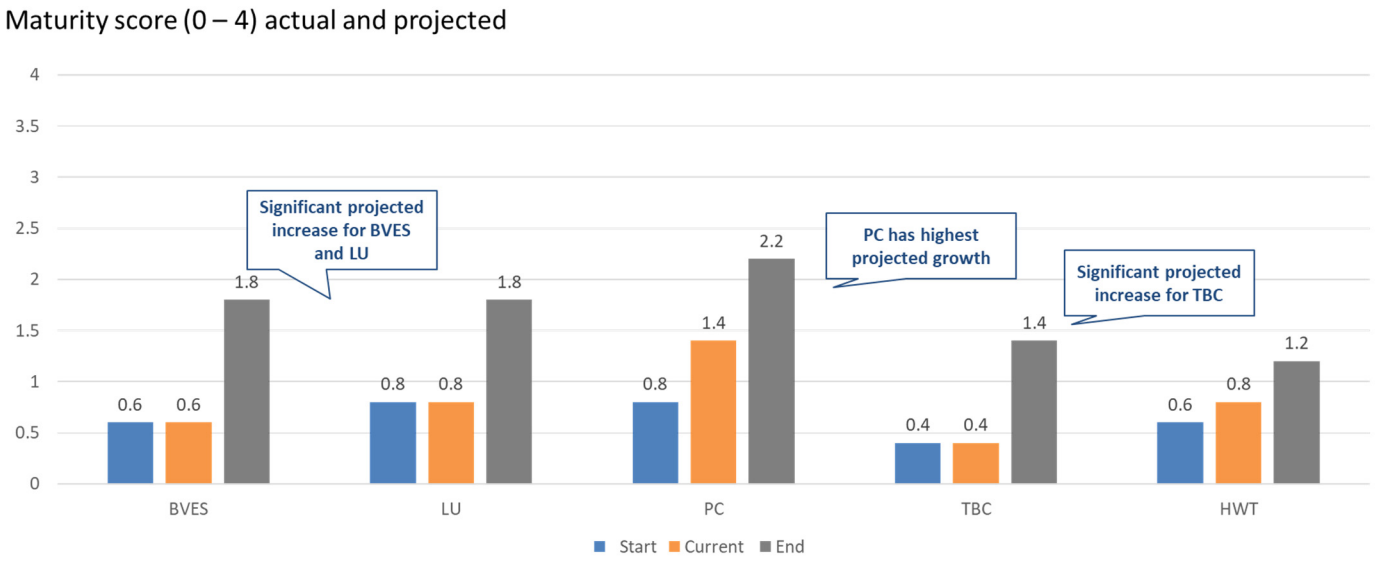
Utility-#	Issue title	Issue description	Remedies required
PC-2	Lack of consistency in approach to wildfire risk modeling across utilities	The utilities do not have a consistent approach to wildfire risk modeling. For example, in their wildfire risk models, utilities use different types of data, use their individual data sets in different ways, and use different third-party vendors. The WSD recognizes that the utilities have differing service territory characteristics, differing data availability, and are at different stages in developing their wildfire risk models. However, the utilities face similar enough circumstances that there should be some level of consistency in their approaches to wildfire risk modeling statewide.	The utilities[57] must collaborate through a working group facilitated by Energy Safety[58] to develop a more consistent statewide approach to wildfire risk modeling. After the WSD completes its evaluation of all the utilities' 2021 WMP Updates, it will provide additional detail on the specifics of this working group. A working group to address wildfire risk modeling will allow for: 1. Collaboration among the utilities; 2. Stakeholder and academic expert input; and 3. Increased transparency.

Figures

Below are charts used as part of the WSD's review of PC's risk assessment and mapping section:

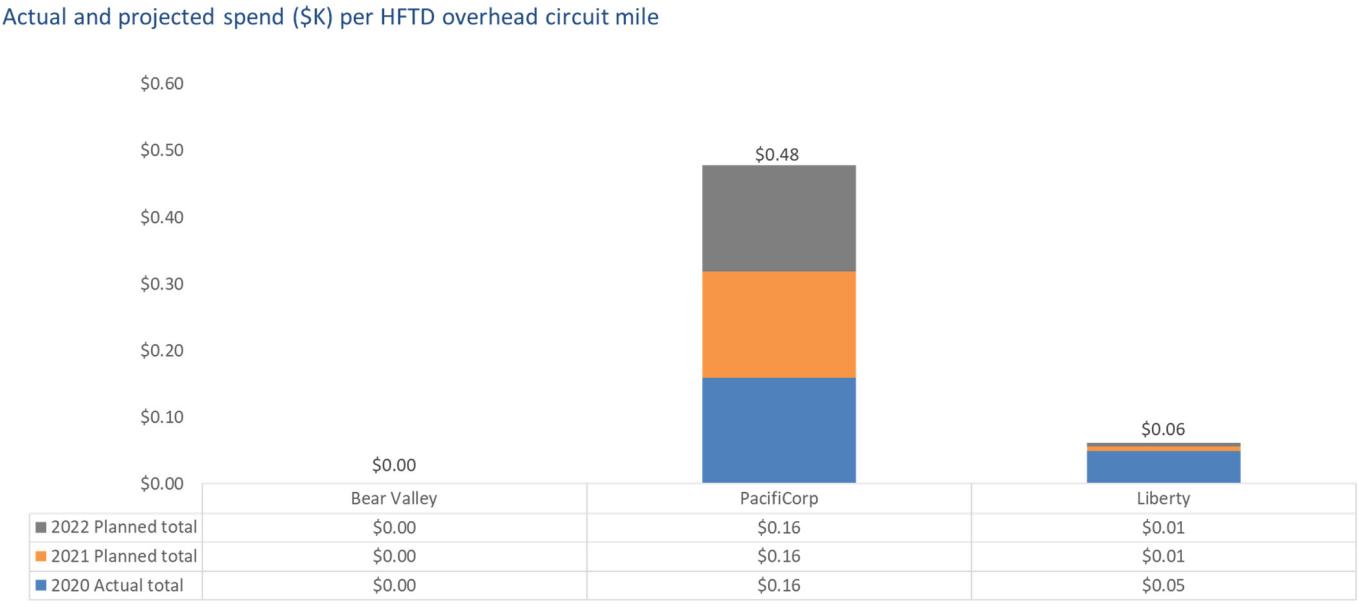
[57] Here "utilities" refers to SDG&E and Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), PacifiCorp, Bear Valley Electric Service, Inc. (BVES), and Liberty Utilities; although this may not be the case every time "utilities" is used through the document.

[58] The WSD is transitioning to the Office of Energy Infrastructure Safety (Energy Safety) on July 1, 2021.



Source: 2021 Maturity Model survey data

Figure 5.1.a: Risk assessment and mapping maturity score progress.



Source: Table 12 of utility 2021 WMPs and subsequent data requests

Figure 5.1.b: Risk assessment and mapping spend per overhead circuit mile, SMJUs 2020-2022.

5.2. Situational Awareness and Forecasting

Introduction

A strong weather monitoring and situational awareness system is an essential fire prevention/mitigation risk reduction strategy because it effectively alerts a utility's preparation and response to potentially dangerous fire weather conditions that can inform its decisions on PSPS implementation, grid design, and system hardening. It is also one of the most inexpensive strategies.

The situational awareness and forecasting section of the WMP Guidelines[59] requires the utility to discuss its use of cameras, weather stations, weather forecasting and modeling tools, grid monitoring sensors, fault indicators, and equipment monitoring. Situational awareness requires the utility to be aware of actual ignitions in real time and to understand the likelihood of utility ignitions based on grid and asset conditions, wind, fuel conditions, temperature, and other factors.

The WMP Guidelines refer to key situational awareness measures, including:

1. Installation of advanced weather monitoring and weather stations that collect data on weather conditions so as to develop weather forecasts and predict where ignition and wildfire spread are likely;
2. Installation of high-definition cameras throughout a utility's service territory, with the ability to control the camera's direction and magnification remotely;
3. Use of continuous monitoring sensors that can provide near-real-time information on grid conditions;
4. Use of a fire risk or fire potential index that takes numerous data points in given weather conditions and predicts the likelihood of wildfire; and,
5. Use of personnel to physically monitor areas of electric lines and equipment in elevated fire risk conditions.

Overview

The WSD finds that PC has made progress in situational awareness and forecasting and finds this section of PC's 2021 WMP Update to be sufficient subject to remedies.

Progress over the past year

The WSD finds that PC has made the following progress:

- PC is beginning to build out its weather station network and is working with a fire engineering consultant to provide input regarding the placement of weather stations considering topography, climate trends and areas with low visibility.
- PC also uses the LRAM to identify areas where climate-driven fire risk and utility equipment exist and then calculate the distances to weather stations.

[59] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, p. 44 (accessed May 27, 2021): https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

- PC began developing a Distribution Fault Anticipation (DFA) pilot program in 2019 and is on schedule to deploy the technology on four circuits in 2021. This technology is promising, with the capability of detecting issues on circuits prior to failure.
- PC incorporated Vapor Pressure Deficit (VPD) into its forecasting in 2020 to improve the reliability of the Keetch-Byram Drought Index (KBDI), which the utility uses as a measure of short and long-term drying. This, combined with additional weather influencers such as the Fosberg Fire Weather Index, serves as an input to identify its operational strategies and is used similarly to a fire potential index for PSPS decision-making and non-reclosing operations.

PC has room for improvement in the following areas:

- PC only completed two of its anticipated 11 weather station deployments in 2020, citing delays due to 2020 fires,[60] as well as the need to facilitate more robust siting.[61]
- No spend was reported in PC's mitigation initiative financials table (Table 12 of PC's 2021 WMP Update) for its "Continuous Monitoring Sensors (Distribution Fault Anticipation)" program for any of the years in the 2020-2022 WMP cycle. However, PC reports units (actual and projected) for each of the years.[62]
- No projected spend was reported in Table 12 for the "Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions" initiative.[63] In a data request,[64] the WSD asked PC why there was 2020 spend for this initiative, but no projected 2021 or 2022 spend (see appendix 10.2 for more information and for PC's response).
- It is unclear whether PC does fuel sampling to determine and track fuel moisture content in vegetation, or if it is solely relying on remote sensing to determine fuel moisture. Peer utilities are using a combination of fuel sampling and remote sensing data to determine live and dead fuel moisture values. The validation using this combination of collection methods provides a more accurate representation of the current state of fuel moisture both living and dead and serves as a valuable input to better understand when large fires are possible.

Key Areas for Improvement and Remedies

The WSD finds that PC must focus on the following area as significant to reducing utility-related wildfire risk:

[60] PacifiCorp 2021 WMP Update, p. 124.

[61] PacifiCorp DR 2apr2021, Question 2, received April 6, 2021.

[62] PacifiCorp 2021 WMP Update, Table 12, Row 14, Columns T-AE.

[63] PacifiCorp 2021 WMP Update, Table 12, Row 17, Columns T-AC.

[64] PacifiCorp DR 27apr2021, Question 6, received May 3, 2021.

Utility-#	Issue title	Issue description	Remedies required
PC-3	GIS and non-spatial data discrepancy	PC's weather station GIS data does not match the non-spatial data included in its 2021 WMP Update, nor does it match the numbers provided in response to a data request (see Appendix 10.2 for more information). PC reports that it completed installation of ten weather stations in 2019 and two in 2020, which brings its current total to twelve. However, PC's GIS weather station data, submitted as part of its 2021 WMP Update, only includes ten GIS data points.	PC must provide complete, accurate, and the most current information, including GIS data, pertaining to all of its program targets and performance.

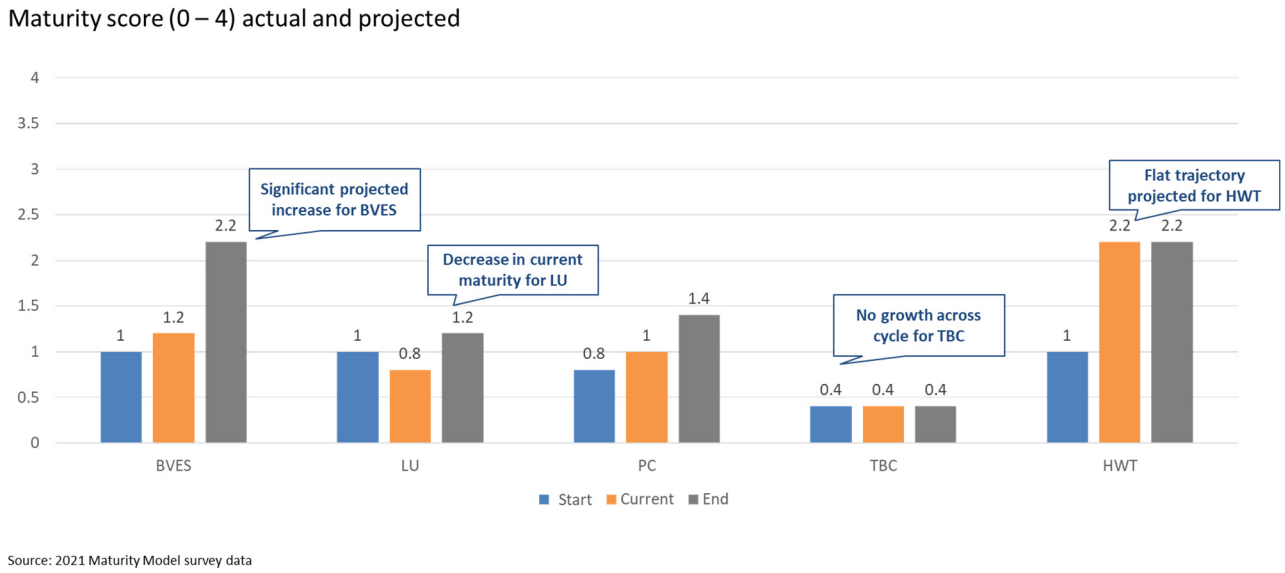
Additional Issues and Remedies

In addition to the key areas listed above, the WSD finds the following issues and associated remedies. The WSD expects PC to take action to address these issues and report on progress made over the year in its 2022 WMP Update.

- ISSUE: PC is trailing behind peer utilities in its situational awareness for ignition recognition with a lack of high-definition (HD) cameras and satellite fire detection technology in its California service territory.
    - REMEDY: PC must explain in its 2022 WMP how it plans to incorporate HD camera deployment and fire detection technology for ignition recognition in its California service territory.

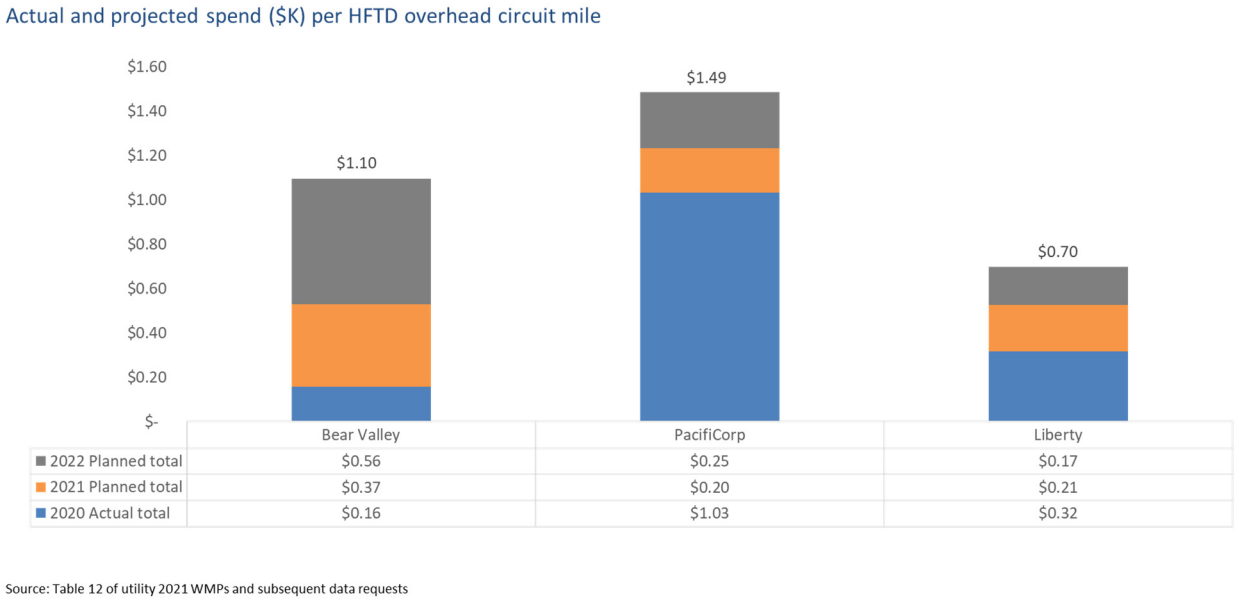
Figures

Below are charts used as part of the WSD's review of PC's situational awareness and forecasting section:



Source: 2021 Maturity Model survey data

Figure 5.2.a: Situational awareness and forecasting maturity score progress.



Source: Table 12 of utility 2021 WMPs and subsequent data requests

Figure 5.2.b: Situational awareness and forecasting spend per HFTD overhead circuit mile, SMJUs 2020-2022.

5.3. Grid Design and System Hardening

Introduction

The grid design and system hardening section of the WMP Guidelines[65] examines how the utility is designing its system to reduce ignition risk and what it is doing to strengthen its distribution, transmission, and substation infrastructure to prevent causing catastrophic wildfires. This section also requires discussion of routine and non-routine maintenance programs, including whether the utility replaces or upgrades infrastructure proactively rather than running facilities to failure. Programs in this category, which often cover the most expensive aspects of a WMP, include initiatives such as the installation of covered conductors to replace bare overhead wires, undergrounding of distribution or transmission lines, and pole replacement programs. The utility is required, at a minimum, to discuss grid design and system hardening in each of the following areas:

1. Capacitor maintenance and replacement,
2. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault,
3. Covered conductor installation,
4. Covered conductor maintenance,
5. Crossarm maintenance, repair, and replacement,
6. Distribution pole replacement and reinforcement, including with composite poles,
7. Expulsion fuse replacement,
8. Grid topology improvements to mitigate or reduce PSPS events,
9. Installation of system automation equipment,
10. Maintenance, repair, and replacement of connectors, including hotline clamps,
11. Mitigation of impact on customers and other residents affected during PSPS event,
12. Other corrective action,
13. Pole loading infrastructure hardening and replacement program based on pole loading assessment program,
14. Transformer maintenance and replacement,
15. Transmission tower maintenance and replacement,
16. Undergrounding of electric lines and/or equipment,
17. Updates to grid topology to minimize risk of ignition in HFTDs, and,
18. Other/not listed items if an initiative cannot feasibly be classified within those listed above.

Overview

The WSD finds that PC has made progress in grid design and system hardening and finds this section of PC's 2021 WMP Update to be sufficient subject to remedies.

Progress over the past year

[65] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, p. 44 (accessed May 27, 2021): https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

The WSD finds that PC has made the following progress:

- PC is reinforcing high priority wooden poles within HFTDs with pole cladding, wrapping, and fireproof spray coating to reduce the threat of damage from wildfires. In 2020, PC identified 4,326 at-risk poles to be included in the program and is aiming to reinforce or wrap 2,262 poles in 2021.[66]
- In the next 4 years, PC has 68 projects planned specific to wildfire risk reduction within the HFTD relating to system automation equipment, which includes relays, breakers, reclosers, and communications equipment with the main focus around fault detection.
- PC is focusing on small diameter copper conductor replacements, due to the fact that such conductor is not compatible with fault detection protection schemes now being implemented,[67] with 6.43 miles planned for replacement in 2021 and 2022, and 100 miles planned to be evaluated for potential replacement starting in 2023.[68]
- During routine inspections, PC focuses on assets that could present wildfire risk in the event of failure and has shortened the required timelines to address any associated repairs and replacements (as discussed in Section 5.4 below).

PC has room for improvement in the following areas:

- PC installed only 1.4 miles of covered conductor in 2020, less than its initial target of 38 miles.[69] PC is using this limited amount of covered conductor as a basis for its reasoning behind expanding its covered conductor program to 85 miles in 2021,[70] despite only having six data points demonstrating the effectiveness of covered conductor.[71] Additionally, while PC is using risk analysis to determine the prioritization of installation for covered conductor, PC is still aiming to install covered conductor across the entirety of HFTD Tier 2 and Tier 3 areas, instead of using other initiatives and mitigations.
- PC performs covered conductor maintenance through General Order (GO) 165 inspections and does not have a separate maintenance program at this time. PC needs to demonstrate a full understanding of maintaining covered conductor given that it is relatively new to PC's system and can present wildfire risk if failure to properly identify needs for repairs and improvements leads to premature failure of covered conductor.
- PC's pole replacement program is quite extensive, with the goal of 128 pole replacements in 2021, 272 poles in 2022, and 4,054 poles in 2023.[72] PC does not explain

[66] PacifiCorp 2021 WMP Update, Table 7-1, p. 133.

[67] PacifiCorp 2021 WMP Update, p. 137.

[68] PacifiCorp 2021 WMP Update, Table 7-3, p. 137.

[69] PacifiCorp 2020 WMP, Table 23, p. 168.

[70] PacifiCorp 2021 WMP Update, Table 12

[71] PacifiCorp DR 27apr2021, Question 3, received May 3, 2021.

[72] Table 7-2: PacifiCorp's 2021 WMP Pole Replacement/Reinforcement Revised Annual Scope, p. 134.

the major increase in the number of planned pole replacements in 2023, nor does it explain how it intends to secure resources to complete such extensive work.

- PC explains that it plans to prioritize wood poles over 40 years old for replacement,[73] but does not provide adequate explanation for why it finds that this particular age of pole requires replacement.
- PC does not currently account for strength needs when conducting pole replacements. Instead, the current driving factors are the material of the poles and the resulting wildfire spread risk.[74] PC does not currently account for poles that may need replacement due to strength needs to support covered conductor installation and consequently may need to replace newly installed poles if covered conductor is installed on a circuit segment where poles were recently replaced.
- PC does not have a separate program for replacing hotline clamps and connectors, instead relying on standard business practices and its covered conductor installations to include these repairs and replacements. PC has seen three ignition events since 2015 involving connection devices,[75] and needs to demonstrate that it is effectively accounting for ignitions seen on its system.
- PC does not currently have a planned wildfire-specific undergrounding program. PC should evaluate undergrounding as part of its wildfire risk reduction mitigations to ensure all alternatives are being considered for fire mitigation, given the high-risk reduction benefits of undergrounding.
- PC does not separate many of the specific asset inspection programs required by the WMP Guidelines, such as capacitors, circuit breakers, and crossarms, and instead inspects these assets as part of routine inspections.

Key Areas for Improvement and Remedies

The WSD finds that PC must focus on the following areas as significant to reducing utility-related wildfire risk:

[73] PacifiCorp 2021 WMP Update, p. 133.

[74] PacifiCorp DR 27apr2021, Question 1, received May 3, 2021.

[75] PacifiCorp 2021 WMP Update, Table 12, Row 115.

Utility-#	Issue title	Issue description	Remedies required
PC-4	Limited evidence to support the effectiveness of covered conductor	The rationale to support the selection of covered conductor as a preferred initiative to mitigate wildfire risk lacks consistency among the utilities, leading some utilities to potentially expedite covered conductor deployment without first demonstrating a full understanding of its long-term risk reduction and cost-effectiveness. The utilities' current covered conductor pilot efforts are limited in scope[76] and therefore fail to provide a full basis for understanding how covered conductor will perform in the field. Additionally, utilities justify covered conductor installation by alluding to reduced PSPS risk but fail to provide adequate comparison to other initiatives' ability to reduce PSPS risk.	The utilities[77] must coordinate to develop a consistent approach to evaluating the long-term risk reduction and cost- effectiveness of covered conductor deployment, including: 1. The effectiveness of covered conductor in the field in comparison to alternative initiatives. 2. How covered conductor installation compares to other initiatives in its potential to reduce PSPS risk.
PC-5	Reconductoring projects not prioritized based on wildfire risk	PC states that it is replacing small diameter copper and iron conductors "throughout PacifiCorp's California service territory" instead of focusing on areas of highest risk.	PC must demonstrate that its copper and iron reconductoring projects prioritize locations with the highest wildfire risk, both in scope and timing.

Additional Issues and Remedies

[76] Limited in terms of mileage installed, time elapsed since initial installation, or both.

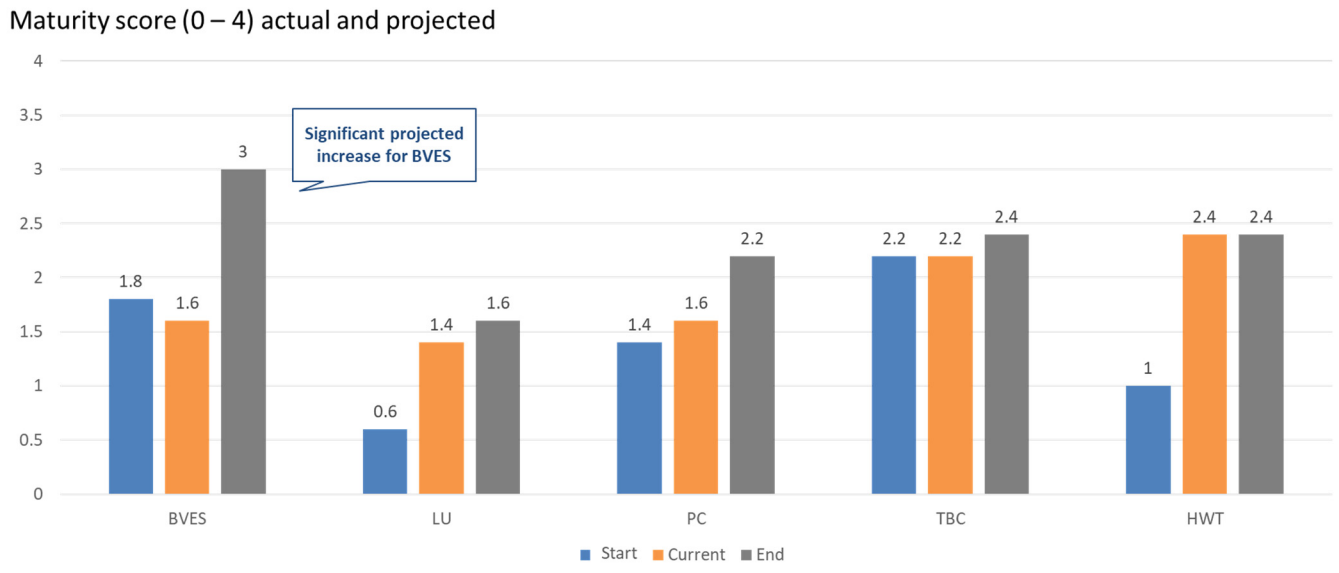
[77] Here "utilities" refers to SDG&E and Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), PacifiCorp, Bear Valley Electric Service, Inc. (BVES), and Liberty Utilities; although this may not be the case every time "utilities" is used through the document.

In addition to the key areas listed above, the WSD finds the following issues and associated remedies. The WSD expects PC to take action to address these issues and report on progress made over the year in its 2022 WMP Update.

- ISSUE: PC lacks a separate covered conductor maintenance program, and does not demonstrate that its GO 165 programs adequately cover maintenance specific to wildfire risk
    - REMEDY: PC shall provide all supporting material to demonstrate that its maintenance programs effectively maintain its covered conductor. If its existing maintenance programs do not provide maintenance specific to covered conductor, PC shall enhance its current operations to provide such maintenance and provide supporting material to detail the enhancements to its existing programs.
- ISSUE: PC is increasing its pole replacement program from 2021 to 2023 without demonstration of need, effectiveness, or proof of adequate resources to perform the full scope.
    - REMEDY: PC must demonstrate the need for the scope of its pole replacement program, as well as a plan to obtain resources needed for the program.
- ISSUE: There is no mechanism in place to prevent overlap between PC's pole replacement program and covered conductor installation.
    - REMEDY: PC must provide a plan to ensure that newly installed poles are not replaced soon after installation due to covered conductor installation.
- ISSUE: PC does not have a separate program to evaluate and track the need for repairs and replacements of hotline clamps and connectors.
    - REMEDY: PC must develop a wildfire-specific program to evaluate the health of its hotline clamps and connectors instead of relying on existing programs, or show how existing programs adequately evaluate and track the need for replacements and repairs of such assets.
- ISSUE: PC has no planned wildfire-specific undergrounding program at this time.
    - REMEDY: PC must evaluate undergrounding as a potential mitigation as part of its full wildfire risk reduction analysis.

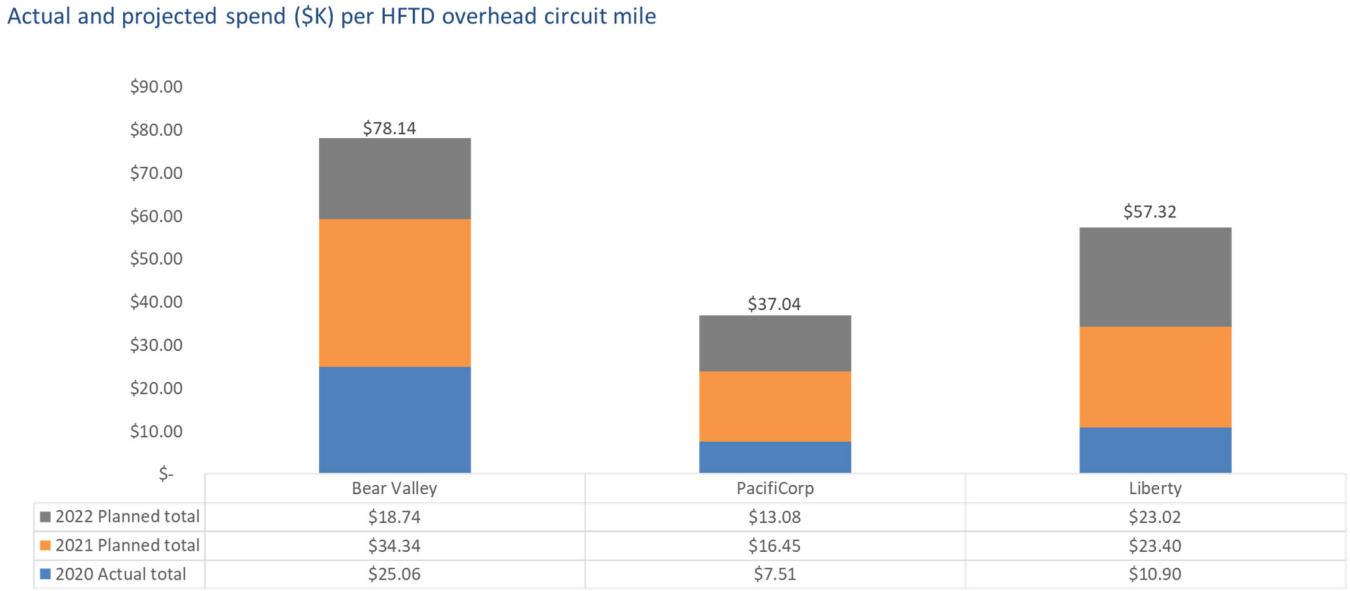
Figures

Below are charts used as part of the WSD's review of PC's grid design and system hardening section:



Source: 2021 Maturity Model survey data

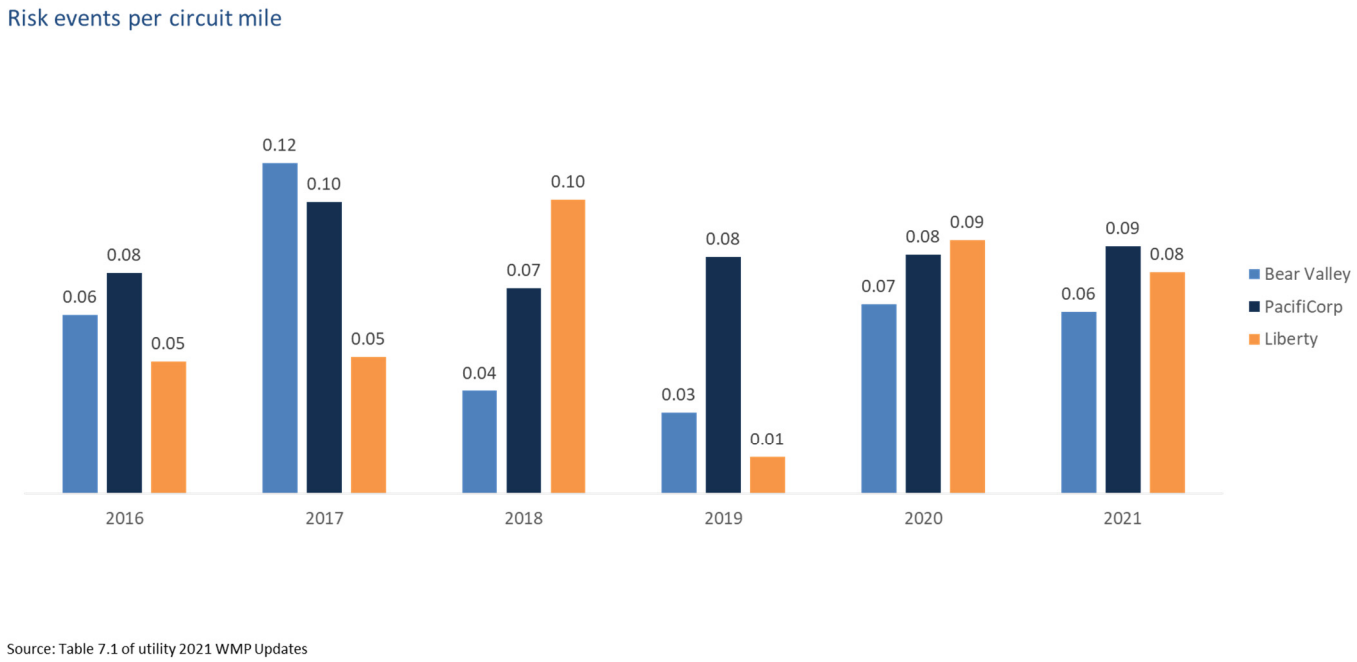
Figure 5.3.a: Grid design and system hardening maturity score progress.



	Bear Valley	PacifiCorp	Liberty
2022 Planned total	$18.74	$13.08	$23.02
2021 Planned total	$34.34	$16.45	$23.40
2020 Actual total	$25.06	$7.51	$10.90

Source: Table 12 of utility 2021 WMPs and subsequent data requests

Figure 5.3.b: Grid design and system hardening spend per HFTD overhead circuit mile, SMJUs 2020-2022.



Source: Table 7.1 of utility 2021 WMP Updates

Figure 5.3.c: SMJU risk events due to equipment/facility failure per overhead circuit mile.

5.4. Asset Management and Inspections

Introduction

The asset management and inspections section of the WMP Guidelines[78] requires the utility to discuss power line/infrastructure inspections for distribution and transmission assets within the HFTD, including infrared, light detection and ranging (LiDAR), substation, patrol, and detailed inspections, designed to minimize the risk of its facilities or equipment causing wildfires. The utility must describe its protocols relating to maintenance of any electric lines or equipment that could, directly or indirectly, relate to wildfire ignition. The utility must also describe how it ensures inspections are done properly through a program of quality control.

Overview

The WSD finds that PC has made progress in asset management and inspections and finds this section of PC's 2021 WMP Update to be sufficient subject to remedies.

Progress over the past year

[78] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, pp. 44-45 (accessed May 27, 2021): https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

The WSD finds that PC has made the following progress:

- PC has made progress on its asset inspection program, including:
  - Increasing the frequency of inspections in high fire consequence areas
  - Narrowing the fire risk condition timeframes for correction
  - Piloting new technology to enhance visual inspections
- In 2020, PC performed approximately 13,000 detailed inspections of overhead distribution facilities, with approximately 7,000 conditions identified. The top five conditions consisted of 65% of the findings, with only 7% qualifying as a potential fire risk condition involving insufficient conductor clearance to the pole or crossarm, with 546 total instances found.[79]
- In 2020, PC performed approximately 3,000 detailed inspections of transmission facilities, with approximately 500 conditions identified. The top five conditions consisted of 57% of the findings, with only 2% qualifying as a potential fire risk condition involving damaged poles requiring replacement, with 15 total instances found.[80]
- PC continued its infrared (IR) inspections pilot program for transmission facilities after starting the pilot in 2019, although PC does not currently have an IR program for distribution facilities. PC found seven findings using IR in 2020 and plans to inspect 700 line-miles in 2021. PC is improving this program by examining data collected for better insight into the cause of identified hot spots.
- In 2019, PC piloted use of LiDAR for augmenting its asset inspections. PC found the information collected to be less accurate than expected based on field verification and is still in the process of determining the extent to which it intends to implement LiDAR into its asset inspection process.
- While PC does not have a wildfire-program specific quality assurance/quality control (QA/QC) process, PC has an overarching asset inspection QA/QC program that checks the accuracy of inspections being performed, including physical audits conducted at random for at least 5% of inspections. PC continues to improve its QA/QC process through iterations of correcting the root cause of any findings during audits and intends to expedite QA/QC audits in HFTDs after 2021.
- In 2020, PC implemented a mobile application for inspections.

PC has room for improvement in the following areas:

- While other utilities have demonstrated high risk-spend efficiency for expulsion fuse replacements,[81] and despite expulsion fuses having been shown to have a high

[79] PacifiCorp 2021 WMP Update, Table 7-6, p. 145.

[80] PacifiCorp 2021 WMP Update, Table 7-7, p. 146.

[81] For example, SDG&E provides estimated RSE values in line 29 of Table 12 in its 2021 WMP Update.

incidence rate for ignitions,[82] PC does not currently track expulsion fuse replacements separately, nor does it have a separate program to specifically target expulsion fuse replacements. PC instead relies on replacements occurring during covered conductor installation and through regular repairs related to its inspection program.[83] PC states that it "will continue to evaluate the need for an additional, stand-alone overhead expulsion fuse program should necessary fuse replacements not be sufficiently addressed through other programs"[84] but does not provide any details on how it is performing these evaluations, nor does it provide a timeline for possible implementation.

- PC does not provide a specific timeline for when it intends to start inspecting all transmission lines within its California service territory annually using helicopters, nor does PC provide adequate justification to show the effectiveness of the scope of this program. PC has also not made it clear how it is utilizing the data collected, instead vaguely stating that it is examining data collected for better insight on the cause of hot spots identified, as discussed in Section 5.8 below.

Key Areas for Improvement and Remedies

The WSD finds that PC must focus on the following areas as significant to reducing utility-related wildfire risk:

[82] PacifiCorp 2021 WMP Update, Table 7.1, Row 105.

[83] PacifiCorp DR 27apr2021, Question 2, received May 3, 2021.

[84] PacifiCorp 2021 WMP Update, p. 134.

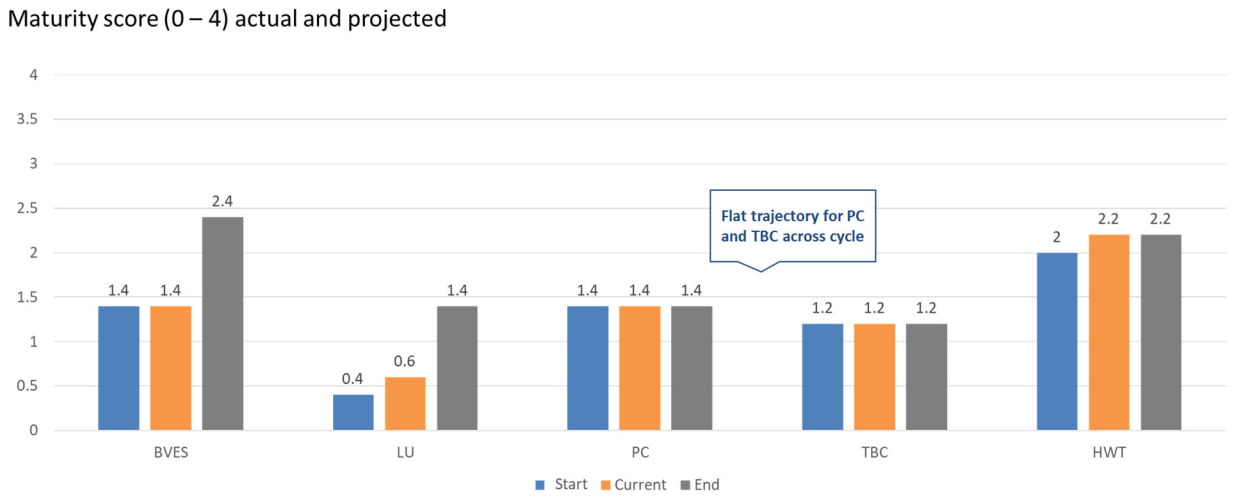
Utility-#	Issue title	Issue description	Remedies required
PC-6	No separate process for replacing expulsion fuses and tracking progress	PC does not currently have a separate method established for replacing expulsion fuses and tracking these replacements.	PC must demonstrate that its current methods are adequate for tracking and assessing the need for expulsion fuse replacements. If its methods are not sufficient, PC must enhance its current operations to properly identify, analyze, and track expulsion fuse replacements.

Additional Issues and Remedies

In addition to the key areas listed above, the WSD finds the following issues and associated remedies. The WSD expects PC to take action to address these issues and report on progress made over the year in its 2022 WMP Update.

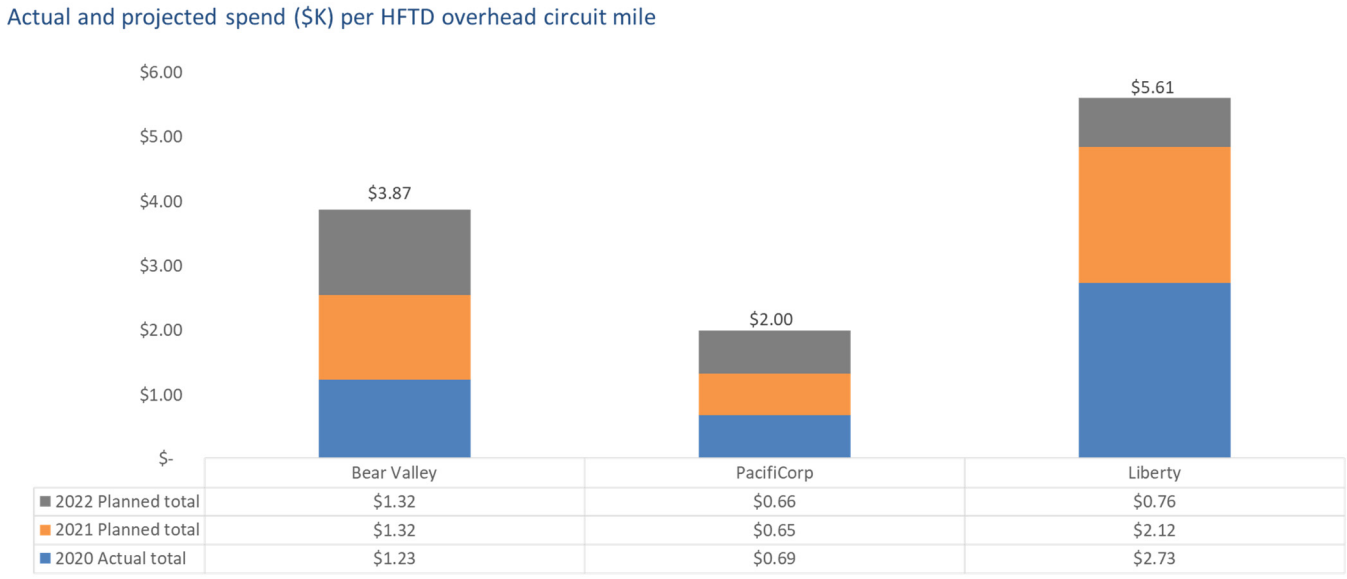
- ISSUE: PC does not provide a timeline for implementation of its annual IR inspection program, nor does it justify the need to inspect all transmission facilities within its California service territory.
    - REMEDY: Provide a timeline for implementing PC's annual IR inspection program.
    - REMEDY: Provide the justification details via cost-benefit analysis and effectiveness (i.e. number of findings) that would lead to PC extending its IR inspection program.

Figures
Below are charts used as part of the WSD's review of PC's asset management and inspections section:



Source: 2021 Maturity Model survey data

Figure 5.4.a: Asset management and inspections maturity score progress.



Source: Table 12 of utility 2021 WMP Updates and subsequent data requests

Figure 5.4.b: Asset management and inspections spend per HFTD overhead circuit mile, SMJUs 2020-2022.

5.5. Vegetation Management and Inspections

Introduction

This section of the WMP Guidelines[85] requires utilities to discuss vegetation management inspections, including inspections that go beyond existing regulation, as well as infrared, light detection and ranging (LiDAR), and patrol inspections of vegetation around distribution and transmission lines/equipment, quality control of those inspections, and limitations on the availability of workers. The utility must also discuss collaborative efforts with local land managers, including efforts to maximize benefit from fuel treatment activities and fire break creation as well as the collaborative development of methods for identifying at-risk vegetation, determining trim clearances beyond minimum regulations, and identifying and mitigating impacts from tree trimming and removal (erosion, flooding, etc.).

Overview

The WSD finds that PC has made progress in vegetation management (VM) and inspections. PC, in response to 2020 WMP Condition PC-7 (Class C) which required PC to "discuss its forward-looking approach for stakeholder cooperation and community engagement,"[86] has thoroughly explained its customer communication strategy for providing advanced notice of VM activities. Additionally, PC has implemented a system for tracking vegetation work with GIS data that is accessible to both PC staff and contractors; previously, PC relied on paper forms. For tree-trimming, the WSD encourages PC to look beyond minimum regulatory compliance and tailor the scope of VM activities to individual circuits using risk analysis.

Progress over the past year

The WSD finds that PC has made the following progress:

- PC has an expanded pole clearing program for poles outside of the State Responsibility Area.[87] In 2021, PC plans to clear vegetation at 3,047 poles under its expanded pole clearing project. This additional clearance can reduce the risk of ignitions regardless of the jurisdiction and provide defensible space for utility infrastructure.
- In 2020, PC partnered with the Shasta Trinity National Forest on a fuel reduction and highway safety enhancement project.
- PC provides a detailed customer communication strategy to provide advance notification prior to vegetation management work. PC also will continue to develop

[85] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, p. 45 (accessed May 27, 2021): https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

[86] Resolution WSD-009, p. 28.

[87] State Responsibility Areas (SRA) are recognized by the Board of Forestry and Fire Protection as areas where CAL FIRE is the primary emergency response agency responsible for fire suppression and prevention. See the State Responsibility Area Viewer for more information (accessed June 2, 2021): https://bof.fire.ca.gov/projects-and-programs/state-responsibility-area-viewer/.

"Operations and Maintenance Plans" (O&M Plan) to facilitate environmental reviews with land managing agencies, augmented by hiring additional staff to oversee the development and implementation. Currently, the utility is developing an O&M Plan with Klamath National Forest with completion expected in 2021.

- PC conducts audits of contractor work including, at times, auditing alongside contractor crew leaders and supervisors while the contract crews are still in the area. PC states this strategy ensures timely feedback and contractor engagement during the audit.
- In 2020, PC adopted a system for tracking vegetation work with GIS data that is accessible to both PC staff and contractors. Previously, PC had relied on paper forms.[88]
- PC is evaluating the use of LiDAR for both its distribution and transmission systems. Analysis of data collected in 2020 and early 2021 revealed "False Positive" (e.g., misidentified tree species, identification of structures as trees). PC is continuing to work with vendors to improve its LiDAR program.
- PC trims beyond the minimum General Order 95, Rule 35 minimum clearances for overhead distribution lines throughout its service territory and targets specific tree species based on growth rates.
- PC continues to perform the "readiness patrols" it first implemented in 2019. PC "conducts these readiness patrols of overhead distribution lines located within HFTD Tier 2 and Tier 3, where program cycle work has not been completed or is not scheduled."[89]
- PC completed its hazard tree inspections in the HFTD in 2020; PC will continue to inspect the HFTD annually for hazard trees. Tier 3 areas are completed by June 1, and Tier 2 areas are completed by end of August.

Issues and Remedies

While the WSD did not identify key areas for improvement in this competency of PC's 2021 WMP Update, the WSD finds the following issues and associated remedies. The WSD expects PC to take action to address these issues and report on progress made over the year in its 2022 WMP Update.

- ISSUE: Section 7.3.5.14 states, "PacifiCorp's general approach to recruiting and training of vegetation management personnel can be found in the company's Vegetation SOP." PC's Vegetation Standard Operating Procedure (SOP) briefly discusses "Professionalism" and "Contract utility forester qualifications." On April 20, 2021, the WSD sent a data request (DR_20210420, Question 3) regarding PC's VM training. PC explained that training for VM personnel is included "as part of the evaluation for a master services

[88] PacifiCorp 2020 WMP, p. 226.

[89] PacifiCorp 2021 WMP Update, p. 165.

agreement" and that "contractors are required to meet qualifications identified in the VM SOP" (see Appendix 10.2 for more information).
    - REMEDY: In its 2022 WMP Update, PC must provide a full description of its recruitment and training practices for both internal and external VM personnel in Section 7.3.5.14 in accordance with the WMP Guidelines. The WSD encourages PC to provide wildfire mitigation specific training to both its internal and contracted VM personnel.
- ISSUE: PC, unlike some of its peer utilities, does not clear overhanging vegetation to the sky, even in the highest fire risk areas. However, PC states that it "previously identified a tactic to further increase overhang clearances within HFTD. This tactic was incorporated minimally into work executed in 2019 and 2020. At a future point in time, PacifiCorp may implement a pilot study to support this tactic."[90]
    - REMEDY: The WSD encourages PC to implement this pilot immediately, clearing overhanging vegetation to the sky, particularly along its highest risk circuits.
- ISSUE: In section 7.3.5.15, PC describes how it categorizes species by growth rates and targets species with faster growth rates for increased clearances. Many other tree characteristics, other than growth rates, can make a tree "at-risk."
    - REMEDY: The WSD encourages PC to incorporate additional "at-risk" factors into its VM inspections. PC must describe which "at-risk" factors could be identified using its LiDAR and remote sensing pilots.[91]
- ISSUE: In section 7.3.5.16, PC states that "Trees which are large enough to hit powerlines when uprooted create a risk of ignition or outages."[92] While true, uprooting is not the only mechanism for strike.
    - REMEDY: PC must clarify and broaden the "Risk to be mitigated" for section 7.3.5.16: Removal and remediation of trees with strike potential to electric lines and equipment.

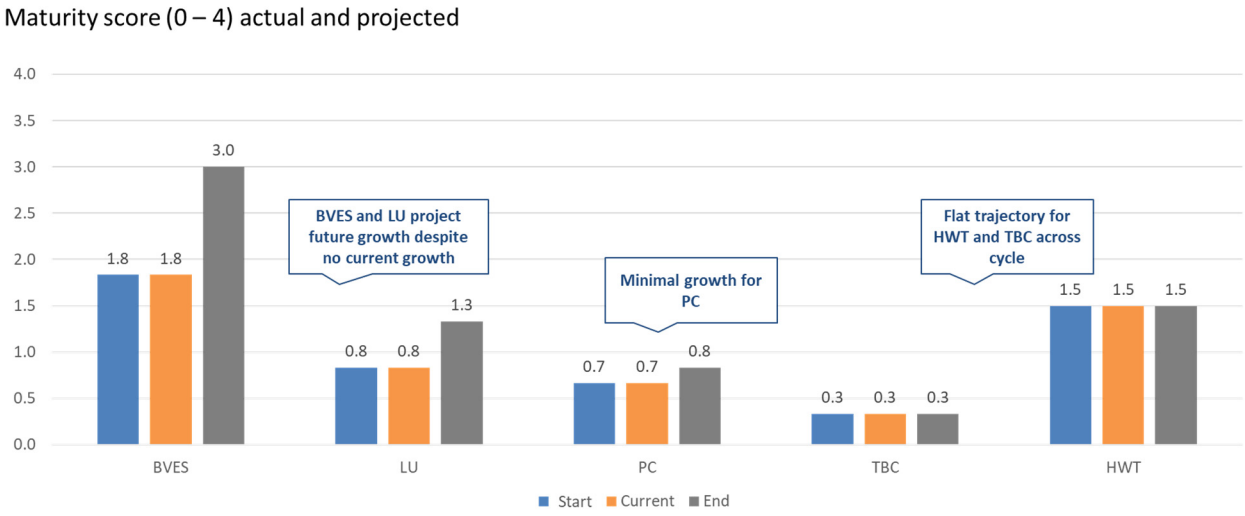
Figures

Below are charts used as part of the WSD's review of PC's vegetation management and inspections section:

[90] PacifiCorp 2021 WMP Update, p. 171.

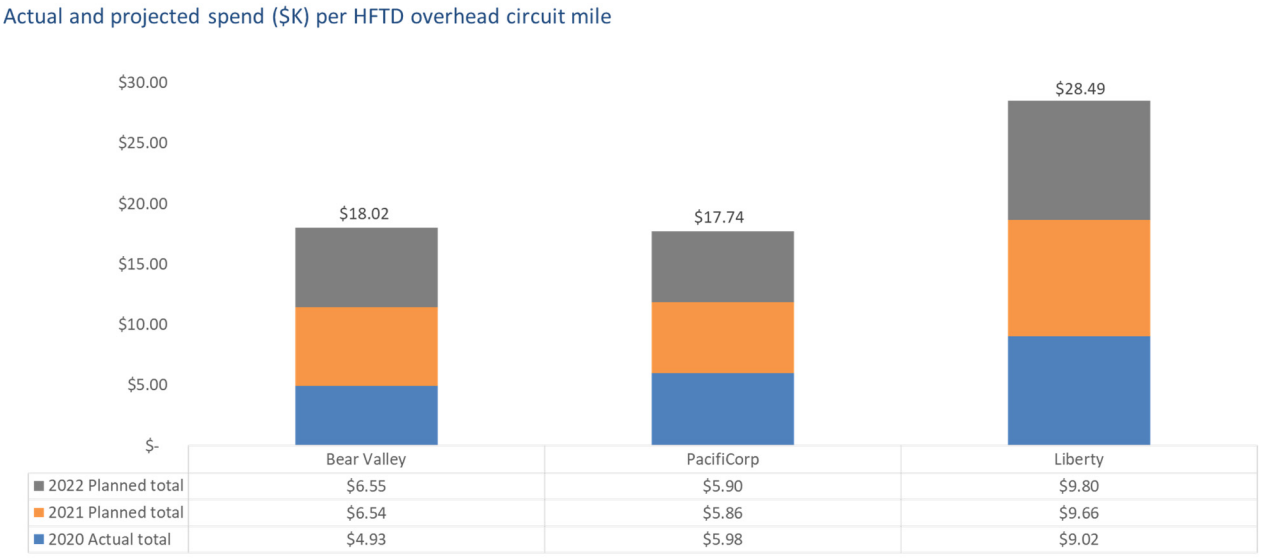
[91] PacifiCorp 2021 WMP Update, Section 4.4, Pilots 3 and 4.

[92] PacifiCorp 2021 WMP Update, p. 168.



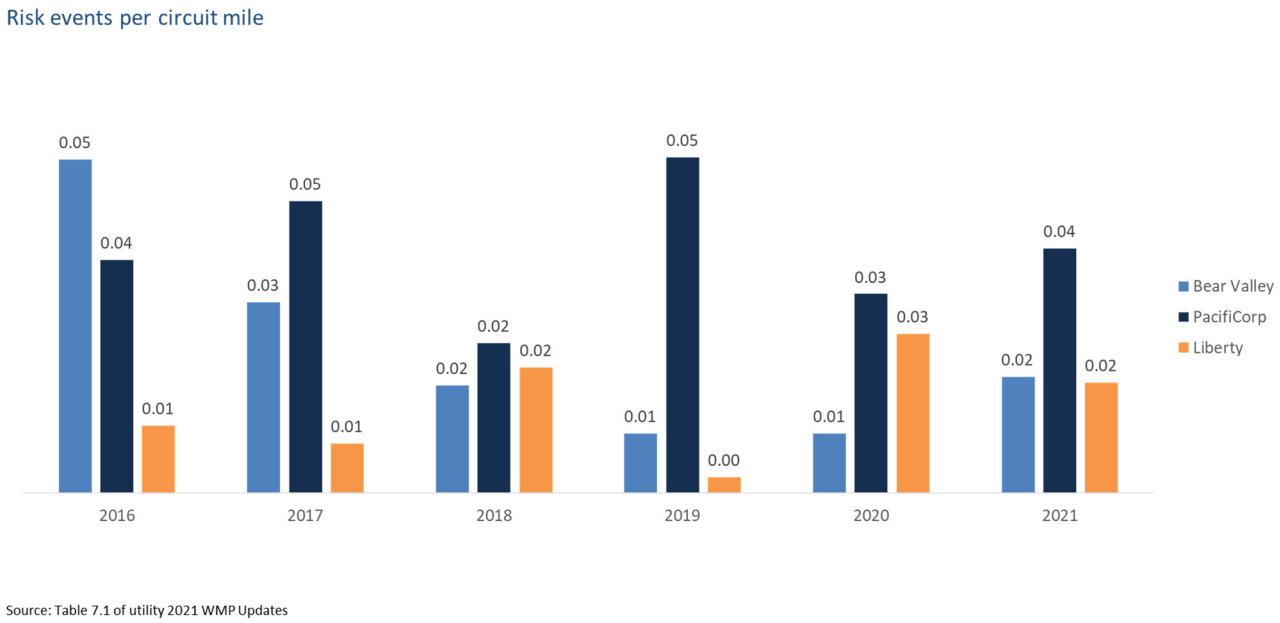
Source: 2021 Maturity Model survey data

Figure 5.5.a: Vegetation management & inspections maturity score progress.



Source: Table 12 of utility 2021 WMP Updates and subsequent data requests

Figure 5.5.b: Vegetation management & inspections spend per HFTD overhead circuit mile, SMJUs 2020-2022.



Source: Table 7.1 of utility 2021 WMP Updates

Figure 5.5.c: SMJU risk events due to vegetation contact per overhead circuit mile.

5.6. Grid Operations and Operating Protocols, including PSPS

Introduction

The grid operations and operating protocols section of the WMP Guidelines[93] requires discussion of ways the utility operates its system to reduce wildfire risk. For example, disabling the reclosing function of automatic reclosers[94] during periods of high fire danger (e.g., during Red Flag Warning conditions) can reduce utility ignition potential by minimizing the duration and amount of energy released when there is a fault. This section also requires discussion of work procedures in elevated fire risk conditions and protocols to reduce the frequency and scope of de-energization including PSPS events (e.g., through sectionalization, etc.). This section also requires the utility to report whether it has stationed and/or on-call ignition prevention and suppression resources and services.

Overview

[93] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, p. 45 (accessed May 27, 2021): https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

[94] A recloser is a switching device that is designed to detect and interrupt momentary fault conditions. The device can reclose automatically and reopen if a fault condition is still detected. However, if a recloser closes a circuit that poses a risk of ignition, wildfire may be the result. For that reason, reclosers are disabled in certain high fire risk conditions. During overcurrent situations, circuit breakers trip a switch that shuts off power to the electrical line.

The WSD finds that PC has made progress in grid operations and operating protocols and finds this section of PC's 2021 WMP Update to be sufficient subject to remedies.

Progress over the past year

The WSD finds that PC has made the following progress:

- Pacific Power Emergency Management[95] has daily checks for fire hazards within PC's California territory, and notifies field employees of any hazards before performing jobs. In addition, staff are specifically trained on detection, prevention, and response to fires; and PC uses specific vehicles designed to reduce the chance of ignitions.

PC has room for improvement in the following areas:

- PC states that it is installing covered conductor in order to minimize PSPS impacts,[96] yet fails to provide estimates of PSPS impacts as a result of implementing covered conductor and does not commit to any PSPS reductions at this time.
- PC fails to provide details on its automatic recloser program. PC states that:

  > *PacifiCorp has designed and developed its automatic reclosing operations wildfire mitigation program to include more restrictive system operating procedures during when wildfire conditions are more elevated to reduce this risk.*[97]

  However, PC does not provide the details on what the actual procedures being utilized consist of, nor the thresholds used to determine when wildfire conditions are "more elevated." Without these details, it is not possible to assess if PC is operating its automatic reclosers effectively. Additionally, PC provides no details on its replacement program for installing and replacing automatic reclosers, either in general or in relation to remote operation. Lastly, PC states that it "has not yet created a metric to quantify the benefits of automatic recloser replacement program."[98] While PC states it is undergoing the process of determining the potential effectiveness of a replacement program, it does not provide an associated timeline. Instead, PC provides only a vague description of the approach it plans to use to determine the program effectiveness.
- PC does not provide details on the thresholds that define times of higher fire risk, nor does it provide details regarding the associated changes in work during times of high fire risk. PC instead relies on the judgement of management, which relays information on risk to field employees as needed.

[95] Management team dedicated to emergency in PC's mother company, Pacific Power.

[96] PacifiCorp 2021 WMP Update, Table 8-1, p. 193.

[97] PacifiCorp 2021 WMP Update, p. 173.

[98] PacifiCorp 2021 WMP Update, p. 94.

- Similar to its 2020 WMP submission, all of PC's current firefighting equipment is located in Oregon, although previously PC has shown that such resources are still accessible for its main base in Yreka, and that additional storage space does not currently exist within PC's California territory.

Key Areas for Improvement and Remedies

The WSD finds that PC must focus on the following areas as significant to reducing utility-related wildfire risk:

Utility-#	Issue title	Issue description	Remedies required
PC-7	Limited explanation for how initiatives reduce PSPS impacts	PC fails to explain how initiatives will reduce PSPS impacts despite selecting some initiatives (such as covered conductor installation) specifically to reduce PSPS risk.	PC must clearly explain how all initiatives reduce scale and scope of PSPS.
PC-8	Lack of details on automatic recloser settings and associated wildfire risk reduction	PC fails to provide the actual recloser settings utilized during heightened wildfire risk.	PC must: 3. Provide the automatic recloser settings described on p. 173 of its 2021 WMP Update, including: a. The "more restrictive system operating procedures" used; and b. The thresholds of heightened wildfire risk for initiating the procedures described in (a). 4. Provide a timeline for when it intends to develop a metric demonstrating the effectiveness of using automatic reclosers, as described on p. 94 of its 2021 WMP Update.

Additional Issues and Remedies

In addition to the key areas listed above, the WSD finds the following issues and associated remedies. The WSD expects PC to take action to address these issues and report on progress made over the year in its 2022 WMP Update.

- ISSUE: PC failed to provide details on its work modifications and restrictions during elevated wildfire conditions.
  - REMEDY: PC must include a) all procedures affected as a result of high fire risk in-field, b) a description of how such procedures are affected, c) the threshold(s) used to determine elevated fire conditions.

Figures

Below are charts used as part of the WSD's review of PC's grid operations and operating protocols section:

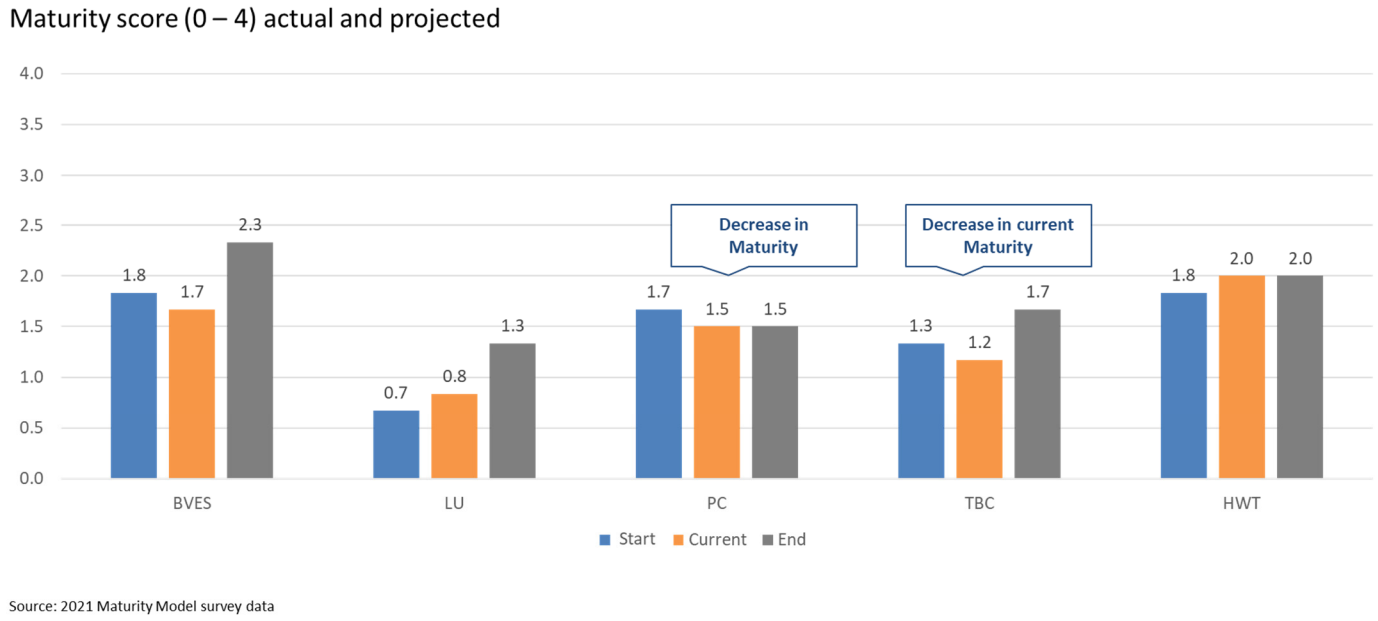
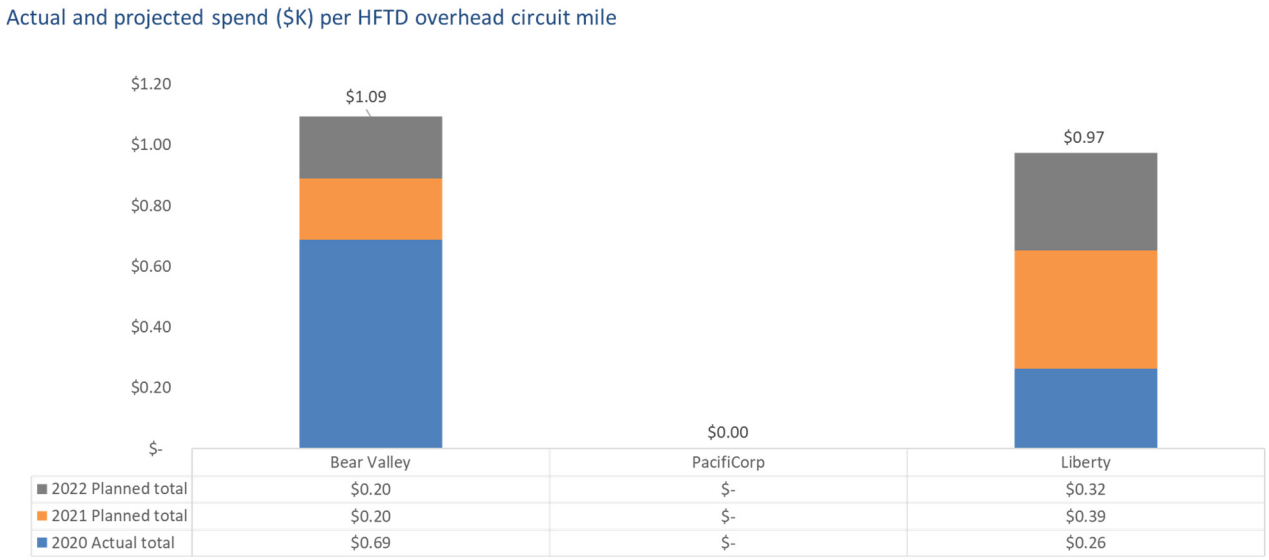


Figure 5.6.a: Grid operations and protocols maturity score progress.



Source: Table 12 of utility 2021 WMP Updates and subsequent data requests

Figure 5.6.b: Grid operations and protocols spend per HFTD overhead circuit mile, SMJUs 2020-2022.

5.7. Data Governance

Introduction

The data governance section of the WMP Guidelines[99] requires information on the utility's initiatives to create a centralized wildfire-related data repository, conduct collaborative research on utility ignition and wildfire, document and share wildfire-related data and algorithms, and track and analyze near-miss data. In addition, this section discusses the quality and completeness of Quarterly Data Reports (QDR) consisting of spatial and non-spatial data submitted as required by condition Guidance-10 in resolution WSD-002. Initial submissions of data were received in September 2020, and QA/QC reports were issued for the spatial component of those submissions in December 2020. Since the initial QA/QC reports, WSD has received two more QDRs, in December 2020 and in February or March 2021 (submitted with the utility's 2021 WMP Update). The spatial data are subject to the WSD GIS Data Reporting Standard (GIS Standard), the first version of which was published by the WSD on August 21, 2020, and which was updated on February 4, 2021.[100] The analysis of spatial data in this section

[99] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, p. 45 (accessed May 27, 2021): https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

[100] The most recent version of the standard, version 2, can be downloaded here: ftp://ftp.cpuc.ca.gov/WMP/2021/GIS/WSD%20GIS%20Data%20Reporting%20Standard.pdf

focuses on specific areas where the data PC submitted with its 2021 WMP do not meet the standard.

Overview

Over the last year, PC made progress in developing its data governance and began submitting some spatial data, which demonstrated some improvement over the course of two WMP submissions. PC still has significant improvements to make in documenting its data governance and with respect to the completeness and quality of its spatial data.

Progress over the past year

The WSD finds that PC has made the following progress:

- Identifying and describing its participation in collaborative research
- Documenting its Localized Risk Assessment Model in the WMP update
- Began providing some of the required spatial data and made modest improvements in completeness of their second submission of data (Q4 vs. Q3)

PC has room for improvement in the following areas:

- PC does not follow the 2021 WMP Guidelines for any of its mitigation initiatives in the Data Governance category. None of the initiatives in this section include the subparts required by Guidelines Section 7.3.b (see PC-1).
- PC needs to describe and establish a clear plan for maintaining a centralized data repository (mitigation initiative 7.3.7.1 of PC's 2021 WMP Update).
- PC needs to document any wildfire-related data and algorithms (initiative 7.3.7.3 of PC's WMP Update). With the exception of its newly developed Localized Risk Assessment Model (LRAM) metrics, PC does not develop any company-specific calculations or algorithms.[101]
- PC needs to explain how it tracks and analyzes risk event data (initiative 7.3.7.4 of PC's 2021 WMP Update).
- With respect to spatial data in PC's Quarterly Data Report submission, PC has made modest, incremental improvement over previous quarters in providing some of the required spatial data. However, several fundamental issues were identified in PC's Q4 2020 data which negatively impacted the usability of the data and did not meet the WSD GIS Data Reporting Standard (GIS Standard). Many of the issues indicate a lack of internal quality control review of data which may have been converted from other formats or systems. Some of the more significant problems include:
    - Erroneous locations: Points submitted in the "Ignitions" feature class are clearly not correctly located.

[101] PacifiCorp 2021 WMP Update, p. 175.

- Missing age data: PC did not provide age data for any transmission lines, or for more than 90% of its distribution lines. PC provided age data for a significant proportion of support structures, but not for over 90% of other assets reported as points. This includes even estimated age ranges, which are requested if more specific age data are not available.
- Missing primary keys: Primary key / unique ID fields are fundamental, and data submitted without a unique primary key is not useable. A primary key is a value in a data table that is unique for each entry (record) and does not change. Primary keys allow data in tables to be linked or referenced from other tables and tracked through time and multiple submissions. The listed feature classes or tables had some records with missing primary keys or values in primary key fields that are not unique to each record:
    - Fuse
    - Switchgear
    - Support Structure
    - Transformer
    - PSPS Event Customer Meter
    - PSPS Event Log

- Domain values not used: the WSD specified coded-value domains for 196 fields in the data schema in order to receive data with universally understood values which can be compared across utilities. In several cases, PC submitted data which did not conform to the domains specified. Some of these values were essentially the same as the correct domain values, but with different punctuation or capitalization, or with words added. Some of the entries in fields/feature classes listed below do not match the specified domains:
    - "Connection Device Type" in Connection Device feature class
    - "Object Contact," "Determination," and "Material at Origin" in Ignition feature class

- Missing data: Separate from the overall incompleteness of PC's spatial data, which are understood to be a work in progress, two issues stand out:
    - The submitted Transformer Detail has one record per transformer, even for those transformers identified as multiple devices in a bank. The intent of the detail table is to allow for multiple records to describe multiple transformers in a bank.
    - No damage detail tables were submitted, so required data are missing for the single PSPS Event Damage point submitted. Relevant data for these points is to be submitted in the appropriate table, to be related to the point by ID number.
    - The submitted fuse data do not have any information on "Asset Type"; however, all have information in the "Asset Subtype" field. This indicates that information was available on the type of fuse, which should have

been utilized to determine which of the types specified in the domain was applicable to each record.

- PC submitted its spatial data in a geodatabase that was not named in the format specified in the GIS Standard (section 2.3.4, originally section 2.2 of the now-superseded v1 standard document). While the name PC used was descriptive, WSD requires a specific name format to allow staff to easily catalog and retrieve data received from several utilities several times per year.
- PC did not consistently use a single "Utility ID" in the spatial data submitted. The majority of submitted data use "PacifiCorp," with some features using "PACIFICORP" (Ignition, PSPS Event Customer Meter). WSD requests that PC choose an ID for its spatial data and use that ID consistently.

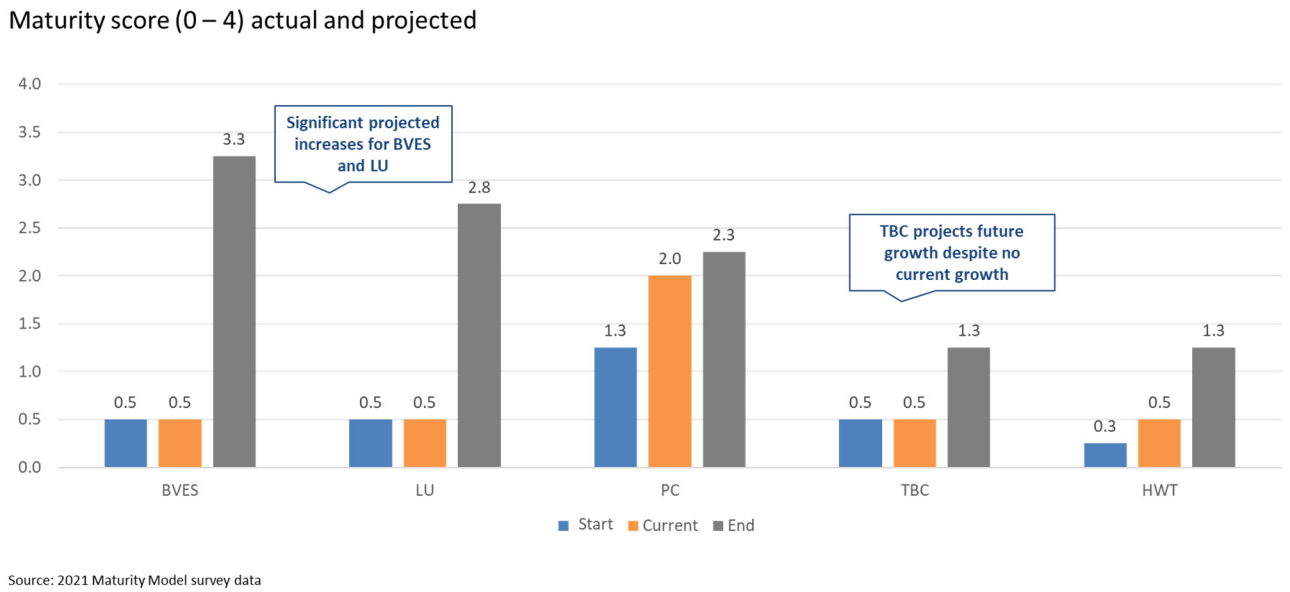
Issues and Remedies

While the WSD did not identify key areas for improvement in this competency of PC's 2021 WMP Update, the WSD finds the following issues and associated remedies. The WSD expects PC to take action to address these issues and report on progress made over the year in its 2022 WMP Update.

- ISSUE: PC's spatial QDR data submissions have shortcomings that must be remedied.
  - REMEDY: PC must submit correct locations, complete age data, primary keys, and foreign keys.
  - REMEDY: PC must use domain values.
  - REMEDY: PC must provide the locations of all assets specified in the data standard or explain the lack of information on these locations, what it is doing to remedy the missing data, and when it anticipates they will be provided.
  - REMEDY: PC must use specified naming conventions for submitted geodatabases, feature classes, and tables.

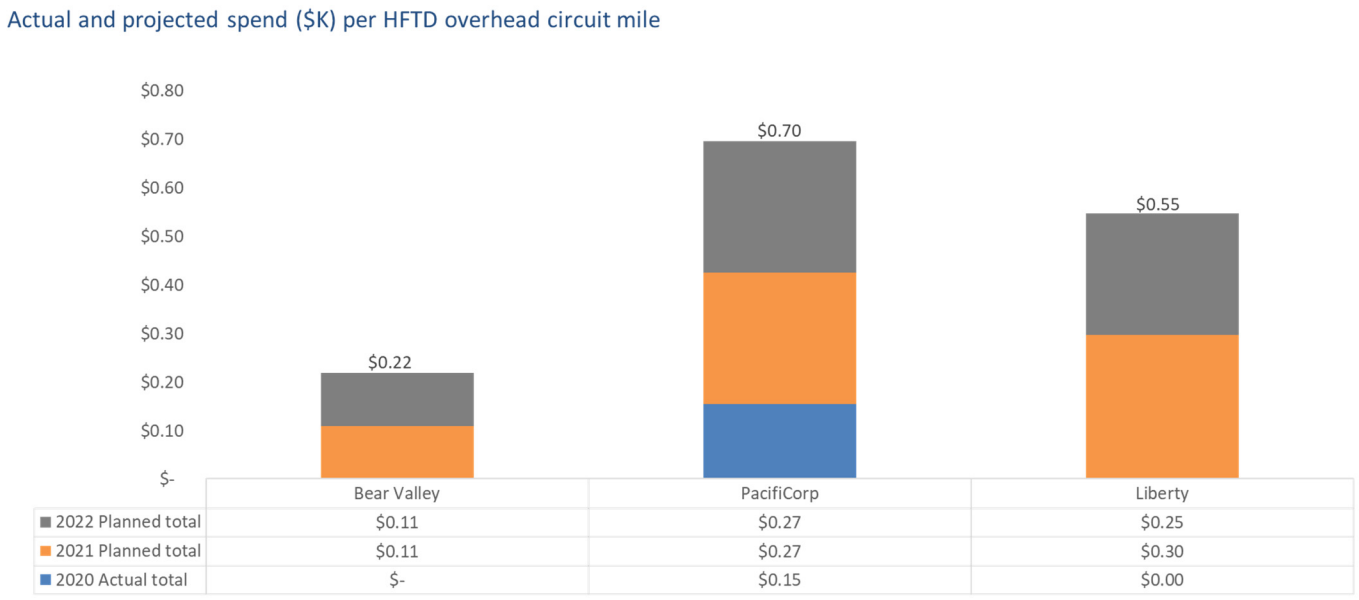
Figures

Below are charts used as part of the WSD's review of PC's data governance section:



Source: 2021 Maturity Model survey data

Figure 5.7.a: Data governance maturity score progress.



	Bear Valley	PacifiCorp	Liberty
2022 Planned total	$0.11	$0.27	$0.25
2021 Planned total	$0.11	$0.27	$0.30
2020 Actual total	$-	$0.15	$0.00

Source: Table 12 of utility 2021 WMP Updates and subsequent data requests

Figure 5.7.b: Data governance spend per HFTD overhead circuit mile, SMJUs 2020-2022.

5.8. Resource Allocation Methodology

Introduction

The resource allocation methodology section of the WMP Guidelines[102] requires the utility to describe its methodology for prioritizing programs by cost-efficiency. This section requires utilities to discuss risk reduction scenario analysis and provide an RSE analysis for each aspect of the plan.

Overview

Over the past year, PC has made improvements to its risk quantification methodology by completing the development of the Localized Risk Assessment Model (LRAM). The completion of the LRAM will allow the utility to objectively quantify the benefits of specific mitigations at specific locations. Due to the timing of the 2021 WMP Update, PC was not able to utilize the LRAM to produce any RSE estimates. Without the quantified risk reduction values, PC's qualitative approach to justify the initiative-selection process is insufficient and lacks transparency. PC must make a firm commitment to calculate as many RSE estimates as feasible and elaborate its initiative-selection process to bring clarity and rigor.

Progress over the past year

The WSD finds that PC has made the following progress:

- PC has completed LRAM which will allow the utility to objectively quantify the benefits of specific mitigations at specific locations with estimated improvements in performance. LRAM will also allow PC to assess before-mitigation fire risk and combine risk values.

Key Areas for Improvement and Remedies

The WSD finds that PC must focus on the following areas as significant to reducing utility-related wildfire risk:

[102] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, p. 45 (accessed May 27, 2021): https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

Utility-#	Issue title	Issue description	Remedies required
PC-9	Inadequate justification of initiative-selection process	PC does not provide any risk-spend efficiency (RSE) estimates for its mitigation initiatives. Without the quantified risk reduction values, PC's qualitative approach to justify the initiative-selection process is insufficient and lacks transparency.	PC must include the quantified, risk reduction outputs from its recently developed risk model to elaborate on its decision-making process to include a thorough overview of the initiative-selection procedure. The overview must show the rankings of the decision-making factors (i.e., compliance-based activities, geographic wildfire tiers, operation efficiencies, etc.) and pinpoint where quantified, risk reduction values and RSE estimates are considered in the initiative-selection process. The WSD recommends a cascading, dynamic "if-then" style flowchart to accomplish this prioritization requirement.

Background

RSE estimates are an essential part of a utility's mitigation initiative selection process. As set forth in the Safety Model Assessment Proceeding (S-MAP) Settlement Agreement, "For each of the mitigations, the utility will calculate the associated risk-spend efficiency (RSE) by dividing the mitigation risk reduction benefit by the mitigation cost estimate."[103] This requirement enables the quantitative comparison of cost-effectiveness of various mitigation initiatives.

During the 2020 WMP evaluations, the WSD identified that PC "has not developed a methodology for calculating an RSE that can be used to help in its resource allocation decisions, as it chooses among potentially effective wildfire prevention and mitigation initiatives."[104] While PC did complete its development of LRAM, the utility failed to provide any RSE estimates in its 2021 WMP Update. PC does provide a qualitive outline of its initiative-selection process by stating:

> Of first priority is compliance-based activities, which is viewed as one form of a risk; thereafter, others are prioritized based on geographic wildfire Tier (Tier 2 vs Tier 3) and overall availability of materials. As opposed to prioritizing a certain type of program, PC

[103] D.18-12-014, p. 23.

[104] Resolution-008, p. 27.

prioritizes the location of work to be completed and groups all potential program aspects applicable at that location into projects. This ensures that all programs on an applicable circuit, line, or combination of circuits and lines are completed at the same time to make efficient use of resources and avoid working in the same location multiple times.[105]

Without the RSE estimates, a qualitative justification of the initiative-selection process is insufficient and lacks transparency.

To bring clarity and rigor to the initiative selection process, PC must elaborate on its decision-making process by providing a thorough overview of the initiative-selection procedure from beginning to implementation. The WSD recommends that PC design a flowchart to demonstrate the decision-making process by ranking the above-mentioned factors (i.e., compliance-based activities, geographic wildfire tiers, operation efficiencies, etc.) and highlighting where quantified, risk reduction values, and RSEs are considered in the initiative selection process.

Additional Issues and Remedies

In addition to the key area listed above, the WSD finds the following issues and associated remedies. The WSD expects PC to take action to address these issues and report on progress made over the year in its 2022 WMP Update.

- ISSUE: In section 7.3.4.5 of its 2021 WMP Update, PC states that its infrared inspections of transmission lines and equipment program found one hotspot out of 1474 line-miles in 2019, and seven hotspots out of 866 line-miles in 2020.[106] PC does "anticipate using data collected during these new inspections to further inform required frequency and anticipates changing the frequency at a future date to better reflect a risk-based approach."[107] However, PC fails to explain how the newly collected data from infrared inspections will inform frequency and how the data will better reflect a risk-based approach.
    - REMEDY: PC must provide quantitative evidence for (a) how the newly collected infrared inspection data will inform frequency of inspections, and (b) how the data will better reflect a risk-based approach.
- ISSUE: PC does not include quantifiable and empirical justification in its alternative analysis for initiative selection. For example, PC does not consider undergrounding as an alternative mitigation due to the higher cost by stating that "undergrounding of electric utility lines tends to be less economical as compared to the installation of

[105] PacifiCorp 2021 WMP Update, p. 175.

[106] PacifiCorp 2021 WMP Update, p. 148.

[107] PacifiCorp 2021 WMP Update, p. 147.

overhead electric lines, including the installation of covered conductor."[108] Undergrounding should be considered as an alternative mitigation and compared to other alternatives based on quantifiable and empirical evidence such as RSE estimates.

  - REMEDY: PC must provide quantifiable justification for its initiative-selection process by calculating the RSEs for the selected mitigation initiative as well as the alternative initiatives.

- ISSUE: PC's cost estimations for covered conductor from 2020 differed vastly from the actuals, with an estimate given for around $207,000 per mile leading to an actual of $3.088 million per mile.[109] While some of the higher costs are based on upfront acquirement for miles that have yet to be installed,[110] PC needs to ensure that the costs estimates given for covered conductor are as accurate as possible and reflect reality, especially given that its estimates are much less than other utilities, as shown in Table 2 below.

Table 2: Covered conductor installation costs by utility.

Electrical Utility	**Covered Conductor Installation Cost Per Mile**
PG&E	$1,498,188[111]
SDG&E	$1,883,977[112]
SCE	$550,725[113]
Liberty	$1,097,670[114]
Bear Valley	$139,000[115]

PC's risk reduction prioritization calculation requires accurate cost estimates because if PC is inaccurately estimating costs to be much lower than actuals, then solutions being selected may not actually be of effective risk-spend.

  - REMEDY: PC must review its cost estimate methodology and approach for covered conductor.

[108] PacifiCorp 2021 WMP Update, p. 139.

[109] PacifiCorp DR 13apr2021, Question 2, received April 19, 2021.

[110] "The costs realized in 2020 include the installed costs for the completed 1.4 miles along with design, estimating, permitting, and material purchase costs realized in 2020 for projects to be completed after 2020." PacifiCorp DR 13apr2021, Question 2(a), received April 19, 2021.

[111] Comments of The Utility Reform Network on 2021 Wildfire Mitigation Plan Updates, p. 35.

[112] Ibid.

[113] Ibid.

[114] Value from "Table 7-3: 2020 Covered Conductor Projects" of Liberty's 2021 WMP Update by dividing total spend by total mileage.

[115] Value from Table 12 of BVES' 2021 WMP Update, by dividing total cycle spend by total miles treated for "Covered Conductor Installation".

  - REMEDY: PC must provide and revisit its assumptions for cost estimates for covered conductors and revise accordingly if needed to reflect the higher actual costs. If such do not need revising, provide proof of accuracy for covered conductor cost estimates, especially in relation to RSE estimates.
- ISSUE: PC still places compliance-based activities as the first step in its initiative-selection process.[116] As PC is maturing in its risk modeling capabilities, there needs to be a proactive shift from compliance-based decision making to risk-based decision making. PC must include quantified, risk-based decision-making factors in its initiative selection process to ensure progress in this area.
  - REMEDY: PC must demonstrate that the utility is prioritizing quantified, risk-based decision-making factors in its newly developed initiative selection visual overview.

Figures

Below are charts and tables used as part of the WSD's review of PC's resource allocation methodology section:

Top 5 Initiative Activities by Planned Spend – PacifiCorp ($K)

Some discrepancies between 2020 Plan and 2020 Actual

44% of spend on Covered Conductor

Top 2 initiatives same as Bear Valley

	Initiative Activity	Category	2020 Plan *From 2020 WMP*	2020 Actual *From 2021 WMP*	2021 Plan	2022 Plan	Total WMP Cycle Planned Spend	Initiative Spend as % of Total Planned Spend[1]
1	7.3.3.3 Covered conductor installation	Grid Design & System Hardening	$7,875	$4,324	$15,014	$11,580	$30,918	44%
2	7.3.5.20 Vegetation management to achieve clearances around electric lines and equipment	Vegetation Management & Inspections	$3,288	$6,699	$6,561	$6,600	$19,860	28%
3	7.3.3.9 Installation of system automation equipment	Grid Design & System Hardening	$3,029	$3,948	$2,062	$500	$6,510	9%
4	7.3.3.6 Distribution pole replacement and reinforcement, including with composite poles	Grid Design & System Hardening	$329	$244	$1,898	$2,950	$5,093	7%
5	7.3.2.5 Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	Situational Awareness & Forecasting	$0	$976	$0	$0	$976	1%
	Total spend for top 5 initiatives		**$14,521**	**$16,192**	**$25,535**	**$21,631**	**$63,357**	**91%**

Spend was only in 2020 for 7.3.2.5

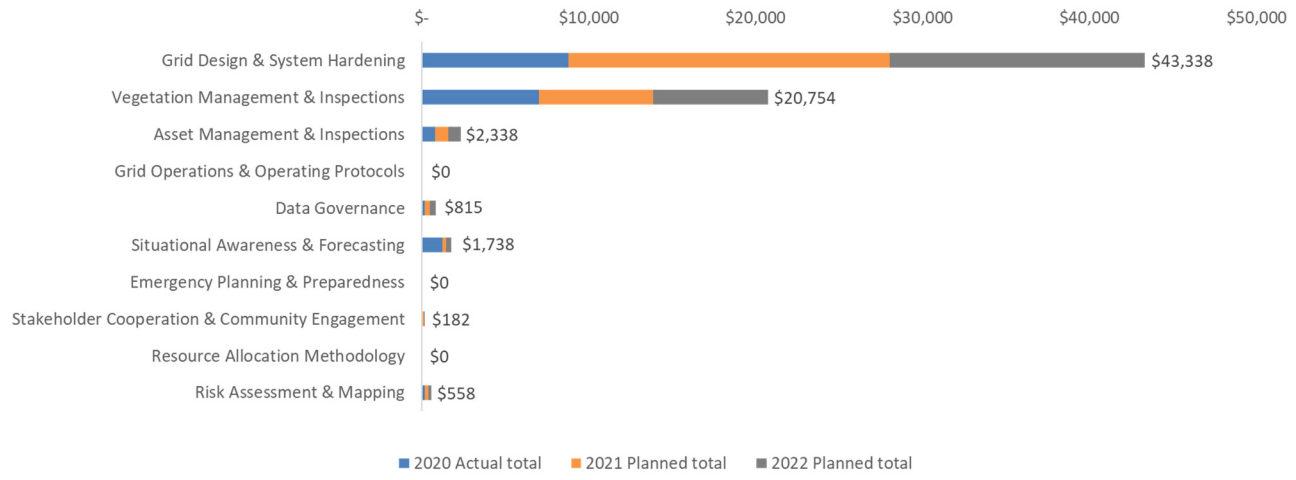
Source: Table 12 of 2021 utility WMP Updates, Tables 21-30 of 2020 utility WMPs, and subsequent data requests.
1. Percentages are rounded in this column, thus may not appear to add up to 91%. When unrounded, these percentages add up to 91%.

Top 5 initiatives compose 91% of total spend

Figure 5.8.a: Resource allocation detail for top five initiative activities by planned spend, PacifiCorp.

[116] PacifiCorp 2021 WMP Update, p. 175

Actual and planned spend by initiative category ($K)



Source: Table 12 of utility 2021 WMP updates, and subsequent data requests

Figure 5.8.b: Overview of spend by initiative category, PacifiCorp.

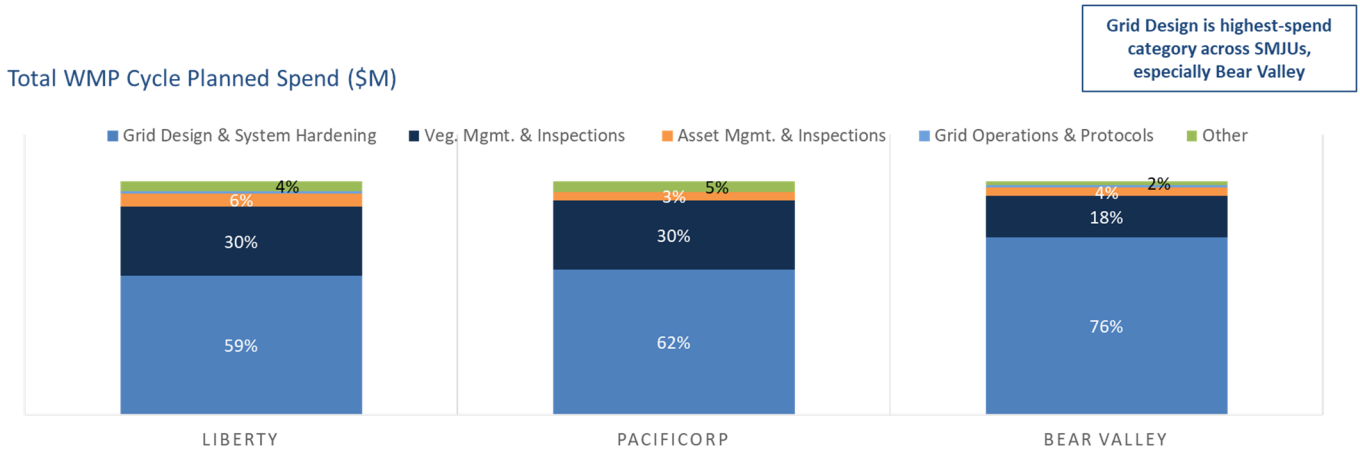
Top 3 categories are the same across SMJUs

Total WMP Cycle Planned Spend ($K)

	Liberty Plan Total	PacifiCorp Plan Total	Bear Valley Plan Total
Grid Design & System Hardening	$80,592 (59%)	$43,338 (62%)	$32,976 (76%)
Veg Mgmt. & Inspections	$40,050 (30%)	$20,754 (30%)	$7,603 (18%)
Asset Mgmt. & Inspections	$7,881 (6%)	$2,338 (3%)	$1,635 (4%)
Grid Operations & Protocols	$1,369 (1%)	$0 (0%)	$461 (1%)
Data Governance	$769 (0.6%)	$815 (1.2%)	$93 (0.2%)
Situational Awareness & Forecasting	$980 (1%)	$1,738 (2%)	$462 (1%)
Emergency Planning & Preparedness	$2,706 (2%)	$0 (0%)	$111 (0.3%)
Stakeholder Cooperation & Community Engagement	$734 (0.5%)	$182 (0.3%)	$16 (0.04%)
Resource Allocation Methodology	$379 (0.3%)	$0 (0%)	$0 (0%)
Risk Assessment & Mapping	$87 (0.1%)	$558 (0.8%)	$0 (0%)
Total Planned Spend for WMP cycle	**$135,548**	**$69,722**	**$43,357**

Source: Table 12 of 2021 utility WMP Updates

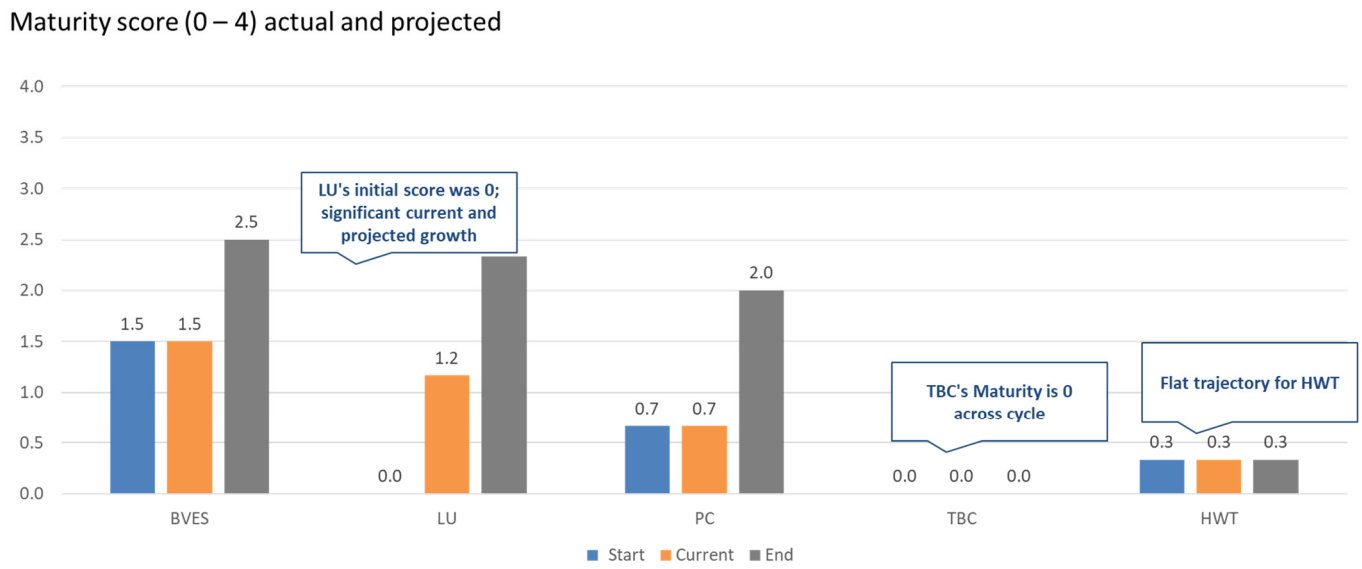
Figure 5.8.c: Breakdown of planned spend by category.



	Liberty ($M)	PacifiCorp ($M)	Bear Valley ($M)
Grid Design & System Hardening	$81	$43	$33
Veg. Mgmt. & Inspections	$40	$21	$8
Asset Mgmt. & Inspections	$8	$2	$2
Grid Operations & Protocols	$2	$0	$.46
Other	$6	$3	$.682

Source: Table 12 of 2021 utility WMP Updates

Figure 5.8.d: Overview of planned spend across utilities.



Source: 2021 Maturity Model survey data

Figure 5.8.e: Resource allocation methodology maturity score progress.

Source: Table 12 of utility 2021 WMP Updates and subsequent data requests

Figure 5.8.f: Resource allocation methodology spend per HFTD overhead circuit mile, SMJUs 2020-2022.

5.9. Emergency Planning and Preparedness

Introduction

This section of the WMP Guidelines[117] requires a general description of the utility's overall emergency preparedness and response plan, including discussion of how the plan is consistent with legal requirements for customer support before, during, and after a wildfire, including support for low-income customers, billing adjustments, deposit waivers, extended payment plans, suspension of disconnection and nonpayment fees, and repairs. Utilities are also required to describe emergency communications before, during, and after a wildfire in languages deemed prevalent in a utility's territory (D.19-05-036, supplemented by D.20-03-004),[118] and other languages required by the Commission.

This section of the WMP Guidelines also requires discussion of the utility's plans for coordination with first responders and other public safety organizations, plans to prepare for

[117] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, p. 46 (accessed May 27, 2021): https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

[118] A language is prevalent if it is spoken by 1,000 or more persons in the utility's territory or if it is spoken by 5% or more of the population within a "public safety answering point" in the utility territory. See Cal. Government Code § 53112.

and restore service, including workforce mobilization and prepositioning of equipment and employees, and a showing that the utility has an adequately sized and trained workforce to promptly restore service after a major event.

Overview

In general, PC does not report new changes, but instead, appears to be continuing business-as-usual for its Emergency Planning and Preparedness programs implemented in previous years.

Progress over the past year

PC appears to have not made any significant progress in its Emergency Planning and Preparedness program. Although PC did provide information in this section, it is difficult to distinguish progress made this year from the position reported in its 2020 WMP because PC did not follow the Guidelines. None of PC's initiatives in this section include the subparts required by Guidelines Section 7.3.b [see PC-1]. This is concerning given that PC reports its highest maturity growth in this category, including the highest possible maturity score of a 4.00 by the end of the WMP cycle.[119] Based on PC's 2021 WMP Update, there is a significant discrepancy between PC's lack of progress on the ground and what it has estimated in terms of maturity growth.

Issues and Remedies

While the WSD did not identify key areas for improvement in this competency of PC's 2021 WMP Update, the WSD finds the following issues and associated remedies. The WSD expects PC to take action to address these issues and report on progress made over the year in its 2022 WMP Update.

- ISSUE: PC does not adequately demonstrate how it intends to meet its self-reported maturity growth and highest possible maturity score of a 4.00 by the end of the WMP cycle.
    - REMEDY: PC must discuss and detail its *progress on* and *future improvements to*[120] each of its Emergency Planning and Preparedness initiatives.
- ISSUE: PC does not demonstrate the adequacy of its service restoration workforce within its 2021 WMP Update. PC did provide additional details on service restoration personnel in response to a question asked in a phone call with WSD staff,[121] however, these details should still be provided in the WMP.

[119] PacifiCorp 2021 Maturity Survey.

[120] 2021 WMP Guidelines, Section 7.3.b requirement, subparts 4 and 5.

[121] See Appendix 10.2 for more information on utility content call.

- REMEDY: PC must discuss the type and number of personnel classifications it employs and the number of contractors in place for service restoration.

Figures

Below are charts used as part of the WSD's review of PC's emergency planning and preparedness section:

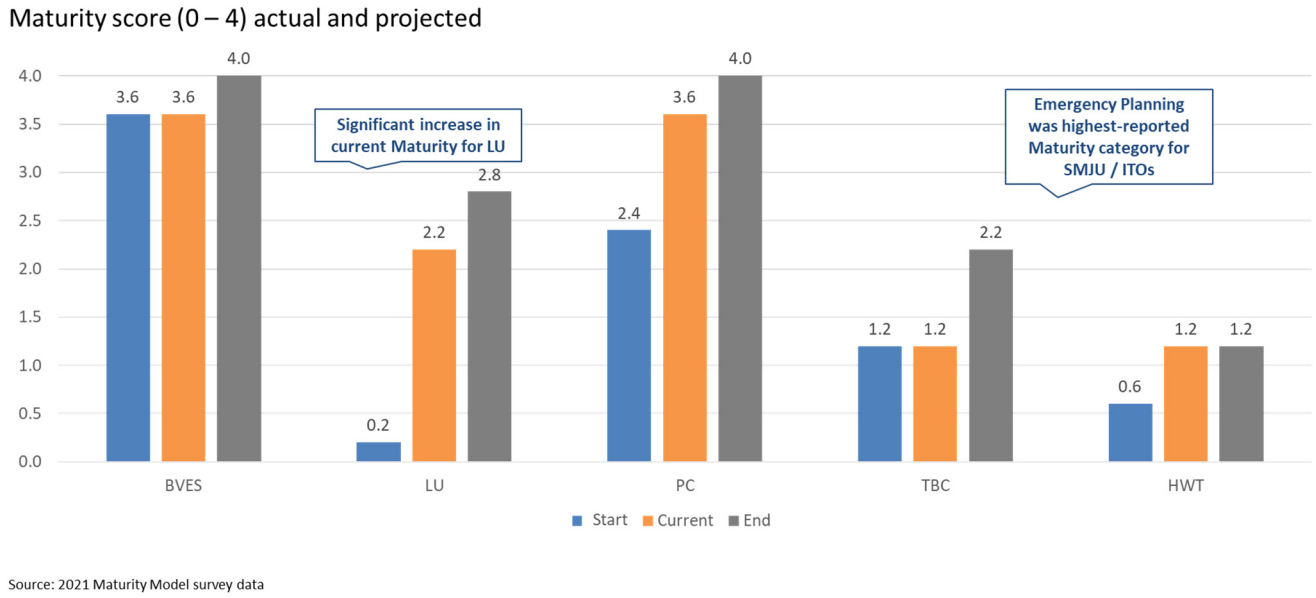
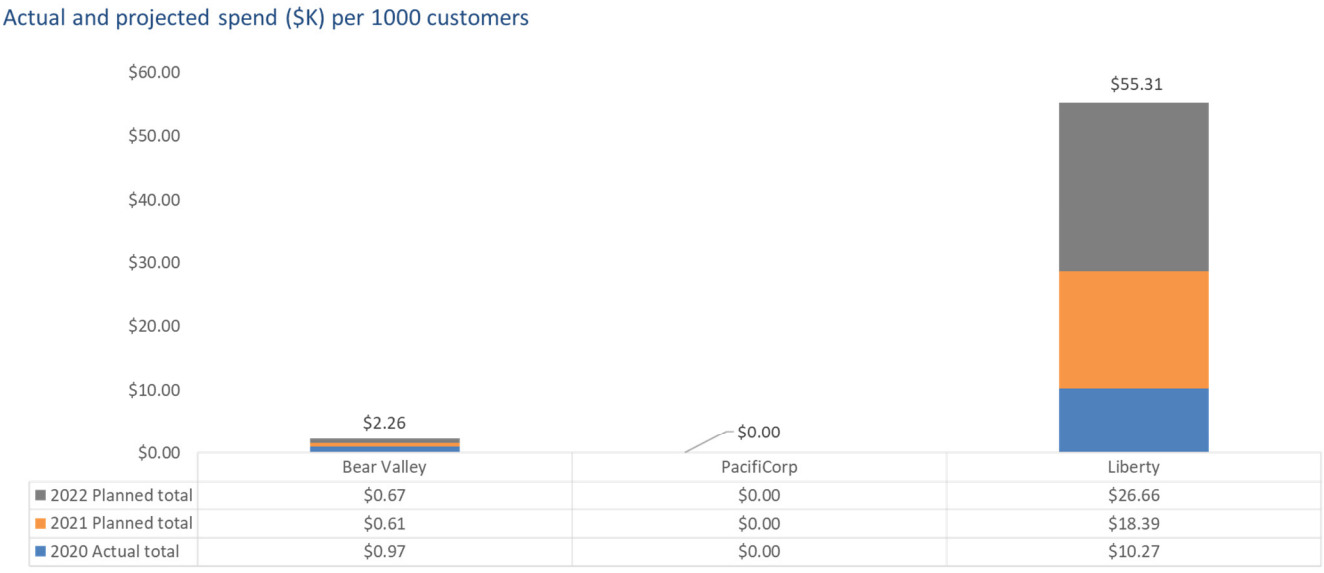


Figure 5.9.a: Emergency planning and preparedness maturity score progress.



Source: Table 12 of utility 2021 WMPs and subsequent data requests

Figure 5.9.b: Emergency planning and preparedness spend per 1000 customers, SMJUs 2020-2022.

5.10. Stakeholder Cooperation and Community Engagement

Introduction

The final initiative category in the WMP Guidelines[122] requires the utility to report on the extent to which it will engage the communities it serves and cooperate and share best practices with community members, agencies outside California, fire suppression agencies, forest service entities and others engaged in vegetation management or fuel reduction.

Overview

The WSD finds that PC has made progress in stakeholder cooperation and community engagement and finds this section of PC's 2021 WMP Update to be sufficient subject to remedies.

Progress over the past year

[122] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, p. 46 (accessed May 27, 2021): https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

The WSD finds that PC has made the following progress:

- As part of its community engagement strategy, PC conducted 30-minute interviews with community-based organizations (CBOs) in the fall of 2020. The interviews and findings help inform how PC can better utilize its CBO communication channels in a manner that is beneficial and efficient for all stakeholders.
- PC is seeking additional methods outside of its current outreach strategy for engaging its access and functional needs (AFN) customers and identifying appropriate spaces for AFN-specific messaging to be incorporated onto existing platforms.[123]
- PC has also updated its PSPS web page[124] to provide more detailed information on potential and actual PSPS events. Additionally, the webpage includes a PSPS forecasting tool that allows users to see event statuses forecasted for each day over the corresponding week; statuses include "Normal", "Watch", and "Event".[125]
- In 2020, PC worked with the other SMJUs, along with a third-party vendor, to develop and conduct a 20-question survey for measuring the effectiveness of its wildfire preparedness and PSPS outreach efforts and identify areas for improvement.[126] The survey will be administered again in 2021.

PC has room for improvement in the following areas:

- PC does not follow the 2021 WMP Guidelines for any of its mitigation initiatives in the Stakeholder Cooperation and Community Engagement category. None of the initiatives in this section include the subparts required by Guidelines Section 7.3.b [see PC-1].
- PC's discussion of its *cooperation and best practice sharing with agencies outside of California* (mitigation initiative 7.3.10.2) is very sparse and needs more detail.
- PC could also improve upon its *forest service and fuel reduction cooperation and joint road map* initiative (7.3.10.4). The discussion provided does not detail how PC engages with local, state, or federal entities on forest management and fuel reduction activities, nor does it mention any plans for a joint stakeholder roadmap or cooperation strategy in this effort.

Issues and Remedies

[123] PacifiCorp 2021 WMP Update, p. 188.

[124] PC's PSPS web page can be accessed at www.pacificpower.net/psps, which redirects to https://www.pacificpower.net/outages-safety/wildfire-safety/public-safety-power-shutoff.html (accessed May 25, 2021).

[125] PacifiCorp 2021 WMP Update, p. 189.

[126] PacifiCorp 2021 WMP Update, pp. 189-191.

While the WSD did not identify key areas for improvement in this competency of PC's 2021 WMP Update, the WSD finds the following issues and associated remedies. The WSD expects PC to address these issues and report on progress made over the year in its 2022 WMP Update.

- ISSUE: PC briefly details its relationships with "tribal emergency managers" in its community engagement strategy by stating, "In the course of daily business, [regional business managers] RBMs frequently interact with key community stakeholder groups including […] tribal emergency management. Their vital role in this ongoing conversation with the communities the company serves cannot be understated."[127] This is the extent of information provided on its plan for outreach to tribal communities in its service territory on the issue of wildfire. The testimony of Joshua Saxon, Executive Director of the Karuk Tribe, which resides in the PC service territory, at the CPUC's "Joint IOUs Workshop on 2020 Public Safety Power Shutoff Events" held on March 29, 2021,[128] indicates that the Karuk Tribe has found PC's outreach efforts concerning wildfire information insufficient. When Mr. Saxon asked PC staff participating in the workshop whether the utility has a tribal liaison, Todd Andres, Regional Business Manager for Siskiyou and Modoc counties, responded in the negative.[129]
    - REMEDY: PC must establish formal lines of communication with tribal leaders in its service territory, treating tribal governments in the same manner it treats local governments and agencies in its service territory. In PC's future WMP submissions, PC must provide the details of its plan for outreach to tribal governments, including how it will engage with tribal leaders during wildfire-related events.

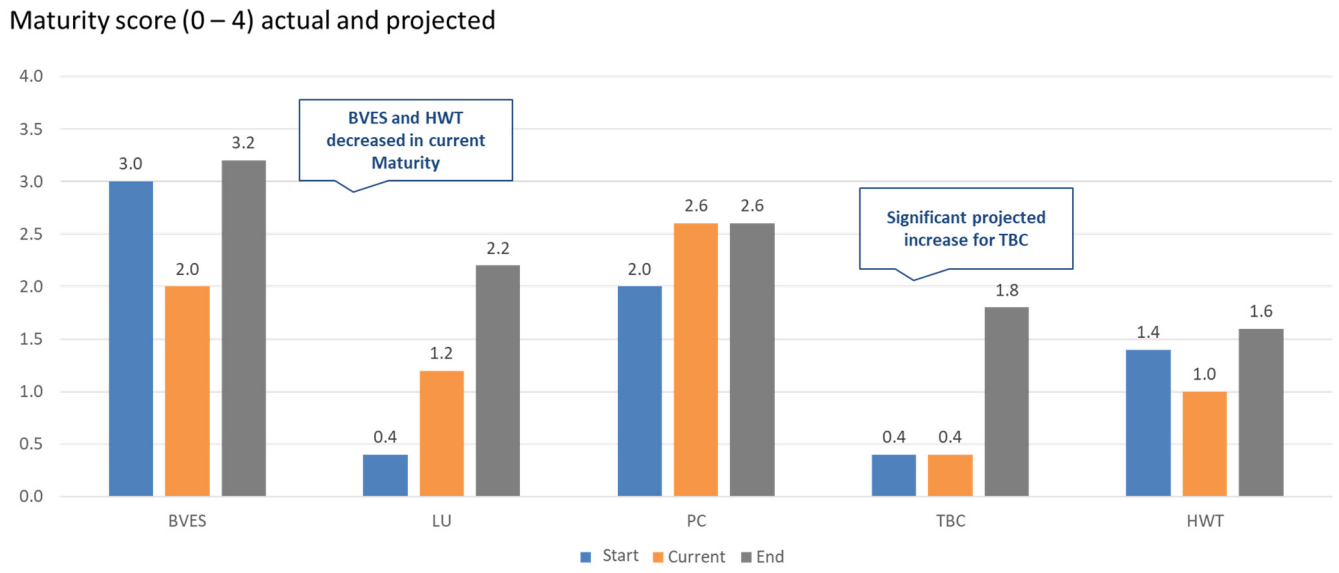
Figures

Below are charts used as part of the WSD's review of PC's stakeholder cooperation and community engagement section:

[127] PacifiCorp 2021 WMP Update, p. 186.

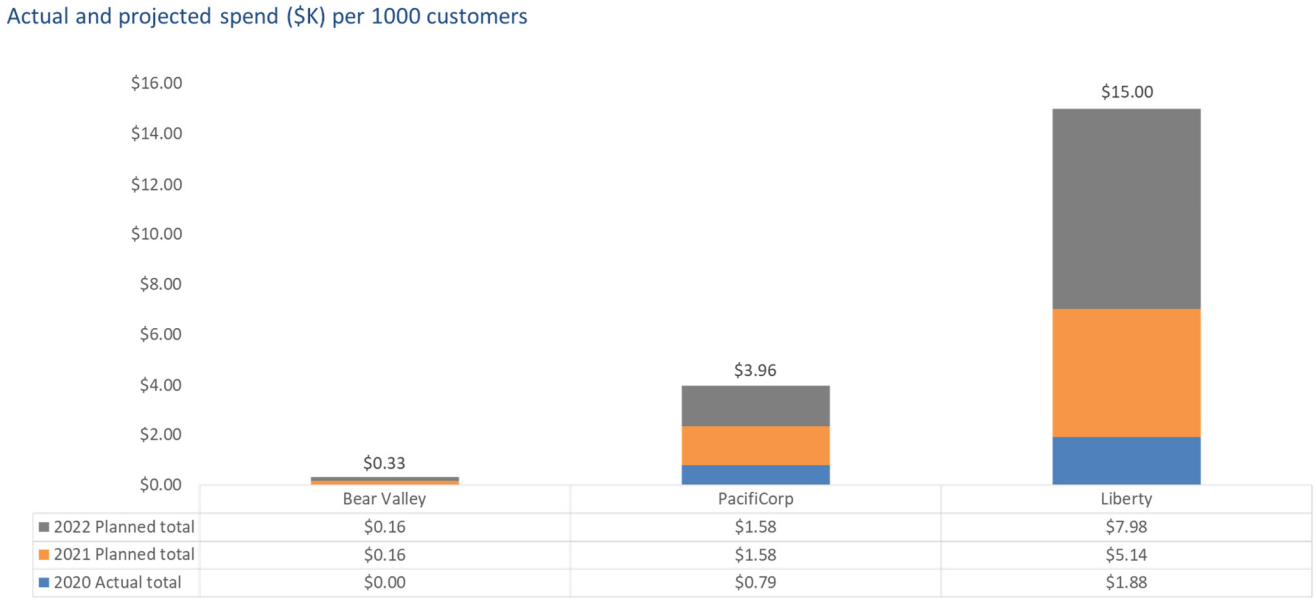
[128] Mr. Saxon's testimony is available at time stamp 4:25:00 in the recording of the workshop (accessed May 20, 2021): http://www.adminmonitor.com/ca/cpuc/workshop/20210329/.

[129] Ibid. This exchange took place in the workshop segment with time stamp 4:53:40 – 4:58:00, in particular at 4:54:45: Mr. Saxon: "Does PacifiCorp have a tribal liaison?" Todd Andres, Regional Business Manager for Siskiyou and Modoc county, PacifiCorp: "I'm not aware of that at this time."



Source: 2021 Maturity Model survey data

Figure 5.10.a: Stakeholder cooperation and community engagement maturity score progress.



Source: Table 12 of utility 2021 WMP Updates and subsequent data requests

Figure 5.10.b: Stakeholder cooperation and community engagement spend per 1000 customers, SMJUs 2020-2022.

6. Public Safety Power Shutoff (PSPS), including directional vision for PSPS

Introduction

In recent years, Public Safety Power Shutoffs (PSPS) have been increasingly used by utilities to mitigate wildfire risk. PSPS events introduce substantial risk to the public and impose a significant burden on public services that must activate during a PSPS event. The WSD supports the use of PSPS only as a last resort and expects the utilities to clearly present plans for reducing the scale, scope, and frequency of PSPS events.

In 2021, WSD separated the reporting of PSPS from the reporting of mitigations and progress metrics to reflect the definition of PSPS as a measure of last resort rather than a mitigation option (pursuant to Guidance Resolution WSD-002 and PSPS decisions D.19-05-036 and D.20-03-004).[130] This section of the WMP Guidelines[131] requires utilities to report their current and projected progress in PSPS mitigation, including lessons learned from the prior year, de-energization and re-energization protocols, PSPS outcome metrics, plans to reduce future PSPS impacts, and community engagement.

Overview

The WSD finds that PC has made incremental progress in relation to PSPS and finds this section of PC's 2021 WMP Update to be sufficient, subject to remedies. Generally, PC has not described lessons learned from the PSPS events impacting its customers in the last year and how it intends to apply its experience to date to reduce PSPS in the near term. Rather, PC has made efforts and progress that only strive to adhere to specific PSPS requirements.[132] It has yet to

[130] When calculating RSE for PSPS, electrical corporations generally assume 100 percent wildfire risk mitigation and very low implementation costs because societal costs and impact are not included. When calculated this way, PSPS will always rise to the top as a wildfire mitigation tool, but it will always fail to account for its true costs to customers. Therefore, electrical corporations shall not rely on RSE calculations as a tool to justify the use of PSPS.

[131] WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, pp. 46-49 (accessed May 27, 2021):
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf.

[132] CA Public Utilities Commission "De-energization Guidelines" as set forth in Resolution ESRB-8, and the Phase 1 and 2 Guidelines established by D.19-05-042, D.20-05-051 and R.18-12-005 proposed decision that would implement Phase 3 Guidelines if adopted.

- https://docs.cpuc.ca.gov/publisheddocs/published/g000/m218/k186/218186823.pdf (Resolution ESRB-8)
- https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M296/K598/296598822.PDF (Phase 1 Guidelines)
- https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M339/K524/339524880.PDF (Phase 2 Guidelines)

convincingly describe its organization-wide plan to reduce scale, scope and frequency of PSPS. This conveys a less proactive approach toward fully acknowledging PSPS as a risk and therefore taking the appropriate measures to reduce that risk, including when compared to its peers.

Progress over the past year

The WSD finds that PC has made the following progress:

- Protocols
  - PC has implemented a two-level approach of "internal watches" and "activation" to guide its event response.
  - PC identified two zones where a PSPS event might be applicable based on fire threat, terrain, fire history, fuel characteristics, and weather. In 2020 these were further subdivided into five smaller zones based on grid configuration, with a goal of affecting fewer customers with de-energization if possible, based on the subdivisions.
- Forecasting and Modeling
  - Since its initial analysis setting triggers for its 2019 and 2020 WMPs, the company has incorporated measurements of long-term drying, climate variables, and weather that would lead to fault events.
  - It added a short-term drying measure, vapor pressure deficit (VPD), which measures the departure from normal dryness in an area to the established triggers of Keetch-Byram Drought Index (KBDI) for fuel dryness, Fosberg Fire Weather Index (FFWI) as a climate metric, and wind gusts and speeds for fault events and fire spread potential.
- General Public PSPS Communications
  - PC provides additional notice of re-energization through public safety partner notification channels and by sending automated notices.
  - PC has integrated the requirement to complete restoration within 24 hours from the termination of the de-energization event, unless unsafe to do so.
  - PC modified its main PSPS webpage with an address tool for the public to determine if in an area is subject to a PSPS event.
- Engaging Vulnerable Communities[133]
  - PC provides additional PSPS notifications to individuals classified as medical baseline customers in PC's customer service system and to individuals who self-identify as having access and functional needs (AFN).
  - PC has engaged a vendor to survey AFN population to help inform the company's communication outreach related to those customers.[134]

[133] Addressed in PacifiCorp 2021 WMP Update Chapter 7.3.10

[134] R.18-12-005_PacifiCorp_Second_Progress_Report_12-7-20.pdf (https://www.pacificpower.net/content/dam/pcorp/documents/en/pacificpower/outages-safety/wildfire-safety/R.18-12-005_PacifiCorp_Second_Progress_Report_12-7-20.pdf)

  - The company is partnering with local and regional agencies that frequently interact with the AFN community.

Plans for the coming year include:

- By June 1, 2021
  - PC plans to continue developing situational awareness by growing its weather network for better forecasting.
- By September 1, 2021
  - PC will have completed the first step of its covered conductor installation, which will limit impacts of PSPS from one of its more populated fire threat areas.
  - PC will have several Distribution Fault Anticipation (DFA) devices installed to provided information to recognize utility risks before they become problems.
- By the 2022 WMP Update
  - PC will have had 1 year of practical experience of its Localized Risk Assessment Modeling (LRAM) for managing risk.
  - PC plans to have greater information, through risk assessment, situational awareness, and system monitoring information to provide more strategic application of all mitigation initiatives.

PC has room for improvement in the following areas:

The WSD finds that PC does not have an adequate approach to PSPS. The utility's primary focus is removing the need for PSPS entirely following the completion of long-term grid hardening goals. Lack of acknowledging potential risk of need to use PSPS in the short term was also demonstrated in PC's 2020 WMP, and again in its quarterly reporting. In response, the WSD requested PC to address 2020 WMP Deficiency, Guidance 4.[135] The answer PC provided when requested to again describe its overall company strategy toward use of PSPS in the 2021 WMP Update[136] instills a lack of confidence that it is taking the potential need for PSPS use as seriously as it needs to be, as other utilities are, bringing to light a number of concerns.

- PC's prevailing approach seems to be one of optimism that it will not need to execute widespread PSPS events. For instance, the utility posits "the extremely remote potential

[135] PC's QR Action Statement - Guidance 4 "Lack of Discussion on PSPS Impacts": PC states that because the company has not had to implement a PSPS prior to 2020 and is employing covered conductor installation for its HFTD Tier 3 and Tier 2 areas, it does not need to develop a specific threshold-based plan categorized by WMP initiative. The information provided did not address or answer the request for threshold values or provide information about the relationship of initiatives to making decisions about implementing PSPS.
Prior to this QR submission PC justified its lack of PSPS planning stating, "it hasn't implemented a PSPS to date, and is optimistic that it won't need to be based on implementation of covered conductor installations." Just days after submitting its QR, PC implemented its first PSPS event on September 13, 2020, and initiated PSPS "watch" events to consider implementing PSPS on September 17, 2020, and October 21, 2020.

[136] PacifiCorp 2021 WMP Update, p. 196.

that all proactive de-energization zones in PC's service territory would be de-energized at the same time"[137] and "it will be rare for proactive de-energization to be simultaneously activated in multiple PSPS areas."[138]

- PC's approach also appears largely geared toward addressing CPUC PSPS de-energization requirements (referenced above), as opposed to being strategically driven by overall risk of weather events triggering PSPS. This is despite having had to initiate three PSPS Events in 2020. The event on September 13, 2020 resulted in de-energization of 2,557 customers.[139]
- PC generally lacks specificity in providing details about its plan to minimize use of PSPS, beyond indicating it hopes to not continue to need to use PSPS *after* its electrical grid system is hardened. The overall approach PC describes demonstrates a lack of concern for understanding and addressing the potential need for PSPS, even as a last resort, and explaining its impact on the public.
- In particular, the following statement by PC is concerning: "It is challenging to mitigate the impacts of PSPS, until sufficient hardening efforts have been delivered to minimize the ignition risk during environmentally favorable periods described in Section 5.3.3."[140] This statement seems to demonstrate that PC continues to look ahead to only rely on grid hardening plans to minimize the need for PSPS, without making alternative plans to diminish the need for PSPS in the meantime.
- PC has not identified a need for transmission system de-energization as part of its PSPS plans.[141]
- PC did not address progress nor mention what it is doing to mitigate the impact to partners, including first responders, critical facilities, and telecommunications companies.
- Finally, with regard to metrics demonstrating reduction in PSPS scale, scope and frequency, PC provided forecast metrics in response to a data request titled "PacifiCorp Data Request_20apr2021" (see Appendix 10.2). The WSD received PC's response on April 23, 2021, which stated:

> "Where data existed, PacifiCorp was able to populate the 2015 – 2020 actual datasets requested in Table 11. However, PacifiCorp does not have the data or experience required to calculate predicated values as requested in Table 11 and, therefore, found in challenging to populate. However, to support the

[137] R.18-12-005_PacifiCorp_Second_Progress_Report_12-7-20, p. 7

[138] PacifiCorp 2021 WMP Update, p. 198.

[139] https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2020/PacifiCorp%20PSPS%20Report%20(10-1-20).pdf

[140] PacifiCorp 2021 WMP Update, p. 195.

[141] PacifiCorp 2021 WMP Update, p. 195.

request, PacifiCorp has populated forecasted values for 2021 and 2022 using values experienced in 2020 as a best estimate."

The methodology for providing this information is unclear. Further, a requested "compelling explanation" for why it was unable to derive this information has not been conveyed. With indicated potential advancements in forecasting capability related to PSPS, practical experience incorporating risk modeling in the coming year, and strategic application of mitigation initiatives the WSD expects to see a method for calculating forecasted PSPS metrics demonstrated in 2022.

Key Areas for Improvement and Remedies

The WSD finds that PC must focus on the following areas as significant to reducing utility-related PSPS risk:

Utility-#	Issue title	Issue description	Remedies required
PC-10	Inadequate approach to PSPS	PC's 2021 WMP Update lacks specific short-term PSPS reduction commitments, sufficient justification, and mitigation initiative targets, apart from covered conductor.	PC must: 1) Acknowledge that, based on its own triggering criteria, it is subject to risk of PSPS in the near-term and describe its vision for reducing potential use of PSPS next fire season, normalized for changes in weather;[142] 2) Provide a firm commitment to a quantifiable reduction in risk of a) frequency, b) scope (i.e., customers impacted), and c) duration of PSPS events during the plan term, including timelines for achieving these reductions; and 3) Identify which initiatives in its 2021 WMP Update are contributing to the goals in (2) above.

Additional Issues and Remedies

In addition to the key area listed above, the WSD finds the following issues and associated remedies. The WSD expects PC to take action to address these issues and report on progress made over the year in its 2022 WMP Update.

- ISSUE: PC discussed and/or considered "PSPS" generally, throughout initiatives without specifically addressing reduction of PSPS implementation frequency, scope, and duration or threshold values.
    - REMEDY: In future submissions, PC must focus on the specific initiatives within the plan it is deploying to reduce scale, scope, and frequency of PSPS events with targeted goals, including the percent or amount of reduction, normalized for changes in weather, from these efforts.

[142] PSPS metrics requested via the WMP Guidelines have been purposefully designed to address changes in weather year over year in order to provide data for comparative analysis across utilities and years. They therefore already use normalized metrics that take into consideration changing weather conditions. For instance, PSPS duration in customer hours (normalized) reflects "Customer hours of PSPS per Red Flag Warning overhead circuit mile day." The expectation is that the utilities show how their other mitigation initiatives reduce their need to use PSPS as a tactic.

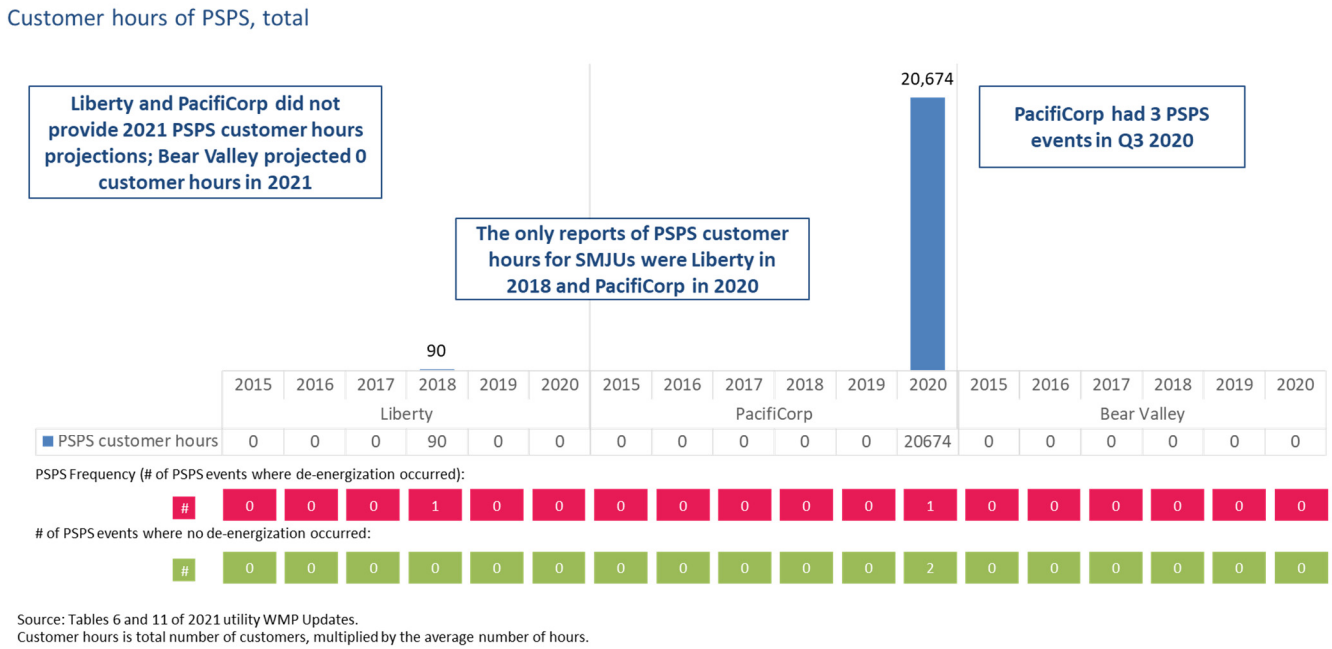
Figures

Below are charts used as part of the WSD's review of PC's Public Safety Power Shutoff section:

The below figures depict the fact that PC implemented its first PSPS "activation" event on September 13, 2020, and initiated PSPS "watch" events to consider implementing PSPS on September 17, 2020, and October 21, 2020.

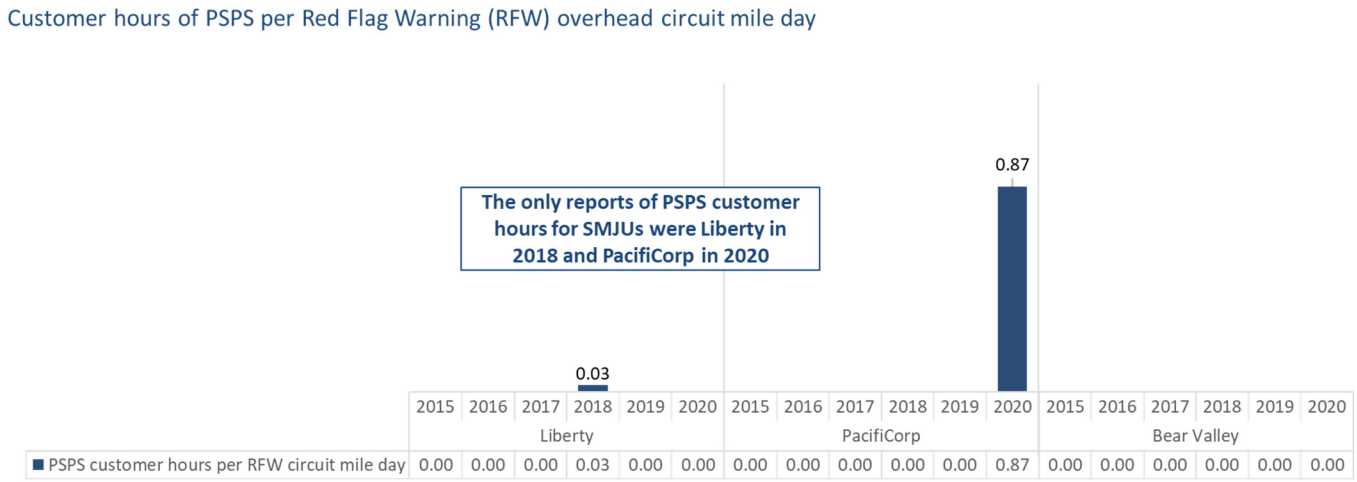
Figure 5.10.a captures the customer hours from the September 13, 2020, PSPS event impacting 2,557 PC customers.

Figure 5.10.b shows customer hours of PSPS per Red Flag Warning circuit mile reflecting the PC de-energization event on September 13, 2020.



Source: Tables 6 and 11 of 2021 utility WMP Updates.
Customer hours is total number of customers, multiplied by the average number of hours.

Figure 6.a: PSPS duration in customer hours (total).



Source: Tables 6 and 11 of 2021 utility WMP Updates.
Note: Normalization calculations were done by taking the total customer hours per year and dividing by total RFW days per year.
Customer hours is total number of customers, multiplied by the average number of hours.

Figure 6.b: PSPS duration in customer hours (normalized).

7. Next steps

PC must address the issues identified in the WSD's review of PC's 2021 WMP Update over the course of the next year. PC must place particular focus on the key areas for improvement described above. PC must report progress on these key areas in the Progress Reports, as described in Section 1.3 of this Action Statement.

Change Orders

If PC seeks to significantly modify (i.e., reduce, increase, or end) WMP mitigation measures in response to data and results on electrical corporation ignition risk reduction impacts, PC must submit a Change Order Report. At a high level, the objective of the change order process is to ensure the electrical corporation continues to follow the most effective and efficient approach to mitigating its wildfire risk. This could change as new information becomes available and as the electrical corporation gains experience and measures the outcomes of its initiatives.

The change order process set forth herein provides a mechanism for the electrical corporation to make adjustments based on this information and experience. The goal of this process is to ensure that utilities make significant changes to their WMPs only if the utilities demonstrate these changes to be improvements per WMP approval criteria (i.e., completeness, technical feasibility, effectiveness, and resource use efficiency). Another goal of the change order process is to maximize the WSD's visibility and ability to respond to any significant changes to the approved plan as efficiently and in as streamlined a way as possible.

A "significant" change to a utility's WMP that would trigger the change order process is defined below:

- A change falls into the following initiative categories, i) risk assessment and mapping, ii) vegetation management and inspections, iv) grid design and system hardening, or v) asset management and inspections.

or

- A change to the utility's PSPS strategy, protocols and/or decision-making criteria.

and

- Meets one or more of the following criteria:
  - A change that would result in an increase, decrease, or reallocation of more than $5 million constituting a greater than 10% change in spend allocation.
  - A change that reduces or increases the estimated risk reduction value of an initiative more than 25%.
  - A change that results in a radical shift of either the strategic direction or purpose of an initiative (e.g., introducing use of a novel risk model that reverses the risk profile of the utility's circuits).

If an electrical corporation is unsure whether a change is significant, the corporation is encouraged to submit an advance inquiry on the matter. The change order process is not intended to provide electrical corporations with a pass to unilaterally change their WMP initiatives and program targets; rather, its purpose is to provide a mechanism for refining certain elements of WMP initiatives when there is demonstrable quantitative and qualitative justification for doing so.

Utilities shall submit any Change Order Reports by 5:00 p.m. on November 1, 2021. The WSD will review change orders and may issue either an approval or a denial if proposed changes are deemed to be materially out of alignment with the WSD's goals.

At a minimum, each proposed change order shall provide the following information:

i. The proposed change
   a. The initiative being altered with reference to where in the WMP the initiative is discussed
   b. The planned budget of that initiative, including:
      i. Planned spend in the 2021 WMP Update of the initiative being altered
      ii. Of the planned spend identified in i. above, how much has already been spent
      iii. Planned spend for the remainder of the WMP plan period
      iv. If spend is being redeployed, how much is being redeployed and to/from which budget
   c. The type of change being proposed, reported as one of the following:
      i. Increase in scale

ii. Decrease in scale
iii. Change in prioritization
iv. Change in deployment timing
v. Change in work being done
vi. Other change (described)

d. A detailed description of the proposed change

ii. Justification for the proposed change

a. In what way, if any, does the change address or improve:

i. Completeness
ii. Technical feasibility of the initiative
iii. Effectiveness of the initiative
iv. Resource use efficiency over portfolio of WMP initiatives

iii. Change in expected outcomes from the proposed change

a. What outcomes, including quantitative ignition probability and PSPS risk reduction, was the changed initiative expected to achieve in the 2021 WMP Update?

b. What outcomes, including quantitative ignition probability and PSPS risk reduction, will the initiative deliver with the proposed adjustment?

Submission of Change Order Reports shall be submitted by e-mail to the Director of Energy Safety. [Energy Safety and the submission e-mail address shall be established by July 1st, 2021]. Utilities shall concurrently serve all reports on the Department of Forestry and Fire Protection at CALFIREUtilityFireMitigationUnit@fire.ca.gov and on the service list in R.18-10-007, consistent with the procedures set forth in Rules 1.9 and 1.10 of the Commission's Rules of Practice and Procedure.

Stakeholders may comment on Change Order Reports within fifteen days of submission following the submission instructions above but may not otherwise seek change orders through this process. The WSD may modify the process for submitting or reviewing change orders at its discretion with written notice.

8. Consultation with CAL FIRE

Pub. Util. Code Section 8386.3(a) requires the WSD to consult with CAL FIRE in reviewing electrical corporations' 2021 WMP Updates. The Commission and CAL FIRE have a memorandum of understanding in place to facilitate this consultation (Pub. Util. Code Section 8386.5). The Commission and the WSD have met these requirements, but this Action Statement does not purport to speak for CAL FIRE.

9. Conclusion

PacifiCorp's 2021 WMP Update is approved.

Catastrophic wildfires remain a serious threat to the health and safety of Californians. Electrical corporations, including PC, must continue to make progress toward reducing utility-related wildfire risk. Through the approval of PC's 2021 WMP Update, the WSD expects PC to effectively implement its wildfire mitigation activities to reduce the risk of utility-related ignitions and the potential catastrophic consequences if an ignition occurs as well as to reduce the scale, scope, and frequency of PSPS events. PC must meet the commitments in its 2020 WMP and update and fully comply with the conditions listed in this Action Statement to ensure it is achieving a meaningful reduction of utility-related wildfire and PSPS risk within its service territory.

/S/ CAROLINE THOMAS JACOBS

Caroline Thomas Jacobs
Director, Wildfire Safety Division
California Public Utilities Commission

10. Appendix

10.1. Status of 2020 WMP Deficiencies

The 2020 WMP Resolutions for each utility contained a set of "Deficiencies" and associated "Conditions" to remedy those issues. Each issue was categorized into one of the following classes, with Class A being the most serious:

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

Class A deficiencies were of the highest concern and required a utility to develop and submit to the WSD a Remedial Compliance Plan (RCP) to resolve the identified issue within 45 days of Commission ratification of the Resolution. Class B deficiencies were of medium concern and required reporting by the utility to provide missing data or a progress update in its Quarterly Report. Such reporting was either on a one-time basis or ongoing as set forth in each condition. Class C deficiencies required the utility to submit additional detail and information or otherwise come into compliance in its following annual WMP Update. Detailed descriptions of the RCP and quarterly reports are contained in Resolution WSD-002, the Guidance Resolution on Wildfire Mitigation Plans.[143]

The deficiencies found in 2020 have either been resolved or are folded into 2021 issues, as detailed in the table below.

Deficiency	Description	RCP/QR Determination	Status
Guidance-1, Class B	Lack of risk-spend efficiency (RSE) information	Insufficient (QR), Actions PC-1 – PC-4	Conditions not met: wrapped into new issue for 2021 (PC-9, Inadequate justification of initiative-selection process)
Guidance-2, Class B	Lack of alternatives analysis for chosen initiatives	Sufficient (QR)	Conditions not met: wrapped into new issue for 2021 (PC-9, Inadequate justification of initiative-selection process)
Guidance-3, Class A	Lack of risk modeling to inform decision-making	Insufficient (RCP), Actions PacifiCorp-1 – PacifiCorp-7	Conditions not met: wrapped into new issue for 2021 (PC-9, Inadequate justification of initiative-selection process)

[143] The Draft Guidance Resolution WSD-002 can be found here on the CPUC website: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M336/K461/336461968.pdf

Deficiency	Description	RCP/QR Determination	Status
Guidance-4, Class B	Lack of discussion on PSPS impacts	Insufficient (QR), Actions PC-5 – PC-9	Conditions not met: wrapped into new issue for 2021 (PC-7, Limited explanation for how initiatives reduce PSPS impacts)
Guidance-5, Class B	Aggregation of initiatives into programs	Sufficient (QR), Actions PC-10 – PC-11	Conditions not met: wrapped into new issue for 2021 (PC-1, Failure to follow format for Section 7.3.b, subparts 1-5, of 2021 WMP Guidelines)
Guidance-6, Class B	Failure to disaggregate WMP initiatives from standard operations	Sufficient (QR), Action PC-12	Conditions not met: wrapped into new issue for 2021 (PC-9, Inadequate justification of initiative-selection process)
Guidance-7, Class B	Lack of detail on effectiveness of "enhanced" inspection programs	Sufficient (QR), Action PC-13	Conditions not met: wrapped into new issue for 2021 (PC-9, Inadequate justification of initiative-selection process)
Guidance-8, Class C	Prevalence of Equivocating Language – failure of commitment	-	Conditions not met: wrapped into new issue for 2021 (PC-1, Failure to follow format for Section 7.3.b, subparts 1-5, of 2021 WMP Guidelines)
Guidance-9, Class B	Insufficient discussion of pilot programs	Sufficient (QR)	Conditions not met: wrapped into new issue for 2021 (PC-9, Inadequate justification of initiative-selection process)
Guidance-10, Class B	Data issues – general	Insufficient (QR), Action PC-14	Conditions not met: progress being monitored
Guidance-11, Class B	Lack of detail on plans to address personnel shortages	Insufficient (QR), Actions PC-15 – PC-17	Conditions not met: progress being monitored
Guidance-12, Class B	Lack of detail on long-term planning	Insufficient (QR), Action PC-18	Conditions not met: progress being monitored
PacifiCorp-1, Class B	PacifiCorp's WMP does not report adequate planning for climate change	Insufficient (QR), Actions PC-19 – PC-20	Conditions met: deficiency resolved.

Deficiency	Description	RCP/QR Determination	Status
PacifiCorp-2, Class B	PacifiCorp has not demonstrated effective weather station utilization	Sufficient (QR), Action PC-21	Conditions not met: wrapped into new issue for 2021 (PC-9, Inadequate justification of initiative-selection process)
PacifiCorp-3, Class B	PacifiCorp did not explain how it would track effectiveness of its covered conductor initiative	Insufficient (QR), Action PC-22	Conditions not met: wrapped into new issue for 2021 (PC-4, Limited evidence to support the effectiveness of covered conductor)
PacifiCorp-4, Class B	PacifiCorp's WMP lacks a QA/QC program for inspections	Insufficient (QR), Action PC-23	Conditions met: deficiency resolved
PacifiCorp-5, Class C	PacifiCorp's WMP does not report sufficient information on the risk reduction outcomes of its automatic recloser program	-	Conditions not met: deficiency wrapped into new issue for 2021 (PC-8, Lack of details on automatic recloser settings and associated wildfire risk reduction)
PacifiCorp-6, Class B	PacifiCorp does not have a specific data governance wildfire mitigation program	Insufficient (QR), Action PC-24	Conditions not met: progress being monitored
PacifiCorp-7, Class C	PacifiCorp's stakeholder cooperation and community engagement needs further detail	-	Conditions met: deficiency resolved

10.2. WSD Data Request Responses

The following are data requests and their responses from PC referenced in the Action Statement above.

Regarding Emergency Planning and Preparedness maturity and spend discrepancy:
Data Request: N/A
Request date: The WSD submitted a question to the utility on March 20, 2021, for a phone call held April 1, 2021; the WSD received a written follow-up response to this question on April 2, 2021.
Request: Table 3-2 (WMP pp. 23-24) indicates $0 in the Emergency Planning & Preparedness category for the entire 2020-22 WMP cycle. In the maturity survey responses, PC is projecting its highest growth in this category. Please reconcile and explain how PC plans to meet this projected maturity without any cycle spend in this category.
Response date: April 2, 2021
Response: It is important to understand that $0 does not reflect 0 effort or change. Therefore, the maturity survey and WMP filing reflect a significant amount of planned effort that does not current track or reflect as incremental spend. Many of the planned resources and changes have been absorbed centrally and are not distinctly allocated and attributed to California operations. Examples of such include additional FTEs and initiatives such as mutual aid and community outreach performed by existing resource. To support future reporting and qualitatively capture effort, PacifiCorp will revisit a change to allocation and setup a statistical work order to track effective spend in future filings similar to what is being done to support transparency and tracking of other programs. As such an order does not exist, it is hard to provide a specific number at this time but PacifiCorp anticipates the value of such effort to be $100,000 in 2021.

Regarding service restoration workforce adequacy:
Data Request: N/A
Request date: The WSD submitted a question to the utility on April 6, 2021, for a phone call held April 7, 2021; the WSD received a written follow-up response to this question on April 8, 2021.
Request: To demonstrate adequacy of size of service restoration workforce (requirement 8386(c)(15)) provide the following:

a. Describe your current service restoration processes (i.e., damage assessments, repairs, switching activities, etc.) and tools (boots on the ground, drones, helicopters, etc.).
b. Report the type and number of each personnel classification currently employed by PacifiCorp that are involved in service restoration activities, including an explanation of what roles and responsibilities they have.
c. How many mutual aid agreements does PacifiCorp have in place? If possible, please explain the type and number of personnel classifications involved in each agreement (or the total number for all agreements).
d. How many contractors are in place for service restoration? Explain the type and number of personnel classifications retained as contractors.

Response date: April 8, 2021
Response:

a. For a single outage event, the system control center identifies the outage and assigns a troubleshooter to physically survey the location of the identified outage, verify the outage, and determine if repairs are needed. This activity If repairs are not needed, step restoration begins. If repairs are needed, these repairs are performed prior to final restoration.
The process for major events, such as those referenced in requirement 8386(c)(15), is very similar to the steps for a single outage but tend to be significantly scaled. For major outages, many assessors are sent to the field to verify and evaluate multiple outages. The assessments may be performed via a range of methods such as line patrol, foot patrol, or helicopter depending on the needs. In contrast to single outages, repair work and step restorations for a major event requires prioritization that incorporates factors such as local emergency services needs, customer locations and counts, and grid topology to facilitate faster overall repair and restoration.
b. PacifiCorp employs approximately 455 union personnel throughout Oregon, California, and Washington. Specific to service restoration, four crafts positions, lineman, communication technicians, relay technicians, and apparatus wireman, are deployed routinely to support single outage restoration as well as major event restoration. The numbers of personnel employed in each of these craft positions is included below for California only as well as Oregon, California, and Washington. When reviewing the information below, it is critical to note that PacifiCorp's service territory borders Oregon and therefore, certain positions may be assigned to California but be based out of Oregon.

Classification	Pacific Power	California Subset
Linemen	231	20
Comm Tech	16	1
Relay Tech	23	2
Substation Wiremen	38	5
TOTAL	308	28

Additional information can be found in PacifiCorp's GO166 filing.
c. PacifiCorp participates in four major mutual aid partnerships at the company, state, regional, and national level. At the company level, PacifiCorp can pull from resources throughout its 6 state service territory in California, Oregon, Washington, Idaho, Wyoming, and Utah. At the state level, PacifiCorp is a member of the California Utility Emergency Association (CUEA Inc). For regional level support, PacifiCorp is a member of the Western Mutual Assistant Group (WRMAG) which covers most US states west of the Rocky Mountains. And finally, this regional group rolls up to the Edison Electric Institute (EEI) mutual assistance partnerships at the national level.
d. Craft lineman are the main contracted resource leveraged by PacifiCorp that can be deployed to assist with a major event or system restoration. This contracted resource constitutes approximately 40% of PacifiCorp's lineman workforce, or 89 lineman on any given day.

Regarding the prioritized list of wildfire risks:
Data Request: PacifiCorp Data Request_2apr2021 (Question 3)
Request date: The WSD submitted a question to the utility on March 16, 2021, for a phone call held March 17; the WSD received a written follow-up response to this question on March 18. The WSD subsequently requested clarifications via data request, sent April 2, 2021. The details below pertain to the data request.
Request: Following the 3/17 utility call, PC provided a revised version of Table 4-5 ('model or legacy' ignition risk drivers) with each risk driver assigned a color to indicate risk level for "fire season" and "non fire season," ranked within each category. Please re-revise Table 4-5 to rank all risks relative to one another (not within each category but with all risks ranked relative to one another). It is only necessary to show the relative risk during fire season. The risks of highest overall concern should be at the top of the list. If multiple risk drivers are considered to have the same level of risk, please rank them side-by-side.
Response date: April 6, 2021
Response: Below is the list of ignition risk drivers, ordered from highest to lowest risk. While numerically the company had grouped certain drivers at the same value, it has ordered them distinctly in the list below.
Ordered from highest to lowest
Wire down event

1. *Contact from object*
2. *Equipment/facility failure*
3. *Wire to wire contact*
4. *Utility work/Operation*
5. *Contamination*
6. *Vandalism/Theft*
7. *Other*
8. *Unknown*

Regarding the projected program target errors in Table 5.43-5-1:
Data Request: PacifiCorp Data Request_2apr2021 (Question 1)
Request date: The WSD submitted a question to the utility on March 16, 2021, for a phone call held March 17; the WSD received a written follow-up response to this question on March 18. The WSD subsequently requested clarifications via data request, sent April 2, 2021. The details below pertain to the data request
Request: In its response to 3/17/21 utility call question 1a, PC provided an Excel file with program targets. A few of the numbers provided do not match those in Table 5.43-5-1 (WMP p. 98). Below is a table presenting those discrepancies. Please reconcile each of the numbers shown in red with the numbers from WMP Table 5.43-5-1, specifically:

a. Weather Station Installations – 2020 Performance
b. Weather Station Installations – 2021 Target
c. Replacement of Cu Conductor – 2021 Target

d. Replacement of Cu Conductor – 2022 Target

"WSD_DR_3.17.21_Question 1(a).xlsx" vs. Table 5.43-5-1 (discrepancies shown in red)

Program Target	2020 Performance	2020 Performance (Table 5.43-5-1)	2021 Target	2021 Target (Table 5.43-5-1)	2022 Target	2022 Target (Table 5.43-5-1)	Units
Weather Station Installations	9	2	20	22	14	14	Stations
Replacement of Cu Conductor	0	0	3.78	0	2.65	17.3	Line Miles

Response date: April 6, 2021

Response: A few equations were wrongly applied when compiling the data request as compared to WMP Table 5.43-5-1 and further reconciling with other tables and sections in the WMP. An error was also found in Table 5.43-5-1 regarding program targets for weather stations in 2021.

Specific to the 2020 Weather Station Reported Performance:

Program Target	2020 Performance	2020 Performance (Table 5.43-5-1)	**CORRECTED 2020 PERFORMANCE**	Description of Issue
Weather Station Installations	9	2	**2**	Discrepancies in how completion of weather stations were tracked via work orders an (purchased vs installed vs relocated across the calendar years). The correct number should be two weather stations installed in 2020 with the additional weather stations currently being installed.

Specific to the 2021 Weather Station Target:

Program Target	2021 Target	2021 Target (Table 5.43-5-1)	**CORRECTED 2021 TARGET**	Description of Issue
Weather Station Installations	20	22	**21**	This target includes 9 "carry-over" from 2020 and 12 additional locations. Cascading effects of wrongly attributed completed

				weather stations in 2020 led to further tracking errors.

Specific to the 2021 Target for replacement of Cu Conductor (small diameter conductor):

Program Target	2021 Target	2021 Target (Table 5.43-5-1)	**CORRECTED 2021 TARGET**	Description of Issue
Replacement of Cu Conductor	3.78	0	**3.78**	Target value incorrectly copied into Table 5.43-5-1 from Table 12.

Specific to the 2022 Target for replacement of Cu Conductor (small diameter conductor):

Program Target	2022 Target	2022 Target (Table 5.43-5-1)	**CORRECTED 2022 TARGET**	Description of Issue
Replacement of Cu Conductor	2.65	17.3	**2.65**	Target value incorrectly copied into Table 5.43-5-1 from Table 12.

Regarding weather station installations:
Data Request: PacifiCorp Data Request_2apr2021 (Question 2)
Request date: April 2, 2021
Request: In the 2021 WMP update, the program target table in section 5.3 (WMP pp. 98) conflicts with Attachment 1 Table 12 regarding the amount of completed and planned installations of weather stations. Please also answer the following questions regarding the utility's weather station initiative:

a. Please confirm that the utility installed 11 weather stations in 2019.
b. Provide the number of weather stations that were planned for completion in 2020 but did not get installed by end the of 2020.
c. Provide the total number of weather stations PacifiCorp is planning to have installed as part of their weather station network by the end of 2022.

Response date: April 6, 2021
Response: Errors have been identified as explained in the response to question 1 above. These errors have permeated through the total program units reported. To provide clarity, the table below includes the 2019/2020 actuals as well as the 2021, 2022, and aggregate 2019-2022 planned values.

2019 Actual	2020 Actual	2021 Plan	2022 Plan	Total 2019-2022
10	2	21	14	47
Wrongly reported previously	Originally planned as 11; 8 stations delayed to facilitate more robust siting and moved to 2021 prior to fire season	Includes 11 originally planned for 2021 and 8 carry over from 2020 to be installed prior to fire season	No change	Includes cascading changes to record keeping

a. 10 weather stations were fully installed in 2019.
b. A total of 11 weather stations were planned for 2020, 2 of which were completed.
c. Total planned by end of 2022 = 47

(Please note: PC's GIS data points do match the non-spatial data provided in its 2021 WMP Update, nor do they match the numbers provided in response to this data request. PC reports that it completed installation of ten weather stations in 2019 and two in 2020, which brings their current total to twelve. However, PC's GIS weather station data, submitted as part of its 2021 WMP Update, only includes ten points [see issue PC-3].)

Regarding spend discrepancies:
Data Request: PacifiCorp Data Request_2apr2021 (Questions 5 and 6)
Request date: April 2, 2021
Request: Question 5: Summing the initiative spend amount provided in Table 12, three of the ten WMP initiative categories do not match the spend reported in Table 3-2, "Summary of WMP Expenditures by Category" (see below). Please reconcile the calculations that do not match and confirm which values are accurate.

a. Data Governance: 2020 Actual, 2021 Planned, 2022 Planned, 2020-2022 Planned
b. Resource Allocation Methodology: 2020 Actual, 2021 Planned, 2022 Planned, 2020-2022 Planned
c. Stakeholder Cooperation & Community Engagement: 2020-2022 Planned

NOTE: due to the discrepancies above, the total spend (reported in Table 3-1) does not match the initiative spend total when summing the spends in Table 12.
When summing the WMP total cycle spend for each category in PacifiCorp's Table 12, the following numbers are obtained (with discrepancies highlighted in red):

Category	**2020 Actual Total**	**2021 Planned Total**	**2022 Planned Total**	**Total WMP cycle spend**
Risk Assessment & Mapping	$ 186,000.00	$ 186,000.00	$ 186,000.00	$ 558,000.00

Situational Awareness & Forecasting	$ 1,209,123.63	$ 233,200.00	$ 295,600.00	$ 1,737,923.63
Grid Design & System Hardening	$ 8,788,467.00	$ 19,246,376.00	$ 15,303,431.00	$ 43,338,274.00
Asset Management & Inspections	$ 802,654.00	$ 759,898.00	$ 775,116.00	$ 2,337,668.00
Vegetation Management & Inspections	$ 6,998,752.00	$ 6,854,916.00	$ 6,900,000.00	$ 20,753,668.00
Grid Operations & Operating Protocols	$ -	$ -	$ -	$ -
Data Governance	**$ 181,000.00**	**$ 316,750.00**	**$ 316,750.00**	**$ 814,500.00**
Resource Allocation Methodology	**$ -**	**$ -**	**$ -**	**$ -**
Emergency Planning & Preparedness	$ -	$ -	$ -	$ -
Stakeholder Cooperation & Community Engagement	$ 36,474.00	$ 72,948.00	$ 72,948.00	**$ 182,370.00**
Total Planned Spend for WMP cycle	**$ 18,202,470.63**	**$ 27,670,088.00**	**$ 23,849,845.00**	**$ 69,722,403.63**

However, PacifiCorp submitted Tables 3-1 and 3-2 in its 2021 WMP which contained the following numbers:

Table 3-1: Summary of WMP Expenditures - Total

Spend in thousands $	
2020 WMP Planned	24,708
2020 Actual	18,202
Difference	6,506
2021 Planned	27,772
2022 Planned	24,015
2020-22 Planned	71,021

Table 3-2: Summary of WMP Expenditures by Category

WMP Category	2020 WMP Planned	2020 Actual	Difference	2021 Planned	2022 Planned	2020-22 Planned (w/ 2020 Actual)
Risk and Mapping	$25	$186	($161)	$186	$186	$558
Situational Awareness	$278	$1,209	($931)	$233	$296	$1,738
Grid Design and System Hardening	$15,403	$8,788	$6,615	$19,246	$15,303	$43,337
Asset Management and Inspections	$1,219	$803	$416	$760	$775	$2,338
Vegetation Management	$5,783	$6,999	($1,216)	$6855	$6,900	$20,754
Grid Operations	$2,000	$0	$2,000	$0	$0	$0
Data Governance	$25	$186	($161)	$186	$186	$558
Resource Allocation	$278	$1,209	($931)	$233	$296	$1,738
Emergency Planning	$0	$0	$0	$0	$0	$0
Stakeholder Cooperation and Community Engagement	$0	$36	$0	$73	$73	$0

Reconcile the calculations listed above that do not match and confirm with the WSD which totals are accurate.

Question 6: The "Difference" column from Table 3-2 in the Stakeholder Cooperation & Community Engagement row reports a $0 difference for this category, however, the 2020 WMP Planned spend is shown as $0 and the 2020 Actual spend is shown as $36,000. Based on these numbers, the difference should be +$36,000. Please confirm the correct difference.
Response date: April 6, 2021
Response: Question 5 Response: In general, calculation errors were made when translating and compiling values from Table 12 into Tables 3-1 and 3-2 regarding data governance and resource allocation and methodology. However, the detailed values in Table 12 should reflect the actual and planned costs.
Additionally, a copy and paste error occurred when aggregating the 2020 WMP Planned values and the 2020 planned costs for both risk assessment and mapping and situational awareness were used for resource allocation and data governance on accident.

Furthermore, as identified in question 6 below, the columns in Table 3-2 were added incorrectly for Stakeholder Cooperation and Community Engagement.
Tables 3-1 ad 3-2 have been recreated below to include the correct aggregate values for each category with the altered values shaded in yellow.

Table 3-1: Summary of WMP Expenditures – Total - REVISED

Spend in thousands $	
2020 WMP Planned	$24,708
2020 Actual	$18,202
Difference	$6,506
2021 Planned	$27,670
2022 Planned	$23,850
2020-22 Planned	$69,722

Table 3-2: Summary of WMP Expenditures by Category - REVISED

WMP Category	2020 WMP Planned	2020 Actual	Difference	2021 Planned	2022 Planned	2020-22 Planned (w/2020 Actual)
Risk and Mapping	$25	$186	($161)	$186	$186	$558
Situational Awareness	$278	$1,209	($931)	$233	$296	$1,738
Grid Design and System Hardening	$15,403	$8,788	$6,615	$19,246	$15,303	$43,337
Asset Management and Inspections	$1,219	$803	$416	$760	$775	$2,338
Vegetation Management	$5,783	$6,999	($1,216)	$6,855	$6,900	$20,754
Grid Operations	$2,000	$0	$2,000	$0	$0	$0
Data Governance	$0	$181	($181)	$317	$317	$815
Resource Allocation	$0	$0	$0	$0	$0	$0
Emergency Planning	$0	$0	$0	$0	$0	$0
Stakeholder Cooperation and Community Engagement	$0	$36	($36)	$73	$73	$182
Total	$24,708	$18,202	$6,506	$27,670	$23,850	$69,722

Question 6 Response: See Response to Question 7.[144] This difference is correct and was incorporated into the revised Table 3-2.

Regarding Vegetation Management training:
Data Request: PacifiCorp Data Request_20apr2021 (Question 3)
Request date: April 20, 2021
Request: Section 7.3.5.14 states, "PacifiCorp's general approach to recruiting and training of vegetation management personnel can be found in the company's Vegetation SOP" (WMP p. 167). The WSD has asked PC to identify where in their VM SOP more information on their recruitment and training can be found; the pages provided (pp. 2-3) briefly discuss "Professionalism" and "Contract utility forester qualifications".

a. Explain in full and complete detail how PC dictates and influences the qualifications of and the training of contracted VM personnel.
b. Does PC include qualification and training requirements as part of VM contractor Request for Proposals (RFP)? If so, provide an example RFP outlining PC's required qualifications and training of contracted VM personnel.
c. Does PC require VM personnel (contracted and internal) to attend and pass initial, onboarding trainings focused on:
    i. PC's VM SOP.
    ii. Wildfire risk reduction.
    iii. List any additional trainings VM personnel are required to attend and pass upon hiring.
d. Does PC require VM personnel (contracted and internal) to attend and pass continuing education, "refresher" training? If so:
    i. How often does this "refresher" training occur?
    ii. What topics are covered?
e. Provide a detailed explanation of how PC and its contractors track and verify VM training (both initial training and continuing, "refresher" education).
f. Explain if and how PC and its contractors track and measure recall and retention of VM training information after initial training is complete.
g. Provide a detailed explanation of how PC and its contractors track, verify, and encourage VM personnel to obtain certification from the International Society of Arboriculture (ISA).

Response date: April 23, 2021
Response:
a. Explain in full and complete detail how PC dictates and influences the qualifications of and the training of contracted VM personnel.

[144] PC meant to say "Question 5" here, not "Question 7."

Through the PacifiCorp procurement department, as part of the evaluation for a master services agreement, the individual companies' training programs are reviewed and given approval to proceed to the next step by a panel of procurement and vegetation staff. Most questions below are a part of the individual contracting companies' submission.
During the procurement process, PacifiCorp requires contractors to respond to several questions to determine if they will be allowed to receive a master services agreement contract. Responses are then evaluated.
PacifiCorp also identifies best management practices that should be followed, qualifications of contractors conducting inspections and line clearance work in sections 1.1, 1.2.1, and 2.1 of the VM SOP.

b. Does PC include qualification and training requirements as part of VM contractor Request for Proposals (RFP)? If so, provide an example RFP outlining PC's required qualifications and training of contracted VM personnel.

PacifiCorp requires contractors submit responses to a Questionnaire as part of the RFP process. Questions regarding qualifications and training are included within the Questionnaire. Additionally, contractors are required to meet qualifications identified in the VM SOP as outlined in response to question 2.a., including frontline line manager ISA certification requirements, forest technician qualifications, and required designations to be held by personnel performing line clearance work.
Pertinent questions regarding training and qualifications include the following:

- *Provide the résumés/certificates/qualifications of proposed personnel who will supervise the vegetation management activity to be provided, or the proposed qualifications for people who would be supervising this work, if specific individuals are not identified. Designate the supervisory levels proposed to be involved to properly control and coordinate the work, including both at the site and at Contractor's office, or if applicable, in Company's office.*
- *Describe as specifically as possible the details of the training program required of all your employees to ensure proper and competent execution of vegetation management services, and all safety, health, environmental and security regulations pertaining to the performance of the Work. Detail your training program including qualification, annual retraining, safety training and skills demonstration.*
- *State what certifications you require by worker classification.*
- *Identify and provide customer service metrics you have in place. Specifically address your procedures and training for addressing customer refusals.*
- *Does your organization have a documented plan for providing environmental training for its workers?*
- *How do you assure your organizations employees performing work for PacifiCorp are adequately informed of applicable environmental issues and properly trained to correctly address them?*

An example Questionnaire is attached.[145]

c. Does PC require VM personnel (contracted and internal) to attend and pass initial, onboarding trainings focused on:

i. PC's VM SOP.

Internal personnel study and understand the SOP before starting work and reviews are continually taking place with contractors in stand-up meeting. Contractors are provided copies of the SOP.

ii. Wildfire risk reduction.

With the increased emphasis placed on wildfire, contractors and company staff attend seminars and meetings when offered to enhance wildfire preparedness and awareness. Internal VM personnel are required to complete a Wildfire Preparedness, Prevention & Response training.

iii. List any additional trainings VM personnel are required to attend and pass upon hiring.

Internal VM personnel are required to take various company related trainings such as security, FERC standards of conduct, code of business conduct and environmental compliance training related to avian. The environmental compliance training is also reviewed with External VM personnel. External VM personnel may also take advantage of third-party training when offered or receive additional training from their employer. VM personnel must also keep their ISA certifications current, which may require continuing education credits.

d. Does PC require VM personnel (contracted and internal) to attend and pass continuing education, "refresher" training? If so:

PacifiCorp does not provide any formal VM training to VM personnel. The trainings identified in response to question 3.c. are required annually. PacifiCorp requires that ISA certifications are maintained, which requires the holders of these certifications to take continuing education credits in many cases. Through conducting audits and holding meetings with external VM personnel, PacifiCorp continuously informally reviewing and discussing specifications and work practices. Contractors may also provide additional training to external VM personnel.

i. How often does this "refresher" training occur? See above.

ii. What topics are covered? See above.

e. Provide a detailed explanation of how PC and its contractors track and verify VM training (both initial training and continuing, "refresher" education).

Training delivered by PacifiCorp is tracked through training rosters to identify participants. PacifiCorp does not track training that may be delivered by the contractor. Completion of training by internal VM personnel is tracked through a Learning Management System that records and retains training completed and dates completed. Information is entered manually from the training rosters or automatically entered if the training was delivered online through the management system.

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[145] Download the spreadsheet "002-Questionnaire_Example" here (accessed May 24, 2021): https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/wildfire-mitigation/responses-issued/Attachments_to_April_20_WSD.zip.

f. Explain if and how PC and its contractors track and measure recall and retention of VM training information after initial training is complete.
Recall and retention is not specifically measured nor tracked. General understanding of the VM program (e.g. specifications) is indirectly evaluated through completing audits of completed work and informal discussions between internal and external VM personnel.
g. Provide a detailed explanation of how PC and its contractors track, verify, and encourage VM personnel to obtain certification from the International Society of Arboriculture (ISA).
Training delivered by PacifiCorp is tracked through training rosters to identify participants. PacifiCorp does not track training that may be delivered by the contractor. At the time of hire, expectations regarding ISA certifications are set with applicable internal and external VM personnel. It is a job requirement for applicable positions. Internal VM personnel are encouraged to obtain additional certifications that are not required, through manager to staff conversations and goal setting sessions.

Regarding Table 11 "Recent use of PSPS and other PSPS metrics" missing projections:
Data Request: PacifiCorp Data Request_20apr2021 (Question 1)
Request date: April 20, 2021
Request: In Table 11 (Recent use of PSPS and other PSPS metrics), required projections for 2021 and 2022 are blank (Columns N-U). Please complete the table as directed in the Guidelines or provide a compelling explanation justifying why Table 11 is incomplete. If completing the table, please use the attached Excel workbook titled "PC 2021 Table 11 DR TEMPLATE 20210420" by filling in Columns N through U (highlighted in orange).
Response date: April 23, 2021
Response: Where data existed, PacifiCorp was able to populate the 2015 – 2020 actual datasets requested in Table 11. However, PacifiCorp does not have the data or experience required to calculate predicated values as requested in Table 11 and, therefore, found in challenging to populate. However, to support the request, PacifiCorp has populated forecasted values for 2021 and 2022 using values experienced in 2020 as a best estimate. These values have been populated in columns N through U in Attachment PC 2021 Table 11 DR TEMPLATE 20210420.xlsx.[146]

Regarding 2021 WMP Update Figure 4.5-21 data point information:
Data Request: PacifiCorp Data Request_27apr2021 (Question 3)
Request date: April 28, 2021
Request: For Figure 4.5-21 in PacifiCorp's 2021 WMP (p. 88), provide information on all the data points used.
Response date: May 3, 2021

[146] Download the spreadsheet "PC2021 Table 11 DR TEMPLATE 20210420" here (accessed May 24, 2021): https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/wildfire-mitigation/responses-issued/Attachments_to_April_20_WSD.zip.

Response: Please see attached file PacifiCorp DR 27apr2021 Question 3 Supporting Data.xlsx[147] for the roster of projects used to evaluate covered conductor/spacer cable effectiveness that PacifiCorp used to forecast improvement in fault rate (risk events) after covered conductor/spacer cable installation. Please note that while this dataset is small, it was the best dataset available within PacifiCorp to use for this evaluation.

Regarding pole replacement program – strength adequacy of poles:
Data Request: PacifiCorp Data Request_27apr2021 (Question 1)
Request date: April 28, 2021
Request: Are the poles that are part of the pole replacement program of adequate strength to carry covered conductor?
Response date: May 3, 2021
Response: The poles being replaced as part of the pole replacement program discussed in Section 7.3.3.6 are in scope for replacement based on risk and material composition, not strength rating. More specifically, these poles are being replaced or reinforced proactively with non-wooden solutions to improve resiliency during a wildfire event to aid in faster restoration and reduce risk.
As a part of the implementation of covered conductor program, each pole is structurally evaluated to ensure carrying capacity. Poles that do not have sufficient strength to carry the additional weight of the covered conductor are replaced. However, these poles, which are considered to be part of the covered conductor program, are not tracked or reported in Section 7.3.3.6. The poles included in Section 7.3.3.6 are considered incremental to any pole replacements identified by this structural evaluation.

Regarding tracking of expulsion fuse replacements:
Data Request: PacifiCorp Data Request_27apr2021 (Question 2)
Request date: April 28, 2021
Request: How does PacifiCorp track expulsion fuse replacements if there is not currently a separate program?
Response date: May 3, 2021
Response: PacifiCorp does not have a system wide expulsion fuse inventory and does not explicitly track all expulsion fuse replacements. However, as a circuit is rebuilt with covered conductor, PacifiCorp is replacing all expulsion fuses with non-expulsion alternatives. Therefore, as part of the implementation of covered conductor, PacifiCorp has the ability to track expulsion fuses replaced at the circuit level. However, this is not a stand-alone program.

[147] Download the spreadsheet "PacifiCorp DR 27apr2021 Question 3 Supporting Data" here (accessed May 24, 2021):
https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/wildfire-mitigation/responses-issued/Attachments_to_April%2027_WSD.zip.

Regarding covered conductor cost estimations:
Data Request: PacifiCorp Data Request_13apr2021 (Question 2 and 2a.)
Request date: April 14, 2021
Request: The table below summarizes PacifiCorp's covered conductor installation for 2020 actual, 2021 planned, and 2022 planned.

Year	Total Cost (Millions)	Miles Treated	Cost per mile (Millions)
2020 Actual	$4.3M	1.4 miles	$3.07M
2021 Planned	$15M	81.2 miles	$.185M
2022 Planned	$11.6M	50 miles	$.2M

Question 2a: PacifiCorp shall provide the reason for the drastic decrease of covered conductor installation cost per mile from 2020 to 2021.
Response date: April 19, 2021
Response: Projects for installing insulated conductor often span across calendar years. The costs realized in 2020 include the installed costs for the completed 1.4 miles along with design, estimating, permitting, and material purchase costs realized in 2020 for projects to be completed after 2020. Because these projects often span across calendar years, dividing the annual costs realized by annual miles treated may not always provide an accurate benchmark or unit cost for the installation of covered conductor.

Regarding initiative spend (2020 actual, but no 2021 or 2022 projected):
Data Request: PacifiCorp Data Request_27apr2021 (Question 6)
Request date: April 28, 2021
Request: During PacifiCorp's first utility content call on 3/17/21, the WSD asked PacifiCorp to identify where in its WMP initiative 7.3.2.6 is addressed. In response, PacifiCorp stated that this initiative had been reclassified (originally SA-1.6) and is now combined into RA-1, which helped explain why Table 12 only shows 2020 actual spend but no 2021 or 2022 projections for initiative 7.3.2.6. The WSD has since found additional initiatives that indicate 2020 spend but no projected spend for 2021 or 2022 in Table 12. For each of the following, please explain the reason for 2020 actual spend but no 2021 or 2022 projected spend (e.g., reclassification, aggregation, etc.). If reclassified or combined into another WMP program, provide the existing program/initiative name, ID, and information on spend aggregation.

a. **7.3.2.5** *Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions* (PacifiCorp lists this initiative as 7.3.2.3 in its WMP, but as 7.3.2.5 in Table 12)
b. **7.3.4.8** *LiDAR inspections of transmission electric lines and equipment*
c. **7.3.5.11** *Patrol inspections of vegetation around distribution electric lines and equipment*

Response date: May 3, 2021
Response:

a. The initiative in Section 7.3.2.5 includes the deployment of personnel during periods of elevated firs risk when activating what is more commonly referred to as "watches" or "activations" as further described in Section 8.1 on page 197. While PacifiCorp has plans in place to identify these high-risk events and conduct the necessary field deployment to support the event, the company has limited experiencing in forecasting the specific timing and spend of these events. Furthermore, PacifiCorp is prepared to track and report on actual events but did not include a forecasted financial for this program due to the limited experience. As a baseline, the company expects to incur costs similar to 2020 in 2021.
b. Due to the pilot nature of the LiDAR inspections of electric lines and equipment, work performed on either distribution or transmission lines are grouped together and described in Section 7.3.4.7. Therefore, no specific values were provided for Section 7.3.4.8. At this time, PacifiCorp does not differentiate between LiDAR inspections of electric lines and equipment are captured in Section 7.3.4.7. Additionally, the pilot project is temporarily on hold pending the results of other LiDAR pilot projects, specifically Pilot 3, and, therefore, no spend is planned in 2021 at this time.
c. During 2020, PacifiCorp began implementing a new tracking system to support vegetation management planning and reporting to introduce additional tracking capability. In Table 12 of the 2021 WMP Update, PacifiCorp included planned line miles associated with Initiative 7.3.5.11. Based on experience in 2020 and planned units, PacifiCorp does expect to spend approximately $520,000 in this category in 2021 and 2022.

10.3. The Ten Maturity and Mitigation Initiative Categories

The following table presents the ten categories of questions on the Maturity Survey, and, where relevant, the version of the category name used in the 2021 WMP Guidelines or Action Statements. All mitigation programs and initiatives should fit into one or more of the following categories. Some examples of activities or data products that fit under each category are listed.

Maturity and mitigation categories	Examples of activities
1. Risk mapping and simulation; WMP Guidelines/ Action Statement: Risk assessment and mapping	Risk and ignition probability mapping; match drop simulations; consequence mapping
2. Situational awareness and forecasting	Weather monitoring; weather station installation; fault indicator technology implementation; fire potential index
3. Grid design and system hardening	Capacitor maintenance and replacement; covered conductor installation and maintenance; expulsion fuse replacement; pole loading infrastructure hardening and replacement
4. Asset management and inspections	Infrared, LiDAR, or drone inspections and routine or detailed patrol inspections of distribution/transmission electric lines and equipment; intrusive pole inspections; pole loading assessments; quality assurance and quality control of inspections
5. Vegetation management and inspections	Fuel management and reduction of "slash"; LiDAR or drone inspections and routine or detailed patrol inspections of vegetation around distribution/transmission electric lines and equipment; inventory, remediation, or removal of hazardous vegetation; quality assurance and quality control of vegetation management inspections
6. Grid operations and protocols; Action Statement: Grid operations and operating protocols, including PSPS	Automatic recloser operations; protocols for re-energization after PSPS; mitigation of PSPS impacts; work procedures and training in conditions of elevated fire risk
7. Data governance	Centralized data repository; ignition/wildfire collaborative research; documentation/disclosure

	of wildfire-related data and algorithms; risk event data tracking and analysis
8. Resource allocation methodology	Method of allocation of resources; method of calculating the risk-spend efficiency of initiatives (not including PSPS, which is not considered a mitigation initiative within WMPs); risk reduction scenario development and analysis
9. Emergency planning and preparedness	Ensuring the utility has an adequate and trained workforce for service restoration; community outreach, public awareness, and communications efforts; customer support during emergencies
10. Stakeholder cooperation and community engagement	Cooperation with suppression agencies; community engagement efforts; sharing best practices and cooperating with agencies outside California; coordinating fuel management with the U.S Forest Service

11. Attachments

11.1. Attachment 1: PC's 2021 Maturity Survey

11.1.1. PC: Description of Data Sources

Data related to the Maturity Model is based on the latest submitted versions of 2021 Utility Wildfire Mitigation Maturity Survey ("Survey") as of May 5, 2021. Data for the Maturity Model is pulled from Survey responses unless stated otherwise.

All source data (the WMP and the Survey responses) are available at: https://www.cpuc.ca.gov/wildfiremitigationplans/.

All the analysis and corresponding tables presented in this appendix rely upon data that is self-reported by the utilities. By utilizing and presenting this self-reported data in this appendix, the WSD is not independently validating that all data elements submitted by utilities are accurate. The WSD will continue to evaluate utility data, conduct data requests, and conduct additional compliance activities to ensure that data provided is accurate.

11.1.2. PC: Introduction to Maturity Model Scoring[148]

In order to determine "maturity" in any one capability, the WSD assigned levels to each aspect of the electrical corporations' wildfire mitigation efforts. Each capability was assigned a level, from 0 – 4 range, with 0 being the lowest and 4 the highest. The WSD calculated a maturity level, in accordance with the required elements to achieve each level, as outlined in the maturity model rubric.

The levels were calculated using an "all or nothing" binary approach. That is, levels are reported as whole numbers only.[149] Thus, in order to reach a specific maturity level, an electrical corporation would have to meet 100 percent of the threshold requirements for that level, as detailed in the maturity model rubric. In general, the maturity model rubric outlines numerous elements that are required to be met to achieve a given level, and the sophistication of requirements to reach a level typically increases with each successively higher maturity level.

For example, to obtain a level of 1 in Capability 24 of the 52 total capabilities, titled "Vegetation grow-in mitigation," the electrical corporation (or utility) must demonstrate the following: "[u]tility maintains vegetation around lines and equipment according to minimum statutory and

[148] From WSD-002 p. 10-11

[149] Note: The category averages shown in 11.1.3 (below) average the capability scores and may include decimals.

regulatory clearances. Utility: i) removes vegetation waste along right of ways and ii) within 1 week of cutting vegetation across entire grid."

Thus, in order to receive a maturity level of 1 for Capability 24, an electrical corporation would not only have to maintain minimum regulatory clearances around its overhead lines but also remove the vegetation waste along its right of ways within one week of conducting vegetation clearance work. If an electrical corporation meets only one of these requirements, then it would be assigned the next lowest level. In this example, a level of 0 would be assigned and the electrical corporation would not receive "partial credit" towards a level of 1.

11.1.3. PC: Maturity detail by capability

Legend: *Maturity Model Scores*

0 | 1 | 2 | 3 | 4

Category A. Risk Assessment and Mapping

	Avg cycle start maturity: 0.8	**Avg current maturity: 1.4**	**Avg projected cycle end maturity: 2.2**
Capability 1. Climate scenario modeling			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 3	Planned state by end of cycle: 3 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
1a: How sophisticated is utility's ability to estimate the risk of weather scenarios?	ii. Wildfire risk can be reliably determined based on weather and its impacts	iv. Risk for various weather scenarios can be reliably estimated	iv. Risk for various weather scenarios can be reliably estimated
1b: How are scenarios assessed?	iii. Independent expert assessment, supported by historical data of incidents and near misses	iii. Independent expert assessment, supported by historical data of incidents and near misses	iii. Independent expert assessment, supported by historical data of incidents and near misses
1c: How granular is utility's ability to model scenarios?	iii. Circuit-based	iv. Span-based	v. Asset-based
1d: How automated is the tool?	i. Not automated	iii. Mostly (>=50%)	iv. Fully
1e: What additional information is used to estimate model weather scenarios and their risk?	ii. Weather, how weather effects failure modes and propagation	iv. Weather measured at the circuit level, how weather effects failure modes and propagation, existing hardware	v. Weather measured at the circuit level, how weather effects failure modes and propagation, existing hardware, level of vegetation

1f: To what extent is future change in climate taken into account for future risk estimation?	i. Future climate change not accounted for in estimating future weather and resulting risk	iii. Basic temperature modeling used to estimate effects of a changing climate on future weather and risk, taking into account difference in geography and vegetation	iv. Modeling with multiple scenarios used to estimate effects of a changing climate on future weather and risk, taking into account difference in geography and vegetation, and considering increase in extreme weather event frequency

Capability 2. Ignition risk estimation			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 3 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
2a: How is ignition risk calculated?	ii. Tools and processes can reliably categorize the risk of ignition across the grid into at least two categories based on characteristics and condition of lines, equipment, surrounding vegetation, and localized weather patterns	ii. Tools and processes can reliably categorize the risk of ignition across the grid into at least two categories based on characteristics and condition of lines, equipment, surrounding vegetation, and localized weather patterns	iv. Tools and processes can quantitatively and accurately assess the risk of ignition across the grid based on characteristics and condition of lines, equipment, surrounding vegetation, localized weather patterns, and flying debris probability, with probability based on specific failure modes and top contributors to those failure modes
2b: How automated is the ignition risk calculation tool?	ii. Partially (<50%)	ii. Partially (<50%)	iv. Fully
2c: How granular is the tool?	ii. Regional	iv. Span-based	iv. Span-based
2d: How is risk assessment confirmed? Select all that apply.	ii. By historical data iii. Through real-time learning	ii. By historical data	i. By experts ii. By historical data iii. Through real-time learning

2e: What confidence interval, in percent, does the utility use in its wildfire risk assessments?	>90%	>90%	>90%

Capability 3. Estimation of wildfire consequences for communities			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
3a: How is estimated consequence of ignition relayed?	ii. Ignition events categorized as low or high risk to communities	ii. Ignition events categorized as low or high risk to communities	ii. Ignition events categorized as low or high risk to communities
3b: What metrics are used to estimate the consequence of ignition risk?	i. As a function of at least one of the following: structures burned, potential fatalities, or area burned	i. As a function of at least one of the following: structures burned, potential fatalities, or area burned	ii. As a function of at least potential fatalities, and one or both of structures burned, or area burned
3c: Is the ignition risk impact analysis available for all seasons?	i. No	ii. Yes	ii. Yes
3d: How automated is the ignition risk estimation process?	ii. Partially (<50%)	ii. Partially (<50%)	iii. Mostly (>=50%)
3e: How granular is the ignition risk estimation process?	ii. Regional	iv. Span-based	v. Asset-based
3f: How are the outputs of the ignition risk impact assessment tool evaluated?	iii. Outputs independently assessed by experts and confirmed by historical data	iii. Outputs independently assessed by experts and confirmed by historical data	iv. Outputs independently assessed by experts and confirmed based on real time learning, for example, using machine learning

3g: What other inputs are used to estimate impact?	i. Level and conditions of vegetation and weather	i. Level and conditions of vegetation and weather	iii. Level and conditions of vegetation and weather, including the vegetation specifies immediately surrounding the ignition site and up-to-date moisture content, local weather patterns

Capability 4. Estimation of wildfire and PSPS risk-reduction impact			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 3 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
4a: How is risk reduction impact estimated?	iii. Approach reliably estimates risk reduction potential of initiatives, on an ordinal scale (e.g. 1-5)	iii. Approach reliably estimates risk reduction potential of initiatives, on an ordinal scale (e.g. 1-5)	iii. Approach reliably estimates risk reduction potential of initiatives, on an ordinal scale (e.g. 1-5)
4b: How automated is your ignition risk reduction impact assessment tool?	ii. Partially (<50%)	iii. Mostly (>=50%)	iv. Fully
4c: How granular is the ignition risk reduction impact assessment tool?	iii. Circuit-based	iv. Span-based	v. Asset-based
4d: How are ignition risk reduction impact assessment tool estimates assessed?	ii. With evidence and logical reasoning	ii. With evidence and logical reasoning	iii. Independent expert assessment

4e: What additional information is used to estimate risk reduction impact?	iii. Existing hardware type and condition, including operating history	iv. Existing hardware type and condition, including operating history; level and condition of vegetation; weather	v. Existing hardware type and condition, including operating history; level and condition of vegetation; weather; and combination of initiatives already deployed

Capability 5. Risk maps and simulation algorithms			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
5a: What is the protocol to update risk mapping algorithms?	i. No defined process for updating risk mapping algorithms	ii. Risk mapping algorithms updated based on detected deviations of risk model to ignitions and propagation	ii. Risk mapping algorithms updated based on detected deviations of risk model to ignitions and propagation
5b: How automated is the mechanism to determine whether to update algorithms based on deviations?	i. Not automated	ii. Partially (<50%)	iii. Mostly (>=50%)
5c: How are deviations from risk model to ignitions and propagation detected?	ii. Manually	ii. Manually	ii. Manually
5d: How are decisions to update algorithms evaluated?	iii. Independently evaluated by experts and historical data	iii. Independently evaluated by experts and historical data	iii. Independently evaluated by experts and historical data

5e: What other data is used to make decisions on whether to update algorithms?	iii. Current and historic ignition and propagation data; near-miss data	iii. Current and historic ignition and propagation data; near-miss data	iii. Current and historic ignition and propagation data; near-miss data

Category B. Situational Awareness and Forecasting

	Avg cycle start maturity: 0.8	**Avg current maturity: 1**	**Avg projected cycle end maturity: 1.4**
Capability 6. Weather variables collected			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
6a: What weather data is currently collected?	iii. Range of accurate weather variables (e.g. humidity, precipitation, surface and atmospheric wind conditions) that impact probability of ignition and propagation from utility assets	iii. Range of accurate weather variables (e.g. humidity, precipitation, surface and atmospheric wind conditions) that impact probability of ignition and propagation from utility assets	iii. Range of accurate weather variables (e.g. humidity, precipitation, surface and atmospheric wind conditions) that impact probability of ignition and propagation from utility assets
6b: How are measurements validated?	ii. Manual field calibration measurements	ii. Manual field calibration measurements	iii. Automatic field calibration measurements
6c: Are elements that cannot be reliably measured in real time being predicted (e.g., fuel moisture content)?	ii. Yes	ii. Yes	ii. Yes
6d: How many sources are being used to provide data on weather metrics being collected?	iii. More than one	iii. More than one	iii. More than one

Capability 7. Weather data resolution			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 1	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
7a: How granular is the weather data that is collected?	i. Weather data collected does not accurately reflect local weather conditions across grid infrastructure	ii. Weather data has sufficient granularity to reliably measure weather conditions in HFTD areas	iii. Weather data has sufficient granularity to reliably measure weather conditions in HFTD areas, and along the entire grid and in all areas needed to predict weather on the grid
7b: How frequently is data gathered	iv. At least six times per hour	iv. At least six times per hour	iv. At least six times per hour
7c: How granular is the tool?	ii. Regional	ii. Regional	iii. Circuit-based
7d: How automated is the process to measure weather conditions?	iv. Fully	iv. Fully	iv. Fully

Capability 8. Weather forecasting ability			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	

Responses to survey questions
Survey questions and the utility's responses are shown below

Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
8a: How sophisticated is the utility's weather forecasting capability?	iii. Utility has the ability to use a combination of accurate weather stations and external weather data to make accurate forecasts	iii. Utility has the ability to use a combination of accurate weather stations and external weather data to make accurate forecasts	iii. Utility has the ability to use a combination of accurate weather stations and external weather data to make accurate forecasts
8b: How far in advance can accurate forecasts be prepared?	i. Less than two weeks in advance	i. Less than two weeks in advance	i. Less than two weeks in advance
8c: At what level of granularity can forecasts be prepared?	ii. Regional	ii. Regional	ii. Regional
8d: How are results error-checked?	iii. Criteria for option (ii) met, and forecasted results are subsequently error checked against measured weather data	iii. Criteria for option (ii) met, and forecasted results are subsequently error checked against measured weather data	iii. Criteria for option (ii) met, and forecasted results are subsequently error checked against measured weather data
8e: How automated is the forecast process?	ii. Partially (<50%)	ii. Partially (<50%)	ii. Partially (<50%)

Capability 9. External sources used in weather forecasting			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
9a: What source does the utility use for weather data?	iii. Utility uses a combination of accurate weather stations and external weather data	iii. Utility uses a combination of accurate weather stations and external weather data	iii. Utility uses a combination of accurate weather stations and external weather data
9b: How is weather station data checked for errors?	ii. Mostly manual processes for error checking weather stations with external data sources	ii. Mostly manual processes for error checking weather stations with external data sources	iii. Mostly automated processes for error checking weather stations with external data sources
9c: For what is weather data used?	i. Weather data is used to make decisions	i. Weather data is used to make decisions	ii. Weather data is used to produce a combined weather map that can be used to help make decisions

Capability 10. Wildfire detection processes and capabilities			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	Planned state by end of cycle: 1 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
10 : Are there well-defined procedures for detecting ignitions along the grid?	ii. Yes	ii. Yes	ii. Yes
10b: What equipment is used to detect ignitions?	i. No consistent set of equipment for detecting ignitions along grid	i. No consistent set of equipment for detecting ignitions along grid	ii. Well-defined equipment for detecting ignitions along grid
10 : How is information on detected ignitions reported?	ii. Procedure exists for notifying suppression forces	ii. Procedure exists for notifying suppression forces	ii. Procedure exists for notifying suppression forces
10d: What role does ignition detection software play in wildfire detection?	i. Ignition detection software not currently deployed	i. Ignition detection software not currently deployed	i. Ignition detection software not currently deployed

Category C. Grid design and system hardening

	Avg cycle start maturity: 1.4	**Avg current maturity: 1.6**	**Avg projected cycle end maturity: 2.2**
Capability 11. Approach to prioritizing initiatives across territory			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 4 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
11a: How are wildfire risk reduction initiatives prioritized?	iii. Plan prioritizes wildfire risk reduction initiatives based on local geography and conditions within only HFTD areas	iii. Plan prioritizes wildfire risk reduction initiatives based on local geography and conditions within only HFTD areas	v. Plan prioritizes wildfire risk reduction initiatives at the asset level based on i) risk modeling driven by local geography and climate/weather conditions, fuel loads and moisture content and topography ii) risk estimates across individual circuits, including estimates of actual consequence, and iii) taking power delivery uptime into account (e.g. reliability, PSPS, etc.)

Capability 12. Grid design for minimizing ignition risk			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
12a: Does grid design meet minimum G095 requirements and loading standards in HFTD areas?	ii. Yes	ii. Yes	ii. Yes
12b: Does the utility provide micro grids or islanding where traditional grid infrastructure is impracticable and wildfire risk is high?	i. No	i. No	i. No
12c: Does routing of new portions of the grid take wildfire risk into account?	i. Yes	i. Yes	i. Yes
12d: Are efforts made to incorporate the latest asset management strategies and new technologies into grid topology?	ii. Yes, some effort made in HFTD areas	ii. Yes, some effort made in HFTD areas	iii. Yes, across the entire service area

Capability 13. Grid design for resiliency and minimizing PSPS			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
13a: What level of redundancy does the utility's transmission architecture have?	ii. n-1 redundancy for all circuits subject to PSPS	ii. n-1 redundancy for all circuits subject to PSPS	ii. n-1 redundancy for all circuits subject to PSPS
13b: What level of redundancy does the utility's distribution architecture have?	ii. n-1 redundancy covering at least 50% of customers in HFTD	ii. n-1 redundancy covering at least 50% of customers in HFTD	ii. n-1 redundancy covering at least 50% of customers in HFTD
13c: What level of sectionalization does the utility's distribution architecture have?	iii. Switches in HFTD areas to individually isolate circuits, such that no more than 2000 customers sit within one switch	iii. Switches in HFTD areas to individually isolate circuits, such that no more than 2000 customers sit within one switch	iii. Switches in HFTD areas to individually isolate circuits, such that no more than 2000 customers sit within one switch
13d: How does the utility consider egress points in its grid topology?	ii. Egress points used as an input for grid topology design	ii. Egress points used as an input for grid topology design	ii. Egress points used as an input for grid topology design

Capability 14. Risk-based grid hardening and cost efficiency			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
14a: Does the utility have an understanding of the risk spend efficiency of hardening initiatives?	ii. Utility has an accurate understanding of the relative cost and effectiveness of different initiatives	ii. Utility has an accurate understanding of the relative cost and effectiveness of different initiatives	iii. Utility has an accurate understanding of the relative cost and effectiveness of different initiatives, tailored to the circumstances of different locations on its grid
14b: At what level can estimates be prepared?	ii. Regional	ii. Regional	iv. Span-based
14c: How frequently are estimates updated?	ii. Less frequently than annually	iii. Annually or more frequently	iii. Annually or more frequently
14d: What grid hardening initiatives does the utility include within its evaluation?	iii. Most	iii. Most	iii. Most
14e: Can the utility evaluate risk reduction synergies from combination of various initiatives?	ii. Yes	ii. Yes	ii. Yes

Capability 15. Grid design and asset innovation			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 2	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
15 : How are new hardening solution initiatives evaluated?	ii. New initiatives evaluated based on installation into grid and measuring direct reduction in ignition events	iii. New initiatives evaluated based on installation into grid and measuring direct reduction in ignition events, and measuring reduction impact on near-miss metrics	iii. New initiatives evaluated based on installation into grid and measuring direct reduction in ignition events, and measuring reduction impact on near-miss metrics
15b: Are results of pilot and commercial deployments, including project performance, project cost, geography, climate, vegetation etc. shared in sufficient detail to inform decision making at other utilities?	ii. Yes, with a limited set of partners	ii. Yes, with a limited set of partners	ii. Yes, with a limited set of partners
15 : Is performance of new initiatives independently audited?	i. No	i. No	i. No

Category D. Asset management and inspections

	Avg cycle start maturity: 1.4	**Avg current maturity: 1.4**	**Avg projected cycle end maturity: 1.4**
Capability 16. Asset inventory and condition assessments			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
16a: What information is captured in the equipment inventory database?	i. There is no service territory-wide inventory of electric lines and equipment including their state of wear or disrepair	i. There is no service territory-wide inventory of electric lines and equipment including their state of wear or disrepair	ii. There is an accurate inventory of equipment that may contribute to wildfire risk, including age, state of wear, and expected lifecycle
16 : How frequently is the condition assessment updated?	ii. Annually	ii. Annually	ii. Annually
16c: Does all equipment in HFTD areas have the ability to detect and respond to malfunctions?	ii. A system and approach are in place to reliably detect incipient malfunctions likely to cause ignition	ii. A system and approach are in place to reliably detect incipient malfunctions likely to cause ignition	iii. Sensorized, continuous monitoring equipment is in place to determine the state of equipment and reliably detect incipient malfunctions likely to cause ignition
16 : How granular is the inventory?	ii. At the span level	ii. At the span level	ii. At the span level

Capability 17. Asset inspection cycle			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
17a: How frequent are your patrol inspections?	ii. Consistent with minimum regulatory requirements	ii. Consistent with minimum regulatory requirements	ii. Consistent with minimum regulatory requirements
17b: How are patrol inspections scheduled?	ii. Based on up-to-date static maps of equipment types and environment	ii. Based on up-to-date static maps of equipment types and environment	ii. Based on up-to-date static maps of equipment types and environment
17c: What are the inputs to scheduling patrol inspections?	i. At least annually updated or verified static maps of equipment and environment	i. At least annually updated or verified static maps of equipment and environment	i. At least annually updated or verified static maps of equipment and environment
17d: How frequent are detailed inspections?	ii. Consistent with minimum regulatory requirements	ii. Consistent with minimum regulatory requirements	ii. Consistent with minimum regulatory requirements
17e: How are detailed inspections scheduled?	ii. Based on up-to-date static maps of equipment types and environment	ii. Based on up-to-date static maps of equipment types and environment	ii. Based on up-to-date static maps of equipment types and environment
17f: What are the inputs to scheduling detailed inspections?	i. At least annually updated or verified static maps of equipment and environment	i. At least annually updated or verified static maps of equipment and environment	i. At least annually updated or verified static maps of equipment and environment
17g: How frequent are your other inspections?	iii. Above minimum regulatory requirements, with more frequent inspections for highest risk equipment	iii. Above minimum regulatory requirements, with more frequent inspections for highest risk equipment	iii. Above minimum regulatory requirements, with more frequent inspections for highest risk equipment
17h: How are other inspections scheduled?	ii. Based on up-to-date static maps of equipment types and environment	ii. Based on up-to-date static maps of equipment types and environment	iii. Risk, as determined by predictive modeling of equipment failure probability and risk causing ignition

17i: What are the inputs to scheduling other inspections?	i. At least annually updated or verified static maps of equipment and environment	i. At least annually updated or verified static maps of equipment and environment	i. At least annually updated or verified static maps of equipment and environment

Capability 18. Asset inspection effectiveness			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
18a: What items are captured within inspection procedures and checklists?	ii. Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations	ii. Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations	ii. Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations
18b: How are procedures and checklists determined?	ii. Based on predictive modeling based on vegetation and equipment type, age, and condition	ii. Based on predictive modeling based on vegetation and equipment type, age, and condition	ii. Based on predictive modeling based on vegetation and equipment type, age, and condition
18c: At what level of granularity are the depth of checklists, training, and procedures customized?	ii. Across a region	ii. Across a region	ii. Across a region

Capability 19. Asset maintenance and repair			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 3	By end of year 1 (current): 3	Planned state by end of cycle: 3 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
19a: What level are electrical lines and equipment maintained at?	iii. Electrical lines and equipment maintained as required by regulation, and additional maintenance done in areas of grid at highest wildfire risk based on detailed risk mapping	iii. Electrical lines and equipment maintained as required by regulation, and additional maintenance done in areas of grid at highest wildfire risk based on detailed risk mapping	iii. Electrical lines and equipment maintained as required by regulation, and additional maintenance done in areas of grid at highest wildfire risk based on detailed risk mapping
19b: How are service intervals set?	ii. Based on wildfire risk in relevant circuit	ii. Based on wildfire risk in relevant circuit	ii. Based on wildfire risk in relevant circuit
19c: What do maintenance and repair procedures take into account?	ii. Wildfire risk, performance history, and past operating conditions	ii. Wildfire risk, performance history, and past operating conditions	ii. Wildfire risk, performance history, and past operating conditions

Capability 20. QA/QC for asset management			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
20a: How is contractor activity audited?	ii. Through an established and functioning audit process to manage and confirm work completed by subcontractors	ii. Through an established and functioning audit process to manage and confirm work completed by subcontractors	iii. Through an established and demonstrably functioning audit process to manage and confirm work completed by subcontractors, where contractor activity is subject to semi-automated audits using technologies capable of sampling the contractor's work (e.g., LiDAR scans, photographic evidence)
20b: Do contractors follow the same processes and standards as utility's own employees?	ii. Yes	ii. Yes	ii. Yes
20c: How frequently is QA/QC information used to identify deficiencies in quality of work performance and inspections performance?	iv. Regularly	iv. Regularly	iv. Regularly
20d: How are work and inspections that do not meet utility-prescribed standards remediated?	ii. QA/QC information is used to identify systemic deficiencies in quality of work and inspections	ii. QA/QC information is used to identify systemic deficiencies in quality of work and inspections	ii. QA/QC information is used to identify systemic deficiencies in quality of work and inspections
20e: Are workforce management software tools used to manage and confirm work completed by subcontractors?	i. No	i. No	ii. Yes

Category E. Vegetation management and inspections

	Avg cycle start maturity: 0.7	**Avg current maturity: 0.7**	**Avg projected cycle end maturity: 0.8**
Capability 21. Vegetation inventory and condition assessments			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
21a: What information is captured in the inventory?	i. There is no vegetation inventory sufficient to determine vegetation clearances across the grid at the time of the last inspection	i. There is no vegetation inventory sufficient to determine vegetation clearances across the grid at the time of the last inspection	ii. Centralized inventory of vegetation clearances based on most recent inspection
21b: How frequently is inventory updated?	i. Never	i. Never	ii. Annually
21c: Are inspections independently verified by third party experts?	i. No	i. No	i. No
21d: How granular is the inventory?	i. Regional	i. Regional	iii. Span-based

Capability 22. Vegetation inspection cycle			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
22a: How frequent are all types of vegetation inspections?	iii. Above minimum regulatory requirements, with more frequent inspections for highest risk areas	iii. Above minimum regulatory requirements, with more frequent inspections for highest risk areas	iii. Above minimum regulatory requirements, with more frequent inspections for highest risk areas
22b: How are vegetation inspections scheduled?	i. Based on annual or periodic schedules	i. Based on annual or periodic schedules	ii. Based on up-to-date static maps of predominant vegetation species and environment
22c: What are the inputs to scheduling vegetation inspections?	i. At least annually-updated static maps of vegetation and environment	i. At least annually-updated static maps of vegetation and environment	ii. Up to date, static maps of vegetation and environment, as well as data on annual growing conditions

Capability 23. Vegetation inspection effectiveness			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
23a: What items are captured within inspection procedures and checklists?	ii. Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations	ii. Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations	ii. Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations
23b: How are procedures and checklists determined?	ii. Based on predictive modeling based on vegetation and equipment type, age, and condition	ii. Based on predictive modeling based on vegetation and equipment type, age, and condition	ii. Based on predictive modeling based on vegetation and equipment type, age, and condition
23c: At what level of granularity are the depth of checklists, training, and procedures customized?	ii. Across a region	ii. Across a region	ii. Across a region

Capability 24. Vegetation grow-in mitigation			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
24a: How does utility clearance around lines and equipment perform relative to expected standards?	ii. Utility meet minimum statutory and regulatory clearances around all lines and equipment	ii. Utility meet minimum statutory and regulatory clearances around all lines and equipment	ii. Utility meet minimum statutory and regulatory clearances around all lines and equipment
24b: Does utility meet or exceed minimum statutory or regulatory clearances during all seasons?	ii. Yes	ii. Yes	ii. Yes
24c: What modeling is used to guide clearances around lines and equipment?	i. Ignition risk modeling	i. Ignition risk modeling	i. Ignition risk modeling
24d: What biological modeling is used to guide clearance around lines and equipment	i. Species growth rates and species limb failure rates	i. Species growth rates and species limb failure rates	ii. Species growth rates and species limb failure rates, cross referenced with local climatological conditions
24e: Are community organizations engaged in setting local clearances and protocols?	ii. Yes	ii. Yes	ii. Yes
24f: Does the utility remove vegetation waste along its right of way across the entire grid?	ii. Yes	ii. Yes	ii. Yes
24g: How long after cutting vegetation does the utility remove vegetation waste along right of way?	ii. Longer than 1 week	ii. Longer than 1 week	ii. Longer than 1 week

24h: Does the utility work with local landowners to provide a cost-effective use for cutting vegetation?	ii. Yes	ii. Yes	ii. Yes
24i: Does the utility work with partners to identify new cost-effective uses for vegetation, taking into consideration environmental impacts and emissions of vegetation waste?	ii. Yes	ii. Yes	ii. Yes

Capability 25. Vegetation fall-in mitigation			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
25a: Does the utility have a process for treating vegetation outside of right of ways?	iii. Utility systematically removes vegetation outside of right of way	iii. Utility systematically removes vegetation outside of right of way	iii. Utility systematically removes vegetation outside of right of way
25b: How is potential vegetation that may pose a threat identified?	ii. Based on the height of trees with potential to make contact with electric lines and equipment	ii. Based on the height of trees with potential to make contact with electric lines and equipment	ii. Based on the height of trees with potential to make contact with electric lines and equipment
25c: Is vegetation removed with cooperation from the community?	ii. Yes	ii. Yes	ii. Yes

25d: Does the utility remove vegetation waste outside its right of way across the entire grid?	ii. Yes	ii. Yes	ii. Yes
25e: How long after cutting vegetation does the utility remove vegetation waste outside its right of way?	ii. Longer than 1 week	ii. Longer than 1 week	ii. Longer than 1 week
25f: Does the utility work with local landowners to provide a cost-effective use for cutting vegetation?	ii. Yes	ii. Yes	ii. Yes
25g: Does the utility work with partners to identify new cost-effective uses for vegetation, taking into consideration environmental impacts and emissions of vegetation waste?	ii. Yes	ii. Yes	ii. Yes

Capability 26. QA/QC for vegetation management			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
26a: How is contractor and employee activity audited?	ii. Through an established and functioning audit process to manage and confirm work completed by subcontractors	ii. Through an established and functioning audit process to manage and confirm work completed by subcontractors	ii. Through an established and functioning audit process to manage and confirm work completed by subcontractors
26b: Do contractors follow the same processes and standards as utility's own employees?	ii. Yes	ii. Yes	ii. Yes
26c: How frequently is QA/QC information used to identify deficiencies in quality of work performance and inspections performance?	iv. Regularly	iv. Regularly	iv. Regularly
26d: How is work and inspections that do not meet utility-prescribed standards remediated?	ii. QA/QC information is used to identify systemic deficiencies in quality of work and inspections	ii. QA/QC information is used to identify systemic deficiencies in quality of work and inspections	ii. QA/QC information is used to identify systemic deficiencies in quality of work and inspections
26e: Are workforce management software tools used to manage and confirm	i. No	i. No	ii. Yes

work completed by subcontractors?			

Category F. Grid operations and protocols

	Avg cycle start maturity: 1.7	**Avg current maturity: 1.5**	**Avg projected cycle end maturity: 1.7**
Capability 27. Protective equipment and device settings			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
27a: How are grid elements adjusted during high threat weather conditions?	ii. Utility increases sensitivity of risk reduction elements during high threat weather conditions	ii. Utility increases sensitivity of risk reduction elements during high threat weather conditions	ii. Utility increases sensitivity of risk reduction elements during high threat weather conditions
27b: Is there an automated process for adjusting sensitivity of grid elements and evaluating effectiveness?	ii. Partially automated process	ii. Partially automated process	ii. Partially automated process
27c: Is there a predetermined protocol driven by fire conditions for adjusting sensitivity of grid elements?	ii. Yes	ii. Yes	ii. Yes

Capability 28. Incorporating ignition risk factors in grid control			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
28a: Does the utility have a clearly explained process for determining whether to operate the grid beyond current or voltage designs?	ii. Yes	ii. Yes	ii. Yes
28b: Does the utility have systems in place to automatically track operation history including current, loads, and voltage throughout the grid at the circuit level?	ii. Yes	ii. Yes	ii. Yes
28c: Does the utility use predictive modeling to estimate the expected life and make equipment maintenance, rebuild, or replacement decisions based on grid operating history, and is that model reviewed?	ii. Modeling is used, but not evaluated by external experts	ii. Modeling is used, but not evaluated by external experts	ii. Modeling is used, but not evaluated by external experts
28d: When does the utility operate the grid above rated voltage and current load?	iii. Never	iii. Never	iii. Never

Capability 29. PSPS op. model and consequence mitigation			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
29a: How effective is PSPS event forecasting?	iv. PSPS event generally forecasted accurately with fewer than 25% of predictions being false positives	iv. PSPS event generally forecasted accurately with fewer than 25% of predictions being false positives	iv. PSPS event generally forecasted accurately with fewer than 25% of predictions being false positives
29b: What share of customers are communicated to regarding forecasted PSPS events?	iv. PSPS event are communicated to >99% of affected customers and >99.9% of medical baseline customers in advance of PSPS action	iv. PSPS event are communicated to >99% of affected customers and >99.9% of medical baseline customers in advance of PSPS action	iv. PSPS event are communicated to >99% of affected customers and >99.9% of medical baseline customers in advance of PSPS action
29c: During PSPS events, what percent of customers complain?	ii. Less than 1%	ii. Less than 1%	ii. Less than 1%
29d: During PSPS events, does the utility's website go down?	i. No	i. No	i. No
29e: During PSPS events, what is the average downtime per customer?	v. Less than 0.1 hours	v. Less than 0.1 hours	v. Less than 0.1 hours
29f: Are specific resources provided to all affected customers to alleviate the impact of the power shutoff (e.g., providing backup generators, supplies, batteries, etc.)?	i. No	i. No	i. No

Capability 30. Protocols for PSPS initiation			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 1	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
30a: Does the utility have explicit thresholds for activating a PSPS?	ii. Utility has explicit policies and explanation for the thresholds above which PSPS is activated as a measure of last resort	ii. Utility has explicit policies and explanation for the thresholds above which PSPS is activated as a measure of last resort	ii. Utility has explicit policies and explanation for the thresholds above which PSPS is activated as a measure of last resort
30b: Which of the following does the utility take into account when making PSPS decisions? Select all that apply	i. SME opinion ii. A partially automated system which recommends circuits for which PSPS should be activated and is validated by SMEs	i. SME opinion	i. SME opinion ii. A partially automated system which recommends circuits for which PSPS should be activated and is validated by SMEs
30c: Under which circumstances does the utility de-energize circuits? Select all that apply.	i. Upon detection of damaged conditions of electric equipment ii. When circuit presents a safety risk to suppression or other personnel iii. When equipment has come into contact with foreign objects posing ignition risk	i. Upon detection of damaged conditions of electric equipment ii. When circuit presents a safety risk to suppression or other personnel iii. When equipment has come into contact with foreign objects posing ignition risk	i. Upon detection of damaged conditions of electric equipment ii. When circuit presents a safety risk to suppression or other personnel iii. When equipment has come into contact with foreign objects posing ignition risk
30d: Given the condition of the grid, with what probability does the utility expect any large scale PSPS events affecting more than 10,000 people to occur in the coming year?	i. Less than 5 % - Grid is in sufficiently low risk condition that PSPS events will not be required, and the only circuits which may require de-energization have sufficient redundancy that energy supply to customers will not be disrupted	i. Less than 5 % - Grid is in sufficiently low risk condition that PSPS events will not be required, and the only circuits which may require de-energization have sufficient redundancy that energy supply to customers will not be disrupted	i. Less than 5 % - Grid is in sufficiently low risk condition that PSPS events will not be required, and the only circuits which may require de-energization have sufficient redundancy that energy supply to customers will not be disrupted

Capability 31. Protocols for PSPS re-energization			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
31a: Is there a process for inspecting de-energized sections of the grid prior to re-energization?	ii. Existing process for accurately inspecting de-energized sections of the grid prior to re-energization	ii. Existing process for accurately inspecting de-energized sections of the grid prior to re-energization	ii. Existing process for accurately inspecting de-energized sections of the grid prior to re-energization
31b: How automated is the process for inspecting de-energized sections of the grid prior to re-energization?	ii. Partially automated (<50%)	ii. Partially automated (<50%)	ii. Partially automated (<50%)
31c: What is the average amount of time that it takes you to re-energize your grid from a PSPS once weather has subsided to below your de-energization threshold?	iii. Within 18 hours	v. Within 8 hours	v. Within 8 hours
31d: What level of understanding of probability of ignitions after PSPS events does the utility have across the grid?	ii. Some probability estimates exist	ii. Some probability estimates exist	ii. Some probability estimates exist

Capability 32. Ignition prevention and suppression			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
32a: Does the utility have defined policies around the role of workers in suppressing ignitions?	iii. Utilities have explicit policies about the role of crews, including contractors and subcontractors, at the site of ignition	iii. Utilities have explicit policies about the role of crews, including contractors and subcontractors, at the site of ignition	iii. Utilities have explicit policies about the role of crews, including contractors and subcontractors, at the site of ignition
32b: What training and tools are provided to workers in the field?	iii. All criteria in option (ii) met; In addition, suppression tools and training to suppress small ignitions caused by workers or in immediate vicinity of workers are provided	iii. All criteria in option (ii) met; In addition, suppression tools and training to suppress small ignitions caused by workers or in immediate vicinity of workers are provided	iii. All criteria in option (ii) met; In addition, suppression tools and training to suppress small ignitions caused by workers or in immediate vicinity of workers are provided
32c: In the events where workers have encountered an ignition, have any Cal/OSHA reported injuries or fatalities occurred in in the last year?	i. No	i. No	i. No
32d: Does the utility provide training to other workers at other utilities and outside the utility industry on best practices to minimize, report and suppress ignitions?	i. No	i. No	ii. Yes

Category G. Data governance

	Avg cycle start maturity: 1.3	**Avg current maturity: 2**	**Avg projected cycle end maturity: 2.3**
Capability 33. Data collection and curation			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 3 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
33a: Does the utility have a centralized database of situational, operational, and risk data?	ii. Yes	ii. Yes	ii. Yes
33b: Is the utility able to use advanced analytics on its centralized database of situational, operational, and risk data to make operational and investment decisions?	ii. Yes, but only for short term decision making	ii. Yes, but only for short term decision making	iii. Yes, for both short term and long-term decision making
33c: Does the utility collect data from all sensored portions of electric lines, equipment, weather stations, etc.?	ii. Yes	ii. Yes	ii. Yes
33d: Is the utility's database of situational, operational, and risk data able to ingest and share data using real-time API protocols with a wide variety of stakeholders?	ii. Yes	ii. Yes	ii. Yes
33e: Does the utility identify highest priority additional data sources to improve decision making?	ii. Yes	ii. Yes	iii. Yes, with plans to incorporate these into centralized database of situational, operational and risk data

33f: Does the utility share best practices for database management and use with other utilities in California and beyond?	i. No	i. No	i. No

Capability 34. Data transparency and analytics			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
34a: Is there a single document cataloguing all fire-related data and algorithms, analyses, and data processes?	i. No	i. No	i. No
34b: Is there an explanation of the sources, cleaning processes, and assumptions made in the single document catalog?	i. No	i. No	i. No
34c: Are all analyses, algorithms, and data processing explained and documented?	ii. Analyses, algorithms, and data processing are documented	ii. Analyses, algorithms, and data processing are documented	ii. Analyses, algorithms, and data processing are documented
34d: Is there a system for sharing data in real time across multiple levels of permissions?	i. No system capable of sharing data in real time across multiple levels of permissions	i. No system capable of sharing data in real time across multiple levels of permissions	i. No system capable of sharing data in real time across multiple levels of permissions

34e: Are the most relevant wildfire related data algorithms disclosed?	iii. Yes, disclosed publicly in WMP upon request	iii. Yes, disclosed publicly in WMP upon request	iii. Yes, disclosed publicly in WMP upon request

Capability 35. Near-miss tracking			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 3	Planned state by end of cycle: 3 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
35a: Does the utility track near miss data for all near misses with wildfire ignition potential?	i. No	ii. Yes	ii. Yes
35b: Based on near miss data captured, is the utility able to simulate wildfire potential given an ignition based on event characteristics, fuel loads, and moisture?	i. No	ii. Yes	ii. Yes
35c: Does the utility capture data related to the specific mode of failure when capturing near-miss data?	i. No	ii. Yes	ii. Yes
35d: Is the utility able to predict the probability of a near miss in causing an ignition based on a set of event characteristics?	i. No	ii. Yes	ii. Yes
35e: Does the utility use data from near misses to change grid operation protocols in real time?	i. No	i. No	i. No

Capability 36. Data sharing with research community			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 3	By end of year 1 (current): 3	Planned state by end of cycle: 3 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
36a: Does the utility make disclosures and share data?	iii. Utility makes required disclosures and shares data beyond what is required	iii. Utility makes required disclosures and shares data beyond what is required	iii. Utility makes required disclosures and shares data beyond what is required
36b: Does the utility in engage in research?	iii. Utility funds and participates in both independent and collaborative research	iii. Utility funds and participates in both independent and collaborative research	iii. Utility funds and participates in both independent and collaborative research
36c: What subjects does utility research address?	ii. Utility ignited wildfires and risk reduction initiatives	ii. Utility ignited wildfires and risk reduction initiatives	ii. Utility ignited wildfires and risk reduction initiatives
36d: Does the utility promote best practices based on latest independent scientific and operational research?	ii. Yes	ii. Yes	ii. Yes

Category H. Resource allocation methodology

	Avg cycle start maturity: 0.7	**Avg current maturity: 0.7**	**Avg projected cycle end maturity: 2**
Capability 37. Scenario analysis across different risk levels			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 3 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
37a: For what risk scenarios is the utility able to provide projected cost and total risk reduction potential?	ii. Utility provides an accurate high-risk reduction and low risk reduction scenario, and the projected cost and total risk reduction potential	ii. Utility provides an accurate high-risk reduction and low risk reduction scenario, and the projected cost and total risk reduction potential	iii. Utility provides an accurate high-risk reduction and low risk reduction scenario, in addition to their proposed scenario, and the projected cost and total risk reduction potential
37b: For what level of granularity is the utility able to provide projections for each scenario?	ii. Region level	ii. Region level	iv. Span level
37c: Does the utility include a long term (e.g., 6-10 year) risk estimate taking into account macro factors (climate change, etc.) as well as planned risk reduction initiatives in its scenarios?	ii. Yes	ii. Yes	ii. Yes
37d: Does the utility provide an estimate of impact on reliability factors in its scenarios?	ii. Yes	ii. Yes	ii. Yes

Capability 38. Presentation of relative risk spend efficiency for portfolio of initiatives			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
38a: Does the utility present accurate qualitative rankings for its initiatives by risk spend efficiency?	ii. Yes	ii. Yes	ii. Yes
38b: What initiatives are captured in the ranking of risk spend efficiency?	ii. All commercial initiatives	ii. All commercial initiatives	ii. All commercial initiatives
38c: Does the utility include figures for present value cost and project risk reduction impact of each initiative, clearly documenting all assumptions (e.g. useful life, discount rate, etc.)?	ii. Yes	ii. Yes	ii. Yes
38d: Does the utility provide an explanation of their investment in each particular initiative?	i. No	i. No	iii. Yes, including the expected overall reduction in risk and estimates of impact on reliability factors
38e: At what level of granularity is the utility able to provide risk efficiency figures?	ii. Region level	ii. Region level	iv. Span level

Capability 39. Process for determining risk spend efficiency of vegetation management initiatives			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
39a: How accurate of a risk spend efficiency calculation can the utility provide?	ii. Utility has an accurate relative understanding of the cost and effectiveness to produce a reliable risk spend efficiency estimate	ii. Utility has an accurate relative understanding of the cost and effectiveness to produce a reliable risk spend efficiency estimate	ii. Utility has an accurate relative understanding of the cost and effectiveness to produce a reliable risk spend efficiency estimate
39b: At what level can estimates be prepared?	ii. Regional	ii. Regional	iv. Span-based
39c: How frequently are estimates updated?	ii. Less frequently than annually	ii. Less frequently than annually	iii. Annually or more frequently
39d: What vegetation management initiatives does the utility include within its evaluation?	ii. Some	ii. Some	ii. Some
39e: Can the utility evaluate risk reduction synergies from combination of various initiatives?	i. No	i. No	ii. Yes

Capability 40. Process for determining risk spend efficiency of system hardening initiatives			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 3 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
40a: How accurate of a risk spend efficiency calculation can the utility provide?	ii. Utility has accurate relative understanding of cost and effectiveness to produce a reliable risk spend efficiency estimate	ii. Utility has accurate relative understanding of cost and effectiveness to produce a reliable risk spend efficiency estimate	iii. Utility has accurate quantitative understanding of cost and effectiveness to produce a reliable risk spend efficiency estimate
40b: At what level can estimates be prepared?	ii. Regional	ii. Regional	iv. Span-based
40c: How frequently are estimates updated?	ii. Less frequently than annually	ii. Less frequently than annually	iii. Annually or more frequently
40d: What grid hardening initiatives are included in the utility risk spend efficiency analysis?	ii. Some commercially available grid hardening initiatives	ii. Some commercially available grid hardening initiatives	iv. All commercially available grid hardening initiatives
40e: Can the utility evaluate risk reduction effects from the combination of various initiatives?	i. No	i. No	ii. Yes

Capability 41. Portfolio-wide initiative allocation methodology			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	Planned state by end of cycle: 1 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
41a: To what extent does the utility allocate capital to initiatives based on risk-spend efficiency (RSE)?	ii. Utility considers estimates of RSE when allocating capital	ii. Utility considers estimates of RSE when allocating capital	iii. Accurate RSE estimates for all initiatives are used to determine capital allocation within categories only (e.g. to choose the best vegetation management initiative)
41b: What information does the utility take into account when generating RSE estimates?	ii. Specific information by initiative, including state of equipment and location where initiative will be implemented	ii. Specific information by initiative, including state of equipment and location where initiative will be implemented	ii. Specific information by initiative, including state of equipment and location where initiative will be implemented
41c: How does the utility verify RSE estimates?	ii. RSE estimates are verified by historical or experimental pilot data	ii. RSE estimates are verified by historical or experimental pilot data	ii. RSE estimates are verified by historical or experimental pilot data
41d: Does the utility take into consideration impact on safety, reliability, and other priorities when making spending decisions?	ii. Yes	ii. Yes	ii. Yes

Capability 42. Portfolio-wide innovation in new wildfire initiatives			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
42a: How does the utility develop and evaluate the efficacy of new wildfire initiatives?	ii. Utility uses pilots and measures direct reduction in ignition events	iii. Utility uses pilots and measures direct reduction in ignition events and near-misses.	iii. Utility uses pilots and measures direct reduction in ignition events and near-misses.
42b: How does the utility develop and evaluate the risk spend efficiency of new wildfire initiatives?	i. No program in place	i. No program in place	ii. Utility uses total cost of ownership
42c: At what level of granularity does the utility measure the efficacy of new wildfire initiatives?	iii. Circuit	iv. Span	0
42d: Are the reviews of innovative initiatives audited by independent parties?	ii. Yes	ii. Yes	ii. Yes
42e: Does the utility share the findings of its evaluation of innovative initiatives with other utilities, academia, and the general public?	ii. Yes	ii. Yes	ii. Yes

Category I. Emergency planning and preparedness

	Avg cycle start maturity: 2.4	**Avg current maturity: 3.6**	**Avg projected cycle end maturity: 4**
Capability 43. Wildfire plan integrated with overall disaster/ emergency plan			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 4	Planned state by end of cycle: 4 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
43a: Is the wildfire plan integrated with overall disaster and emergency plans?	iii. Wildfire plan is an integrated component of overall plan	iii. Wildfire plan is an integrated component of overall plan	iii. Wildfire plan is an integrated component of overall plan
43b: Does the utility run drills to audit the viability and execution of its wildfire plans?	ii. Yes	ii. Yes	ii. Yes
43c: Is the impact of confounding events or multiple simultaneous disasters considered in the planning process?	ii. Yes	ii. Yes	ii. Yes
43d: Is the plan integrated with disaster and emergency preparedness plans of other relevant stakeholders (e.g., CAL FIRE, Fire Safe Councils, etc.)?	i. No	ii. Yes	ii. Yes
43e: Does the utility take a leading role in planning, coordinating, and integrating plans across stakeholders?	ii. Yes	ii. Yes	ii. Yes

Capability 44. Plan to restore service after wildfire related outage			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 4 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
44a: Are there detailed and actionable procedures in place to restore service after a wildfire related outage?	ii. Yes	ii. Yes	ii. Yes
44b: Are employee and subcontractor crews trained in, and aware of, plans?	ii. Yes	ii. Yes	ii. Yes
44c: To what level are procedures to restore service after a wildfire-related outage customized?	iii. Circuit level	iii. Circuit level	iii. Circuit level
44d: Is the customized procedure to restore service based on topography, vegetation, and community needs?	ii. Yes	ii. Yes	ii. Yes
44e: Is there an inventory of high risk spend efficiency resources available for repairs?	i. No	i. No	ii. Yes
44f: Is the wildfire plan integrated with overall disaster and emergency plans?	iii. Wildfire plan is an integrated component of overall plan	iii. Wildfire plan is an integrated component of overall plan	iii. Wildfire plan is an integrated component of overall plan

Capability 45. Emergency community engagement during and after wildfire			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 4	By end of year 1 (current): 4	Planned state by end of cycle: 4 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
45a: Does the utility provide clear and substantially complete communication of available information relevant to affected customers?	iii. Yes, along with referrals to other agencies	iii. Yes, along with referrals to other agencies	iii. Yes, along with referrals to other agencies
45b: What percent of affected customers receive complete details of available information?	v. >99.9% of medical baseline customers	v. >99.9% of medical baseline customers	v. >99.9% of medical baseline customers
45c: What percent of affected medical baseline customers receive complete details of available information?	v. >99.9% of medical baseline customers	v. >99.9% of medical baseline customers	v. >99.9% of medical baseline customers
45d: How does the utility assist where helpful with communication of information related to power outages to customers?	ii. Through availability of relevant evacuation information and links on website and toll-free telephone number, and assisting disaster response professionals as requested	ii. Through availability of relevant evacuation information and links on website and toll-free telephone number, and assisting disaster response professionals as requested	ii. Through availability of relevant evacuation information and links on website and toll-free telephone number, and assisting disaster response professionals as requested
45e: How does the utility with engage other emergency management agencies during emergency situations?	ii. Utility engages with other agencies in an ad hoc manner	ii. Utility engages with other agencies in an ad hoc manner	iii. Utility has detailed and actionable established protocols for engaging with emergency management organizations
45f: Does the utility communicate and coordinate resources to communities during emergencies (e.g.,	ii. Yes	ii. Yes	ii. Yes

shelters, supplies, transportation etc.)?

Capability 46. Protocols in place to learn from wildfire events			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 4	By end of year 1 (current): 4	Planned state by end of cycle: 4 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
46a: Is there a protocol in place to record the outcome of emergency events and to clearly and actionably document learnings and potential process improvements?	ii. Yes	ii. Yes	ii. Yes
46b: Is there a defined process and staff responsible for incorporating learnings into emergency plan?	ii. Yes	ii. Yes	ii. Yes
46c: Once updated based on learnings and improvements, is the updated plan tested using "dry runs" to confirm its effectiveness?	ii. Yes	ii. Yes	ii. Yes

46d: Is there a defined process to solicit input from a variety of other stakeholders and incorporate learnings from other stakeholders into the emergency plan?	ii. Yes	ii. Yes	ii. Yes

Capability 47. Processes for continuous improvement after wildfire and PSPS			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 4	Planned state by end of cycle: 4 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
47a: Does the utility conduct an evaluation or debrief process after a wildfire?	ii. Yes	ii. Yes	ii. Yes
47b: Does the utility conduct a customer survey and utilize partners to disseminate requests for stakeholder engagement?	ii. One or the other	iii. Both	iii. Both
47c: In what other activities does the utility engage?	iv. Public listening sessions, debriefs with partners, and others	iv. Public listening sessions, debriefs with partners, and others	iv. Public listening sessions, debriefs with partners, and others
47d: Does the utility share with partners findings about what can be improved?	ii. Yes	ii. Yes	ii. Yes
47e: Are feedback and recommendations on potential improvements made public?	ii. Yes	ii. Yes	ii. Yes

47f: Does the utility conduct proactive outreach to local agencies and organizations to solicit additional feedback on what can be improved?	ii. Yes	ii. Yes	ii. Yes
47g: Does the utility have a clear plan for post-event listening and incorporating lessons learned from all stakeholders?	i. No	ii. Yes	ii. Yes
47h: Does the utility track the implementation of recommendations and report upon their impact?	i. No	ii. Yes	ii. Yes
47i: Does the utility have a process to conduct reviews after wildfires in other the territory of other utilities and states to identify and address areas of improvement?	ii. Yes	ii. Yes	ii. Yes

Category J. Stakeholder cooperation and community engagement

	Avg cycle start maturity: 2	Avg current maturity: 2.6	Avg projected cycle end maturity: 2.6
Capability 48. Cooperation and best practice sharing with other utilities			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 4	By end of year 1 (current): 4	Planned state by end of cycle: 4 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
48a: Does the utility actively work to identify best practices from other utilities through a clearly defined operational process?	ii. Yes, from other California utilities	ii. Yes, from other California utilities	ii. Yes, from other California utilities
48b: Does the utility successfully adopt and implement best practices identified from other utilities?	ii. Yes	ii. Yes	ii. Yes
48c: Does the utility seek to share best practices and lessons learned in a consistent format?	ii. Yes	ii. Yes	ii. Yes
48d: Does the utility share best practices and lessons via a consistent and predictable set of venues/media?	ii. Yes	ii. Yes	ii. Yes
48e: Does the utility participate in annual benchmarking exercises with other utilities to find areas for improvement?	ii. Yes	ii. Yes	ii. Yes

48f: Has the utility implemented a defined process for testing lessons learned from other utilities to ensure local applicability?	ii. Yes	ii. Yes	ii. Yes

Capability 49. Engagement with communities on utility wildfire mitigation initiatives			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
49a: Does the utility have a clear and actionable plan to develop or maintain a collaborative relationship with local communities?	ii. Yes	ii. Yes	ii. Yes
49b: Are there communities in HFTD areas where meaningful resistance is expected in response to efforts to mitigate fire risk (e.g. vegetation clearance)?	i. No	i. No	i. No
49c: What percent of landowners are non-compliant with utility initiatives (e.g., vegetation management)?	ii. Less than 5%	ii. Less than 5%	ii. Less than 5%
49d: What percent of landowners complain about utility initiatives (e.g., vegetation management)?	ii. Less than 5%	ii. Less than 5%	ii. Less than 5%

49e: Does the utility have a demonstratively cooperative relationship with communities containing >90% of the population in HFTD areas (e.g. by being recognized by other agencies as having a cooperative relationship with those communities in HFTD areas)?	ii. Yes	ii. Yes	ii. Yes
49f: Does utility have records of landowners throughout communities containing >90% of the population in HFTD areas reaching out to notify of risks, dangers or issues in the past year?	ii. Yes	ii. Yes	ii. Yes

Capability 50. Engagement with LEP and AFN populations			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 3	By end of year 1 (current): 4	Planned state by end of cycle: 4 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
50a: Can the utility provide a plan to partner with organizations representing Limited English Proficiency (LEP) and Access & Functional Needs (AFN) communities?	ii. Yes	ii. Yes	ii. Yes
50b: Can the utility outline how these partnerships create pathways for implementing suggested activities to address the needs of these communities?	ii. Yes	ii. Yes	ii. Yes
50c: Can the utility point to clear examples of how those relationships have driven the utility's ability to interact with and prepare LEP & AFN communities for wildfire mitigation activities?	ii. Yes	ii. Yes	ii. Yes
50d: Does the utility have a specific annually-updated action plan further reduce wildfire and PSPS risk to LEP & AFN communities?	i. No	ii. Yes	ii. Yes

Capability 51. Collaboration with emergency response agencies			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 2	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
51a: What is the cooperative model between the utility and suppression agencies?	i. Utility does not sufficiently cooperate with suppression agencies	ii. Utility cooperates with suppression agencies by notifying them of ignitions	ii. Utility cooperates with suppression agencies by notifying them of ignitions
51b: In what areas is the utility cooperating with suppression agencies	ii. All areas under utility control	ii. All areas under utility control	ii. All areas under utility control
51c: Does the utility accurately predict and communicate the forecasted fire propagation path using available analytics resources and weather data?	i. No	i. No	i. No
51d: Does the utility communicate fire paths to the community as requested?	i. No	i. No	i. No
51e: Does the utility work to assist suppression crews logistically, where possible?	ii. Yes	ii. Yes	ii. Yes

Capability 52. Collaboration on wildfire mitigation planning with stakeholders			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	**Start of cycle**	**By end of year 1 (current)**	**Planned state by end of cycle**
52a: Where does the utility conduct substantial fuel management?	ii. Utility conducts fuel management along rights of way	ii. Utility conducts fuel management along rights of way	ii. Utility conducts fuel management along rights of way
52b: Does the utility engage with other stakeholders as part of its fuel management efforts?	iii. Utility shares fuel management plans with other stakeholders and works with other stakeholders conducting fuel management concurrently	iii. Utility shares fuel management plans with other stakeholders and works with other stakeholders conducting fuel management concurrently	iii. Utility shares fuel management plans with other stakeholders and works with other stakeholders conducting fuel management concurrently
52c: Does the utility cultivate a native vegetative ecosystem across territory that is consistent with lower fire risk?	ii. Yes	ii. Yes	ii. Yes
52d: Does the utility fund local groups (e.g., fire safe councils) to support fuel management?	i. No	i. No	i. No

11.1.4. PC: Numerical maturity summary

Please reference the Guidance Resolution for the Maturity Rubric and for necessary context to interpret the levels shown below. **All levels are based solely on the Maturity Rubric and on PC's responses to the Utility Wildfire Mitigation Maturity Survey ("Survey").**

Start: Score reported in February 2020; **Current:** Score reported in February 2021; **End:** Score reported in February 2021 projected for February 2023

Category	Capability 1	Capability 2	Capability 3	Capability 4	Capability 5	Capability 6
A. Risk Assessment and Mapping	1. Climate scenario modeling	2. Ignition risk estimation	3. Estimation of wildfire consequences for communities	4. Estimation of wildfire and PSPS risk-reduction impact	5. Risk maps and simulation algorithms	
	Start: 1 Current: 3 End: 3	Start: 1 Current: 1 End: 3	Start: 1 Current: 1 End: 1	Start: 1 Current: 1 End: 3	Start: 0 Current: 1 End: 1	
B. Situational Awareness and Forecasting	6. Weather variables collected	7. Weather data resolution	8. Weather forecasting ability	9. External sources used in weather forecasting	10. Wildfire detection processes and capabilities	
	Start: 2 Current: 2 End: 2	Start: 0 Current: 1 End: 2	Start: 0 Current: 0 End: 0	Start: 2 Current: 2 End: 2	Start: 0 Current: 0 End: 1	
C. Grid design and system hardening	11. Approach to prioritizing initiatives across territory	12. Grid design for minimizing ignition risk	13. Grid design for resiliency and minimizing PSPS	14. Risk-based grid hardening and cost efficiency	15. Grid design and asset innovation	
	Start: 2 Current: 2 End: 4	Start: 1 Current: 1 End: 1	Start: 2 Current: 2 End: 2	Start: 1 Current: 1 End: 2	Start: 1 Current: 2 End: 2	
D. Asset management and inspections	16. Asset inventory and condition assessments	17. Asset inspection cycle	18. Asset inspection effectiveness	19. Asset maintenance and repair	20. QA/QC for asset management	
	Start: 0 Current: 0 End: 0	Start: 1 Current: 1 End: 1	Start: 1 Current: 1 End: 1	Start: 3 Current: 3 End: 3	Start: 2 Current: 2 End: 2	
E. Vegetation management and inspections	21. Vegetation inventory and condition assessments	22. Vegetation inspection cycle	23. Vegetation inspection effectiveness	24. Vegetation grow-in mitigation	25. Vegetation fall-in mitigation	26. QA/QC for vegetation management
	Start: 0 Current: 0 End: 0	Start: 1 Current: 1 End: 2	Start: 1 Current: 1 End: 1	Start: 0 Current: 0 End: 0	Start: 0 Current: 0 End: 0	Start: 2 Current: 2 End: 2
F. Grid operations and protocols	27. Protective equipment and device settings	28. Incorporating ignition risk factors in grid control	29. PSPS op. model and consequence mitigation	30. Protocols for PSPS initiation	31. Protocols for PSPS re-energization	32. Ignition prevention and suppression
	Start: 1 Current: 1 End: 1	Start: 2 Current: 2 End: 2	Start: 1 Current: 1 End: 1	Start: 2 Current: 1 End: 2	Start: 2 Current: 2 End: 2	Start: 2 Current: 2 End: 2
G. Data governance	33. Data collection and curation	34. Data transparency and analytics	35. Near-miss tracking	36. Data sharing with research community		
	Start: 2 Current: 2 End: 3	Start: 0 Current: 0 End: 0	Start: 0 Current: 3 End: 3	Start: 3 Current: 3 End: 3		
H. Resource allocation methodology	37. Scenario analysis across different risk levels	38. Presentation of relative risk spend efficiency for portfolio of initiatives	39. Process for determining risk spend efficiency of vegetation management initiatives	40. Process for determining risk spend efficiency of system hardening initiatives	41. Portfolio-wide initiative allocation methodology	42. Portfolio-wide innovation in new wildfire initiatives
	Start: 1 Current: 1 End: 3	Start: 0 Current: 0 End: 2	Start: 1 Current: 1 End: 1	Start: 1 Current: 1 End: 3	Start: 0 Current: 0 End: 1	Start: 1 Current: 1 End: 2
I. Emergency planning and preparedness	43. Wildfire plan integrated with overall disaster/ emergency plan	44. Plan to restore service after wildfire related outage	45. Emergency community engagement during and after wildfire	46. Protocols in place to learn from wildfire events	47. Processes for continuous improvement after wildfire and PSPS	
	Start: 2 Current: 4 End: 4	Start: 2 Current: 2 End: 4	Start: 4 Current: 4 End: 4	Start: 4 Current: 4 End: 4	Start: 0 Current: 4 End: 4	
J. Stakeholder cooperation and community engagement	48. Cooperation and best practice sharing with other utilities	49. Engagement with communities on utility wildfire mitigation initiatives	50. Engagement with LEP and AFN populations	51. Collaboration with emergency response agencies	52. Collaboration on wildfire mitigation planning with stakeholders	
	Start: 4 Current: 4 End: 4	Start: 1 Current: 1 End: 1	Start: 3 Current: 4 End: 4	Start: 0 Current: 2 End: 2	Start: 2 Current: 2 End: 2	

11.2. Attachment 2: Definition of Initiatives by Category

Category	Initiative activity	Definition
A. Risk mapping and simulation	A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment	Development and use of tools and processes to develop and update risk map and simulations and to estimate risk reduction potential of initiatives for a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.
	Climate-driven risk map and modelling based on various relevant weather scenarios	Development and use of tools and processes to estimate incremental risk of foreseeable climate scenarios, such as drought, across a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.
	Ignition probability mapping showing the probability of ignition along the electric lines and equipment	Development and use of tools and processes to assess the risk of ignition across regions of the grid (or more granularly, e.g., circuits, spans, or assets).
	Initiative mapping and estimation of wildfire and PSPS risk-reduction impact	Development of a tool to estimate the risk reduction efficacy (for both wildfire and PSPS risk) and risk-spend efficiency of various initiatives.
	Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment	Development and use of tools and processes to assess the impact of potential ignition and risk to communities (e.g., in terms of potential fatalities, structures burned, monetary damages, area burned, impact on air quality and greenhouse gas, or GHG, reduction goals, etc.).
B. Situational awareness and forecasting	Advanced weather monitoring and weather stations	Purchase, installation, maintenance, and operation of weather stations. Collection, recording, and analysis of weather data from weather stations and from external sources.
	Continuous monitoring sensors	Installation, maintenance, and monitoring of sensors and sensorized equipment used to monitor the condition of electric lines and equipment.
	Fault indicators for detecting faults on electric lines and equipment	Installation and maintenance of fault indicators.
	Forecast of a fire risk index, fire potential index, or similar	Index that uses a combination of weather parameters (such as wind speed, humidity, and temperature), vegetation and/or fuel conditions, and other factors to judge current fire risk and to create a forecast indicative of fire risk. A sufficiently granular index shall inform operational decision-making.

	Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	Personnel position within utility service territory to monitor system conditions and weather on site. Field observations shall inform operational decisions.
	Weather forecasting and estimating impacts on electric lines and equipment	Development methodology for forecast of weather conditions relevant to utility operations, forecasting weather conditions and conducting analysis to incorporate into utility decision-making, learning and updates to reduce false positives and false negatives of forecast PSPS conditions.
C. Grid design and system hardening	Capacitor maintenance and replacement program	Remediation, adjustments, or installations of new equipment to improve or replace existing capacitor equipment.
	Circuit breaker maintenance and installation to de-energize lines upon detecting a fault	Remediation, adjustments, or installations of new equipment to improve or replace existing fast switching circuit breaker equipment to improve the ability to protect electrical circuits from damage caused by overload of electricity or short circuit.
	Covered conductor installation	Installation of covered or insulated conductors to replace standard bare or unprotected conductors (defined in accordance with GO 95 as supply conductors, including but not limited to lead wires, not enclosed in a grounded metal pole or not covered by: a "suitable protective covering" (in accordance with Rule 22.8), grounded metal conduit, or grounded metal sheath or shield). In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.
	Covered conductor maintenance	Remediation and adjustments to installed covered or insulated conductors. In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in

		the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.
	Crossarm maintenance, repair, and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing crossarms, defined as horizontal support attached to poles or structures generally at right angles to the conductor supported in accordance with GO 95.
	Distribution pole replacement and reinforcement, including with composite poles	Remediation, adjustments, or installations of new equipment to improve or replace existing distribution poles (i.e., those supporting lines under 65kV), including with equipment such as composite poles manufactured with materials reduce ignition probability by increasing pole lifespan and resilience against failure from object contact and other events.
	Expulsion fuse replacement	Installations of new and CAL FIRE-approved power fuses to replace existing expulsion fuse equipment.
	Grid topology improvements to mitigate or reduce PSPS events	Plan to support and actions taken to mitigate or reduce PSPS events in terms of geographic scope and number of customers affected, such as installation and operation of electrical equipment to sectionalize or island portions of the grid, microgrids, or local generation.
	Installation of system automation equipment	Installation of electric equipment that increases the ability of the utility to automate system operation and monitoring, including equipment that can be adjusted remotely such as automatic reclosers (switching devices designed to detect and interrupt momentary faults that can reclose automatically and detect if a fault remains, remaining open if so).
	Maintenance, repair, and replacement of connectors, including hotline clamps	Remediation, adjustments, or installations of new equipment to improve or replace existing connector equipment, such as hotline clamps.
	Mitigation of impact on customers and other	Actions taken to improve access to electricity for customers and other residents during PSPS events, such as installation and operation of local

	residents affected during PSPS event	generation equipment (at the community, household, or other level).
	Other corrective action	Other maintenance, repair, or replacement of utility equipment and structures so that they function properly and safely, including remediation activities (such as insulator washing) of other electric equipment deficiencies that may increase ignition probability due to potential equipment failure or other drivers.
	Pole loading infrastructure hardening and replacement program based on pole loading assessment program	Actions taken to remediate, adjust, or install replacement equipment for poles that the utility has identified as failing to meet safety factor requirements in accordance with GO 95 or additional utility standards in the utility's pole loading assessment program.
	Transformers maintenance and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing transformer equipment.
	Transmission tower maintenance and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing transmission towers (e.g., structures such as lattice steel towers or tubular steel poles that support lines at or above 65kV).
	Undergrounding of electric lines and/or equipment	Actions taken to convert overhead electric lines and/or equipment to underground electric lines and/or equipment (i.e., located underground and in accordance with GO 128).
	Updates to grid topology to minimize risk of ignition in HFTDs	Changes in the plan, installation, construction, removal, and/or undergrounding to minimize the risk of ignition due to the design, location, or configuration of utility electric equipment in HFTDs.
D. Asset management and inspections	Detailed inspections of distribution electric lines and equipment	In accordance with GO 165, careful visual inspections of overhead electric distribution lines and equipment where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.
	Detailed inspections of transmission electric lines and equipment	Careful visual inspections of overhead electric transmission lines and equipment where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.

	Improvement of inspections	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
	Infrared inspections of distribution electric lines and equipment	Inspections of overhead electric distribution lines, equipment, and right-of-way using infrared (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.
	Infrared inspections of transmission electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using infrared (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.
	Intrusive pole inspections	In accordance with GO 165, intrusive inspections involve movement of soil, taking samples for analysis, and/or using more sophisticated diagnostic tools beyond visual inspections or instrument reading.
	LiDAR inspections of distribution electric lines and equipment	Inspections of overhead electric distribution lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	LiDAR inspections of transmission electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric distribution lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric transmission lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.

	Patrol inspections of distribution electric lines and equipment	In accordance with GO 165, simple visual inspections of overhead electric distribution lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.
	Patrol inspections of transmission electric lines and equipment	Simple visual inspections of overhead electric transmission lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.
	Pole loading assessment program to determine safety factor	Calculations to determine whether a pole meets pole loading safety factor requirements of GO 95, including planning and information collection needed to support said calculations. Calculations shall consider many factors including the size, location, and type of pole; types of attachments; length of conductors attached; and number and design of supporting guys, per D.15-11-021.
	Quality assurance / quality control of inspections	Establishment and function of audit process to manage and confirm work completed by employees or subcontractors, including packaging QA/QC information for input to decision-making and related integrated workforce management processes.
	Substation inspections	In accordance with GO 175, inspection of substations performed by qualified persons and according to the frequency established by the utility, including record-keeping.
E. Vegetation management and inspection	Additional efforts to manage community and environmental impacts	Plan and execution of strategy to mitigate negative impacts from utility vegetation management to local communities and the environment, such as coordination with communities to plan and execute vegetation management work or promotion of fire-resistant planting practices
	Detailed inspections of vegetation around distribution electric lines and equipment	Careful visual inspections of vegetation around the right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded.
	Detailed inspections of vegetation around transmission electric lines and equipment	Careful visual inspections of vegetation around the right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded.
	Emergency response vegetation management due to red flag warning or other urgent conditions	Plan and execution of vegetation management activities, such as trimming or removal, executed based upon and in advance of forecast weather

		conditions that indicate high fire threat in terms of ignition probability and wildfire consequence.
	Fuel management and reduction of "slash" from vegetation management activities	Plan and execution of fuel management activities that reduce the availability of fuel in proximity to potential sources of ignition, including both reduction or adjustment of live fuel (in terms of species or otherwise) and of dead fuel, including "slash" from vegetation management activities that produce vegetation material such as branch trimmings and felled trees.
	Improvement of inspections	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
	LiDAR inspections of vegetation around distribution electric lines and equipment	Inspections of right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	LiDAR inspections of vegetation around transmission electric lines and equipment	Inspections of right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	Other discretionary inspections of vegetation around distribution electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Other discretionary inspections of vegetation around transmission electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Patrol inspections of vegetation around distribution electric lines and equipment	Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business.
	Patrol inspections of vegetation around transmission electric lines and equipment	Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business.
	Quality assurance / quality control of vegetation inspections	Establishment and function of audit process to manage and confirm work completed by employees or subcontractors, including packaging QA/QC information for input to decision-making

		and related integrated workforce management processes.
	Recruiting and training of vegetation management personnel	Programs to ensure that the utility is able to identify and hire qualified vegetation management personnel and to ensure that both full-time employees and contractors tasked with vegetation management responsibilities are adequately trained to perform vegetation management work, according to the utility's wildfire mitigation plan, in addition to rules and regulations for safety.
	Remediation of at-risk species	Actions taken to reduce the ignition probability and wildfire consequence attributable to at-risk vegetation species, such as trimming, removal, and replacement.
	Removal and remediation of trees with strike potential to electric lines and equipment	Actions taken to remove or otherwise remediate trees that could potentially strike electrical equipment, if adverse events such as failure at the ground-level of the tree or branch breakout within the canopy of the tree, occur.
	Substation inspection	Inspection of vegetation surrounding substations, performed by qualified persons and according to the frequency established by the utility, including record-keeping.
	Substation vegetation management	Based on location and risk to substation equipment only, actions taken to reduce the ignition probability and wildfire consequence attributable to contact from vegetation to substation equipment.
	Vegetation inventory system	Inputs, operation, and support for centralized inventory of vegetation clearances updated based upon inspection results, including (1) inventory of species, (2) forecasting of growth, (3) forecasting of when growth threatens minimum right-of-way clearances ("grow-in" risk) or creates fall-in/fly-in risk.
	Vegetation management to achieve clearances around electric lines and equipment	Actions taken to ensure that vegetation does not encroach upon the minimum clearances set forth in Table 1 of GO 95, measured between line conductors and vegetation, such as trimming adjacent or overhanging tree limbs.
F. Grid operations and protocols	Automatic recloser operations	Designing and executing protocols to deactivate automatic reclosers based on local conditions for ignition probability and wildfire consequence.
	Crew-accompanying ignition prevention and suppression resources and services	Those firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, and water) that are deployed with construction crews and other electric workers to

		provide site-specific fire prevention and ignition mitigation during on-site work
	Personnel work procedures and training in conditions of elevated fire risk	Work activity guidelines that designate what type of work can be performed during operating conditions of different levels of wildfire risk. Training for personnel on these guidelines and the procedures they prescribe, from normal operating procedures to increased mitigation measures to constraints on work performed.
	Protocols for PSPS re-energization	Designing and executing procedures that accelerate the restoration of electric service in areas that were de-energized, while maintaining safety and reliability standards.
	PSPS events and mitigation of PSPS impacts	Designing, executing, and improving upon protocols to conduct PSPS events, including development of advanced methodologies to determine when to use PSPS, and to mitigate the impact of PSPS events on affected customers and local residents.
	Stationed and on-call ignition prevention and suppression resources and services	Firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, firefighting foam, chemical extinguishing agent, and water) stationed at utility facilities and/or standing by to respond to calls for fire suppression assistance.
G. Data governance	Centralized repository for data	Designing, maintaining, hosting, and upgrading a platform that supports storage, processing, and utilization of all utility proprietary data and data compiled by the utility from other sources.
	Collaborative research on utility ignition and/or wildfire	Developing and executing research work on utility ignition and/or wildfire topics in collaboration with other non-utility partners, such as academic institutions and research groups, to include data-sharing and funding as applicable.
	Documentation and disclosure of wildfire-related data and algorithms	Design and execution of processes to document and disclose wildfire-related data and algorithms to accord with rules and regulations, including use of scenarios for forecasting and stress testing.
	Tracking and analysis of near miss data	Tools and procedures to monitor, record, and conduct analysis of data on near miss events.
H. Resource allocation methodology	Allocation methodology development and application	Development of prioritization methodology for human and financial resources, including application of said methodology to utility decision-making.
	Risk reduction scenario development and analysis	Development of modelling capabilities for different risk reduction scenarios based on wildfire

		mitigation initiative implementation; analysis and application to utility decision-making.
	Risk-spend efficiency analysis	Tools, procedures, and expertise to support analysis of wildfire mitigation initiative risk-spend efficiency, in terms of MAVF and/ or MARS methodologies.
I. Emergency planning and preparedness	Adequate and trained workforce for service restoration	Actions taken to identify, hire, retain, and train qualified workforce to conduct service restoration in response to emergencies, including short-term contracting strategy and implementation.
	Community outreach, public awareness, and communications efforts	Actions to identify and contact key community stakeholders; increase public awareness of emergency planning and preparedness information; and design, translate, distribute, and evaluate effectiveness of communications taken before, during, and after a wildfire, including Access and Functional Needs populations and Limited English Proficiency populations in particular.
	Customer support in emergencies	Resources dedicated to customer support during emergencies, such as website pages and other digital resources, dedicated phone lines, etc.
	Disaster and emergency preparedness plan	Development of plan to deploy resources according to prioritization methodology for disaster and emergency preparedness of utility and within utility service territory (such as considerations for critical facilities and infrastructure), including strategy for collaboration with Public Safety Partners and communities.
	Preparedness and planning for service restoration	Development of plans to prepare the utility to restore service after emergencies, such as developing employee and staff trainings, and to conduct inspections and remediation necessary to re-energize lines and restore service to customers.
	Protocols in place to learn from wildfire events	Tools and procedures to monitor effectiveness of strategy and actions taken to prepare for emergencies and of strategy and actions taken during and after emergencies, including based on an accounting of the outcomes of wildfire events.
J. Stakeholder cooperation and community engagement	Community engagement	Strategy and actions taken to identify and contact key community stakeholders; increase public awareness and support of utility wildfire mitigation activity; and design, translate, distribute, and evaluate effectiveness of related communications. Includes specific strategies and actions taken to address concerns and serve needs of Access and

		Functional Needs populations and Limited English Proficiency populations in particular.
	Cooperation and best practice sharing with agencies outside CA	Strategy and actions taken to engage with agencies outside of California to exchange best practices both for utility wildfire mitigation and for stakeholder cooperation to mitigate and respond to wildfires.
	Cooperation with suppression agencies	Coordination with CAL FIRE, federal fire authorities, county fire authorities, and local fire authorities to support planning and operations, including support of aerial and ground firefighting in real-time, including information-sharing, dispatch of resources, and dedicated staff.
	Forest service and fuel reduction cooperation and joint roadmap	Strategy and actions taken to engage with local, state, and federal entities responsible for or participating in forest management and fuel reduction activities; and design utility cooperation strategy and joint stakeholder roadmap (plan for coordinating stakeholder efforts for forest management and fuel reduction activities).

11.3. Attachment 3: Glossary of Terms

Term	Definition
AB	Assembly Bill
AFN	Access and Functional Needs
ALJ	Administrative Law Judge
BVES	Bear Valley Electric Service
CAISO	California Independent System Operator
Cal Advocates	Public Advocate's Office
CAL FIRE	California Department of Forestry and Fire Protection
CEJA	California Environmental Justice Alliance
CNRA	California Natural Resources Agency
D.	Decision
DFA	Distribution Fault Attribution
DR	Data Request
EBMUD	East Bay Municipal Utility District

EFD	Early Fault Detection
EPIC	Electric Program Investment Charge
EPUC	Energy Producers and Users Coalition
EVM	Enhanced Vegetation Management
FERC	Federal Energy Regulatory Commission
FGDC	Federal Geographic Data Committee
FIRIS	Fire Integrated Real Time Intelligence System
FMEA	Failure Modes and Effects Analysis
FPI	Fire Potential Index
GIS	Geographic Information Systems
GO	General Order
GPI	Green Power Institute
GRC	General Rate Case
HFRA	High Fire Risk Area
HFTD	High Fire Threat District
Horizon West	Horizon West Transmission
HWT	Horizon West Transmission
I.	Investigation
ICS	Incident Command System
ICS	Incident Command Structure
IOU	Investor Owned Utility
ISA	International Society of Arboriculture
ITO	Independent Transmission Operator
IVM	Integrated Vegetation Management Plan
IVR	Interactive Voice Response
JIS	Joint Information System
kV	Kilovolt
Liberty	Liberty Utilities / CalPeco Electric
LiDAR	Light Detection and Ranging
LTE	Long-Term Evolution

Maturity Model	Utility Wildfire Mitigation Maturity Model
MAVF	Multi-Attribute Value Function
MGRA	Mussey Grade Road Alliance
MMAA	Mountain Mutual Aid Association
NERC	North American Electric Reliability Corporation
NFDRS	National Fire Danger Rating System
OCFA	Orange County Fire Authority
OEIS (Energy Safety)	Office of Energy Infrastructure Safety
OP	Ordering Paragraph
OPW	Outage Producing Winds
PG&E	Pacific Gas and Electric Company
PLP	Pole Loading Assessment Program
PMO (PacifiCorp)	Project Management Office
PMO (SCE)	Public Safety Program Management Office
PMU	Phasor Measurement Unit
POC	Protect Our Communities Foundation
PRC	Public Resources Code
PSPS	Public Safety Power Shutoff
QA	Quality Assurance
QC	Quality Control
R.	Rulemaking
RAMP	Risk Assessment and Management Phase
RAR	Remote Automatic Reclosers
RBDM	Risk-Based Decision Making
RCP	Remedial Compliance Plan
RCRC	Rural County Representatives of California
REFCL	Rapid Earth Fault Current Limiter
RFW	Red Flag Warning
RSE	Risk-Spend Efficiency
SB	Senate Bill

SCADA	Supervisory Control and Data Acquisition
SCE	Southern California Edison Company
SDG&E	San Diego Gas & Electric Company
S-MAP	Safety Model Assessment Proceeding
SMJU	Small and Multijurisdictional Utility
SUI	Wildland-Urban Interface
SWATI	Santa Ana Wildfire Threat Index
TAT	Tree Assessment Tool
TBC	Trans Bay Cable
TURN	The Utility Reform Network
USFS	United States Forest Service
WMP	Wildfire Mitigation Plan
WRRM	Wildfire Risk Reduction Model
WSAB	Wildfire Safety Advisory Board
WSD	Wildfire Safety Division
WSIP	Wildfire Safety Inspection Program