State of California – A Natural Resources Agency
Gavin Newsom, Governor

OFFICE OF ENERGY INFRASTRUCTURE SAFETY
715 P Street, 20th Floor | Sacramento, CA 95814
916.902.6000 | *www.energysafety.ca.gov*
Caroline Thomas Jacobs, Director

December 9, 2022

To: 2022 Wildfire Mitigation Plans docket (#2022-WMPs)
Subject: Decision on PacifiCorp's 2022 Wildfire Mitigation Plan Update

Dear Wildfire Mitigation Plan Stakeholders,

Enclosed is the Office of Energy Infrastructure Safety's (Energy Safety's) final Decision on PacifiCorp's 2022 Wildfire Mitigation Plan (WMP) Update.

On November 4, 2022, Energy Safety published a draft of this Decision on its website and served it to Energy Safety's Wildfire Mitigation Plans service list for public review and comment.

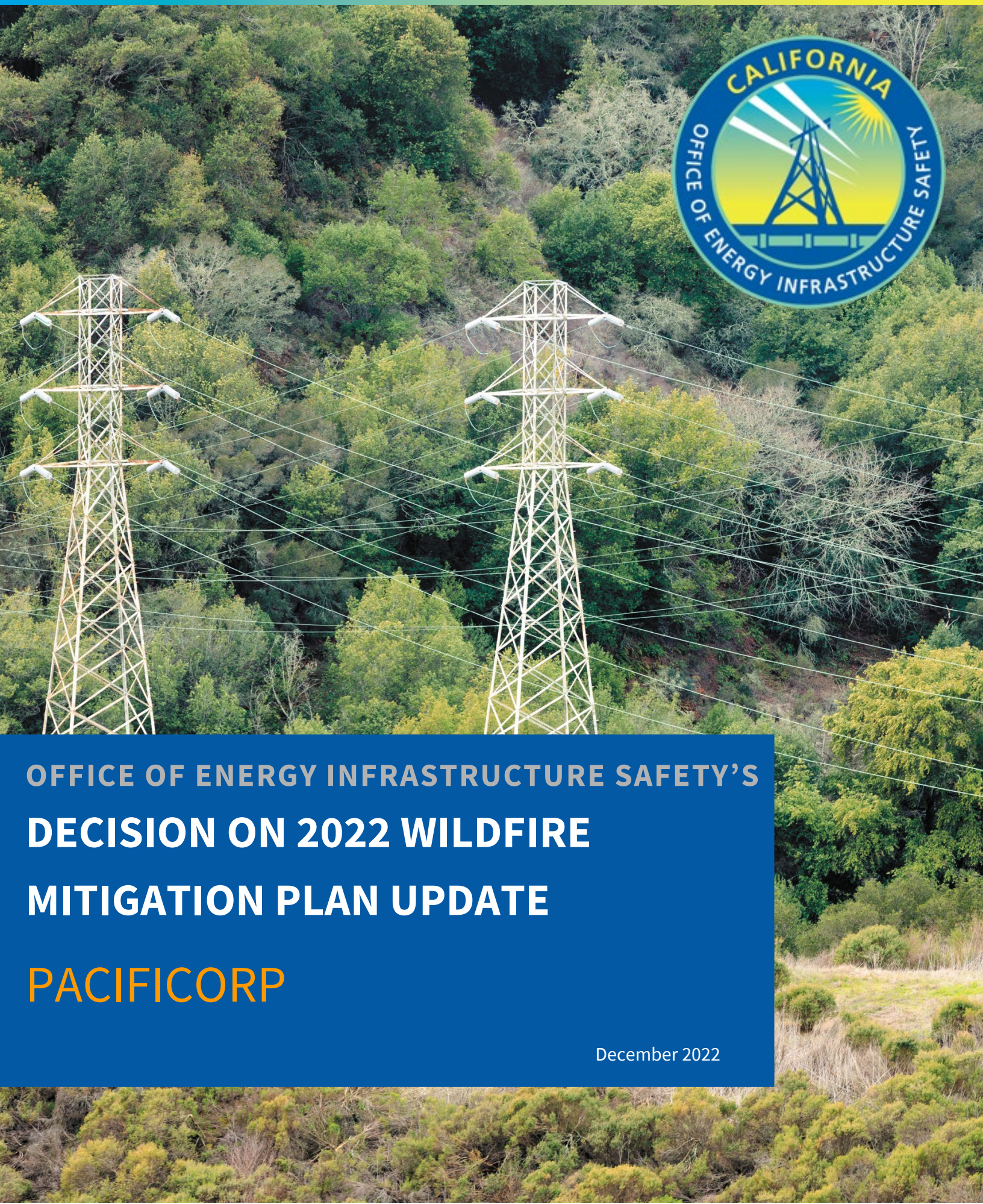
Comments on the draft Decision were due on November 28, 2022, and reply comments were due on December 5, 2022. Energy Safety did not receive comments on the Draft Decision and made no substantive revisions to the Decision.

The Maturity Survey summary table was inadvertently omitted from the draft Decision and has been appended as Appendix G to the final Decision.

This Decision documents Energy Safety's approval of PacifiCorp's 2022 WMP Update.

Sincerely,

Lucy C. Morgans
Program Manager | Electric Safety Policy Division
Electrical Infrastructure Directorate
Office of Energy Infrastructure Safety



OFFICE OF ENERGY INFRASTRUCTURE SAFETY'S

DECISION ON 2022 WILDFIRE MITIGATION PLAN UPDATE

PACIFICORP

December 2022

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Executive Summary

The Office of Energy Infrastructure Safety (Energy Safety) was formed in July 2021 to ensure electrical utilities take effective actions to reduce utility-related wildfire risk. Energy Safety strives to deliver near-term results while promoting a long-term utility vision to reduce wildfire and build cultures of safety.

The California Legislature enacted several measures requiring electrical corporations to reduce risk of utility-caused catastrophic wildfires. Key legislative measures include Assembly Bills 1054 and 111, Public Utilities Code sections 326(b) and 8389, Senate Bills 901 and 1028, and Government Code section 15475 (see Section 1.1, "Legal Authority").

Pursuant to Public Utilities Code section 8386.3(a), this Decision serves as Energy Safety's assessment and approval of PacifiCorp's Wildfire Mitigation Plan 2022 Update (2022 Update).

Energy Safety's Decision incorporates comments from the public and other stakeholders.

This Executive Summary includes a high-level summary of Energy Safety's assessment of PacifiCorp's maturity model, progress, and areas in the current plan Energy Safety determined warrant continued improvement. Energy Safety's comprehensive evaluation is included as Section 4, and a detailed list of all areas for continued improvement and required progress can be found in Section 7.

Maturity Model Evaluation

Energy Safety 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 February 2020, the utilities completed a survey that established a baseline for maturity as well as their anticipated progress over the three-year plan period. In 2021 and 2022, the utilities again completed the survey, enabling Energy Safety to monitor progress and ascertain potential improvements to maturity based on self-reported progress to date.

Energy Safety makes the following key findings regarding PacifiCorp's maturity progress in 2022 and over the three-year plan cycle. Detailed explanations of utility maturity are contained in each section of the evaluation.

- PacifiCorp's maturity in risk assessment and mapping has seen a large increase across the current Wildfire Mitigation Plan cycle, and its 2022 maturity is significantly higher

than those of Liberty Utilities and Bear Valley Electric Service Inc., the other small and multi-jurisdictional utilities operating in California. PacifiCorp projects further maturity growth in 2023.

- Although PacifiCorp did not increase in maturity in multiple categories from 2021 to 2022, it projects increases in maturity in 2023 for grid design and system hardening, vegetation management, data governance, resource allocation methodology, and emergency planning and preparedness.

Areas of Significant Progress

PacifiCorp has made significant progress over the past year and/or has matured in its mitigation strategies for future years in the following areas:

- In terms of vegetation management, PacifiCorp has begun piloting a "ground-to-sky" study to support clearing overhanging limbs from above electrical equipment. In 2022, PacifiCorp plans to identify areas within its high fire threat district to perform ground-to-sky clearances in 2023, targeting species prone to limb failure.
- In terms of risk modeling, PacifiCorp has completed the first phase of its Localized Risk Assessment Model, which considers both utility and environmental risk to output combined risk scores. PacifiCorp also intends to implement a third-party's consequence risk modeling before its 2023 Wildfire Mitigation Plan. The implementation of this model also includes integration of modeling of ignition likelihood, further development of a resource allocation methodology, and more detailed analysis for operational decision making for mitigation selection.
- PacifiCorp completed its pilot of the Available Probabilistic Arc Energy Risk model and intends to adopt the model long-term over the next five years, with the model being a data element within PacifiCorp's Localized Risk Assessment Model.
- As PacifiCorp builds out its weather station network, improves its risk modeling, and completes asset hardening projects, PacifiCorp anticipates that the scale, scope, and frequency of Public Safety Power Shutoff events will be reduced.
- A key change since its 2021 Update is that PacifiCorp plans to implement modeling tools to enhance situational awareness. PacifiCorp anticipates that this additional capability will provide more granular data with increased accuracy. PacifiCorp expects that this may also reduce the scale, scope, and frequency of Public Safety Power Shutoff events.

Energy Safety evaluated 2022 Updates with a particular focus on how each utility is driving down the risk of utility-related ignitions. The evaluation included assessing the utility's progress implementing wildfire mitigation initiatives, evaluating the feasibility of its strategies, and measuring year-to-year trends. As a result of this evaluation, Energy Safety identified areas where the utility should continue to improve its wildfire mitigation capabilities in future plans.

Section 4 contains Energy Safety's detailed assessment and resulting areas for continued improvement. A complete list of all PacifiCorp's areas for continued improvement is included in Section 7.

Selected themes from PacifiCorp's areas for continued improvement are:

- PacifiCorp must demonstrate how it has used its risk modeling to determine the areas of highest risk and must prioritize projects based on the highest risk areas.
- PacifiCorp must continue to participate in the covered conductor effectiveness joint study established by Energy Safety's 2021 Wildfire Mitigation Plan Action Statements in order to share and determine best practices for inspecting and maintaining covered conductor. PacifiCorp must also provide goals and timelines for implementing lessons learned as a result of this joint study.
- PacifiCorp is not currently on track to meet its covered conductor or pole replacement targets for 2022 and does not anticipate meeting these targets until sometime in 2023. Both hardening efforts are critical to addressing risk along PacifiCorp's system and are a major portion of PacifiCorp's mitigations to reducing ignition likelihood. Furthermore, PacifiCorp has not provided sufficient information to show how it plans to meet its targets in the future. PacifiCorp must demonstrate that it can complete grid hardening targets moving forward, taking into consideration the factors that have led to delays thus far.
- PacifiCorp must show that it has a pole replacement program that evaluates and addresses risks outside of its covered conductor program.
- PacifiCorp must provide further details on how it compared undergrounding to other mitigation efforts as part of its selection process. This should include justifying the locations of the two current undergrounding projects and any future projects.
- PacifiCorp must further evaluate how it can integrate new technologies into its current inspection practices. Doing so would allow PacifiCorp to identify additional issues that

routine inspections may not be able to detect and increase potential risk reduction through asset inspections.

- PacifiCorp must provide risk-spend efficiency estimates for its mitigation initiatives in its 2023 Wildfire Mitigation Plan and clearly demonstrate where quantified risk reduction values and risk-spend efficiency estimates are being considered in its initiative selection and decision-making processes.

1. Introduction and Background

PacifiCorp submitted a comprehensive Wildfire Mitigation Plan (WMP or Plan) in 2020 covering a three-year term from 2020 through the end of 2022 (the current WMP cycle). PacifiCorp submits annual updates to that Plan for Office of Energy Infrastructure Safety (Energy Safety) approval or denial. This Decision represents Energy Safety's assessment of PacifiCorp's 2022 WMP Update (2022 Update), which PacifiCorp submitted on May 6, 2022, in response to Energy Safety's Final 2022 WMP Update Guidelines (Guidelines).[1]

Energy Safety approves PacifiCorp's 2022 Update.

1.1 Legal Authority

In 2018, following the devastating wildfires in 2016 and 2017, the California Legislature passed several bills increasing regulatory supervision of the electrical corporations' efforts to reduce utility-related wildfires. Assembly Bill (AB) 1054 (Statutes of [Stats.] 2019, Chapter [Ch.] 79) created Energy Safety (initially formed as the Wildfire Safety Division [WSD] at the California Public Utilities Commission [CPUC]) and tasked it with reviewing annual WMPs submitted by electrical corporations.

The main regulatory vehicle for Energy Safety to evaluate electrical corporations' wildfire risk reduction efforts is the WMP, which was first introduced in Senate Bill (SB) 1028 (Stats. 2016, Ch. 598) and further defined in subsequent legislation. Investor-owned electrical corporations[2] 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 (Stats. 2018, Ch. 626) framework in 2019.[3]

---

[1] Final 2022 Wildfire Mitigation Plan Update Guidelines (accessed January 26, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true

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

[3] See Rulemaking 18-10-007.

On July 1, 2021, all functions of the CPUC's WSD were transferred to Energy Safety.[4] Energy Safety "is the successor to […] and is vested with, all of the duties, powers, and responsibilities of the Wildfire Safety Division,"[5] including, but not limited to, jurisdiction for evaluating and approving or denying utilities' WMPs and evaluating compliance with the WMPs. Energy Safety must ensure utility wildfire mitigation efforts sufficiently address utility wildfire risk. To support its efforts, Energy Safety developed a long-term strategic roadmap, Reducing Utility-Related Wildfire Risk (2020).[6] This strategic roadmap underpins Energy Safety's evaluation of the WMPs.

1.1.1 Cost Recovery

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 (GRCs) or an appropriate application.[7] Nothing in this Decision should be construed as approval of WMP-related costs.[8]

1.2 Multi-Year Plan Process

In February 2020, the utilities[9] submitted their three-year 2020-2022 WMPs. In 2020, Energy Safety conducted its evaluation and either approved, conditionally approved, or denied the Plans. In the case of conditional approval, Energy Safety identified areas for further improvement in the Plans, assigning these areas different severity levels, and required the utilities to address issues through various mechanisms depending on the designation of severity, Class A, B, or C.

---

[4] Public Utilities Code § 326(b).

[5] Gov. Code § 15475.

[6] Energy Safety's strategic roadmap Reducing Utility-Related Wildfire Risk (2020) (accessed January 26, 2022): https://energysafety.ca.gov/who-we-are/strategic-roadmap/.

[7] Public Utilities Code § 8386.4(b).

[8] Energy Safety's approval does not relieve the electrical corporation of any and all otherwise applicable permitting, ratemaking, or other legal and regulatory obligations.

[9] 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.

In 2021, the utilities submitted updates to their 2020 WMPs. Energy Safety evaluated the utilities' WMP Updates and either approved or denied the Plans. If Energy Safety identified a critical issue in a utility's Plan, Energy Safety issued a Revision Notice requiring the utility to remedy the issue prior to completion of Energy Safety's evaluation. (See Section 1.3.2 for more information on Revision Notices.) Upon receipt of the utility's response to the Revision Notice, Energy Safety determined if the response was sufficient to warrant approval of the WMP or insufficient such that denial of the WMP was warranted. Energy Safety did not issue a Revision Notice to PacifiCorp for its 2021 Update.

Plan year 2022 is the final year in the first three-year plan cycle. Therefore, Energy Safety's evaluation of PacifiCorp's 2022 Update focuses heavily on the progress the utility made over the three-year plan cycle and whether the utility matured in its understanding of its own wildfire ignition risks and appropriate mitigations to decrease those risks.

1.3 2022 Evaluation Process

Energy Safety issued WMP Update Guidelines (Guidelines) on December 15, 2021. The Guidelines streamline the reporting and evaluation and incorporate the requirements of SB 533 (Stats. 2021, Ch. 244). Pursuant to the adopted Guidelines, PacifiCorp submitted its 2022 Update on May 6, 2022.

Energy Safety begins evaluating WMPs and Updates by reviewing the submittal for completeness. Energy Safety begins evaluating WMPs and Updates by reviewing the submittal for completeness. Energy Safety determines whether the submittal addresses the statutory requirements contained in Public Utilities Code section 8386(c) and the Guidelines. Energy Safety does not conduct a substantive evaluation at that time. If the WMP or Update is not complete, Energy Safety may reject the plan and require the utility to resubmit.

Once Energy Safety determines the WMP or Update is complete, Energy Safety begins its assessment using the criteria listed in Section 1.3.2. The prior year's WMPs or Updates are included in the review to gauge progress and trends.

At any time during the evaluation, Energy Safety may issue a Revision Notice for reasons listed in Section 1.3.2. The utility must respond to the Revision Notice and revise and resubmit the relevant sections of its WMP or Update.

1.3.1 Rejection for Incompleteness

Pursuant to the Guidelines, "Energy Safety will first evaluate each electrical corporation's 2022 WMP Update as submitted for completeness based on the statutory requirements and adherence to the 2022 Guidelines," and "Energy Safety will reject without further review any WMP that does not satisfy initial completeness checks." [10]

PacifiCorp's 2022 Update, submitted to Energy Safety on May 6, 2022, did not satisfy the completeness requirements. Consequently, Energy Safety issued a Rejection for Incompleteness and Order to Resubmit to PacifiCorp on June 15, 2022.[11] PacifiCorp resubmitted its 2022 Update on July 18, 2022.[12]

1.3.2 Energy Safety Evaluation Criteria

Energy Safety evaluated 2022 Updates according to the following factors:

- *Completeness:* The utility comprehensively responds to the statutory requirements contained in Public Utilities Code section 8386(c) and Energy Safety's Guidelines.
- *Technical and programmatic feasibility and effectiveness:* The proposed initiatives are technically feasible and effective in addressing the risks that exist in the utility's service territory. The proposed initiatives are programmatically feasible for the specific utility given its maturity and progress to date.
- *Resource use efficiency:* The proposed 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 demonstrates sufficient progress on objectives and program targets reported in its 2021 Update.
- *Forward-looking growth:* The utility demonstrates a clear action plan to continue reducing utility-related ignitions and the scale, scope, and frequency of Public Safety

[10] Final 2022 Wildfire Mitigation Plan Update Guidelines, Attachment 5, p.4 (accessed August 30, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

[11] Rejection for Incompleteness and Order to Resubmit PacifiCorp 2022 Wildfire Mitigation Plan Update (accessed Sept. 29, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52539&shareable=true.

[12] All references to PacifiCorp's 2022 Update throughout this Decision refer to PacifiCorp's resubmission dated July 18, 2022.

Power Shutoff (PSPS) events.[13] In addition, the utility focuses sufficiently 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 augmented vegetation management.

- *Progress metrics:* The utility tracks the degree to which its wildfire mitigation activity has changed the conditions of its wildfire risk exposure in terms of drivers of ignition probability.
- *Outcome metrics:* The utility uses outcome metrics to measure its performance and outcomes in 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:* The utility uses targets to track its progress toward specific objectives for its wildfire mitigation activities.[14] Program targets track the utility's pace of activity completion as laid out in the WMP but do not track the efficacy of its activities. The primary use of these program targets is to track utility progress with its WMP.

To assess PacifiCorp's 2022 Update, Energy Safety relied on:

- PacifiCorp's 2022 Update and resubmitted 2022 Update
- Input from the California Department of Forestry and Fire Protection (CAL FIRE)
- Public and Stakeholder Comments
- PacifiCorp's response to the Utility Wildfire Mitigation Maturity Survey (Maturity Survey)
- PacifiCorp's data submissions
- PacifiCorp's responses to data requests

[13] 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.

[14] Objectives are unique to each utility and reflect the 1-, 3-, and 10-year projections of progress toward the WMP goal.

Energy Safety's assessment of PacifiCorp's 2022 Update is summarized in Section 4.

1.3.3 Revision Notices

Public Utilities Code section 8386.3(a) states, "Before approval, the division may require modifications of the plan." Energy Safety effectuates this provision by issuing a Revision Notice. The purpose of a Revision Notice is to hold utilities accountable for:

- Submitting a sufficiently detailed 2022 Update
- Addressing issues or improvement requests from the previous year
- Providing adequate data and information to justify proposed mitigation strategies.

Examples of when Energy Safety may choose to issue a Revision Notice include, but are not limited to, the following:

- The utility failed to implement the remedies detailed in the prior year's Decision[15]
- The utility did not provide sufficient information for evaluation
- The utility made a significant shift in its wildfire mitigation strategy without sufficient substantiation
- The utility's submission does not meet evaluation criteria listed in Section 1.3.1
- An element of the WMP that is critical to life-safety or property is unsatisfactory

Energy Safety did not issue a Revision Notice to PacifiCorp for its 2022 Update.

1.3.4 Final Decision

Upon completion of its review, Energy Safety determines whether each utility's 2022 Update will be:

- Approved (approval may include a requirement that the utility demonstrate continued growth in its 2023 WMP), or
- Denied (the utility does not have an approved 2022 Update and must reapply for approval in 2023).

[15] Also called an Action Statement (2020, 2021).

Energy Safety's approval of a WMP or WMP Update does not mean that the utility has reached the highest levels of maturity or has reduced its ignition risk to zero. Rather, approval means the utility has satisfied the evaluation criteria and substantiated its mitigation strategy such that implementation of the plan is appropriate. When Energy Safety approves a WMP or WMP Update, it does so with an eye toward continued improvement. Therefore, in this Decision, Energy Safety lists areas where the utility must continue to mature in its capabilities, known as areas for continued improvement.

2. Energy Safety Decision on PacifiCorp's 2022 Update

Pursuant to Public Utilities Code section 8386.3(a), this Decision is the totality of Energy Safety's review of PacifiCorp's 2022 Update. PacifiCorp's 2022 Update is approved.

3. Public and Stakeholder Comments

Energy Safety invited stakeholders, including members of the public, to provide comments on the utilities' 2022 Updates. WMP comments were due on June 20, 2022, and reply comments were due on June 27, 2022. The Rejection for Incompleteness and Order to Resubmit extended the comment date to August 15, 2022, and the reply comment date to August 22, 2022. The following individuals and organizations submitted comments:

- California Department of Fish and Wildlife (CDFW)
- The Public Advocate's Office (Cal Advocates)
- Green Power Institute (GPI)
- Rural County Representatives of California (RCRC)

Comments received on the 2022 Updates can be viewed in the 2022 Wildfire Mitigation Plan Updates (2022-WMPs) docket log.[16]

Energy Safety evaluated these comments and concurred with and in some instances incorporated the following stakeholder input on PacifiCorp's 2022 Update, as reflected in this Decision:

- Energy Safety should require PacifiCorp to provide additional detail on how it employs risk assessment and mapping tools for its decision making (Cal Advocates)
- Energy Safety should require PacifiCorp to demonstrate that its pole replacement targets are realistic and explain why it missed 2021 targets (Cal Advocates)
- Energy Safety should require PacifiCorp breakout its Line Rebuild program, including its covered conductor and pole replacement programs (Cal Advocates and GPI)
- Energy Safety should require PacifiCorp to provide analysis that supports the selection of two undergrounding projects (Cal Advocates)

[16] 2022 Wildfire Mitigation Plan Updates (2022-WMPs) docket log: https://efiling.energysafety.ca.gov/Lists/DocketLog.aspx?docketnumber=2022-WMPs (accessed April 14, 2022).

- Energy Safety should require PacifiCorp to address why its wildfire suppression equipment is not stored within its California territory (GPI)
- Energy Safety should require PacifiCorp to improve its quality assurance/quality control (QA/QC) process for asset inspections (Cal Advocates)
- Energy Safety should require PacifiCorp to provide risk-spend efficiency (RSE) estimates to justify its decision-making process for wildfire mitigation initiatives (GPI)
- PacifiCorp should consult CDFW and other responsible agencies as early as possible when implementing wildfire mitigation activities to complete the required environmental documents and discretionary reviews (CDFW)

4. Energy Safety's Assessment of PacifiCorp's 2022 Update

The following sections present Energy Safety's comprehensive evaluation of PacifiCorp's 2022 Update, including Energy Safety's assessment of progress over the past year and throughout the current WMP cycle. Energy Safety looks at PacifiCorp's past and current WMP and Update submissions to assess year-over-year trends and track Energy Safety's past requirements as well as the utility's own projections. In addition to comparing PacifiCorp's initiatives from year to year, Energy Safety also assesses any new programs, plans, or technologies PacifiCorp is proposing in its 2022 Update. The sections below assess past progress, encourage growth through new initiatives or approaches, and identify areas for continued improvement following up on 2021 requirements.

Energy Safety found PacifiCorp's initial 2022 Update incomplete and issued a Rejection for Incompleteness and Order to Resubmit on June 15, 2022.[17] PacifiCorp resubmitted its 2022 Update on July 18, 2022. Energy Safety reviewed PacifiCorp's resubmitted 2022 Update and found it to be complete.[18] Energy Safety then proceeded to do a substantive evaluation of PacifiCorp's resubmitted 2022 Update as set forth in the subsequent sections.

4.1 Introductory Sections of the WMP

The introductory sections of the Guidelines[19] 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, Section 1 requires inclusion of the name and relevant background and credentials for all experts consulted in

[17] Energy Safety Rejection for Incompleteness (accessed October 10, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52539&shareable=true.

[18] PacifiCorp's resubmitted 2022 Update (accessed October 10, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52700&shareable=true.

[19] Final 2022 Wildfire Mitigation Plan Update Guidelines, Attachment 2.1 and 2.2 pp. 25-35 (accessed February 15, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

preparation of the 2022 Update. Contact information and names may be submitted in a redacted file.

Section 2 requires the utility to specify the location of the information required by Public Utilities Code section 8386(c). Each utility must affirm that the WMP Update addresses each statutory requirement AND cite the section and page number(s) where each statutory requirement is addressed.

PacifiCorp provides the required information in Sections 1 and 2 of its 2022 Update, including all information required by Public Utilities Code section 8386(c).

4.2 Actuals and Planned Spending for Mitigation Plan

The actuals and planned spending section of the Guidelines[20] requires utilities to report a summary of WMP expenditures, actual and planned, for the current WMP cycle. This summary must include an estimated annual increase in costs to the ratepayer due to utility-related ignitions and wildfire mitigation activities. The Guidelines require that ratepayer impact calculations be clearly shown to demonstrate how the utility derived each value.[21]

PacifiCorp provides all required information regarding expenditures.

Energy Safety monitors expenditure data for accuracy and consistency. See Table 4.2-1 below for a comparison of the WMP actual and planned expenditures of the three small and multi-jurisdictional utilities (SMJUs).

[20] Final 2022 Wildfire Mitigation Plan Update Guidelines, Attachment 2.3 pp. 37-40 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

[21] Nothing in the request for such information should be construed as approval of any such expenditure, which is left to the CPUC pursuant to Public Utilities Code section 8386.4(b).

Table 4.2-1: Actual and Planned WMP Expenditures – SMJUs (2020-2022) ($ Thousands)

Utility	2020 Actual	2021 Actual	2022 Planned	Total WMP Cycle as Reported in 2022
BVES	$17,208.7	$21,332.28	$20,438.97	$58,979.94
Liberty	$33,331.1	$33,567.54	$55,126.5	$122,025.1
PacifiCorp	$18,520.26	$42,149.45	$91,899.79	$152,569.5

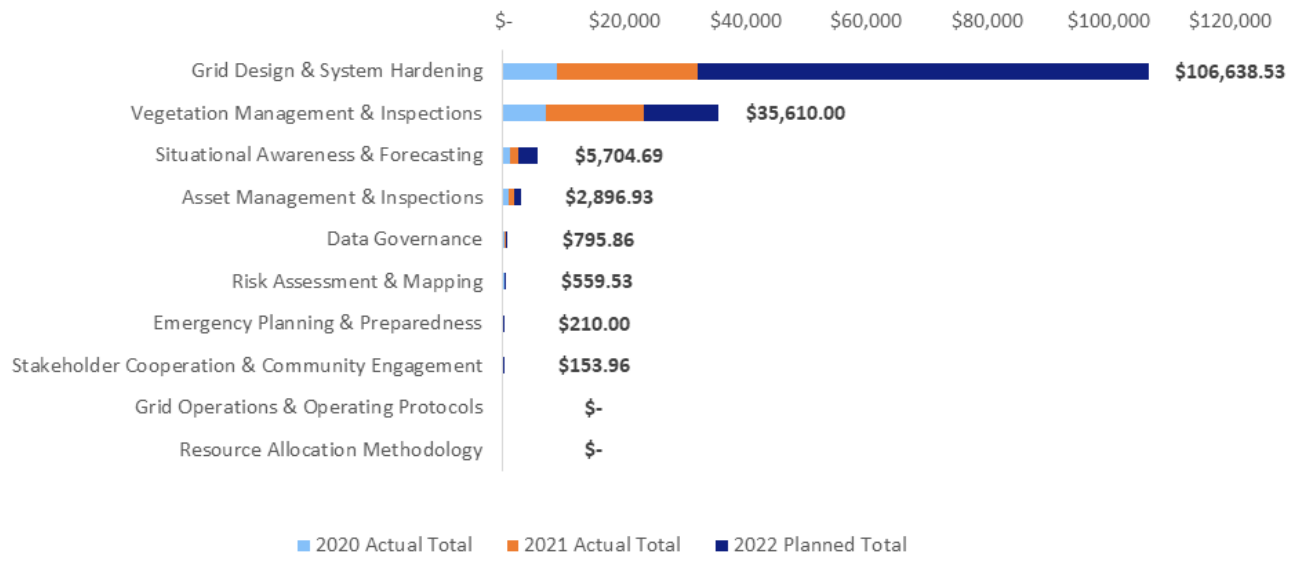
PacifiCorp did not meet its planned spending goals in 2020 by a cumulative total of $6,491,000; however, PacifiCorp surpassed its 2021 spending goals by a total of $8,774,000. Actual spending in 2021 was less than planned in two categories: grid design and system hardening and stakeholder cooperation and community engagement.

PacifiCorp reports no spending in the program categories of grid operations and operating protocols and resource allocation methodology.

PacifiCorp's WMP expenditures are largest in the program categories of grid design and system hardening and vegetation management and inspections, which make up approximately 69.90 percent and 23.34 percent, respectively, of PacifiCorp's actual and planned WMP spending from 2020 to 2022 (see Figure 4.2-1). All other program spending totaled together was modest in comparison (approximately 6.77 percent).

See Figure 4.2-1 below for a comparison between actual spending in 2020, actual spending in 2021, and planned spending in 2022 across mitigation categories.

Figure 4.2-1: PacifiCorp Actual and Planned WMP Spending by Category ($ Thousands)



4.3 Lessons Learned and Risk Trends

The lessons learned and risk trends section of the Guidelines[22] requires utilities to report how their plans have evolved since 2021 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.

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

- Describe how it monitors and accounts for the contribution of weather and fuel to ignition probability and wildfire consequence.

[22] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.4 pp. 41-50 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

- Identify any areas where the CPUC's high fire threat district (HFTD) should be modified.
- Identify any areas classified by the utility as "high fire threat" that differ from the CPUC's HFTD and explain why these areas are so classified.
- Rank trends anticipated to have the greatest impact on ignition probability and wildfire consequence.

PacifiCorp provides all required information on lessons learned, current risk trends, and research conducted.

PacifiCorp describes its lessons learned in 2021 across the 10 WMP program categories.[23] However, multiple subsections describe general lessons learned without detailing how they informed PacifiCorp's 2022 Update (e.g., how a lesson learned resulted in subsequent implementation or refinement of a mitigation initiative). This is an area that PacifiCorp must improve upon in 2023 (see Section 4.3.1 for details).

PacifiCorp currently monitors and accounts for the contribution of weather to ignition probability and estimated wildfire consequence using situational awareness modeling tools, including its own in-house Weather Research and Forecast (WRF) model. At this time PacifiCorp does not have a formal combined index, such as the Fire Potential Index (FPI) used by other electrical corporations; however, PacifiCorp states that development is in progress that aligns with the information learned through workshops. To better understand the weather's contribution to wildfire risk and consequence, PacifiCorp is taking a two-pronged approach that uses what PacifiCorp calls "big data analytics" as well as existing wildfire modeling technologies. PacifiCorp describes "big data analytics" as its effort in which it is actively creating a 30-year, 2 km-resolution, hourly WRF reanalysis of weather variables and fire weather indices across much of the western U.S. PacifiCorp states that, once complete, these data will be correlated with historical fire occurrence and consequence to improve its weather-related thresholds with respect to wildfire risk.[24]

In 2021, PacifiCorp reported using the Localized Risk Assessment Model (LRAM) to evaluate areas outside of the Commission-adopted HFTD and identify any aspects of the HFTD that

[23] PacifiCorp's 2022 Update, pp. 31-34.

[24] PacifiCorp's 2022 Update, pp. 36-37.

should be modified or adopted. Based on its LRAM fire/climate scores, PacifiCorp determined two areas that may be candidates for consideration for being added to the HFTD: Crescent City toward Klamath Glen and Montague. In 2022, PacifiCorp has not identified any new areas where an HFTD expansion is warranted and maintains its previously established HFTD map.[25]

4.3.1 Areas for Continued Improvement

PacifiCorp must continue to improve in the following areas:

PacifiCorp must provide examples and future plans for implementing specific lessons learned. For example, under PacifiCorp's Section 4.1.3, which lists its lessons learned in the grid design and system hardening category, PacifiCorp lists one of its lessons learned as "The ability to underground certain areas can rely heavily on effective alignment with landowners."[26] It is unclear what has been done and what steps are being taken as a result of this lesson. There are many such examples of lessons learned throughout Section 4.1 in which PacifiCorp does not specify how it has or plans to implement changes to follow up on the lessons learned. In its 2023 WMP, PacifiCorp must provide concrete examples of outcomes or future plans as a result of specific lessons learned.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 7.

4.4 Inputs to the Plan and Directional Vision for the WMP

The inputs and directional vision section of the Guidelines[27] requires the utility to rank and discuss trends it anticipates may have 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,

---

[25] PacifiCorp's 2022 Update, p. 39.

[26] PacifiCorp's 2022 Update, p. 32.

[27] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.5 pp. 52-57 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

utilities must report the current and planned qualifications of their workforce to meet these objectives.

4.4.1 Goal, Objectives, and Program Targets

The goal of the WMP is to ensure the utilities are sufficiently planning to reduce the number of ignitions caused by utility actions or equipment and minimize the societal consequences (with specific consideration of the impact on access and functional needs [AFN] populations and marginalized communities) of both wildfires and PSPS events.

This subsection of the Guidelines[28] requires utilities to provide their objectives, which are unique to each utility and reflect their 1-, 3-, and 10-year projections of progress toward the abovementioned goal. The Guidelines also require utilities to report their unique program targets, which are quantifiable measurements of activities identified in WMPs and Updates to show the utility's progress toward reaching its objectives.

PacifiCorp provides the required information.

4.4.2 Workforce Planning

This subsection of the Guidelines[29] requires utilities to report their worker qualifications and training practices regarding utility-related ignitions and PSPS mitigation for workers in mitigation-related roles including:

- Vegetation inspections
- Vegetation management projects
- Asset inspections
- Grid hardening
- Risk event inspection

[28] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.5.1-2.5.3 pp. 53-54 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

[29] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.5.4 pp. 56-57 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

PacifiCorp provides all required information regarding worker qualifications and training practices within each listed role.

4.5 Metrics and Underlying Data

The metrics and underlying data section of the Guidelines[30] requires utilities to report metrics and program targets as follows:

- *Progress metrics* that track how much utility wildfire mitigation activity has changed 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* that track the utility's pace of completing proposed wildfire mitigation activities to show progress toward a utility's specific objectives. Program targets do not track the efficacy of wildfire mitigation activities. The primary use of these program targets in 2022 is to assess the progress the utility made over the three-year plan cycle and whether the utility matured in its understanding of its own wildfire ignition risks and appropriate mitigations to decrease those risks.

This section also requires utilities to provide several 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 Section 4.6.7, "Data Governance," for a detailed review of the utility's progress and areas for continued improvement in this topic area.

The following figures provide information on how the three SMJUs compare over the period 2015-2021 in actual numbers and 2022-2023 in projected numbers in terms of reported ignitions (Figure 4.5-1), risk events (Figure 4.5-2), Red Flag Warning circuit mile days per year

[30] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.6 pp. 58-69 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

(Figure 4.5-3), and asset inspection findings normalized by circuit miles inspected (Figure 4.5-4).

Figure 4.5-1: Ignitions per 10,000 Overhead Circuit Miles – SMJUs (2015-2021 Actual, 2022-2023 Projected)

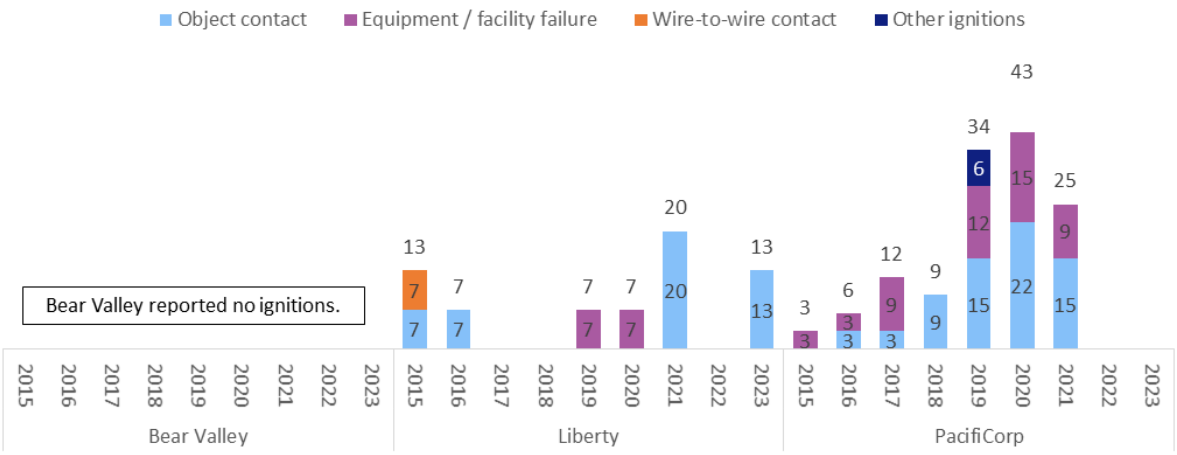


Figure 4.5-2: Risk Events per Overhead Circuit Mile – SMJUs (2015-2021 Actual)

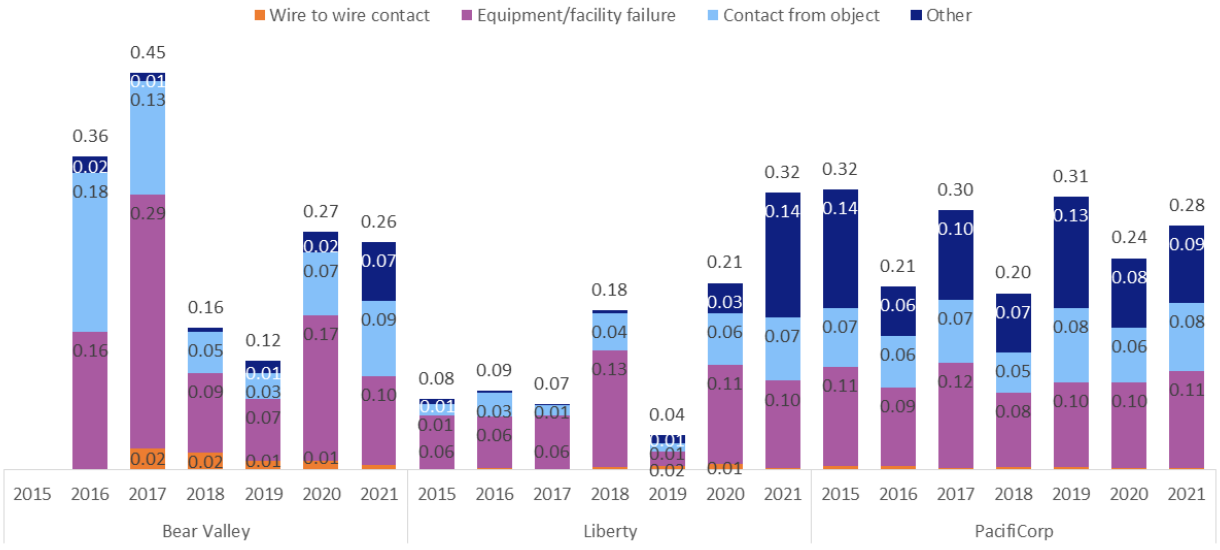


Figure 4.5-3: Red Flag Warning Overhead Circuit Mile Days per Year – SMJUs (2015-2021 Actual)

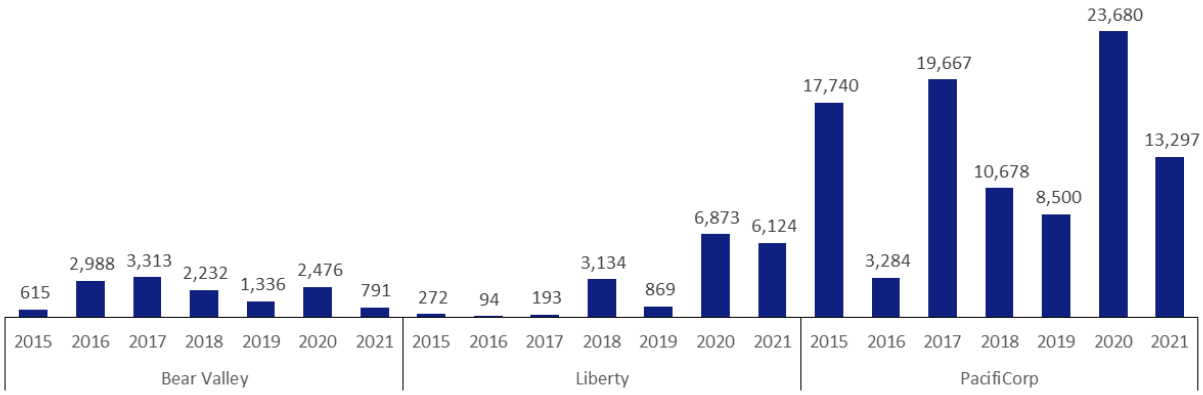
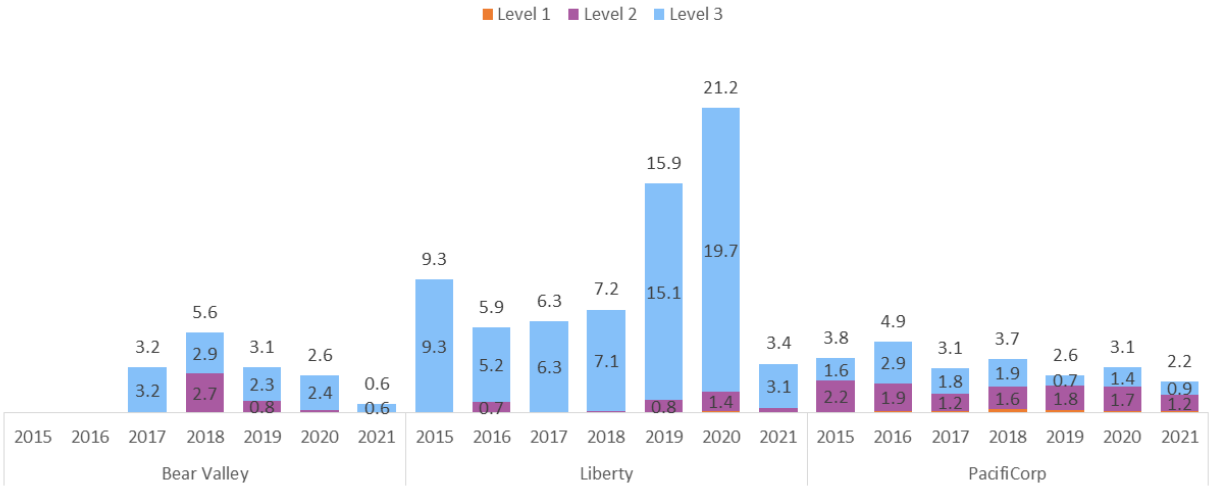


Figure 4.5-4: Asset Inspection Findings Normalized by Circuit Miles Inspected – SMJUs (2015-2021 Actual)



4.6 Mitigation Initiatives and Maturity Evaluation

The mitigation initiatives and maturity evaluation section of the Guidelines[31] requires the utility to describe in its WMP Update each mitigation initiative it will undertake to reduce the risk of catastrophic wildfire. The Guidelines require the utility to self-report its current wildfire risk mitigation capabilities and plans for improvement in those capabilities.[32, 33] The utility's self-reported capability level is referred to in this Decision as "maturity" and measured by Energy Safety's Utility Wildfire Mitigation Maturity Model (Maturity Model). Maturity levels range from zero to four, with four being the most mature. The utility reports on its maturity levels and mitigation initiatives using the same 10 categories, allowing Energy Safety to evaluate a utility's reported and projected maturity in wildfire mitigation in the context of its corresponding current and planned initiatives. The 10 maturity and mitigation initiative categories are listed below, with further details in Appendix D:

- Risk assessment and mapping
- Situational awareness and forecasting
- Grid design and system hardening
- Asset management and inspections

---

[31] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.7 pp. 70-77 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

[32] The 2020 WMP Guidelines introduced the Utility Wildfire Mitigation Maturity Assessment as one of the four "key elements of the 2020 WMP submission and review process" (accessed April 29, 2022): https://energysafety.ca.gov/wp-content/uploads/docs/misc/docket/322133494.pdf.
The 2022 WMP Guidelines further defines the assessment process in Attachment 4: 2022 Maturity Model (accessed April 29, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true. From that document (p. 3): "Energy Safety requires each utility to complete an annual Maturity Survey to report on its current capabilities and plans for improvement in those capabilities."

[33] Utilities that submitted a WMP were required to complete a survey (the Maturity Survey) in which they answered specific questions that 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 10 categories identified for mitigation initiatives. The most recent survey for each utility, including SDG&E, can be found on the Energy Safety website here: https://energysafety.ca.gov/what-we-do/electrical-infrastructure-safety/wildfire-mitigation-and-safety/wildfire-mitigation-plans/2022-wmp/ (accessed February 15, 2022).

- Vegetation management and inspections
- Grid operations and operating protocols
- Data governance
- Resource allocation methodology
- Emergency planning and preparedness
- Stakeholder cooperation and community engagement

Below, Energy Safety evaluates PacifiCorp's initiatives across the 10 categories in terms of the utility's Maturity Survey responses. Energy Safety discusses the utility's maturity progress for each category within the relevant wildfire mitigation initiative section.

4.6.1 Risk Assessment and Mapping

The risk assessment and mapping section of the Guidelines[34] requires the utility to discuss the risk assessment and mapping initiatives implemented to minimize the risk of utility-related ignitions. Utilities must describe initiatives related to equipment maps and modeling of overall wildfire risk, ignition probability, wildfire consequence, risk reduction impact, match-drop simulations,[35] and climate/weather-driven risks.

The parameters of risk assessment (discussed here) and resource allocation (discussed later in Section 4.6.8) to reduce wildfire risk derive from the CPUC's Risk-Based Decision-Making Framework (formerly S-MAP) and RAMP proceedings.[36]

[34] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.7.3 p. 74 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

[35] 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.

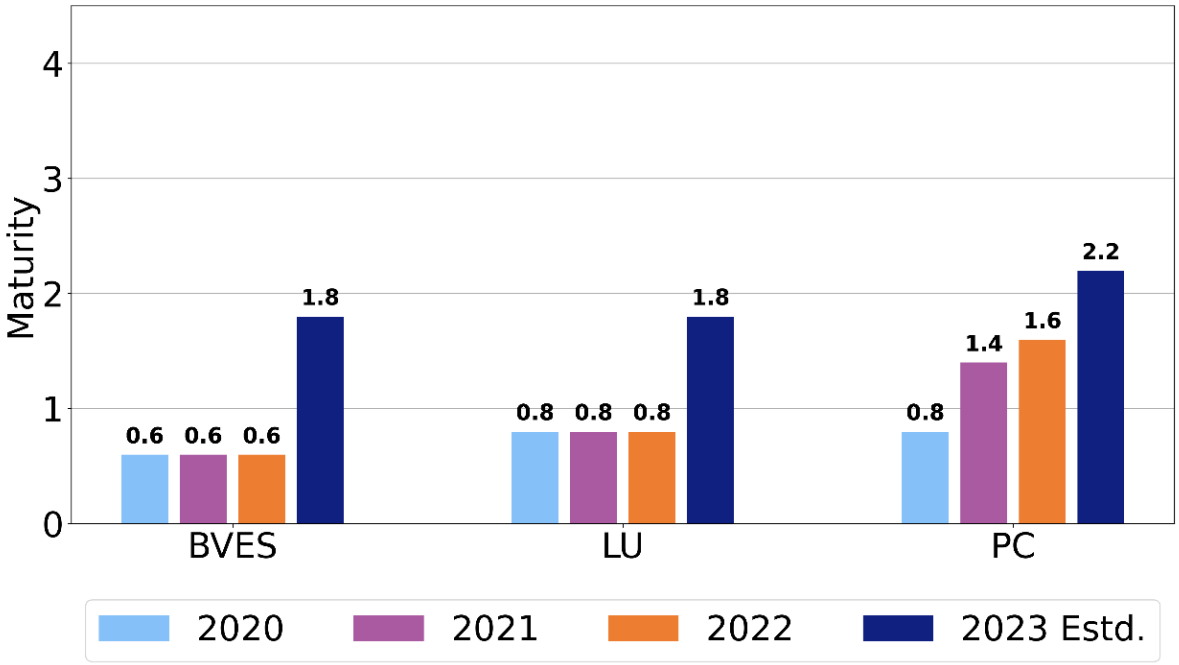
[36] The risk-based decision-making framework was adopted in the CPUC's D. 18-12-014 and refined in D. 21-11-009. An open CPUC proceeding R. 20-07-013 is addressing further developments to the risk-based decision-making framework. See the docket for this proceeding here: https://apps.cpuc.ca.gov/apex/f?p=401:56:0::NO:RP,57,RIR:P5_PROCEEDING_SELECT:R2007013 (accessed February 16, 2022).

The utility's risk modeling should ultimately inform the utility of the highest risk areas in order to inform its decision-making processes, along with the risk-spend efficiency (RSE) analyses discussed in Section 4.6.8.

4.6.1.1 Maturity Assessment

PacifiCorp's maturity in risk assessment and mapping has seen a large increase across the current WMP cycle, starting at a level of 0.8 in 2020 and increasing to 1.6 in 2022, according to its responses to the 2022 Maturity Survey (see Figure 4.6.1-1). PacifiCorp's current maturity in this category is significantly higher than those of Bear Valley Electric Service Inc. (Bear Valley) (0.6) and Liberty Utilities (Liberty) (0.8) as of 2022. PacifiCorp projects a further increase in its risk assessment and mapping maturity in 2023.

Figure 4.6.1-1: Cross-Utility Maturity for Risk Assessment and Mapping – SMJUs (2020-2022 Actual, 2023 Estimated)



PacifiCorp has progressed or plans to progress in the following areas:

- PacifiCorp's ignition risk calculation tool moved from partially (less than 50%) to fully automated.[37]
- PacifiCorp includes experts and real-time learning as part of its ignition risk assessment confirmation.[38]
- PacifiCorp's ignition risk estimation process increased granularity from span-based to asset-based.[39]
- For its ignition risk impact assessment tool, PacifiCorp now includes vegetation specifics immediately surrounding an ignition site, as well as up-to-date moisture content and local weather patterns.[40]

PacifiCorp's risk assessment and mapping maturity is currently limited by the following:

- PacifiCorp does not use real-time learning during weather events to update its climate scenarios.[41]
- PacifiCorp only uses low or high risk categories for estimated consequence to communities, as opposed to quantitatively.[42]
- PacifiCorp includes potential fatalities, as well as structures burned and/or area burned as part of its metrics used to estimate the consequence of ignition risk.[43] Further maturity in this area would include monetary damages, impact on air quality, and impact on greenhouse gas (GHG) reduction goals as additional metrics.

[37] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to A.II.b.

[38] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to A.II.b.

[39] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to A.III.e.

[40] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to A.III.g.

[41] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to A.I.b.

[42] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to A.III.a.

[43] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to A.III.b.

- PacifiCorp's ignition risk estimation process and ignition risk reduction impact assessment is not fully automated (greater than 50%).[44]
- PacifiCorp estimates risk reduction potential of initiatives using an ordinal scale, as opposed to quantitatively with confidence intervals.[45]
- PacifiCorp's protocol for updating risk mapping algorithms is based on detected deviations of the risk model to ignitions and propagation, with deviations detected manually, as opposed to continuously in real-time.[46]
- PacifiCorp does not currently use data from other utilities or sources to determine whether to update algorithms.[47]

4.6.1.2 PacifiCorp's Progress

PacifiCorp has made the following progress thus far in the current WMP cycle:

Risk Modeling Development and Integration

PacifiCorp completed the first phase of its Localized Risk Assessment Model (LRAM), which considers both utility and environmental risk to output combined risk scores. PacifiCorp also intends to implement a third-party's consequence risk modeling by its 2023 WMP. The implementation of this model also includes integration of modeling of ignition likelihood, further development of a resource allocation methodology, and more detailed analysis for operational decision making for mitigation selection.

Arc Energy Risk Model

PacifiCorp completed its pilot of the Available Probabilistic Arc Energy Risk model, and intends to adopt the model long-term over the next five years, with the model being a data element within PacifiCorp's LRAM. PacifiCorp found that the pilot identified locations that had a higher risk of having damaged conductor or ignitions relating to equipment failure.

---

[44] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to A.III.d and A.IV.b.

[45] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to A.IV.a.

[46] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to A.V.a and A.V.b.

[47] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to A.V.e.

PacifiCorp intends to continue to use this arc energy risk model to evaluate its distribution system and score relative ignition risk to identify locations for system improvements.

Ignition Decreases

PacifiCorp reported a decrease in its ignitions from 2020 to 2021, including from both contacts from objects (CFO) and equipment facility failures (EFF), as seen in Table 4.6.1-1 This could be in part to successful implementation of mitigations across the years, therefore decreasing the likelihood of ignitions across PacifiCorp's territory.

Table 4.6.1-1: PacifiCorp Total Ignitions from 2015 to 2021[48]

Type	2015	2016	2017	2018	2019	2020	2021
CFO	0	1	1	3	4	7	4
EFF	1	1	3	0	4	5	3
Total	1	2	4	3	11	14	8

4.6.1.3 Areas for Continued Improvement

In addition to progress made, PacifiCorp must continue to improve in the following areas:

Climate Change Understanding and Implementation

While PacifiCorp includes discussion of improvements to its future climate projections, PacifiCorp needs to include more dynamic analysis of climate change impacts on risk and account for long-term risks as part of its initiative selection process. PacifiCorp discusses analyzing research relating to climate change to better understand changes that could occur within its service territory, particularly within the high fire threat district (HFTD). However,

[48] "CFO" stands for contact from objects and "EFF" stands for equipment and facility failures. The total number also includes ignitions outside of these two categories, such as from wire-to-wire contacts and contamination, so may not be equivalent to the sum of CFO and EFF ignitions. These two categories had the most ignitions, hence why others are not represented within this table.

PacifiCorp does not directly discuss how it intends to account for climate change within its modeling to predict which areas will be most impacted and how. PacifiCorp needs to work with other utilities to evaluate best practices for climate change moving forward.

Further Integration of Community Vulnerability

While PacifiCorp identifies and considers access and functional needs (AFN) customers as part of its PSPS risk, PacifiCorp does not indicate how community vulnerability is integrated into its risk modeling. Factors such as income disparity, disability, and age diversity population ratios are vital in understanding communal impacts of wildfire risk. Socially vulnerable areas could face more devastating impacts with fewer resources available for recovery. PacifiCorp must evaluate and incorporate such factors as part of wildfire consequence risk modeling and should work with other utilities to determine best practices.

Wildfire Consequence Modeling Improvements

Current risk models are limited in their evaluation of wildfire spread based on timing limitations as well as suppression effects. For timing, it is important to evaluate spread over long periods of time to capture the potential risk of an ignition leading to a catastrophic fire. For suppression, spread models may overestimate the size of spread as effects of suppression are not accounted for, which may limit and reduce spread. In order to obtain more accurate results of consequence risk, PacifiCorp must evaluate how to account for these within its existing risk models.

As part of Energy Safety's 2022 WMP final decisions, Energy Safety requires the three large investor-owned utilities (IOUs) to evaluate spread timing and suppression effects for consequence spread modeling. PacifiCorp must participate in these evaluations, as covered within the Risk Modeling Working Group established by the 2021 WMP reviews.

Prioritization Based on Top-Risk Calculations

As part of the 2022 WMP Guidelines, utilities were required to submit a table that demonstrated the targeted percentage of work utilities are conducting in a self-defined top risk categories and areas. While PacifiCorp provided Table 5.2 containing this information, PacifiCorp did not use its risk modeling outputs to develop a more granular understanding of risk based on risk ranking. Instead, PacifiCorp determined the top-risk percentages based on HFTD Tier 2 and 3 designations for all initiatives. This equated to 3 percent in Tier 3, 38 percent in Tier 2, and 59 percent in areas outside the HFTD. This does not adequately

demonstrate how PacifiCorp is prioritizing based on its calculations for areas of top risk, nor how PacifiCorp is using its risk modeling to inform its top-risk calculations.

PacifiCorp must demonstrate how it has used its risk modeling to determine the areas of highest risk and must prioritize projects based on the highest risk areas. Currently, PacifiCorp has oversimplified the calculation of top risk, which obscures how PacifiCorp understands and plans mitigations based on known risk.

Lessons Learned From Past Wildfires

Within its 2022 WMP, PacifiCorp provides no indication of lessons learned from recent PacifiCorp-reported catastrophic fires. Within California, this includes the Slater Fire, which started in September 2020, and the McKinney Fire, which started in July 2022. Although still under active investigation, PacifiCorp reported both fires to the CPUC. Once conclusions are drawn relating to the cause of the fires, PacifiCorp must demonstrate what it has learned from these fires and any other catastrophic fires, both in terms of its selection of initiatives and changes to procedures. PacifiCorp must investigate the root causes of its ignitions at the programmatic and systemic levels and take steps to prevent similar ignitions from occurring in the future.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 7.

4.6.2 Situational Awareness and Forecasting

A strong weather monitoring and situational awareness system is an essential ignition risk reduction strategy: it mobilizes a utility's response to potentially dangerous fire weather conditions and informs its decisions on PSPS implementation, grid design, and system hardening. It is also one of the least expensive risk reduction strategies.

The situational awareness and forecasting section of the Guidelines[49] 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

[49] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.7.3 p. 74 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

likelihood of utility ignitions based on grid and asset conditions, wind, fuel conditions, temperature, and other factors.

The Guidelines refer to key situational awareness measures, including:

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

4.6.2.1 Maturity Assessment

According to its responses to the 2022 Maturity Survey, PacifiCorp has an average maturity level of 1.0, an increase from its average level of 0.8 at the beginning of the WMP cycle (Figure 4.6.2-1). PacifiCorp's increase in maturity is primarily a result of collecting more granular weather data to reliably measure weather conditions,[50] moving from a regional weather resolution granularity to circuit-based,[51] using a mostly automated process for error-checking weather stations,[52] and using weather data to create visual and configurable live maps to help with decision making.[53]

[50] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to B.IIa.

[51] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to B.II.c.

[52] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to B.IV.b.

[53] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to B.IV.c.

PacifiCorp projected in 2020 and 2021 that it would have well-defined equipment for detecting ignitions along the grid by the start of 2023.[54] PacifiCorp decreased in its maturity in this capability according to its response in the 2022 Maturity Survey, as it no longer plans to have a set of equipment for detecting ignitions along the grid by end of year 2022.[55]

In comparison, PacifiCorp's projected maturity level for 2023 is lower than that of Bear Valley and Liberty (Figure 4.6.2-1).

Areas limiting PacifiCorp's maturity in situational awareness include:

- The level of granularity to which its weather forecasts can be prepared.[56]
- The lack of equipment for detecting ignitions along the grid[57]

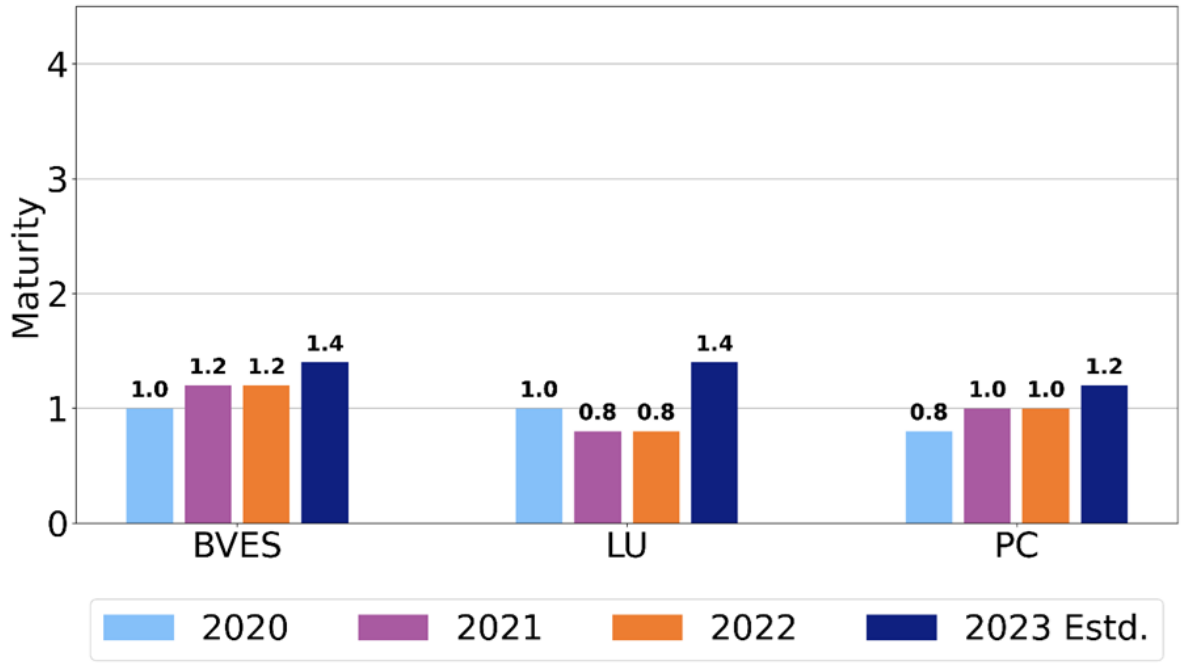
[54] PacifiCorp's 2020-21 Utility Wildfire Mitigation Maturity Survey, response to B.V.b.

[55] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to B.V.b.

[56] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to B.III.c

[57] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to B.V.b

Figure 4.6.2-1: Cross-Utility Maturity Levels for Situational Awareness - SMJU's (2020-2022 Actual, 2023 Estimated)



4.6.2.2 PacifiCorp's Progress

PacifiCorp has made the following progress thus far in the current WMP cycle:

- PacifiCorp plans to operationalize its high resolution 30-year Weather Research & Forecast (WRF) model by 2023 and generate a twice daily forecast across a 96-hour time period. PacifiCorp reports that the WRF model, the development of its Fire Potential Index (FPI), and updated wildfire consequence modeling software will improve its situational awareness of forecasted fire weather, identify risks to its assets, and better inform its PSPS decision making.
- In Q4 of 2021, PacifiCorp began gathering data to pilot installing distribution fault anticipation (DFA) technology on two circuits. PacifiCorp plans to complete the final installations of two additional circuits as part of its pilot by Q1 2023. This technology could improve its ability to detect incipient failures.
- PacifiCorp introduced a new initiative to install Communicating Fault Current Indicators (CFCI) on circuits where more sensitive settings are deployed during periods of high risk. In 2022, PacifiCorp plans to install 500 fault indicators in the more remote areas of its HFTD. PacifiCorp reports that this will enhance the accuracy of

locating faults, improve response times in the event of an ignition, and lead to potentially faster restorations times during outages.

4.6.2.3 Areas for Continued Improvement

In addition to progress made, PacifiCorp must continue to improve in the following areas:

Weather Station Density

PacifiCorp continues to install weather stations based on placement recommendations from its meteorology team but has not determined a total number of weather stations it plans to deploy in California.[58] In its 2023 WMP PacifiCorp must discuss its weather station to circuit mapping methodology for identifying spatial gaps in its network and its decision on an adequate number of weather stations for optimal density.

Wildfire Detection Program

PacifiCorp planned in 2020 and in 2021 to have well-defined equipment for detecting ignitions along the grid by the end of 2022. In 2022, PacifiCorp is still in the planning stage of high definition (HD) camera deployment and is the only utility that does not plan to have any HD cameras or fire detection in place by 2023. PacifiCorp must provide an update on the outcome from its 2022 wildfire detection program planning phase[59] and on its plan going forward for monitoring and detecting ignitions along its grid.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 7.

4.6.3 Grid Design and System Hardening

The grid design and system hardening section of the Guidelines[60] 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 utility-related ignitions resulting in catastrophic wildfires. This section also requires discussion of routine and non-routine

---

[58] Data Request OEIS-PC-22-001, Question 2.

[59] Data Request OEIS-PC-22-001, Question 5.

[60] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.7.3 pp. 74-75 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

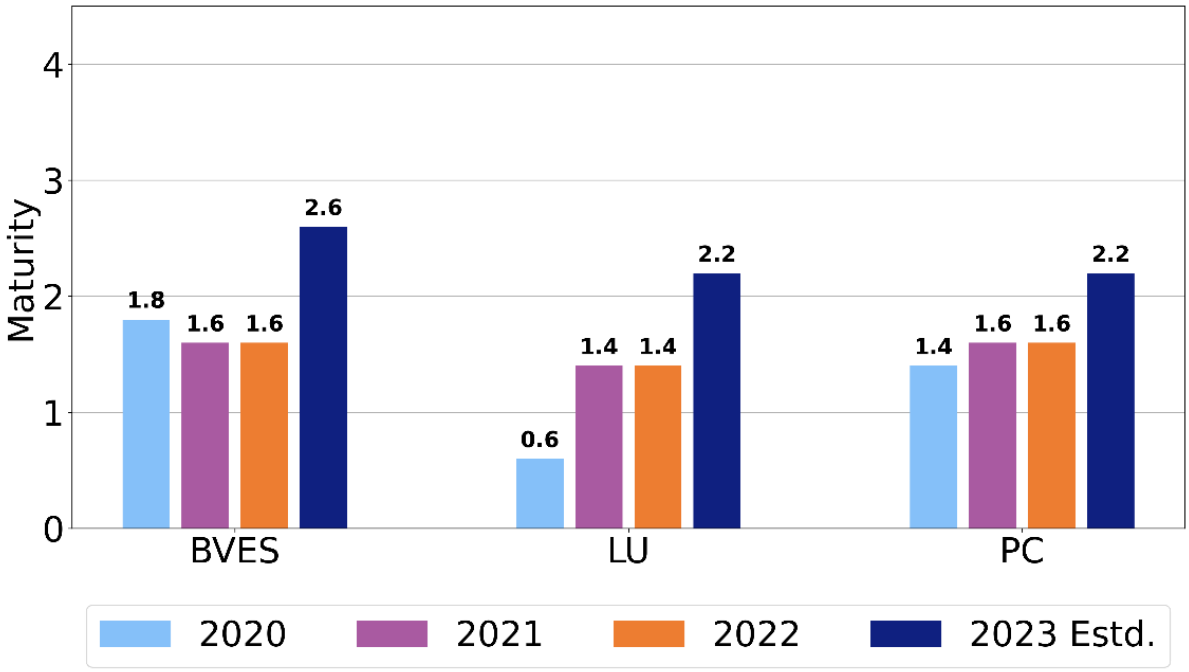
maintenance programs, including whether the utility replaces or upgrades infrastructure proactively rather than running facilities to failure. Programs in this category, which are often the most expensive aspects of a WMP, include initiatives such as the installation of covered conductors to replace 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:

- Capacitor maintenance and replacement
- Circuit breaker maintenance and installation to de-energize lines upon detecting a fault
- Covered conductor installation
- Covered conductor maintenance
- Crossarm maintenance, repair, and replacement
- Distribution pole replacement and reinforcement, including with composite poles
- Expulsion fuse replacement
- Grid topology improvements to mitigate or reduce PSPS events
- Installation of system automation equipment
- Maintenance, repair, and replacement of connectors, including hotline clamps
- Mitigation of impact on customers and other residents affected during PSPS events
- Other corrective action
- Pole loading infrastructure hardening and replacement program based on pole loading assessment program
- Transformer maintenance and replacement
- Transmission tower maintenance and replacement
- Undergrounding of electric lines and equipment
- Updates to grid topology to minimize risk of ignition in the HFTD
- Other areas if an initiative cannot feasibly be classified within those listed above

4.6.3.1 Maturity Assessment

PacifiCorp remained the same in its grid design and system hardening maturity from 2021 to 2022, with little increase from 2020, although its maturity level in this category is similar to those of Liberty and Bear Valley.

Figure 4.6.3-1: Cross-Utility Maturity Levels for Grid Design and System Hardening – SMJUs (2020-2022 Actual, 2023 Estimated)



PacifiCorp projects an increase in maturity in the following areas by 2023:

- PacifiCorp plans to include risk estimates across individual circuits as well as reliability risk into account when prioritizing initiatives, apart from only accounting for local geography and conditions.[61]
- PacifiCorp plans to apply its efforts to incorporate the latest asset management strategies and new technologies into grid topology across its entire service area.[62]
- PacifiCorp plans to increase the granularity of its grid hardening risk-spend efficiency estimates from the regional level to span-based.[63]

PacifiCorp's grid design and system hardening maturity is currently limited by the following:

[61] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to C.I.a.

[62] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to C.II.d.

[63] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to C.IV.b.

- PacifiCorp only meets General Order (GO) 95 requirements, instead of designing to exceed requirements in areas based on an understanding of ignition risk.[64]
- PacifiCorp does not provide microgrids nor islanding in areas of high wildfire risk.[65]
- PacifiCorp does not have redundancy for its distribution architecture for more than 50 percent of customers within the HFTD.[66]
- PacifiCorp's sectionalization for its distribution system allows for up to 2,000 customers along one switch, a much higher number than the higher-maturity option of 200 customers.[67]
- While PacifiCorp considers egress as an input for grid design, points are not available or mapped for each customer, and potential traffic is not mapped based on traffic simulation.[68]
- PacifiCorp does not include all grid hardening initiatives within its evaluation.[69]
- PacifiCorp's new hardening initiatives are not independently evaluated or field tested, nor is the performance of these initiatives independently audited.[70]

4.6.3.2 PacifiCorp's Progress

PacifiCorp has made the following progress thus far in the current WMP cycle:

Undergrounding Projects Planned

PacifiCorp has two undergrounding projects planned in 2023, totaling five miles. In its 2021 Update, PacifiCorp did not have any undergrounding projects planned, and was required to

[64] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to C.II.a.

[65] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to C.II.b.

[66] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to C.III.b.

[67] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to C.III.c.

[68] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to C.III.d.

[69] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to C.IV.d.

[70] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to C.V.a and C.V.c.

conduct further analysis for using undergrounding as a potential mitigation.[71] Through that analysis, PacifiCorp identified the viable projects where benefits included reduced maintenance costs, avoided cost increases needed at higher elevations for additional pole replacements, and limited permitting and construction constraints.

Expulsion Fuse Replacement Program

In 2022, PacifiCorp established a new program to replace expulsion fuses, as required by Energy Safety in its response to PacifiCorp's 2021 Update.[72] This program includes expediting replacements along with covered conductor construction, as well as expanding the replacement program for circuits within the HFTD not currently scheduled for covered conductor installation. PacifiCorp has a target for completing 2,269 expulsion fuse replacements in 2022 and plans to replace all fuses within the HFTD over the next few years.

4.6.3.3 Areas for Continued Improvement

In addition to progress made, PacifiCorp must continue to improve in the following areas:

Covered Conductor Effectiveness Lessons Learned

The joint covered conductor effectiveness study clarified the existing differences in approach toward and execution of covered conductor installation across utilities. However, PacifiCorp did not commit to applying any lessons learned. Many sections of the joint study state that the utilities will continue to do studies, collect documentation, or conduct discussion, rather than committing them to make changes. Many of the "next steps" described in the study also do not include concrete commitments (e.g., utilities are "continuing these efforts in 2022 and providing an update in their 2023-2025 WMPs"). PacifiCorp must apply lessons learned to its assessments of covered conductor and show that it is progressing as a result of its joint efforts with the other utilities.

Covered Conductor Maintenance

PacifiCorp does not have a separate maintenance program or training program for covered conductor inspections. It relies instead on integration of maintenance as part of its standard

[71] Action Statement on PacifiCorp's 2021 Wildfire Mitigation Plan Update, p. 42.

[72] Action Statement on PacifiCorp's 2021 Wildfire Mitigation Plan Update, p. 47.

inspections, with no future improvements planned at this time. However, the joint covered conductor study described in PacifiCorp's 2022 Update found that several covered conductor-specific failure modes exist that require operators to consider additional personnel training, augmented installation practices, and adoption of new mitigation strategies (e.g., additional lightning arrestors, conductor washing programs, etc.).

It is imperative that utilities evaluate their existing covered conductor maintenance program to ensure that failure modes specific to covered conductor are being properly evaluated and new equipment specific to covered conductor is being maintained to extend the equipment's expected lifetime and maintain its health.

Meeting Hardening Targets

PacifiCorp is continuing to miss its covered conductor targets and pushing off or increasing targets into next year, as seen in Table 4.6.3-1. PacifiCorp is behind on its 2022 target, installing only 25.7 cumulative miles, even though PacifiCorp planned 31 miles to be completed by Q2.[73] PacifiCorp states that given the existing delays, it does not anticipate completing its 2022 total target of 112 miles set in the 2022 WMP, as seen in Table 4.6.3-1, until the end of Q2 2023.[74]

Similarly, PacifiCorp has also been continuously behind on its pole replacement targets, as seen in Table 4.6.3-2. PacifiCorp planned to have 2,020 poles replaced by the close of the year 2022. However, PacifiCorp informed Energy Safety that it will not be able to meet this target; PacifiCorp has reported that it has replaced 619 poles, but the remaining poles will not be replaced until the end of Q2 2023.[75]

Both hardening efforts are critical to addressing risk along PacifiCorp's system and consist of a major portion of PacifiCorp's mitigations aimed at reducing ignition likelihood. Given the ongoing nature of this issue, PacifiCorp must demonstrate that it can complete the targets that it sets by providing its plans to meet its targets while taking into consideration the factors faced thus far that have led to the delays and associated lessons learned. PacifiCorp

[73] Data Request OEIS-PC-22-003, Question 1.

[74] Data Request OEIS-PC-22-003, Question 1.

[75] Data Request OEIS-PC-22-003, Question 2.

cannot continue to set targets that it does not plan to meet and must successfully meet its targets in implementing mitigations that it discusses within its WMP in order to effectively address wildfire risk. This should include setting realistic future targets that are based on accurate assumptions with respect to resourcing, supply chain issues, and updates to reflect delays. PacifiCorp also needs to demonstrate how it is monitoring progress and identifying and addressing delays in order to get back on track in a timely fashion. This should include prioritizing areas where PacifiCorp is falling behind to address the issue as quickly as possible. The targets PacifiCorp has set should be feasible, but PacifiCorp must also address wildfire risk sufficiently and in a timely manner, particularly given other utilities' larger and more aggressive hardening plans.

Table 4.6.3-1: PacifiCorp 2020-2022 Covered Conductor Targets and Performance [76]

Covered Conductor	2020	2021	2022	2020-2022
Initial WMP Target	38	52	50	140
Adjusted WMP Target	N/A	81	112	193
Actual	1	20	25.7	46.7

Table 4.6.3-2: PacifiCorp 2020-2022 Distribution Pole Replacement Targets and Performance [77]

Distribution Poles	2020	2021	2022	2020-2022
Initial WMP Target	39	300	272	611

[76] The Initial WMP Target is derived from the target included in the prior year's WMP Update (i.e., initial 2022 target from the 2021 Update). The Adjusted WMP Target is the target from the current year's WMP Update (i.e., adjusted 2022 target from the 2022 Update). The values for 2022 and 2020-2022 are based on the latest update from July 26, 2022.

[77] Similar to the covered conductor table, the Initial WMP Target is derived from the target included in the prior year's WMP Update (i.e., initial 2022 target from the 2021 Update). The Adjusted WMP Target is the target from the current year's WMP Update (i.e., adjusted 2022 target from 2022 Update). The values for 2022 and 2020-2022 are based on the latest update from July 26, 2022.

Distribution Poles	2020	2021	2022	2020-2022
Adjusted WMP Target	N/A	128	2020	2148
Actual	29	87	25.7	141.7

Pole Replacement Program Tracking

As required in Energy Safety's Final 2021 Action Statement,[78] Energy Safety required PacifiCorp to analyze how pole replacements and covered conductor installation overlap to maximize resource efficiency. However, now PacifiCorp's entire pole replacement program relating to wildfire risk is encompassed within its covered conductor program. The correlation of these two programs may not be one-to-one, given some pole hardening or replacements may address different types of risks than covered conductor. PacifiCorp must show that it has a pole replacement program that evaluates and addresses risks outside of its covered conductor program.

Undergrounding Selection

PacifiCorp's selection of locations and justification for undergrounding projects are not fully supported nor are they transparent because PacifiCorp does not have an integrated modeling tool that can generate RSE estimates yet, as discussed further in Section 4.6.8. In its 2022 Update, PacifiCorp states that the advantages of undergrounding include lower maintenance costs, improved access to facilities, lower cost compared to covered conductor, avoiding cultural areas, and eliminating permitting constraints. However, PacifiCorp provides a wide range in estimates for distribution undergrounding projects, between $1 and $6 million per line mile. Given the wide range of possible costs for undergrounding and the lack of sophistication in PacifiCorp's resource allocation methodology, PacifiCorp must provide further details on how it compared undergrounding to other mitigation efforts as part of its

[78] Action Statement on PacifiCorp's 2021 Wildfire Mitigation Plan Update, p. 42.

selection process. This must include justifying the locations of the two current undergrounding projects and any future projects.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 7.

4.6.4 Asset Management and Inspections

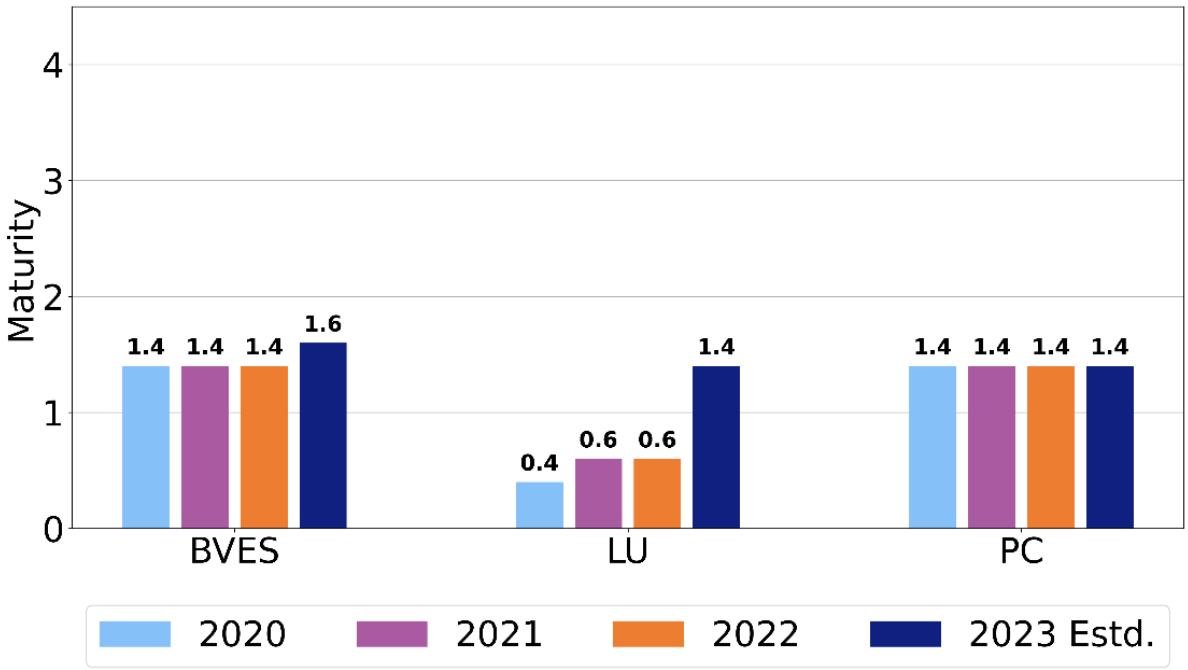
The asset management and inspections section of the Guidelines[79] requires the utility to discuss power line and infrastructure inspections for distribution and transmission assets within the HFTD, including infrared, light detection and ranging (LiDAR), substation, patrol, and detailed inspections 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 formal quality control program.

4.6.4.1 Maturity Assessment

PacifiCorp's maturity in asset management and inspections has remained the same across the current WMP cycle, with no projected increase by 2023, as shown in Figure 4.6.4-1. PacifiCorp's maturity level, while remaining the same, was higher than Liberty's in previous years and similar to Bear Valley. However, Bear Valley projects a higher maturity in 2023 than does PacifiCorp.

[79] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.7.3 p. 75 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

Figure 4.6.4-1: Cross-Utility Maturity Levels for Asset Management and Inspections – SMJUs (2020-2022 Actual, 2023 Estimated)



PacifiCorp projects an increase in maturity in the following areas by 2023:

- PacifiCorp plans to have an accurate inventory of its equipment that may contribute to wildfire risk, including age, state of wear, and expected lifecycle.[80]
- PacifiCorp plans to implement sensorized continuous monitoring equipment to determine the state of its equipment and to reliably detect incipient malfunctions likely to cause ignition.[81]

PacifiCorp's asset management maturity is currently limited by the following:

- PacifiCorp only updates its equipment inventory database annually and only has span-level granularity.[82]

[80] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to D.I.a.

[81] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to D.I.c.

[82] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to D.I.b and D.I.d.

- PacifiCorp does not go above minimum regulatory requirements with regard to the frequency of its patrol and detailed inspections and it does not perform more frequent inspections for its highest risk equipment.[83]
- PacifiCorp bases its inspection schedules on static maps of equipment types and environment as opposed to using risk (as determined by predictive modeling) as its basis for how these inspections are scheduled.[84]
- PacifiCorp does not take into account higher risk lines and equipment when developing its checklists, training, and procedures, including granularity.[85]
- PacifiCorp uses QA/QC information to identify systemic deficiencies in the quality of its work and inspections but does not use it to grade individuals or recommend training based on weaknesses.[86]

4.6.4.2 PacifiCorp's Progress

PacifiCorp has made the following progress thus far in the current WMP cycle:

Inclusion of Infrared

PacifiCorp's Infrared (IR) inspection pilot for distribution is still in progress, with potential expansion in 2023 pending pilot results. Since completing its transmission IR inspection pilot in 2019, PacifiCorp has expanded to annually inspect 700 transmission line miles. PacifiCorp reports that its scheduling for IR inspections is based on risk analysis to determine when lines are at peak load to try and capture when lines are at highest stress.[87]

4.6.4.3 Areas for Continued Improvement

In addition to progress made, PacifiCorp must continue to improve in the following areas:

---

[83] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to D.II.a and D.II.d.

[84] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to D.II.b, D.II.c, D.II.e, D.II.f, D.II.h, and D.II.i.

[85] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to D.III.a, D.III.b, and D.III.c.

[86] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to D.V.d.

[87] PacifiCorp's 2022 Update, p. 185.

Increasing Asset Inspections

In general, PacifiCorp is still primarily basing its asset management and inspection requirements on GO 165 requirements. PacifiCorp justifies only performing detailed asset inspections at the minimum rate of every five years per GO 165 because its territory lies within rural areas. PacifiCorp also does not use its risk modeling outputs to inform how it schedules, conducts, or prioritizes its inspections. Doing so would increase the effectiveness and efficiency of its asset inspection process and would also allow PacifiCorp to identify areas of higher risk and proactively address equipment failures.

Currently, the only additional inspections PacifiCorp is planning on implementing are infrared inspections. In terms of additional technologies, such as drones and thermography, PacifiCorp has not provided any details on how it is piloting, exploring, and/or expanding on the use of these technologies to augment its current inspection practices. Given the success seen from other utilities using these technologies for asset inspections, PacifiCorp must further evaluate how it can integrate new technologies into its current inspection practices. Doing so would allow PacifiCorp to identify additional issues that routine inspections may not be able to detect and increase potential risk reduction through asset inspections.

Improvements to its Quality Assurance and Quality Control Program

PacifiCorp has performed quality assurance and quality control (QA/QC) of asset inspections and discussed using results from its QA/QC process to improve its inspection practices, such as adjusting its inspection process to allow for Priority C[88] findings to be collected. However, there are a number of areas where PacifiCorp's QA/QC program could be improved. For example, PacifiCorp uses the same contractor that performs the initial inspections to perform the QA/QC audits, as opposed to performing the audits internally. PacifiCorp omits critical details on its QA/QC process within its 2022 Update, such as how it defines and sets thresholds for passing or failing a QA/QC audit, as well as when a reinspection would occur. PacifiCorp provides insufficient detail on the feedback process relating to QA/QC in terms of how findings are used to improve its inspections moving forward. This could include implementing additional training based on inspector performance. Overall, PacifiCorp must

[88] Priority C is equivalent to Level 3 under General Order 95 Rule 18, defined as "Acceptable safety and/or reliability risk." that requires utilities to "Take action (re-inspect, re-evaluate, or repair) as appropriate."

improve its QA/QC, including providing documentation showing results and progress relating to any findings, and how its QA/QC process reflects lessons learned based on findings to date.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 7.

4.6.5 Vegetation Management and Inspections

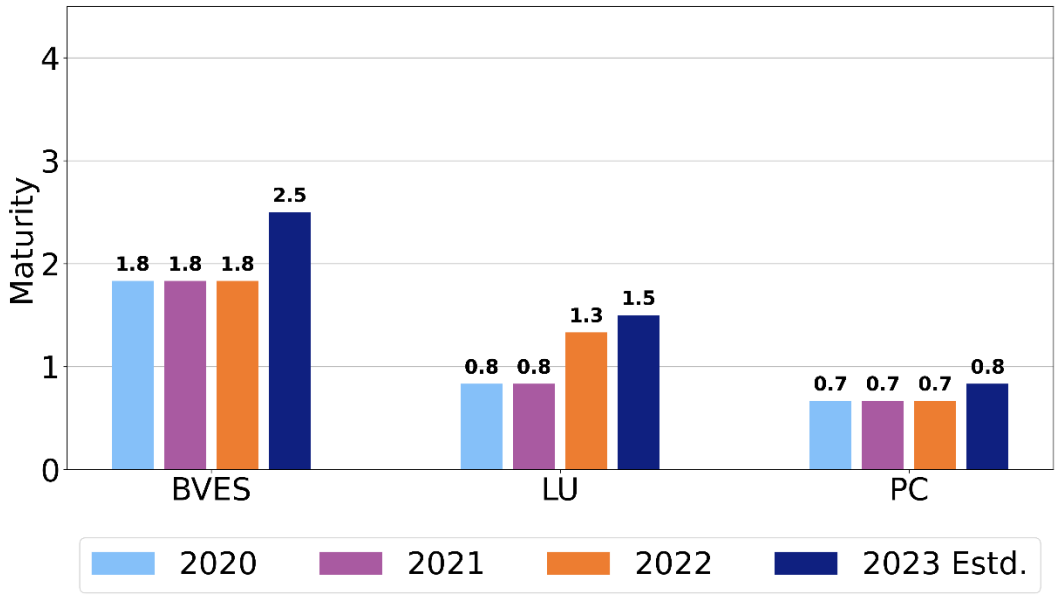
The vegetation management and inspections section of the Guidelines[89] requires utilities to discuss vegetation management inspections. The discussion must include inspections that go beyond existing regulation, as well as remote sensing inspections, and patrol inspections of vegetation around distribution and transmission lines and equipment. Utilities must also discuss quality control of those inspections and limitations on the availability of workers. In addition, they must 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 (e.g., erosion, flooding).

4.6.5.1 Maturity Assessment

According to its responses to the 2022 Maturity Survey, PacifiCorp's average maturity level of 0.7 in vegetation management and inspections has remained the same since 2020 (Figure 4.6.5-1). PacifiCorp has the lowest maturity level in comparison with Liberty and Bear Valley.

[89] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.7.3 pp. 75-76 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

Figure 4.6.5-1: Cross-Utility Maturity Levels for Vegetation Management and Inspections – SMJUs (2020-2022 Actual, 2023 Estimated)



PacifiCorp projects an increase in maturity in the following areas by 2023:

- PacifiCorp plans to increase its maturity level by switching to a centralized inventory for vegetation.[90]
- PacifiCorp plans to increase the granularity of its inventory from circuit to span level.[91]
- PacifiCorp plans to use static maps of vegetation and annual growing conditions to schedule inspections.[92]

[90] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to E.I.a.

[91] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to E.I.d.

[92] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to E.II.b. and E.II.c.

PacifiCorp's vegetation management maturity is currently limited by the following:

- PacifiCorp's vegetation inventory is updated annually. It would have higher maturity if it updated its inventory more frequently (i.e., within one month, week, or day of collection).[93]
- PacifiCorp takes longer than one week after cutting vegetation to remove waste both along and outside of its right of way. It would have higher maturity if it removed vegetation waste within one week or less of the day the vegetation cutting takes place, or on the same day the vegetation cutting takes place.[94]

4.6.5.2 PacifiCorp's Progress

PacifiCorp has made the following progress thus far in the current WMP cycle:

Operations & Maintenance Plans with the U.S. Forest Service

PacifiCorp continues to progress in developing an Operation and Maintenance (O&M) Plan with Klamath National Forest, which will establish agency review times of proposed maintenance activities. PacifiCorp has also begun discussions with the U.S. Forest Service's Region 5 office (which covers all of California) to start development of O&M plans with other forests in PacifiCorp's territory.[95]

Electronic Planning and Tracking System

PacifiCorp reports that it debuted its electronic planning and tracking system in 2020 and implemented updates in 2021 and 2022 that allow PacifiCorp staff and contractors to access GIS data in the field.[96] Prior to 2020, PacifiCorp had relied on paper records.[97]

---

[93] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to E.I.b.

[94] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to E.IV.g and E.V.e.

[95] PacifiCorp's 2022 Update, p. 200.

[96] PacifiCorp's 2022 Update, p. 217

[97] PacifiCorp's 2022 Update, p. 206

Ground-to-Sky Clearance Pilot

In its 2021 Update, PacifiCorp said it "may implement a pilot study"[98] to support clearing overhanging limbs from "ground-to-sky" above electrical equipment. In its Action Statement approving PacifiCorp's 2021 Update, Energy Safety encouraged PacifiCorp to implement this pilot.[99] PacifiCorp has since started this pilot and in 2022 will identify areas within HFTD Tier 2 and 3 to perform ground-to-sky clearances in 2023. PacifiCorp will target species prone to limb failure for overhang clearance and ultimately "determine efficacy of ground-to-sky pruning."[100]

4.6.5.3 Areas for Continued Improvement

In addition to progress made, PacifiCorp must continue to improve in the following area:

Through analysis of all utilities' current and past WMP submissions, Energy Safety has identified the need for a scoping meeting to discuss how utilities could best learn vegetation management best management practices from each other. This scoping meeting may result in additional meetings, workshops, or the formation of a working group. Energy Safety believes this scoping meeting will lead to efforts to help clarify the current differences between electrical corporations' vegetation management programs and allow for collaboration among the electrical corporations, stakeholders, and academic experts. PacifiCorp must participate and collaborate with its peers and Energy Safety in this scoping meeting.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 7.

[98] PacifiCorp's 2021 Update, p. 171.

[99] Action Statement on PacifiCorp's 2021 Wildfire Mitigation Plan Update, p. 51.

[100] PacifiCorp's 2022 Update – Revision 1, pp. 49-50.

4.6.6 Grid Operations and Operating Protocols, Including PSPS

The grid operations and operating protocols section of the Guidelines[101] requires discussion of ways the utility operates its system to reduce wildfire risk. For example, disabling the reclosing function of automatic reclosers[102] during periods of high fire danger (e.g., Red Flag Warning conditions) can reduce utility ignition potential by minimizing the energy released and the duration of the release when there is a fault. This section also requires discussion of work procedures in conditions of elevated fire risk and protocols to reduce the frequency and scope of de-energization, including PSPS events (e.g., through sectionalization). Further, this section requires the utility to report whether it has stationed and/or on-call ignition prevention and suppression resources and services.

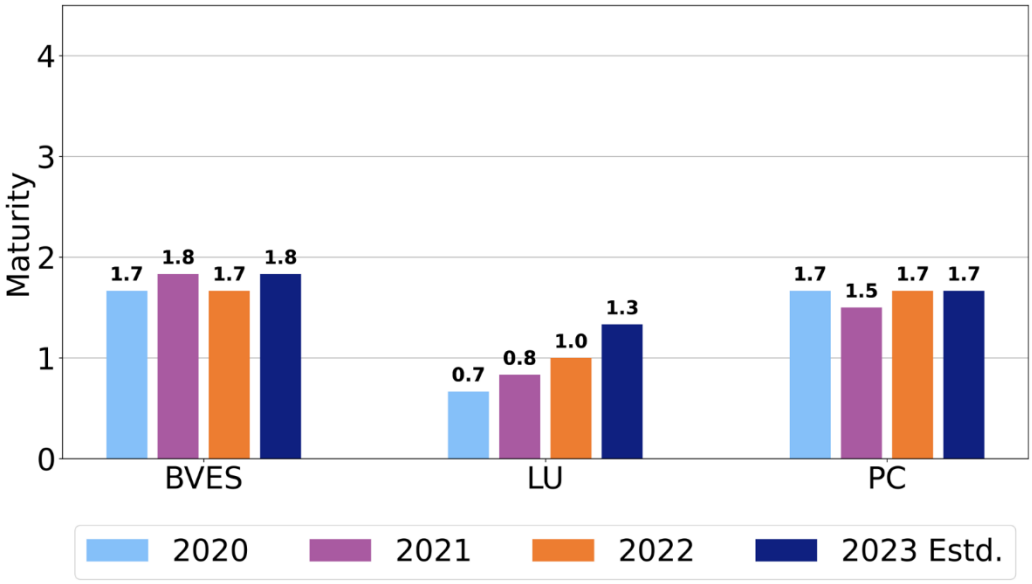
4.6.6.1 Maturity Assessment

During the current WMP cycle, PacifiCorp's maturity in grid operations and operating protocols slightly decreased from 2020 to 2021, and in 2022 returned to its 2020 level, as shown in Figure 4.6.6-1.

[101] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.7.3 p. 76 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

[102] 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 the 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.

Figure 4.6.6-1: Cross-Utility Maturity Levels for Grid Operations and Operating Protocols – SMJUs (2020-2022 Actual, 2023 Estimated)



PacifiCorp projects an increase in maturity in the following area by 2023:

- PacifiCorp projects that it will provide training to workers at other utilities and outside the utility industry on best practices to minimize, report and suppress ignitions.[103] Although PacifiCorp projects it will provide this training by 2023, this increase in maturity is not enough to increase its overall maturity in the grid operations category.

PacifiCorp's grid operations maturity is currently limited by the following:

- PacifiCorp increases the sensitivity of its grid elements during high threat weather conditions; however, it does not monitor near misses, nor does it make these adjustments based on risk mapping.[104]

[103] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to F.VI.d.

[104] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to F.I.a.

- PacifiCorp's predictive model is not currently evaluated by external experts, nor is it verified by historical data.[105]
- PacifiCorp reports that it does not provide specific resources to customers to alleviate the impact of power shutoffs during PSPS events;[106] however, PacifiCorp does currently have a free portable battery program available for its customers who depend on medical equipment powered by electricity, as well as a generator rebate program for qualifying customers in HFTD Tier 2 and 3 areas.[107, 108]
- PacifiCorp has an existing process for inspecting de-energized sections of its grid prior to turning the power back on; however, this process is only partially automated at present and PacifiCorp does not augment this process with both sensors and aerial tools.[109]

4.6.6.2 PacifiCorp's Progress

PacifiCorp has made the following progress thus far in the current WMP cycle:

- PacifiCorp is implementing sensitivity settings for protective devices by adjusting reclosers to what PacifiCorp calls elevated fire risk (EFR) settings. After performing a pilot to evaluate different sensitivity settings, PacifiCorp started installing reclosers and relays in 2020, and started using EFR settings in 2021. PacifiCorp uses the Geographic Area Coordination Center's (GACC) 7-Day fire potential determination to inform whether or not EFR settings will be enabled, which occurs when fire risk is

[105] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to F.II.c.

[106] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to F.III.f.

[107] PacifiCorp's 2022 Update, pp. 180-181.

[108] PacifiCorp states that its free portable battery program initiative was prioritized in response to Decision 21-06-034 (the CPUC's Decision Adopting Phase 3 Revised and Additional Guidelines and Rules for Public Safety Power Shutoffs [Proactive De-Energizations] of Electric Factilities to Mitigate Wildfire Risk Caused by Utility Infrastructure). PacifiCorp also states that its generator rebate program was prioritized in response to the CPUC's current PSPS guidelines. See PacifiCorp's 2022 Update, pp. 180-181.

[109] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to F.V.a and F.V.b.

deemed having a forecasted wildfire risk of significant or above.[110] Reclosing is disabled for extreme weather events and periods of extreme risk.

- PacifiCorp states that in 2021, reduced patrol times and aerial patrols were used during a PSPS event in Dunsmuir, California, which expedited the re-energization process and restoration time. PacifiCorp states that for 2022, it will continue to explore the use of aerial patrols to expedite patrols prior to re-energization.[111]
- Since 2021, PacifiCorp has initiated its free portable backup program, which it describes further in the grid design and system hardening section of its 2022 Update. This is a program available for customers who depend on medical equipment powered by electricity. Phase 1 of this program began delivery to qualifying Medical Baseline (MBL) customers located in HFTD Tier 2 and Tier 3 areas. PacifiCorp states that the next phases of its program will expand outreach to all MBL customers within its California service territory.[112]

4.6.6.3 Areas for Continued Improvement

In addition to progress made, PacifiCorp must continue to improve in the following area:

EFR Settings Impacts and Development

Given its recent implementation, PacifiCorp has not performed a full analysis of reliability and related public safety impacts because of changes to its elevated fire risk (EFR) settings. PacifiCorp must analyze any reliability and related public safety impacts associated with changes to its protective device sensitivity settings, including a lookback on 2022 performance. Currently, PacifiCorp is unable to determine the number of ignitions prevented from EFR implementation and has not performed analysis on the potential arc events avoided by enabling EFR settings.[113] PacifiCorp must describe the mitigation measures implemented to reduce any reliability impacts of EFR, if noticeable impacts are observed.

---

[110] Data Request OEIS-PC-22-002, Question 4.

[111] PacifiCorp's 2022 Wildfire Mitigation Plan Update, p. 226.

[112] PacifiCorp's 2022 Wildfire Mitigation Plan Update, p. 228.

[113] Data Request OEIS-PC-22-002, Question 4.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 7.

4.6.7 Data Governance

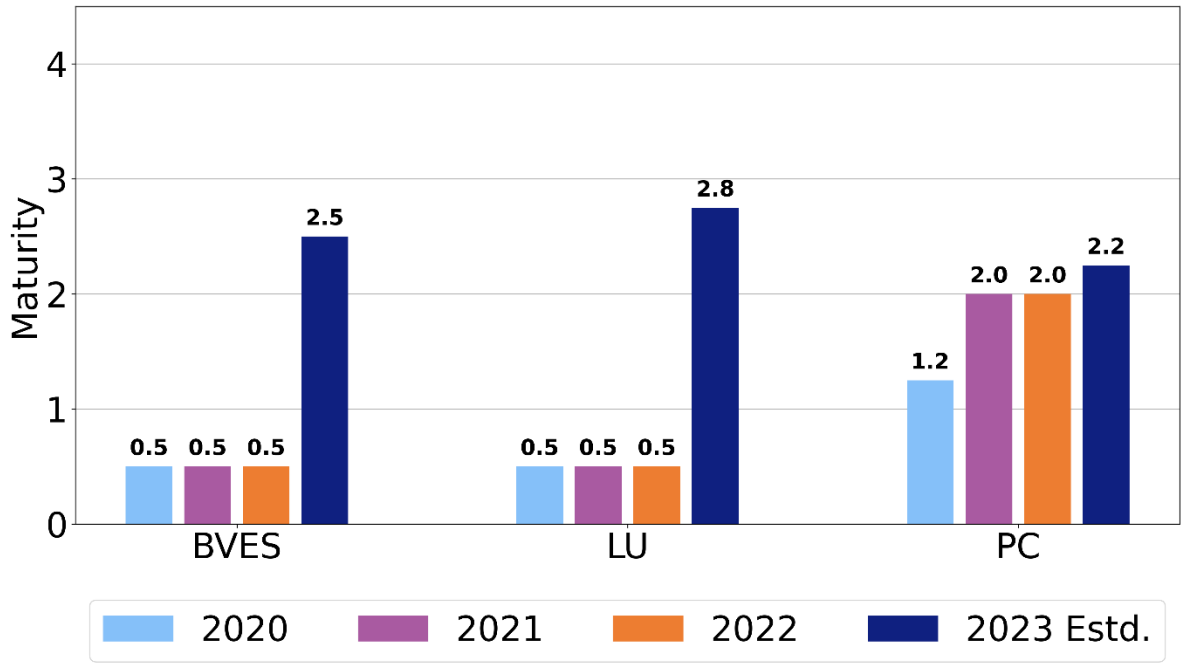
The data governance section of the Guidelines[114] requires the utility to report information on its initiatives to create a centralized wildfire-related data repository, conduct collaborative research on utility ignition and wildfire, document and share wildfire-related data and algorithms, and track and analyze near-miss data.

4.6.7.1 Maturity Assessment

During the current WMP cycle, PacifiCorp's maturity in data governance increased from 1.2 in 2020 to 2.0 in 2021 and remained the same in 2022, as shown in Figure 4.6.7-1. PacifiCorp's current maturity is high relative to Liberty and Bear Valley (both at a 0.5 in this category in 2022). PacifiCorp's maturity growth over the current WMP cycle has also been more consistent when compared Liberty and Bear Valley's unchanged maturity from 2020-2022. PacifiCorp projects it will increase its maturity in data governance to 2.2 by 2023, which would make it similar to the maturity levels of Liberty and Bear Valley if 2023 projections are met.

[114] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.7.3 pp. 76-77 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

Figure 4.6.7-1: Cross-Utility Maturity Levels for Data Governance – SMJUs (2020-2022 Actual, 2023 Estimated)



PacifiCorp has progressed or plans to progress in the following areas by 2023:

- PacifiCorp reports that it identifies highest priority additional data sources to improve its decision making, with plans to incorporate these into its centralized database.[115]
- PacifiCorp projects that it will be able to use advanced analytics on its centralized database for both short and long-term decision making.[116]

PacifiCorp's data governance maturity is currently limited by the following:

- PacifiCorp does not share best practices for database management and use with other utilities in California and beyond.[117]

[115] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to G.I.e.

[116] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to G.I.b.

[117] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to G.I.f.

- PacifiCorp does not have a single document cataloguing all fire-related data and algorithms, analyses, and data processes.[118]
- PacifiCorp reports that its analyses, algorithms, and data processing are documented; however, they are not explained.[119]
- PacifiCorp does not have a system capable of sharing data in real time across multiple levels of permissions[120]
- PacifiCorp reports that it publicy discloses the most relevant wildfire-related data algorithms in its WMP upon request; however, it does not publicly disclose information as it becomes available (regardless of regulatory request).[121]
- PacifiCorp does not use data from near misses to change grid operation protocols in real time.[122]

4.6.7.2 PacifiCorp's Progress

PacifiCorp has made the following progress thus far in the current WMP cycle:

- PacifiCorp implemented centralized data collection for vegetation management.
- PacifiCorp initiated a variety of collaborative research projects, including distribution fault anticipation (DFA) and investigation of LiDAR for pole loading and vegetation inspection.
- PacifiCorp documented models used for wildfire mitigation planning, inputs, and calculation methodologies.

[118] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to G.II.a and G.II.b.

[119] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to G.II.c.

[120] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to G.II.d.

[121] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to G.II.e.

[122] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to G.III.e.

4.6.7.3 Areas for Continued Improvement

Energy Safety expects PacifiCorp to continue to stay on a path to improve the maturity of its data governance. Energy Safety has no areas for continued improvement for PacifiCorp under the data governance section of its 2022 Update.

4.6.8 Resource Allocation Methodology

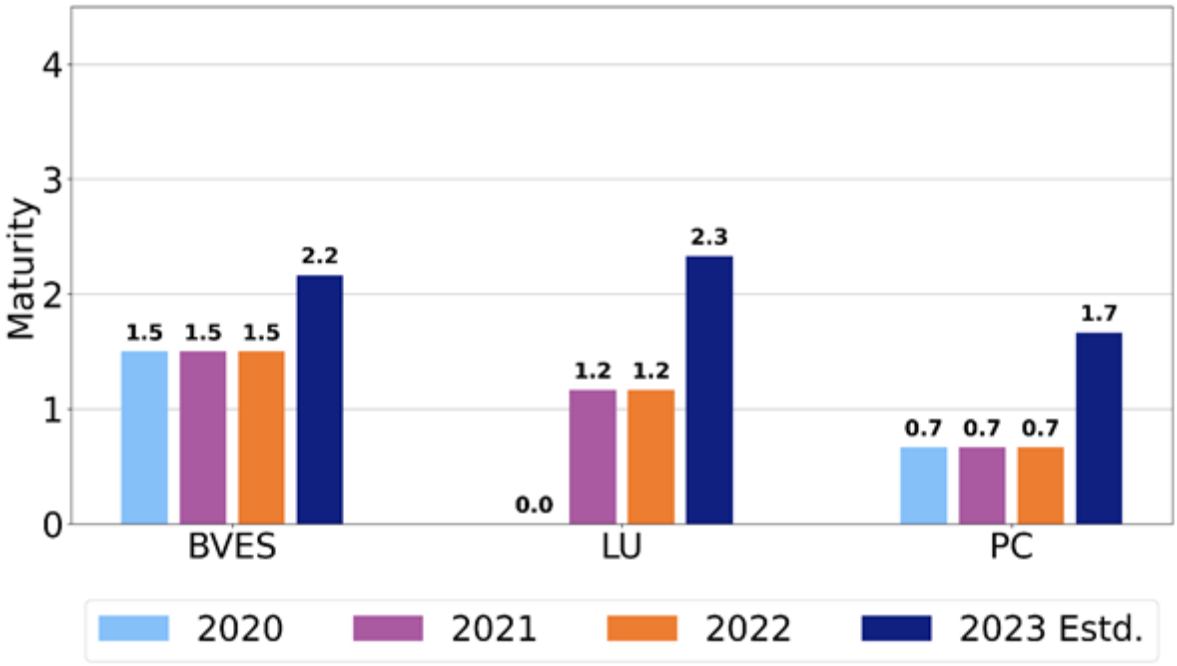
The resource allocation methodology section of the Guidelines[123] requires the utility to describe its methodology for prioritizing programs by cost effectiveness. Utilities must discuss their risk reduction scenario analysis and provide a risk-spend efficiency (RSE) analysis for each aspect of the plan.

4.6.8.1 Maturity Assessment

PacifiCorp's maturity level has remained unchanged in the resource allocation methodology category over the current WMP cycle at 0.7. PacifiCorp's maturity in this category is lower than those of Liberty and Bear Valley, which respectively reached maturity levels of 1.2 and 1.5 in 2022.

[123] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.7.3 p. 77 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

Figure 4.6.8-1: Cross-Utility Maturity Levels for Resource Allocation Methodology – SMJUs (2020-2022 Actual, 2023 Estimated)



PacifiCorp projects an increase in maturity in the following areas by 2023:

- PacifiCorp plans on including high and low risk reduction scenarios in addition to its proposed scenario, as well as projected cost and total risk reduction potential.[124]
- PacifiCorp plans on including estimates of impact on reliability factors as part of its explanation for investment in particular initiatives.[125]
- PacifiCorp plans to increase the granularity of its RSE figures, vegetation management initiative estimates, and system hardening initiative estimates from the region-level to the span-level.[126]

[124] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to H.I.a.

[125] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to H.II.d.

[126] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to H.II.e, H.III.b, and H.IV.b.

- PacifiCorp plans to increase the frequency for updates to RSE estimates, vegetation management initiatives and system hardening initiatives from less than annually to annually or more frequently.[127]
- PacifiCorp plans to be able to evaluate risk reduction synergies from the combination of various initiatives.[128]
- PacifiCorp plans to be able to calculate quantitative understanding of cost and effectiveness for system hardening initiative RSE calculations.[129]
- PacifiCorp plans to include the total cost of ownership, or the cost over the expected useful life of an asset (purchase, operation and maintenance) when developing and evaluating the RSEs of new wildfire initiatives.[130]

PacifiCorp's maturity in this category is limited by the following:

- PacifiCorp does not include emerging initiatives as part of its RSE ranking.[131]
- PacifiCorp does not have an accurate quantitative understanding of cost, including sensitivities and effectiveness, to produce a reliable risk-spend efficiency estimate.[132]
- PacifiCorp includes only some vegetation management initiatives and system hardening initiatives within its RSE evaluations, as opposed to all initiatives. Initiatives are also not supported by independent or lab testing.[133] According to its 2021 Maturity Survey responses, PacifiCorp projected including all commercially available system hardening initiatives by 2023.
- When allocating capital for initiatives and prioritization, PacifiCorp considers only estimates of RSEs, as opposed to using accurate RSE estimates for all initiatives across

[127] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to H.III.c and H.IV.c.

[128] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to H.III.e and H.IV.e.

[129] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to H.IV.a.

[130] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to H.VI.b.

[131] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to H.II.b.

[132] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to H.III.a.

[133] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to H.III.d and H.IV.d.

the entire portfolio.[134] According to its 2021 Maturity Survey responses, PacifiCorp projected to at least use accurate RSE estimates to determine capital allocation within initiative categories (such as comparing vegetation management initiatives) by 2023.

- PacifiCorp does not include the state of specific assets and locations where initiatives will be implemented as part of the information used to generate RSE estimates.[135]
- PacifiCorp does not plan on confirming RSE estimates using independent experts or other utilities in California, instead it uses only historical or experimental pilot data.[136]
- PacifiCorp does not use in-field testing to help measure the reduction in ignition events and near-misses to determine the efficacy of new wildfire initiatives, instead only using pilots and measures to determine reduction.[137]
- PacifiCorp can only measure the efficacy of new wildfire initiatives at the circuit-level.[138] According to its 2021 Maturity Survey responses, PacifiCorp responded that it was able to measure efficacy at the span-level and projected to reach asset-level granularity by 2023.

4.6.8.2 PacifiCorp's Progress

According to its 2022 Update, PacifiCorp has made progress developing its RSE framework, provided transparency in its decision making, is expanding its Localized Risk Assessment Model (LRAM), and provides information on its plans for further RSE calculation and methodology improvements, as described below.

Resource Allocation and Decision Making

In 2021, PacifiCorp participated in workshops with other California utilities to collaborate on the development and implementation of its initial RSE framework. PacifiCorp created a new Wildfire Mitigation Program Delivery group and opened new positions to ensure adequate

[134] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to H.V.a.

[135] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to H.V.b.

[136] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to H.V.c.

[137] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to H.VI.a.

[138] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to H.VI.c.

resources are hired and assigned to manage wildfire mitigation initiatives. These positions play a key role in developing plans and assigning and managing resources to execute mitigation activities. PacifiCorp expects to assess the impact of this recent investment in its human resources and adjust allocation as needed to meet the demands posed by individual initiatives.[139]

During the 2021 WMP evaluation, Energy Safety identified the importance and need for decision-making flowcharts to bring increased transparency to a utility's mitigation selection and prioritization process. In its 2022 Update PacifiCorp provided an initiative selection flowchart to demonstrate its general approach to risk-based decision making for initiative selection.

Localized Risk Assessment Model

PacifiCorp continues to develop its Localized Risk Assessment Model (LRAM) to evaluate risk and scope wildfire mitigation initiatives to help prioritize work based on risk reduction potential. To date, LRAM has been primarily used to prioritize work within the HFTD: LRAM calculates a combined score for each zone of protection (ZOP) to aid in the selection of assets, evaluate projects, and prioritize implementation of projects based on risk.

According to its 2022 Update, PacifiCorp intends to expand the use of LRAM to calculate risk-spend efficiencies. PacifiCorp expects to use its risk event reduction assessments and ignition probabilities to calculate the effectiveness of mitigation measures in addition to refining the costs of those initiatives, which are a direct input to the calculations. As wildfire mitigation work is completed this year, PacifiCorp intends to move towards using LRAM to evaluate risk reduction and confirm whether the impact of this work can be seen in the data.

LRAM is PacifiCorp's first step towards assessing risk reduction scenarios to inform project prioritization. While PacifiCorp states that it found LRAM helpful in informing project prioritization and overall risk model development,[140] this tool does not include full simulation or modeling capabilities. Therefore, PacifiCorp is investing in additional tools, data and

[139] Regarding human resource allocation, PacifiCorp identifies, acquires, and allocates expertise that aligns with its managing wildfire mitigation work. PacifiCorp also promotes staff awareness of its WMP to ensure resources are appropriately assigned to its wildfire mitigation activities.

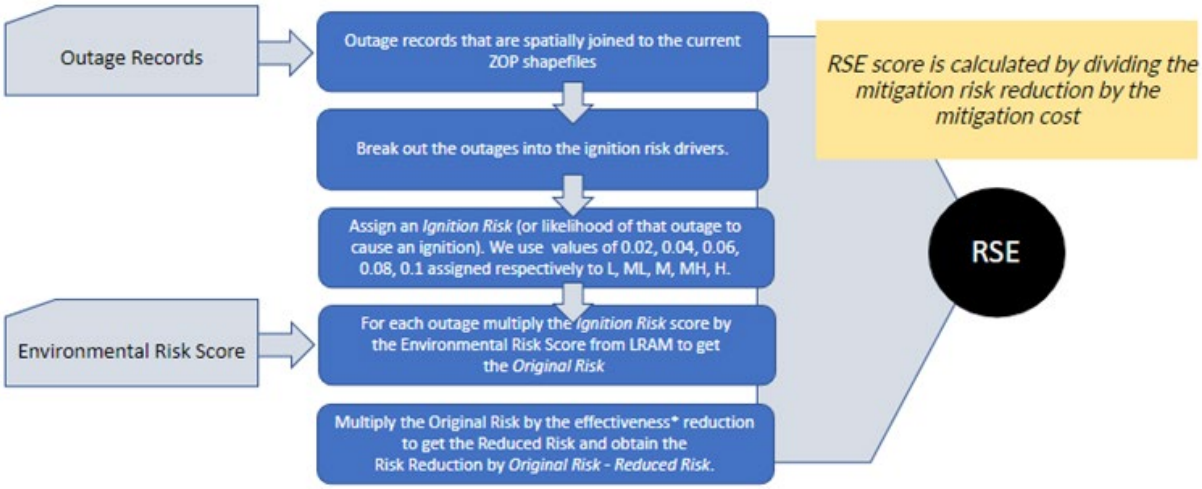
[140] PacifiCorp's 2022 Update, p. 237.

modeling capabilities through the procurement of the Wildfire Analyst Enterprise (WFA-E) suite of tools. Additionally, PacifiCorp plans to use its LRAM foundation alongside the Wildfire Risk Reduction Model (WRRM) module to create a quantifiable resource allocation methodology, risk reduction quantification and RSE. Once fully operational, PacifiCorp states that the WRRM project selection tool will inform its RSE calculations, support it in assessing different risk reduction scenarios, and deepen its understanding of mitigation strategy efficiency.[141]

RSE Methodology

To calculate RSEs, PacifiCorp has developed the methodology illustrated in Figure 4.6.8-2, which uses outage data and LRAM environmental risk scores as inputs. PacifiCorp plans to develop a verification process to improve its assessment of factors that influence RSE estimates. Pending completion of its verification process, PacifiCorp anticipates including RSE estimates in 2023 for line rebuilds (i.e., covered conductors) and potentially other grid hardening initiatives. PacifiCorp reports that it recognizes the importance of reducing risk efficiently given the capital invested and plans to prioritize grid hardening activities according to RSE calculations.

Figure 4.6.8-2: PacifiCorp RSE Methodology Flowchart



[141] PacifiCorp's 2022 Update, p. 239.

PacifiCorp aims to prioritize RSEs and plans to refine its methodology for RSE calculations throughout 2022 as follows:

- By June 1, PacifiCorp plans to complete initial RSE evaluation at the initiative level and continue to participate in Energy Safety led workshops and utility working groups to improve RSE calculations.
- By September 1, PacifiCorp plans to begin implementation of the WRRM to support RSE calculations and develop a plan to incorporate revised Energy Safety requirements for RSE calculations.
- Starting in 2022, PacifiCorp plans to perform a series of presentations and meetings as part of its Internal Stakeholder Engagement Plan to ensure prioritization of wildfire mitigation initiatives throughout its organization.

Before its 2023 WMP, PacifiCorp aims to:

- Develop an implementation plan to incorporate new Energy Safety RSE requirements into its modeling and tools by 2024.
- Fully implement the WRRM model, including RSE calculations.
- Update and include RSE calculations in the 2024 WMP Update.
- Continue evaluating organizational needs to support WMP implementation.

Within the next three years, PacifiCorp plans to update RSE estimates to align with 2023 WMP Guidelines, improve RSE calculation granularity, leverage RSE to evaluate grid hardening scope outside of PSPS areas, and evaluate a framework to assess new technologies or pilot projects in terms of RSE. Within 10 years, PacifiCorp plans to use its RSE estimates to evaluate initiatives throughout its service territory.

4.6.8.3 Areas for Continued Improvement

In addition to progress made, PacifiCorp must continue to improve in the following area.

PacifiCorp's new approach to calculating RSEs and selecting initiatives lacks transparency and does not include any quantification of risk reduction. PacifiCorp does not adequately demonstrate proper cost/benefit analysis as part of its initiative selection and prioritization process. When asked to procure rudimentary RSE estimates, PacifiCorp was able to provide

estimates for covered conductor and undergrounding.[142] By its 2023 WMP, PacifiCorp must develop a quantitative initiative selection process, which includes calculating RSE estimates as planned and use them to implement a clearly defined and robust initiative-selection process.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 7.

4.6.9 Emergency Planning and Preparedness

The emergency planning and preparedness section of the Guidelines[143] requires the utility to provide a general description of its overall emergency preparedness and response plan, including a discussion of how the plan is consistent with legal requirements for customer support before, during, and after a wildfire. This discussion must cover support for low-income customers, billing adjustments, deposit waivers, extended payment plans, suspension of disconnection and nonpayment fees, and repairs. The utility is also required to describe emergency communications before, during, and after a wildfire in languages deemed prevalent in its territory (Decision 19-05-036, supplemented by Decision 20-03-004),[144] and other languages required by the CPUC.

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

4.6.9.1 Maturity Assessment

PacifiCorp's maturity in emergency planning and preparedness increased from 2.4 in 2020 to 3.6 in 2021 and remained the same in 2022, as shown in Figure 4.6.9-1. PacifiCorp's maturity

---

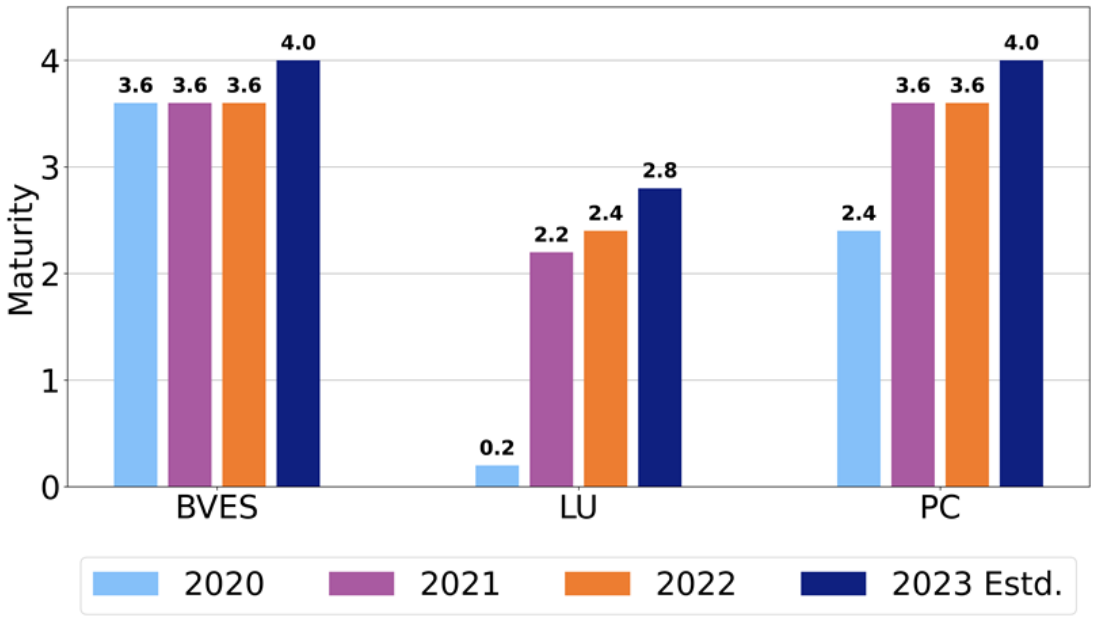
[142] Data Request OEIS-PC-22-003, Question 3.

[143] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.7.3 p. 77 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

[144] 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 California Government Code section 53112 for more information.

levels are comparable to or higher than those of Liberty and Bear Valley, and it projects a slight increase in maturity in emergency planning and preparedness in 2023, which would put PacifiCorp at the highest possible maturity level in this category.

Figure 4.6.9-1: Cross-Utility Maturity Levels for Emergency Planning and Preparedness – SMJUs (2020-2022 Actual, 2023 Estimated)



PacifiCorp projects an increase in maturity in the following areas by 2023:

- PacifiCorp does not have an inventory of high RSE resources available for repairs; however, it expects that it will have an inventory in 2023.[145]
- PacifiCorp currently engages with other emergency management agencies during emergency situations in an "ad hoc manner." PacifiCorp reports that in 2023 it will have detailed and actionable protocols for engaging with emergency management organizations.[146]

[145] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to I.II.e.

[146] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to I.III.e.

PacifiCorp's emergency planning maturity is currently limited by the following:

- PacifiCorp's service restoration procedures after a wildfire-related outage are currently customized to the circuit level. It would have higher maturity if it customized these procedures to the span or asset level.[147]

4.6.9.2 PacifiCorp's Progress

PacifiCorp has made the following progress thus far in the current WMP cycle:

- In 2021, PacifiCorp began hosting practice rounds at its Emergency Coordination Center (ECC) to improve response times to customers and public safety partners during de-energizations.
- PacifiCorp continues to refine its identification of access and functions needs (AFN) customers and ongoing communication targeted to reach more AFN customers. While PacifiCorp identifies all MBL customers as AFN customers, in 2022, PacifiCorp intends to increase its outreach to all customers in order to identify additional customers relying on medical equipment and to broaden the scope of customers who self-identify as AFN. PacifiCorp states that all customers will receive communications about the reduced rate for MBL customers and a Spanish version of the MBL application will be available on the website in 2022.[148]
- In 2021, PacifiCorp added a check box on the California Alternate Rates for Energy (CARE) application asking customers to identify as AFN. The check box captured an additional 193 AFN customers throughout the service territory and 43 AFN customers in the Power De-Energization Zones (PDZs).[149]

4.6.9.3 Areas for Continued Improvement

In addition to progress made, PacifiCorp must continue to improve in the following area:

[147] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to I.II.c.

[148] PacifiCorp's 2022 Wildfire Mitigation Plan Update, p. 241.

[149] PacifiCorp's 2022 Wildfire Mitigation Plan Update, p. 241.

Resources in California

PacifiCorp reports that its fire suppression equipment and resources are only in Oregon and Washington.[150] Given recent PacifiCorp-reported catastrophic fires, as discussed in Section 4.6.1, PacifiCorp must update its analysis to show that its current resource designations are sufficient for responding to faults and ignitions in California.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 7.

4.6.10 Stakeholder Cooperation and Community Engagement

The stakeholder cooperation and community engagement section in the Guidelines[151] requires the utility to report on the extent to which it will engage the communities it serves. This engagement includes cooperating and sharing best practices with community members, agencies outside California, fire suppression agencies, the U.S. Forest Service, and others engaged in vegetation management or fuel reduction.

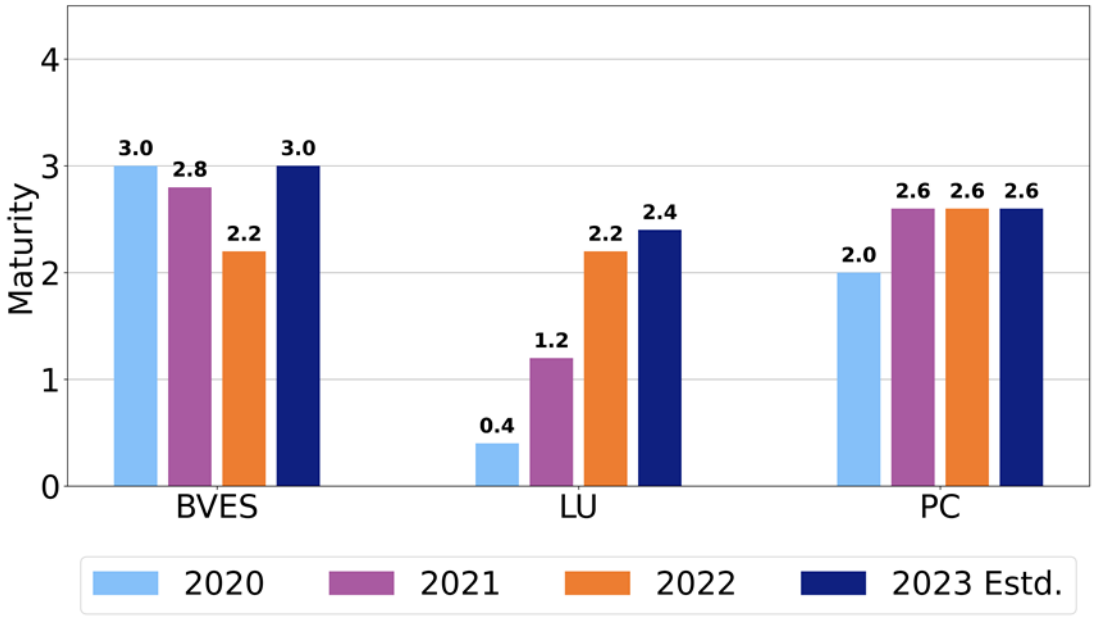
4.6.10.1 Maturity Assessment

PacifiCorp's maturity in stakeholder cooperation and community engagement increased from 2.0 in 2020 to 2.6 in 2021 and remained the same in 2022, as shown in Figure 4.6.10-1. PacifiCorp's current maturity levels are slightly above that of both Liberty and Bear Valley in 2022.

[150] PacifiCorp's 2022 Update, Table 7.4, p. 223.

[151] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.7.3 p. 77 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

Figure 4.6.10-1: Cross-Utility Maturity Levels for Stakeholder Cooperation and Community Engagement – SMJUs (2020-2022 Actual, 2023 Estimated)



PacifiCorp's maturity in stakeholder cooperation and community engagement is currently limited by the following:

- PacifiCorp reports that less than five percent of landowners are non-compliant with its initiatives, with the same percent of landowners that complain about utility initiatives. It would have higher maturity if less than two percent of landowners were non-compliant or complained about utility initiatives.[152]
- PacifiCorp cooperates with suppression agencies by notifying them of ignitions but does not work with them to detect ignitions.[153]
- PacifiCorp is not able to accurately predict and communicate forecasted fire propagation paths using its available analytics resources and weather data.[154]

[152] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, responses to J.II.c and J.II.d.

[153] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to J.IV.a.

[154] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to J.IV.c.

Correspondingly, PacifiCorp does not communicate fire paths to the community as requested.[155]

- PacifiCorp engages with stakeholders as part of its fuel management efforts by sharing its plans and working with stakeholders conducting fuel management concurrently.[156] It would have higher maturity if its efforts included adjusting plans to cooperate with other stakeholders state-wide to focus on areas that would have the biggest impact in reducing wildfire risk.

4.6.10.2 PacifiCorp's Progress

In its 2022 Update, PacifiCorp does not report progress on its stakeholder cooperation mitigation initiatives. Energy Safety was unable to adequately assess PacifiCorp's progress in this area based on how PacifiCorp presented information in this section of its WMP. See below for further details.

4.6.10.3 Areas for Continued Improvement

PacifiCorp must continue to improve in the following areas:

PacifiCorp does not clearly report the progress made in its stakeholder cooperation initiatives. Under the progress subsections of its "Community engagement," "Cooperation and best practice sharing with agencies outside California," and "Cooperation with suppression agencies" initiatives (7.3.10.1 through 7.3.10.3), PacifiCorp either details its existing cooperation and engagement efforts, discusses plans for 2022, and/or discusses past activities. However, PacifiCorp does not provide sufficient context or discussion, and it is not clear what actual progress has been made since PacifiCorp's 2020 WMP or its 2021 Update.

PacifiCorp must clearly detail specific points of progress from prior WMP submissions for each of its mitigation initiatives rather than providing descriptions of current operations, past activities, or future plans. If there has been no progress on a given initiative, PacifiCorp must clearly state this.

---

[155] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to J.IV.d.

[156] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to J.V.b.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 7.

4.7 Public Safety Power Shutoff (PSPS), Including Directional Vision for PSPS

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

In 2021, Energy Safety separated the reporting of PSPS from the reporting of mitigations and progress metrics to reflect the definition of PSPS as a last resort rather than a mitigation option (pursuant to CPUC Guidance Resolution WSD-002 and CPUC PSPS Decisions 19-05-036 and 20-03-004).[157] This section of the Guidelines[158] 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. The Guidelines specifically require utilities to address Senate Bill 533[159] requirements to identify circuits that have frequently been de-energized and provide measures for how utilities will reduce the need for, and impact of, future de-energization of those circuits.

---

[157] 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.

[158] 2022 Wildfire Mitigation Plan Guidelines Template, Attachment 2.8 pp. 78-83 (accessed March 6, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=51912&shareable=true.

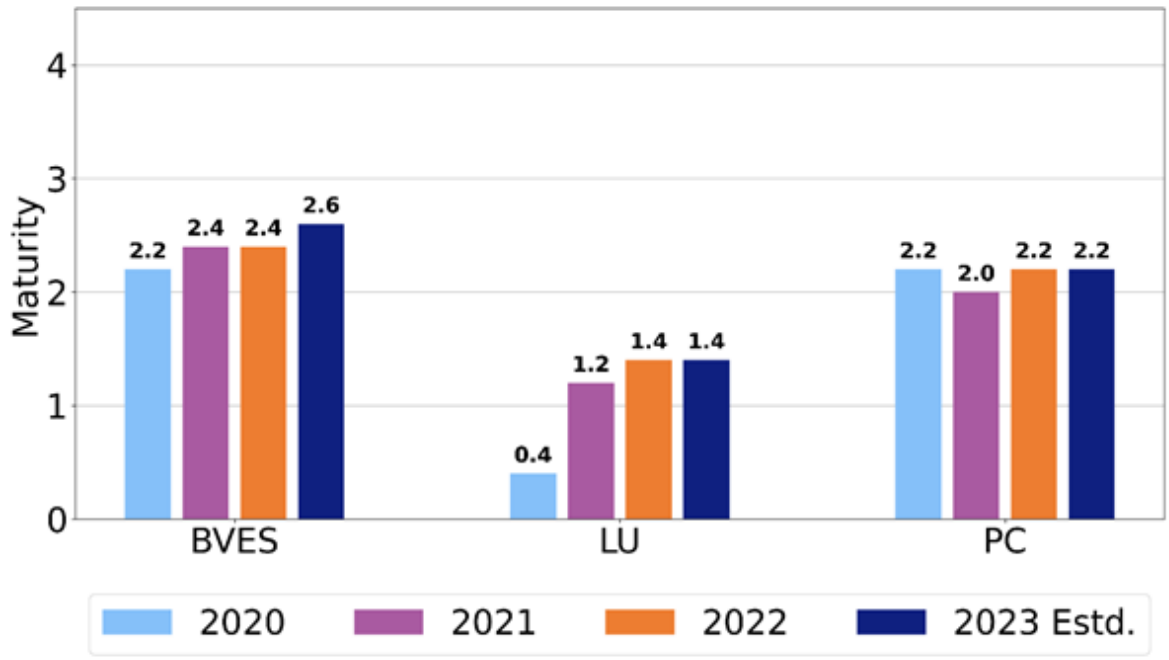
[159] Senate Bill No. 533, Chapter 244, An act to amend section 8386 of the Public Utilities Code, relating to electricity: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB533 (accessed April 11, 2022).

4.7.1 Maturity Assessment

The Maturity Model does not include a distinct PSPS category. PSPS questions in the Maturity Survey are found under capabilities in various maturity categories. The PSPS-related capabilities referenced here are in the maturity categories of situational awareness, grid operations and operating protocols, and emergency planning and preparedness. The PSPS category represented in Figure 4.7-1 below includes PSPS-related capabilities from these categories. Maturity levels are calculated in the same way as the other categories.

According to its responses on the 2022 Maturity Survey, PacifiCorp started the current WMP cycle at a maturity level comparable to those of Liberty and Bear Valley in several categories and capabilities related to PSPS. The utility assessed itself at a maturity level of 2.2 in 2020 and 2.0 in 2021. In 2022, PacifiCorp increased its maturity level back to 2.2. While PacifiCorp has made progress, according to its 2022 Maturity Survey responses its maturity level in this category falls in the middle between those of Liberty and Bear Valley.

Figure 4.7-1: Cross-Utility Maturity for PSPS-Related Capabilities — SMJUs (2020-2022 Actual, 2023 Estimated)



Areas which may be preventing PacifiCorp from maturing further are discussed below.

PacifiCorp's maturity level has remained steady in the estimation of wildfire and PSPS risk-reduction impact capability of the risk assessment and mapping category. Its maturity level may be limited by responses on the Maturity Survey that include the following:

- PacifiCorp reports that its estimates of risk reduction impact use an ordinal scale (e.g., 1-5), which is consistent with 2021. It anticipates using this scale in 2023. If it were at a higher level of maturity, PacifiCorp would use an interval or quantitative confidence interval.[160]
- The granularity of PacifiCorp's ignition risk reduction impact assessment tool is span-based. Asset-based granularity represents the highest level of maturity, which PacifiCorp anticipates reaching in 2023.[161]

PacifiCorp's maturity level is flat in the grid design for resiliency and minimizing PSPS capability of the grid design and system hardening category. Its maturity level may be limited by its response to questions on the Maturity Survey that include the following:

- PacifiCorp reports the level of redundancy for its distribution architecture is covering at least 50 percent of customers in the HFTD. The highest level of maturity would be achieving coverage of at least 85 percent of customers in the HFTD.[162]
- Regarding the level of sectionalization of PacifiCorp's distribution hardware, PacifiCorp's circuits in the HFTD are individually isolated such that no more than 2,000 customers sit within one switch. The highest level of maturity would require that no more than 200 customers sit within one switch.[163]

[160] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to A.IV.a.

[161] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to A.IV.c.

[162] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to C.III.b.

[163] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to C.III.c.

In the grid operations and protocols category, PacifiCorp's maturity was limited by answers under three different capabilities: PSPS operating model and consequence mitigation, protocols for PSPS initiation, and protocols for PSPS initiation.

- No specific resources are provided to customers to alleviate the impact of a power shutoff (e.g., providing backup generators, supplies, batteries, etc.). Providing such resources would indicate the highest level of maturity.[164]
- PacifiCorp has explicit policies and explanation for windspeed thresholds above which PSPS is activated as a measure of last resort. The highest level of maturity would also include maintaining its grid in sufficiently low risk condition to not require any PSPS activity, though it may de-energize specific circuits upon detection of damaged electrical lines and equipment or contact with foreign objects.[165]
- PacifiCorp has an existing process for accurately inspecting de-energized sections of the grid prior to re-energization. Augmentation of its system with sensors and aerial tools is needed to reach the highest level of maturity.[166]

4.7.2 PacifiCorp's Progress

Outcome Metrics

PacifiCorp is committed to learning from two PSPS events and one PSPS watch, which did not result in any de-energized customers, and incorporating any changes or improvements needed. These lessons are described further in the next section, PSPS Preparedness and Methodology. Metrics provided in Table 11 of its 2022 Update, recent use of PSPS and other PSPS metrics, regarding scale, scope, and frequency of PSPS events from 2018-2021, show that PacifiCorp has implemented two PSPS events, depicted in Figures 4.7-2, 4.7-3, and 4.7-4.

[164] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to F.III.f.

[165] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to F.IV.a

[166] PacifiCorp's 2022 Utility Wildfire Mitigation Maturity Survey, response to F.V.a.

Figure 4.7-2: Recent Use of PSPS: Frequency of PSPS events (Total) – SMJUs (2018-2021 Actual, 2022 Projected)

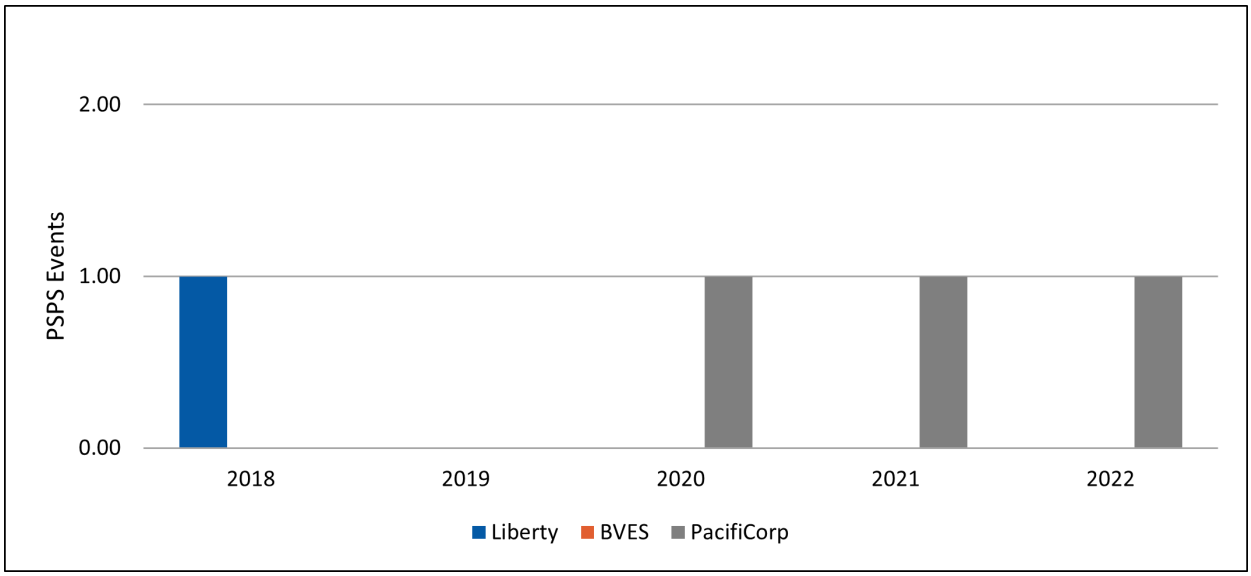


Figure 4.7-3: Recent Use of PSPS Circuits: Scope of PSPS Events (Total) per 1,000 Overhead Circuit Miles – SMJUs (2018-2021 Actual, 2022 Projected)

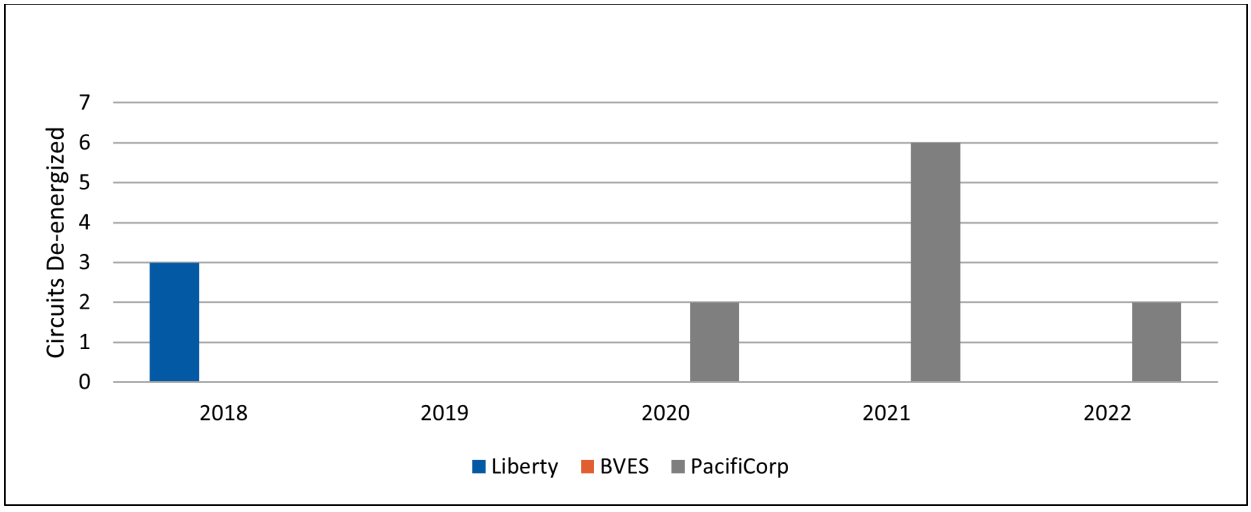
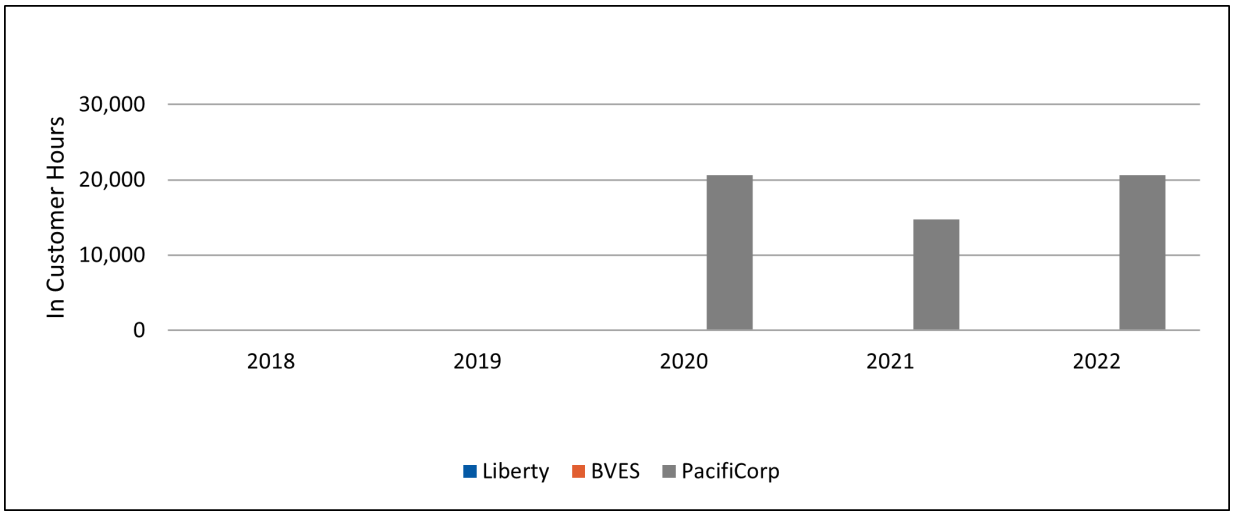


Figure 4.7-4: Recent Use of PSPS, Duration of PSPS Events (Total) – SMJUs (2018-2021 Actual, 2022 Projected)



PSPS Preparedness and Methodology

PacifiCorp continues to learn from each PSPS event and adapt its mitigation approach as needed. It reports three lessons learned from its 2021 PSPS experience:

- PacifiCorp reports that real-time production of GIS mapping data proved more challenging to create and distribute than it anticipated. As a result, PacifiCorp identified the need for a more streamlined process to produce GIS mapping data and plans to implement a Public Safety Partner Portal to address the problem.
- PacifiCorp reports that its messaging lacking during PSPS events, indicated by low customer awareness of the availability of customer resource centers (CRCs). Going forward PacifiCorp plans to include additional CRC information in customer messaging and external media sources.
- PacifiCorp reports that positive confirmations that notifications were received by AFN customers were delayed and inconsistently recorded, and better notification records are necessary. PacifiCorp plans to respond to these shortcomings by:
    - Increasing education for call center personnel to recognize errors and establish processes to make corrections more quickly.
    - Implementing new steps in PSPS protocols that include quicker verification of notifications.
    - Placing emergency technical support on call to support and troubleshoot errors as they arise throughout the duration of the event.

PacifiCorp reports it will incorporate these lessons learned in 2022.

Near-Term Plans (1-3 years):

- PacifiCorp continues to pursue more granular situational awareness to provide better insight into if and when a PSPS event might be necessary.
- PacifiCorp reports a sustained focus on grid hardening initiatives such as its Line Rebuild program (i.e., covered conductor). PacifiCorp anticipates that it will raise windspeed thresholds for initiating a PSPS due to reduced ignition risk resulting from grid hardening activities.[167]
- It is PacifiCorp's intent to procure modeling tools and begin using an aggregate index to assess risk by 2023. PacifiCorp expects this will be an iterative process as new information, methods and industry best practices are incorporated.

Long-Term Plans (3-10 years):

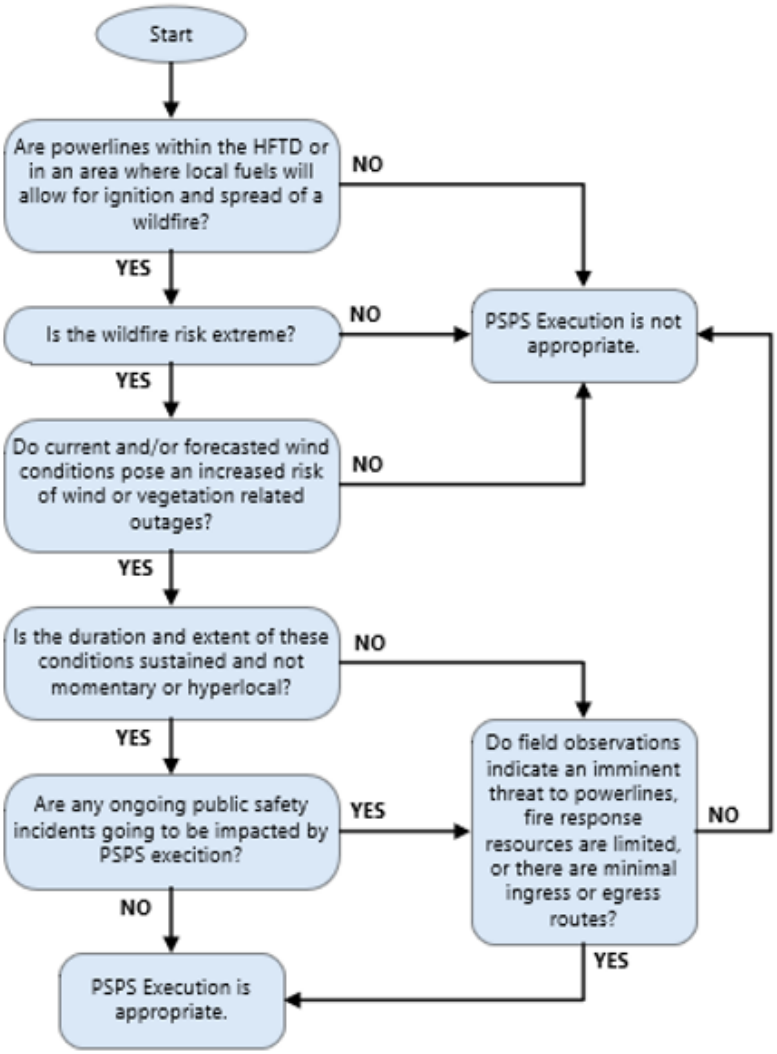
- PacifiCorp expects to improve its ability to remotely reconfigure the network's system protection (e.g., through fault detection devices and sectionalization capability) as more communication technologies and grid configurations are implemented, reducing risk and therefore need for PSPS.
- PacifiCorp indicates its plans for completing system hardening efforts will remove bare wire circuit segments and help protect customers served by those segments from PSPS risk.
- As PacifiCorp builds out its weather network, improves its risk modeling, and completes asset hardening projects, PacifiCorp anticipates that its PSPS scope will be reduced.
- PacifiCorp expects that its goals of greater network modularization, including grid technology advancement, will reduce the duration of PSPS events.

[167] The impact system hardening has on preliminary thresholds for a PSPS watch is still being evaluated; PacifiCorp has not adjusted its thresholds this year.

Protocols for De-Energization and Re-Energization

In its 2022 Update PacifiCorp describes its PSPS procedure, from monitoring and de-energization to later re-energization. PacifiCorp uses an internal escalation process, which includes activating its Emergency Coordination Center (ECC), altering system protection control settings, and conducting patrols. PacifiCorp provides a schematic view of its decision-making process on whether it will initiate a PSPS event in Figure 4.7-5.

Figure 4.7-5: PacifiCorp PSPS Initiation Decision Flowchart (Source: PacifiCorp)[168]



[168] PacifiCorp's 2022 Update, p. 258.

PacifiCorp reports that it evaluates wildfire risk and weather-related outage risk daily across its service territory using newly deployed weather and wildfire models, National Weather Service and Geographic Area Coordination Center data, and its in-house experts. To assess wind-related outages PacifiCorp correlated five years of historical High Resolution Rapid Refresh (HRRR) model forecasts to outage occurrences, allowing it to identify higher risk circuits up to 48-hours in advance.

Starting in 2021, PacifiCorp began to host ECC activation exercises to improve response times. PacifiCorp plans to continue to conduct ECC activation exercises in 2022 and incorporating lessons learned from 2021 regarding tracking and reporting.

In its 2022 Update, PacifiCorp presents its re-energization process in Section 7.3.9.5, "Preparedness and planning for service restoration." PacifiCorp reports that it prepared plans for service restoration in PSPS zones to expedite service restoration.

With regard to forecasting:

- PacifiCorp anticipates it will complete its annual calibration of weather stations by June 2022 to provide increasing granularity and additional weather data to situational awareness forecast processes, which may reduce the scale and scope of PSPS. This includes the installation of additional weather stations to access localized weather risk data and inform decision making.
- To better leverage weather station data and other key information, PacifiCorp reports that it is investing in a range of new data processing and modeling capabilities. PacifiCorp built and implemented new computing capabilities that became operational in November 2021. The new capabilities are intended to enable an operational weather forecast model and create a high-resolution, 30-year historical record of weather across PacifiCorp's service territory by 2023. PacifiCorp reports that the system is fully redundant, with backup capabilities to prevent it from going down in emergency situations when it is needed most.

With regard to risk assessment:

- PacifiCorp is procuring a modeling suite to evaluate daily fire risk across its service territory. The modeling suite is anticipated to provide more granular data and improve accuracy to potentially reduce PSPS scope by the next WMP submission. Beginning in 2023, machine-learning models will support improved PSPS decision making. Further improvements are anticipated through 2026.

- By the end of 2022, PacifiCorp plans to fully implement Wildfire Analyst-Enterprise (WFA-E) software to provide indicators of risks to all assets based on fire spread simulations. It will also use fire simulations to identify destructive fires and provide a detailed map of weather and fire information. The information produced will drive operational decisions, including whether to initiate a PSPS event.
- In 2021, PacifiCorp built situational awareness websites for use by its employees, customers, and public safety partners. PacifiCorp expects to make ongoing enhancements to these sites throughout 2022.

PacifiCorp expects that additional data and a more sophisticated situational awareness model will better inform its decision making. This is anticipated to reduce PSPS impacts by lessening the chance of a PSPS event being implemented unnecessarily and allowing for PSPS events to have a smaller scope.

Community Engagement

PacifiCorp has established partnerships with state, county, and local agencies to support PSPS response and provides ongoing updates to partners to maintain a shared operating framework. PacifiCorp works with public safety partners, local emergency managers and tribal leadership to identify appropriate locations to deploy CRCs (at least three CRC locations per county and at least one per PSPS zone).

PacifiCorp plans to continually improve its community outreach efforts based on feedback from customers and public safety partners. It also plans to maintain alignment with regulatory requirements. In particular, PacifiCorp continues to refine both its process for identification of access and functional needs (AFN) customers and its targeted communications to reach more customers.

- In 2021, PacifiCorp added an option to its California Alternate Rates for Energy (CARE) application, which is sent to all customers, to identify as AFN. The response captured an additional 193 AFN customers throughout the service territory, 43 of whom are in the HFTD.
- PacifiCorp representatives attended the AFN Statewide Council and AFN Collaborative Planning team for the first time in 2021 for insight. PacifiCorp incorporated commonly applicable portions from the joint utility plan and modified other portions to match the size and scope of its territory.

- In 2022, PacifiCorp participated in a working session with Liberty and Bear Valley to supplement the larger statewide groups and focus on best practices. The working session focused on identifying AFN customers at greatest risk during a PSPS event, in addition to vulnerable customers which utilities may not be able to identify but to whom utilities should still provide support and resources to mitigate PSPS impacts.
- In 2022, PacifiCorp intends to increase outreach to identify more customers that rely on medical equipment and broaden the scope of customers who self-identify as AFN. Customers will receive communications about the Medical Baseline (MBL) rate, and a Spanish version of the MBL application will be available on the website this year.

PacifiCorp reports that its education and awareness strategy is informed by customer survey data, community stakeholder input, and community needs. In 2022, PacifiCorp plans to update its survey to include an evaluation of PSPS impact reduction programs. PacifiCorp intends for the survey to inform adequacy and potential improvement for such programs.

Frequently De-Energized Circuits

PacifiCorp reported no frequently de-energized circuits in its 2022 Update.[169]

4.7.3 Areas for Continued Improvement

In addition to progress made, PacifiCorp must continue to improve in the area described below.

Lack of Quantitative Targets for PSPS Initiatives and Short-Term Reduction Commitments

In its 2022 Update, PacifiCorp states that it intends to deploy its WMP initiatives to reduce the probability of using PSPS over the coming years and provides an overview of recent lessons learned. However, PacifiCorp's 2022 Update does not fully quantify short-term PSPS reduction commitments and mitigation initiative targets in either Table 11 or Section 8. PacifiCorp has provided some targets for reducing PSPS in fields of Table 11, "Recent use of

[169] A frequently de-energized circuit is defined as a circuit which has been de-energized pursuant to a de-energization event to mitigate the risk of wildfire three or more times in a calendar year.

PSPS and other PSPS metrics," but has not provided ambitious targets in other fields (e.g., it has values of zero).

PacifiCorp reports that it intends to procure modeling tools and begin developing and using a fully mature aggregate index to assess risk, similar to the Fire Potential Index used by other utilities by 2023.[170] Energy Safety expects that PacifiCorp will be able to more robustly estimate expected reductions based on developing its risk model capability during 2022.

In its 2023 WMP, PacifiCorp must provide quantifiable risk reduction projections of frequency, scope, and duration of potential PSPS events during the plan term, including timelines for achieving these reductions.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 7.

[170] PacifiCorp's 2022 Update, p. 233.

5. Next Steps

PacifiCorp is expected to continue to mature over the coming year. However, PacifiCorp must specifically demonstrate the required progress set forth in Section 7.

5.1 Change Orders

If PacifiCorp seeks to modify (reduce, increase, or end) WMP mitigation measures in response to data and results on electrical corporation ignition risk reduction impacts, PacifiCorp must submit a Change Order Request. For information and requirements regarding the change order process, refer to the 2022 Change Order Guidelines.[171]

[171] 2022 Change Order Guidelines (accessed October 26, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52883&shareable=true.
Draft Revised 2022 Change Order Guidelines (accessed November 2, 2022): https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53099&shareable=true.

6. Consultation with the Office of the State Fire Marshal

The Office of the State Fire Marshal is a CAL FIRE program. Public Utilities Code section 8386.3(a) requires Energy Safety to consult with the Office of the State Fire Marshal in reviewing electrical corporations' WMPs and WMP Updates. Energy Safety and CAL FIRE have a memorandum of understanding in place to facilitate this consultation.[172] The Office of the State Fire Marshal participated in all aspects of the evaluation, but this Decision does not purport to speak for the Office of the State Fire Marshal or CAL FIRE.

[172] Required by Public Utilities Code § 8386.5.

7. List of PacifiCorp's Areas for Continued Improvement and Required Progress

Energy Safety evaluated 2022 Updates with a particular focus on how each utility is driving down the risk of utility-related ignitions. The evaluation included assessing the utility's progress implementing wildfire mitigation initiatives, evaluating the feasibility of its strategies, and measuring year-to-year trends. As a result of this evaluation, Energy Safety identified areas where the utility should continue to improve its wildfire mitigation capabilities in future plans. The complete list of all PacifiCorp's areas for continued improvement follows below.

- **PC-22-01. Specific Lessons Learned With Associated Actions.**
    - Description: In Section 4.1 of its WMP, PacifiCorp does not provide concrete or specific examples for its lessons learned. For example, under Section 4.1.3 of PacifiCorp's 2022 Update, PacifiCorp lists a lesson learned in the grid design and system hardening category as, "the ability to underground certain areas can rely heavily on effective alignment with landowners." This does not provide a specific lesson learned, nor does it elucidate the steps that are being taken as a result of this lesson.
    - Required Progress: In its 2023 WMP, PacifiCorp must provide concrete examples of lessons learned and the specific steps that are being taken directly as a result of the lessons learned.
    - Discussed in Decision Section 4.3.1, "Lessons Learned and Risk Trends."

- **PC-22-02. Collaboration and Research in Best Practices in Relation to Climate Change Impacts and Wildfire Risk and Consequence Modeling.**
    - Description: While PacifiCorp includes some climate projections within its modeling, PacifiCorp does not sufficiently account for climate change in its planning.

- Required Progress: Prior to the submission of their 2023 WMPs, all electrical corporations (not including independent transmission operators) must participate in an Energy Safety-led scoping meeting to discuss how utilities can best learn from each other, external agencies, and outside experts on the topic of integrating climate change into projections of wildfire risk. They must also participate in any follow-on activities to this meeting. In addition, the climate change and risk modeling scoping meeting will identify future topics to explore regarding climate change modeling and impacts relating to wildfire risk. This scoping meeting may result in additional meetings or workshops or the formation a working group. Energy Safety will provide additional details on the specifics of this scoping meeting in due course.
- Discussed in Decision Section 4.6.1, "Risk Assessment and Mapping."

- **PC-22-03. Inclusion of Community Vulnerability in Consequence Modeling.**
  - Description: PacifiCorp does not currently include the impacts of wildfire on communities, such as community vulnerability, within consequence modeling.
  - Required Progress: Prior to the submission of their 2023 WMPs, all electrical corporations (not including independent transmission operators) must participate in an Energy Safety-led scoping meeting to discuss how to best learn from each other, external agencies and outside experts on the topic of community vulnerability. They must also participate in any follow-on activities to this meeting. In addition, the community vulnerability scoping meeting will identify future topics to explore regarding integration of community vulnerability into consequence modeling and impacts relating to wildfire risk. This scoping meeting may result in an additional meetings or workshops or the formation of a working group. Energy Safety will provide additional details on the specifics of this scoping meeting in due course.
  - Discussed in Decision Section 4.6.1, "Risk Assessment and Mapping."

- **PC-22-04. Wildfire Consequence Modeling Improvements.**
  - Description: PacifiCorp's risk model is limited in its evaluation of wildfire spread based on timing limitations as well as suppression effects.

- Required Progress: Prior to the submission of its 2023 WMP, PacifiCorp must work with other utilities to evaluate how to best account for, quantify, and model catastrophic fire risk that occurs more than eight hours post-ignition as well as suppression effects on wildfire spread. Further guidance will be determined and covered during the risk model working group meetings established by Energy Safety's 2021 WMP Action Statements.
- Discussed in Section 4.6.1, "Risk Assessment and Mapping."

- **PC-22-05. Prioritization Based on Risk Analysis.**
  - Description: Table 5.2 of PacifiCorp's plan uses Tier 2 and 3 designations for top risk calculations, as opposed to risk calculations based on risk modeling. It is unclear whether or how PacifiCorp currently uses modeling output to inform prioritization.
  - Required Progress: In its 2023 WMP, PacifiCorp must:
    - Provide an update on its progress using risk model output to inform its initiative plans based on highest risk areas, including determination of top risk percentages, for all initiatives, including covered conductor and undergrounding.
    - Explain how PacifiCorp plans to use its risk model to inform both operations and mitigation planning.
  - Discussed in Decision Section 4.6.1, "Risk Assessment and Mapping."

- **PC-22-06. Lessons Learned from Past Wildfires.**
  - Description: PacifiCorp provides no indication of lessons learned, both in terms of WMP initiatives and procedures, as a result of recent PacifiCorp-reported catastrophic wildfires.
  - Required Progress: In its 2023 WMP, PacifiCorp must:
    - Investigate the root causes of its ignitions at the programmatic and systemic levels.
    - List the cause(s) of each catastrophic wildfire and any associated lessons learned.

        - Detail the specific measures PacifiCorp is taking to i) directly mitigate the causes of past PacifiCorp-ignited catastrophic wildfires, and ii) integrate lessons learned from past PacifiCorp-ignited wildfires into its wildfire mitigation strategy.
    - Discussed in Decision Section 4.6.1, "Risk Assessment and Mapping."

- **PC-22-07. Update on Wildfire Detection Program.**
    - Description: PacifiCorp planned in 2020 and in 2021 to have equipment for detecting ignitions on its grid by the start of 2023. In 2022, PacifiCorp's progress is still in the planning pilot stage of its wildfire detection program and is the only utility that will not have any of its own HD Cameras installed by 2023.
    - Required Progress: In its 2023 WMP, PacifiCorp must provide an update on progress and details on the equipment it plans to operationalize and procedures it has developed for detecting ignitions on its grid through its wildfire detection program. This includes the total number of HD cameras it plans to install, program targets, timeline for completion, and future progress.
    - Discussed in Decision Section 4.6.2, "Situational Awareness and Forecasting."

- **PC-22-08. Adequate Weather Station Density.**
    - Description: In comparison with Bear Valley and Liberty, PacifiCorp has fewer weather stations installed per circuit mile and has not determined the total number of weather stations it plans to deploy for adequate weather station density.
    - Required Progress: In its 2023 WMP, PacifiCorp must discuss its assessment of weather station density and determine the total number of weather stations it plans to install in its California service territory. This includes any weather station to circuit mapping analysis that has been done to determine spatial gaps.
    - Discussed in Decision Section 4.6.2, "Situational Awareness and Forecasting."

- **PC-22-09. Applying Joint Lessons Learned Concerning Covered Conductor.**
    - Description: PacifiCorp has not provided goals and timelines for implementing lessons learned from the covered conductor effectiveness joint study.
    - Required Progress: In its 2023 WMP, PacifiCorp must:
        - Provide a concrete list of goals with planned dates of implementation for any lessons learned in the covered conductor effectiveness joint study.
        - Provide a table indicating which WMP sections include changes (compared to its 2021 and 2022 Updates) as a result of the covered conductor effectiveness joint study. This should include, but not be limited to:
            - Changes made to covered conductor effectiveness calculations.
            - Changes made to initiative selection based on effectiveness and benchmarking across alternatives.
            - Inclusion of rapid earth fault current limiter (REFCL), open phase detection (OPD), early fault detection (EFD), and distribution fault anticipation (DFA) as alternatives, including for PSPS considerations.
            - Changes made to cost impacts and drivers.
            - An update on data sharing across utilities on measured effectiveness of covered conductor in-field and pilot results, including collective evaluation.
    - Discussed in Decision Section 4.6.3, "Grid Design and System Hardening."

- **PC-22-10. Covered Conductor Inspection and Maintenance.**
    - Description: PacifiCorp lacks specific directives for inspection procedures regarding covered conductor inspection and maintenance.
    - Required Progress: All electrical corporations (not including independent transmission operators) must work to share and determine best practices for inspecting and maintaining covered conductor, including either augmenting existing practices or developing new programs. This should be considered as a continuation of the covered conductor effectiveness joint study established by

Energy Safety's 2021 WMP Action Statements. The study will continue to be utility-led, with the expectation for Energy Safety to be included as a participant. A report on progress on this continuation of the covered conductor effectiveness joint study will be expected in the 2023 WMPs.

- Discussed in Decision Section 4.6.3, "Grid Design and System Hardening."

- **PC-22-11. Failure to Meet Grid Hardening Targets.**
  - Description: PacifiCorp has fallen behind on its covered conductor and pole replacement targets and is not expected to meet these targets in 2022.
  - Required Progress: In its 2023 WMP, PacifiCorp must:
    - Demonstrate how it has set realistic, achievable yet ambitious WMP targets, taking into account any lessons learned from this year.
    - Provide a plan for how it is going to meet unmet grid hardening targets in 2023 and set realistic but sufficiently ambitious targets in the future. This plan should include how PacifiCorp is:
      - Evaluating resource allocation, including labor and materials. This should take into account resourcing and supply chain issues.
      - Monitoring progress closely, identifying and addressing delays.
      - Making adjustments to future targets based on incomplete 2022 targets and additional delays, including how PacifiCorp is prioritizing projects to address delays quickly.
      - Making corrections based on lessons learned to prevent future delays, including changes in execution as well as future targets.
  - Discussed in Decision Section 4.6.3, "Grid Design and System Hardening."

- **PC-22-12. Disaggregation of Pole Replacements and Covered Conductor Installation.**
  - Description: PacifiCorp's pole replacement program as it relates to wildfire risk is integrated into its covered conductor program and does not include

descriptions for how PacifiCorp identifies and prioritizes pole replacements outside of covered conductor installation.

- Required Progress: In its 2023 WMP, PacifiCorp must:
  - Disaggregate its pole replacement program as necessary to include targeted replacements to address known wildfire risk, including egress/ingress issues; OR
  - Demonstrate that complete aggregation of its covered conductor and pole replacement programs provides the most cost/benefit efficiency and addresses the proper ignition risks at a given location.
- Discussed in Decision Section 4.6.3, "Grid Design and System Hardening."

- **PC-22-13. Selection of Undergrounding Projects.**
  - Description: PacifiCorp has not provided enough detail in terms of how it selected its undergrounding projects, particularly when accounting for risk allocation methodologies.
  - Required Progress: In its 2023 WMP, PacifiCorp must provide full analysis on benefits of undergrounding in comparison to other initiatives, including covered conductor. This analysis should include:
    - Risk modeling output for location selection.
    - Cost/benefit analysis, including maintenance and long-term costs.
    - PSPS risk analysis.
    - Any additional locations considered for selection.
  - Discussed in Decision Section 4.6.3, "Grid Design and System Hardening."

- **PC-22-14. Further Development of Integrating Risk-Informed Decision Making for Inspection Scheduling and Planning.**
  - Description: While PacifiCorp states it uses some risk-informed prioritization for inspections based on Tier 2 and Tier 3 designations and consequence modeling, PacifiCorp has not implemented risk modeling-informed enhancements in its inspection program.
  - Required Progress: In its 2023 WMP, PacifiCorp must:

- Evaluate enhancing and augmenting its existing inspections to be informed by wildfire risk (i.e., increased frequency, changes in inspection lists).
- Benchmark with other utilities to determine what additional technologies can be used to augment current inspections, such as drones and thermography, and develop plans to pilot or implement use moving forward.
- Provide a concrete timeline detailing when PacifiCorp plans to implement risk modeling-informed enhancements for each of its inspection types.

  - Discussed in Decision Section 4.6.4, "Asset Management and Inspections."

- **PC-22-15. Improvement of QA/QC Process.**
  - Description: PacifiCorp's QA/QC process for asset inspections currently lacks documentation and does not show how it uses lessons learned to inform changes on future inspections or trainings.
  - Required Progress: In its 2023 WMP, PacifiCorp must:
    - Provide its documentation and process for its QA/QC of asset inspections. This should include targets for performance and thresholds set for when PacifiCorp takes corrective actions.
    - Analyze QA/QC findings from asset inspections and improve its QA/QC process to account for and minimize similar mistakes in the future.
    - Complete QA/QC of asset inspections either internally or using a contractor that differs from the contractor who performed the initial inspection.
  - Discussed in Decision Section 4.6.4, "Asset Management and Inspections."

- **PC-22-16. Participate in Vegetation Management Best Management Practices Scoping Meeting.**
  - Description: Vegetation management processes and protocols for the reduction of wildfire risk are not uniform across electrical corporations.

- Required Progress: Prior to the submission of their 2023 WMPs, PacifiCorp and all other electrical corporations (not including independent transmission operators) must participate in an Energy Safety-led scoping meeting to discuss how utilities can best learn from each other and future topics to explore regarding vegetation management best management practices for wildfire risk reduction. PacifiCorp must also participate in any follow-on activities to this meeting. This vegetation management best management practices scoping meeting may result in additional meetings or workshops or the formation of a working group. Energy Safety will provide additional details on the specifics of this scoping meeting later in 2022.
- Discussed in Decision Section 4.6.5, "Vegetation Management and Inspections."

- **PC-22-17. Progress on Use of Enhanced Fire Risk (EFR) Settings.**
  - Description: PacifiCorp has not performed a full analysis on reliability and related public safety impacts for changes to its EFR settings.
  - Required Progress: In its 2023 WMP, PacifiCorp must:
    - Analyze any reliability and public safety impacts associated with changes in sensitivity of protective device settings, including a lookback related to 2022 performance.
    - Describe mitigation measures implemented to reduce reliability impacts of EFR if noticeable impacts are observed.
  - Discussed in Decision Section 4.6.6, "Grid Operations and Protocols."

- **PC-22-18. Inadequate Justification of Initiative-Selection Process.**
  - Description: PacifiCorp does not provide any RSE estimates for its mitigation initiatives. Without the quantified risk reduction values, PacifiCorp's qualitative approach to justify the initiative-selection process is insufficient and lacks transparency.
  - Required Progress: In its 2023 WMP, PacifiCorp must provide RSE estimates for its mitigation initiatives and implement them in its initiative selection process in its 2023 WMP Update. PacifiCorp must also clearly demonstrate where

quantified, risk reduction values and RSE estimates are being considered in its decision-making process.

- Discussed in Decision Section 4.6.8, "Resource Allocation Methodology."

- **PC-22-19. Emergency Resources Availability.**
  - Description: PacifiCorp's emergency resources are located within Oregon and Washington.
  - Required Progress: In its 2023 WMP, PacifiCorp must analyze its response times regarding its emergency resources as a result of recent PacifiCorp-reported catastrophic fires. Depending on the analysis, PacifiCorp must evaluate deployment and storage of resources within California given the need to respond more quickly and effectively to ignitions to prevent catastrophic fires.
  - Discussed in Decision Section 4.6.9, "Emergency Planning and Preparedness."

- **PC-22-20. Unclear Progress Associated with Stakeholder Cooperation Initiatives.**
  - Description: In Section 7.3.10 of its 2022 Update, it is difficult to distinguish progress for many of PacifiCorp's stakeholder cooperation initiatives.
  - Required Progress: PacifiCorp must clearly detail specific points of progress from prior WMP submissions for each of its mitigation initiatives, rather than simply providing statements of current operations, past activities, or future plans. If there is no progress on a given initiative, PacifiCorp must clearly state this.
  - Discussed in Decision Section 4.6.10, "Stakeholder Cooperation and Community Engagement."

- **PC-22-21. Lack of Quantitative Targets for PSPS Initiatives and Short-Term Reduction Commitments.**
  - Description: PacifiCorp's 2022 Update does not fully describe short-term PSPS reduction commitments and mitigation initiative targets either in Table 11 or in Section 8.

- Required Progress: Provide quantifiable risk reduction projections of frequency, scope, and duration of potential PSPS events during the plan term, including timelines for achieving these reductions. Energy Safety expects that PacifiCorp will be able to fully quantify expected progress based on its work developing its risk model (described in Section 8) in 2022. PacifiCorp can use its modeled results to more comprehensively report expected reductions of impacts on customers and circuits and benefits to affected customers and circuits.
- Discussed in Decision Section 4.7, "Public Safety Power Shutoff (PSPS)."

8. Conclusion

PacifiCorp's 2022 Update is approved.

Catastrophic wildfires remain a serious threat to the health and safety of Californians. Electrical corporations, including PacifiCorp, must continue to make progress toward reducing utility-related ignition risk. Energy Safety expects PacifiCorp 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. PacifiCorp must meet the commitments in its 2022 Update and fully comply with the conditions listed in this Decision to ensure it meaningfully reduces of utility-related ignition and PSPS risk within its service territory.

Lucy C. Morgans
Program Manager | Electric Safety Policy Division
Electrical Infrastructure Directorate
Office of Energy Infrastructure Safety

DATA DRIVEN
FORWARD-THINKING
INNOVATIVE
SAFETY FOCUSED

OFFICE OF ENERGY INFRASTRUCTURE SAFETY
A California Natural Resources Agency
www.energysafety.ca.gov

715 P Street, 20th Floor
Sacramento, CA 95814
916.902.6000

APPENDICES

Appendix A. Status of 2021 WMP Issues

Energy Safety's 2021 Update Action Statement for each utility contained a set of "issues" and associated "remedies." Each issue was categorized into one of three groups:

- *Critical issues* were those for which Energy Safety issued a Revision Notice to the utility with required remedies. The utility submitted a revised Update addressing the critical issues, and Energy Safety re-evaluated the Update with the utility's revisions. Upon that review, issues may have been downgraded to either "key areas for improvement" or "additional issues," or were fully resolved.
- *Key areas for improvement* were areas Energy Safety identified as significant to reducing utility-related wildfire risk. Energy Safety provided remedies that utilities were required to address over the course of the year. Utilities were required to report on progress in these key areas in a progress report submitted to Energy Safety on November 1, 2021.
- *Additional issues* were those Energy Safety identified as areas for continued improvement to increase the maturity of the utility's wildfire mitigation capabilities. Energy Safety provided remedies that utilities were required to address over the course of the year. Utilities were required to report on progress in the 2022 WMP Update.

Issues identified in 2021 either have been resolved or are incorporated in the 2022 areas for continued improvement. The 2021 key areas for improvement are listed in Table A-1. The status column indicates whether each has been fully remedied. If not, the column notes where to find more information in this Decision.

Table A-1. PacifiCorp 2021 Key Issues Status

Issue #	Title	Status
PC-21-01	Failure to follow format for Section 7.3.b, subparts 1-5, of 2021 WMP Guidelines	Utility sufficiently addressed the required remedy
PC-21-02	Lack of consistency in approach to wildfire risk modeling across utilities	Utility sufficiently addressed thus far; Energy Safety will continue to monitor progress.
PC-21-03	GIS and nonspatial data discrepancy	Utility sufficiently addressed the required remedy
PC-21-04	Limited evidence to support the effectiveness of covered conductor	Utility sufficiently addressed thus far; Energy Safety will continue to monitor progress.
PC-21-05	Reconductoring projects not prioritized based on wildfire risk	Utility did not sufficiently address the required remedy. For more information on how the utility must improve, see areas for continued improvement, Section 4.6.3 of this Decision.
PC-21-06	No separate process for replacing expulsion fuses and tracking progress	Utility sufficiently addressed the required remedy.
PC-21-07	Limited explanation for how initiatives reduce PSPS impacts	Utility sufficiently addressed thus far; Energy Safety will continue to monitor progress.

Issue #	Title	Status
PC-21-08	Lack of details on automatic recloser settings and associated wildfire risk reduction	Utility did not sufficiently address the required remedy. For more information on how the utility must improve, see areas for continued improvement, Section 4.6.6 of this Decision.
PC-21-09	Inadequate justification of initiative-selection process	Utility did not sufficiently address the required remedy. For more information on how the utility must improve, see areas for continued improvement, Section 4.6.8 of this Decision.
PC-21-10	Inadequate approach to PSPS	Sufficiently addressed thus far; Energy Safety will continue to monitor progress. For discussion of progress and related areas for continued improvement see Section 4.7 of this Decision.

Appendix B. Energy Safety Data Request Responses

The following are data requests and their responses from PacifiCorp referenced in the Decision.

Regarding: Weather Stations

Data Request: OEIS-PC-22-001 (Question 2)

Request date: May 20, 2022

Request:

a. How many of PacifiCorp's weather stations are Remote Automatic Weather Stations (RAWS)?
b. How many of PacifiCorp's weather stations are Micro Weather Stations (MWS)?
c. Are any of PacifiCorp's weather stations outfitted with 10hr fuel moisture sensors?
d. Are any of PacifiCorp's weather stations able to report weather observations more frequently than every 10 minutes?
e. What is the total number of weather stations PacifiCorp plans to have deployed in its weather station network for optimal density?

Response date: May 26, 2022

Response:

a. There are two remote automatic weather stations (RAWS) that were installed in January of 2021. There are no active plans to install additional RAWS, but they will be considered if the locations do not allow for a micro weather station (MWS) to be installed.
b. There were 31 MWS installed by the end of 2021. In 2022, an additional 50 MWS are planned to be added, giving a total of 81 MWS in the state.
c. For MWS installed prior to 2021, the fuel moisture sensors were included with the installation, and maintained as part of the preventative maintenance program. For 2022, onward, PacifiCorp identified that data regarding dead and live fuel moisture can be provided through Technosylva weather modelling.
d. The weather stations have the ability to be programmed for more frequent observations. To date, the 10-minute weather data has been granular enough for real time operations and longer term risk modeling. As PacifiCorp develops additional

dynamic risk modeling capability, the Company may investigate whether or not an increased frequency of weather station data can provide additional benefits.

e. At the end of 2021, there were 33 weather stations, and the intended plan is to install 50 additional weather stations in 2022. That would give a weather station network of 83 stations in California. However, PacifiCorp has not determined the optimal final density of weather stations in California. Page 153 of PacifiCorp's 2022 Wildfire Mitigation Plan (WMP) mentions plans to develop a weather station circuit based methodology which will support determination of a weather station optimal density.

Regarding: HD Camera Installation

Data Request: OEIS-PC-22-001 (Question 5)

Request date: May 20, 2022

Request:

a. In section 4.4.1.1 and 7.3.2.2 PacifiCorp describes developing a new wildfire detection program.
   i. In 2022, how many HD Cameras does PacifiCorp plan to install in its CA service territory?
   ii. Will PacifiCorp be leveraging Satellite Fire Detection as part of its wildfire detection program?

Response date: May 26, 2022

Response:

a. Please refer to the Company's responses to subparts i. and ii. below:
   i. PacifiCorp is currently in the scoping phase of the Wildfire Detection program which will include HD Cameras. At this time, the exact number of HD Cameras is being determined and will probably not become operational until 2023.
   ii. At this time, PacifiCorp does not plan to have a separate pilot for Satellite Fire Detection. With the procurement of Technosylva, PacifiCorp plans to utilize their services for fire detection which may include the use of Satellite Fire Detection.

Regarding: Elevated Fire Risk Settings

Data Request: OEIS-PC-22-002 (Question 4)

Request date: August 10, 2022

Request:

a. Regarding PacifiCorp's use of elevated fire risk (EFR) settings for reclosers:
   i. Provide the thresholds and/or conditions used by PC to decide when EFR settings are enabled, including PC's decision making for implementing such settings.
   ii. Provide the statistics of the reliability impacts made in 2021 through the use of EFR settings (i.e., number of outages, duration of outages, number of customers impacted when EFR settings were enabled).
   iii. Provide the estimated number of ignitions reduced/prevented through the use of EFR settings in 2021.

Response date: August 15, 2022

Response: The Company assumes that the reference to "PC" is intended to be a reference to PacifiCorp. Based on the foregoing assumption, the Company responds as follows:

i. PacifiCorp's meteorology team assign district-level wildfire risk based on an assessment of the Geographic Area Coordination Center's (GACC) 7-Day Significant Fire Potential product based on publicly available fuels information and weather forecast data:

PacifiCorp Wildfire Risk	GACC 7-Day Significant Fire Potential	Fuels Considerations	Wind Gust Considerations
Little to No Wildfire Risk	Low or Little to No Risk		
Elevated Wildfire Risk	Low or Moderate	Dry	
Significant Wildfire Risk	Moderate	Very Dry	
	High Risk*	Dry or Very Dry	Max Gusts < 95th Percentile
Extreme Wildfire Risk	High Risk*	Dry or Very Dry	Max Gusts ≥ 95th Percentile

* Excludes Lightning or Recreation High Risk triggers

PacifiCorp Fuels	100-hr Dead Fuel Moisture	1000-hr Dead Fuel Moisture	Energy Release Component
Dry	Near or Below Average*		Near or Above Average*
Very Dry	≤ 10th Percentile	≤ 10th Percentile	≥ 90th Percentile

*Relative to the average fire season values for a given location

Meteorology provides outputs via a daily Systems Impact Forecast Matrix. Wildfire risk that falls within significant (orange) and extreme (red) risk are further

evaluated by meteorology to include a review of fuels and fire weather forecasts and observations. When moving into an elevated, significant, or extreme wildfire risk, meteorology will perform additional review of fuels and fire weather forecasts and observations, including by using some or all of the additional metrics and methods outlined in the tables below:

TABLE 1 - Initial Weather, Fuel, and Wildfire Impact Assessment

Additional Considerations When Assessing Wildfire Potential	
Wildfire Consequence Modeling (WFA-E)	Millions of wildfire simulations are performed daily to map out potential wildfire risk, behavior, and consequence across the service territory.
Fire Weather Watch or Red Flag Warning	Has the National Weather Service issued a Fire Weather Watch or Red Flag Warning for the area in question?
High Resolution Fire Weather Forecasts	PacifiCorp runs a 2km WRF model which produces a twice daily territory-wide forecast of fire weather conditions across a 96 hour time horizon.
Evaporative Demand Drought Index (EDDI)	EDDI identifies anomalous atmospheric evaporative demand and provides an early warning of increased wildfire risk.
Fuels Conditions (Grasses, Live Fuels, & Dead Fuels)	Observations of the local fuels conditions. Are grasses fully cured and receptive to ignition? Are live fuels critically dry? Is there excessive tree mortality?
Current or Recent Wildfire Activity	Current or recent wildfire activity is an indication that the weather and fuels conditions will contribute to fire occurrence and spread.
Hot-Dry-Windy Index (HDWI)	HDWI considers wind speed and VPD to determine which days are more likely to have adverse conditions that make it more difficult to manage a wildland fire.
Vapor Pressure Deficit (1-month running average)	Vapor Pressure Deficit is a measure of the atmospheric demand (thirst) for water. Values above the 94th percentile have been associated with large wildfires.
FHCA or HFTD (Y/N)	Fire High Consequence Areas & High Fire Threat District (CA) are pre-identified areas of elevated risk based on historical fires, climatology, geography and populations.

If there is conflicting or inconsistent data or forecasts, meteorology may escalate to senior power delivery management for discussion, evaluation, and resolution, to determine the best estimation of an appropriate wildfire risk assessment in a particular area.

Meteorology will provide a list identifying circuits of concern. Meteorology and operations will discuss the circuit level of concerns which may involve an entire circuit or a portion of a circuits to assist with determining an appropriate level of protection device settings.

Upon receipt of the circuits and devices that fall within elevated risk criteria, engineering and technical services will conduct an evaluation of the circuits which are identified as having a forecasted wildfire risk of significant or above. After evaluating those circuits, engineering and technical services will provide, as

appropriate, the following information to transmission and distribution (T&D) operations and system operations:

1. Device EFR capability and field action to be set in EFR mode.
2. Load transfers.
3. Potential proactive de-energization zone sectionalization and restore options.
4. The number of customers impacted beyond each device.

T&D operations will implement device setting modifications and maintain them in setting until wildfire risk conditions improve to elevated (yellow) or low (green).

ii. PacifiCorp is in the process of installing reclosers and relays. In the midst of this process, some pieces of equipment may not have communications or the ability to be changed remotely. Many of the EFR settings are enabled through a manual process, and the exact timing of implementation may not be documented for 2021. Therefore, PacifiCorp cannot provide the outage data during EFR settings as the Company does not have the timing of when EFR settings were enabled.

iii. It is not possible to count how many ignitions were prevented as it is impossible to predict when ignitions will occur. Generally, the potential for ignitions goes down when there is less arcing. By activating the EFR settings, the timing and quantity of measured arc events were reduced, which indicated to PacifiCorp that the correlated ignition potential was also reduced.

Regarding: Covered Conductor Impementation (Follow-Up Questions)

Data Request: OEIS-PC-22-003 (Question 1)

Request date: September 8, 2022

Request:

a. In Data Request 002, Q02, Energy Safety requested PacifiCorp to explain, "How does PC plan to achieve its overall covered conductor target in 2022 (e.g., 112 miles in 2022)?" In response to this question, PacifiCorp provided information on its plans to contract with a Construction Management Partner early 2023. PacifiCorp also provided a graphical representation (figure 1) of the planned schedule for this work.

i. In figure 1, construction of the 112 circuit miles targeted for 2022 is shown to be completed between January 7, 2022, and May 26, 2022. Has this work been completed? Was this work completed by this milestone? If the work was not completed by May 26 this year, explain why it was not completed.
ii. If the targeted 112 circuit miles of covered conductor was not completed by May 26, 2022, will it be completed by the end of this year? If this work will not be completed by the end of this year, explain why not.

Response date: September 14, 2022

Response:

The Company assumes that the reference to "Data Request 002, Q02" is intended to be a reference to OEIS Data Request 2.2. Based on the foregoing assumption, the Company responds as follows:

i. The graphical representation was to describe a typical project timeline and was not specific to any one of the 2022 covered conductor projects. The Q2 2022 quarterly initiative update states that 31 miles were planned to be completed by May 26, 2022, but 26 miles were actually completed. The Company did not complete five miles on time, however, the Company continues to work on the 2022 scope which will through December 31, 2022. PacifiCorp was impacted by material shortages, damages, and evacuations due to recent fires, delays in permitting, as well as construction firms which are also facing resources constraints. PacifiCorp is currently assessing the impact on project schedules and evaluating alternatives to bring the project back on track.
ii. As stated in the Q2 2022 quarterly initiative update, PacifiCorp was planning to complete 31 miles of covered conductor by Q2 2022, and to complete the 112 line miles by end of calendar year. At this time, due to the reasons mentioned in the Company's response to subpart (i) above, PacifiCorp anticipates completing the full planned 112 miles by Q2 2023.

Regarding: Pole Replacement Implementation

Data Request: OEIS-PC-22-003 (Question 2)

Request date: September 8, 2022

Request:

a. PacifiCorp has set the target of replacing 2,020 poles by the end of this year. Will PacifiCorp be able to accomplish this goal by the end of 2022? What is the status of this program? How many poles have been replaced to date and when will the remaining poles be replaced?

Response date: September 14, 2022

Response:

a. As of June 30, 2022, PacifiCorp has completed 612 pole replacements as reported on the Q2 2022 quarterly initiative update. PacifiCorp will continue to work on the pole replacement project through to the end of the year, and expects the 2,020 pole replacements to be completed by Q2 2023.

Regarding: RSE Values

Data Request: OEIS-PC-22-003 (Question 3)

Request date: September 8, 2022

Request:

a. During a weekly call with PacifiCorp and Energy Safety, that took place on June 1, 2022, the following information was provided, "Last year we believed our LRAM would turn into a RSE generating machine, then in late 2021/early 2022 the company pivoted on what risk modeling looks like for us. We decided to change our approach to be in line with what the other utilities were doing using the Technosylva tools… Our goal now is to bring on Technosylva, we're working on a contract for the WRRM model."

   Provide an update on the status of your plan to acquire new modeling tools that will provide you with the ability to calculate RSE values.

b. During this same call, PacifiCorp stated something along the lines that it "could probably provide qualitative risk reduction estimate with what we have now, but it wouldn't be a meaningful and sustainable number (i.e., qualitative)."

Provide these risk reduction estimates for wildfire initiatives as best as possible. At a minimum, this should include covered conductor and undergrounding. If more time is required, provide an explanation and timeline for when PacifiCorp thinks it will be able to provide such estimates.

Response date: September 14, 2022

Response:

a. PacifiCorp has completed procurement of Technosylva Wildfire Risk Reduction Model (WRRM) with planned release to operations and use for risk modeling and preliminary Risk-Spend Efficiency (RSE) calculations beginning in Q1 2023. PacifiCorp will continue to mature its RSE methodology based on these initial results and lessons learned from other utilities during working group meetings and benchmarking discussions.

b. Please refer to the table provided below. As discussed in the Company's response to subpart (a) above, PacifiCorp is currently updating its risk assessment and mitigation effectiveness methodologies. The information presented below is historical and subject to change as part of overall changes to RSE calculations used by PacifiCorp for project planning and prioritization:

Initiative	Average RSE	None	Tier 2	Tier 3	Territory
Covered conductor	4.32	2.36	4.27	7.45	3.20
Undergrounding	1.45	0.94	1.45	2.26	1.16

Appendix C. Comments on the Draft Decision

Energy Safety did not receive comments on the Draft Decision.

Appendix D. 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 2022 WMP Guidelines or Decisions. 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; Per WMP Guidelines/this Decision document: 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

Maturity and Mitigation Categories	Examples of Activities
	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; Per this Decision document: 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

Maturity and Mitigation Categories	Examples of Activities
	outside California; coordinating fuel management with the U.S Forest Service

Appendix E. Definition of Initiatives by Category

Category A. Risk Mapping and Simulation / Risk Assessment and Mapping

Category A. Risk Mapping and Simulation / Risk Assessment and Mapping Initiative Activity	Definition
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 modeling 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

Category A. Risk Mapping and Simulation / Risk Assessment and Mapping Initiative Activity	Definition
	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.).

Category B. Situational Awareness and Forecasting

Category B. Situational Awareness and Forecasting Initiative Activity	Definition
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.

Category B. Situational Awareness and Forecasting Initiative Activity	Definition
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.

Category C. Grid Design and System Hardening

Category C. Grid Design and System Hardening Initiative Activity	Definition
Capacitor maintenance and replacement program	Remediation, adjustments, or installations of new equipment to improve or replace existing capacitor equipment.

Category C. Grid Design and System Hardening Initiative Activity	Definition
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

Category C. Grid Design and System Hardening Initiative Activity	Definition
	(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

Category C. Grid Design and System Hardening Initiative Activity	Definition
	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

Category C. Grid Design and System Hardening Initiative Activity	Definition
	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 residents affected during PSPS event	Actions taken to improve access to electricity for customers and other residents during PSPS events, such as installation and operation of local 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.

Category C. Grid Design and System Hardening Initiative Activity	Definition
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 the HFTD	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 the HFTD.

Category D. Asset Management and Inspections

Category D. Asset Management and Inspections Initiative Activity	Definition
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

Category D. Asset Management and Inspections Initiative Activity	Definition
	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)

Category D. Asset Management and Inspections Initiative Activity	Definition
	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

Category D. Asset Management and Inspections Initiative Activity	Definition
	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

Category D. Asset Management and Inspections Initiative Activity	Definition
	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.

Category E. Vegetation Management and Inspections

Category E. Vegetation Management and Inspections Initiative Activity	Definition
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

Category E. Vegetation Management and Inspections Initiative Activity	Definition
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.

Category E. Vegetation Management and Inspections Initiative Activity	Definition
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

Category E. Vegetation Management and Inspections Initiative Activity	Definition
	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,

Category E. Vegetation Management and Inspections Initiative Activity	Definition
	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.

Category E. Vegetation Management and Inspections Initiative Activity	Definition
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.

Category F. Grid Operations and Operating Protocols

Category F. Grid Operations and Operating Protocols Initiative Activity	Definition
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

Category F. Grid Operations and Operating Protocols Initiative Activity	Definition
	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.

Category G. Data Governance

Category G. Data Governance Initiative Activity	Definition
Centralized repository for data	Designing, maintaining, hosting, and upgrading a platform that supports storage, processing, and utilization of all utility

Category G. Data Governance Initiative Activity	Definition
	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.

Category H. Resource Allocation Methodology

Category H. Resource Allocation Methodology Initiative Activity	Definition
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 modeling capabilities for different risk reduction scenarios based on wildfire mitigation initiative

Category H. Resource Allocation Methodology Initiative Activity	Definition
	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.

Category I. Emergency Planning and Preparedness

Category I. Emergency Planning and Preparedness Initiative Activity	Definition
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

Category I. Emergency Planning and Preparedness Initiative Activity	Definition
	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.

Category J. Stakeholder Cooperation and Community Engagement

Category J. Stakeholder Cooperation and Community Engagement Initiative Activity	Definition
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

Category J. Stakeholder Cooperation and Community Engagement Initiative Activity	Definition
	utility cooperation strategy and joint stakeholder roadmap (plan for coordinating stakeholder efforts for forest management and fuel reduction activities).

Appendix F. 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
CBO	Community-based organization
CEJA	California Environmental Justice Alliance
CNRA	California Natural Resources Agency
CPUC	California Public Utilities Commission
D.	Decision
DFA	Distribution fault anticipation
DR	Data request
EBMUD	East Bay Municipal Utility District
EFD	Early fault detection
EPIC	Electric Program Investment Charge

Term	Definition
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
HWT or Horizon West	Horizon West Transmission
I.	Investigation
ICS	Incident command system or structure
IOU	Investor-owned utility

Term	Definition
ISA	International Society of Arboriculture
ITO	Independent transmission operator
IVM	Integrated vegetation management
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
Maturity Survey	Utility Wildfire Mitigation Maturity Survey
MARS	Multi-attribute risk score
MAVF	Multi-attribute value function
MBL	Medical Baseline
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

Term	Definition
OEIS or Energy Safety	Office of Energy Infrastructure Safety
OP	Ordering paragraph
OPD	Open phase detection
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
PoF	Probability of failure
PoI	Probability of ignition
PRC	Public Resources Code
PSPS	Public Safety Power Shutoff
Pub. Util. Code or PU Code	Public Utilities Code
QA	Quality Assurance
QC	Quality Control
R.	Rulemaking
RAMP	Risk Assessment and Management Phase
RAR	Remote automatic reclosers

Term	Definition
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
SAWTI	Santa Ana Wildfire Threat Index
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, now the Risk-Based Decision-Making Framework Proceeding
SMJU	Small and multijurisdictional utility
SUI	Wildland-urban interface
TAT	Tree Assessment Tool
TBC	Trans Bay Cable
TURN	The Utility Reform Network
USFS	United States Forest Service

Term	Definition
VM	Vegetation management
VRI	Vegetation Risk Index
WMP	Wildfire Mitigation Plan
WRRM	Wildfire Risk Reduction Model
WSAB	Wildfire Safety Advisory Board
WSD	Wildfire Safety Division
WSIP	Wildfire Safety Inspection Program

Appendix G. PacifiCorp: Numerical Maturity Summary

Please reference the 2022 Guidelines 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 PacifiCorp's responses to the Utility Wildfire Mitigation Maturity Survey.

Figure G-1: Summary Maturity Table – PacifiCorp

Category	Capability 1				Capability 2				Capability 3				Capability 4				Capability 5				Capability 6			
	2020	2021	2022	2023 Estd.	2020	2021	2022	2023 Estd.	2020	2021	2022	2023 Estd.	2020	2021	2022	2023 Estd.	2020	2021	2022	2023 Estd.	2020	2021	2022	2023 Estd.
A. Risk assessment and mapping	1. Climate scenario modeling and sensitivities				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							
	1	3	3	3	1	1	2	3	1	1	1	1	1	1	1	3	0	1	1	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							
	2	1	2	2	0	1	1	2	0	0	0	0	2	2	2	2	0	0	0	0				
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							
	2	2	2	4	1	1	1	1	2	2	2	2	1	1	1	2	1	2	2	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							
	0	0	0	0	1	1	1	1	1	1	1	1	3	3	3	3	2	2	2	2				
E. Vegetation management and inspection	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			
	0	0	0	0	1	1	1	2	1	1	1	1	0	0	0	0	0	0	0	0	2	2	2	2
F. Grid operations and protocols	27. Protective equipment and device settings				28. Incorporating ignition risk factors in grid control				29. PSPS operating model and consequence mitigation				30. Protocols for PSPS initiation				31. Protocols for PSPS re-energization				32. Ignition prevention and suppression			
	1	1	1	1	2	2	2	2	1	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2
G. Data governance	33. Data collection and curation				34. Data transparency and analytics				35. Near-miss tracking				36. Data sharing with research community											
	2	2	2	3	0	0	0	0	0	3	3	3	3	3	3	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 initaitve allcoation methodology				42. Portfolio-wide innovation in new wildfire initiatives			
	1	1	1	3	0	0	0	2	1	1	1	1	1	1	1	2	0	0	0	0	1	1	1	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							
	2	4	4	4	2	2	2	4	4	4	4	4	4	4	4	4	0	4	4	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							
	4	4	4	4	1	1	1	1	3	4	4	4	0	2	2	2	2	2	2	2				

Notes: Years correspond to maturity as of January 1 of the reported year. Not all categories have the same number of capabilities.