

Wildfire Mitigation Plan Action Statement:
Liberty Utilities



**Wildfire Safety Division
Draft Action Statement on Liberty
Utilities's 2021 Wildfire Mitigation
Plan Update**

June 2021

Resolution WSD-018 - Attachment A

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Introduction and Background

This Action Statement represents the assessment of the California Public Utilities Commission’s (CPUC) Wildfire Safety Division (WSD)¹ on the 2021 Wildfire Mitigation Plan (WMP or Plan) of Liberty. This Plan is an update for the comprehensive 2020-2022 plan filed by Liberty in 2020. Liberty submitted its 2021 WMP Update on March 5, 2021, in response to guidelines provided by the WSD.² Assembly Bill (AB) 1054³ mandates that the WSD complete its evaluation of WMPs within three months of submission, unless the WSD issues an extension.⁴

Liberty’s 2021 WMP Update is approved.

1. Legal Authority

In 2018, following the devastating wildfires in 2016 and 2017, the California Legislature passed several bills increasing oversight of the electrical corporations’ efforts to reduce utility-related wildfires.⁵ AB 1054 created the WSD at the CPUC and tasked it with reviewing annual WMPs submitted by electrical corporations under the CPUC’s jurisdiction. As of July 2021, the WSD will become the Office of Energy Infrastructure Safety (Energy Safety) within the California Natural Resources Agency (CNRA).⁶

The main regulatory vehicle for the WSD to evaluate electrical corporations’ wildfire risk reduction efforts is the WMP, which was first introduced in Senate Bill (SB) 1028⁷ and further defined in SB 901,⁸ AB 1054, and AB 111. Investor-owned electrical corporations (hereafter referred to as “utilities”) are required to submit WMPs assessing their level of wildfire risk and providing plans for wildfire risk reduction. The CPUC evaluated the utilities’ first WMPs under the SB 901 framework in 2019.⁹

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

² The Commission approved 2021 WMP guidelines in Resolution WSD-011.

³ Stats. of 2019, Ch. 79.

⁴ Pub. Util. Code § 8386.3(a).

⁵ In this document “utility” should be understood to mean “electrical corporation.”

⁶ See AB 111, Stats. of 2019, Ch. 81.

⁷ Stats. of 2016, Ch. 598.

⁸ Stats. of 2018, Ch. 626.

⁹ See Rulemaking (R.) 18-10-007.

AB 1054 and AB 111 transferred responsibility for evaluation and approval or denial of WMPs to the WSD; AB 1054 provides, "After approval by the division, the Commission shall ratify the action of the division."¹⁰ The WSD must ensure utility wildfire mitigation efforts sufficiently address increasing utility wildfire risk. To support its efforts, the WSD developed a long-term strategic roadmap, Reducing Utility-Related Wildfire Risk (2020).¹¹ This strategic roadmap informs the WSD's work in updating the WMP process and guidelines and the WSD's evaluation of the WMPs.

2. Multi-Year Plan Process

In February of 2020, the utilities¹² submitted their three-year 2020-2022 WMPs. The WSD conducted its evaluation and either approved, conditionally approved, or denied the Plans. In the case of conditional approval, the WSD identified items missing or incomplete in the Plans on a scale of severity, with Class A Deficiencies representing issues that required resolution through a Remedial Compliance Plan (RCP).¹³ The 2020 Class B Deficiencies required resolution through Quarterly Reports,¹⁴ and Class C Deficiencies were to be resolved in the 2021 WMP Update.

In 2020, the WSD issued a conditional approval of Liberty's WMP. Liberty submitted its RCP¹⁵ to resolve Class A Deficiencies on July 27, 2020. WSD released its evaluation¹⁶ of Liberty's RCP on December 30, 2020, and provided direction to address "insufficient" responses in Liberty's updated 2021 Plan. Liberty submitted its first Quarterly Report on September 9, 2020, to resolve 2020 Class B Deficiencies.¹⁷ The WSD released its evaluation of Liberty's Quarterly

¹⁰ Pub. Util. Code § 8386.3(a).

¹¹ The Wildfire Safety Division's strategic roadmap Reducing Utility-Related Wildfire Risk (2020) (accessed March 4, 2021): <https://www.cpuc.ca.gov/WSD/roadmap/>

¹² Utilities that submitted a WMP in 2020: PG&E, SCE, SDG&E, PacifiCorp, Liberty, Bear Valley, Trans Bay Cable, and Horizon West Transmission.

¹³ An RCP "must present all missing information and/or articulate the electrical corporation's plan, including proposed timeline, to bring the electrical corporation's WMP into compliance." See Resolution WSD-002 at 17.

¹⁴ "Class B issues are of moderate concern and require reporting on a quarterly basis by the electrical corporation to provide missing data or update its progress in a quarterly report." See Resolution WSD-002 at 18.

¹⁵ [www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/WSD/R1810007-Liberty%20Utilities%20\(CalPeco%20Electric\)%20LLC's%202020%20WMP%20Remedial%20Co....pdf](http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/WSD/R1810007-Liberty%20Utilities%20(CalPeco%20Electric)%20LLC's%202020%20WMP%20Remedial%20Co....pdf)

¹⁶ www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/WSD/Liberty%20RCP%20Action%20Statement%2020201230.pdf

¹⁷ <ftp://ftp.cpuc.ca.gov/WMP/QuarterlyReports/2020/Liberty%20CalPeco%20First%20Quarterly%20Report%20on%202020%20WMP%209-9-2020.PDF>. Subsequent Quarterly Reports addressing conditions requiring ongoing reporting will be evaluated as part of utilities' 2021 WMP Updates.

Report on January 21, 2021, and also issued direction to address “insufficient” responses in its 2021 WMP Update.¹⁸

3. 2021 Evaluation Process

On November 16, 2020, the CPUC adopted updated WMP requirements (Guidelines) and procedures for the 2021 WMP Plan Year pursuant to Pub. Util. Code Section 8389(d).¹⁹ The updates to the 2021 WMP Guidelines are intended to streamline the reporting and evaluation process. Pursuant to the adopted Guidelines, the three large utilities²⁰ submitted 2021 WMP Updates on February 5, 2021; small and multi-jurisdictional utilities (SMJUs) and independent transmission operators (ITOs) submitted 2021 WMP Updates on March 5, 2021.

The 2021 WMP submissions are updates of the 2020-2022 WMPs and are intended to show progress since 2020 and report changes from the 2020 WMP. Importantly for 2021, the WSD amended its review process and will no longer issue conditional approvals. Instead, where the WSD found critical issues with 2021 submissions, the WSD issued a Revision Notice requiring the utility to remedy such issues prior to completion of the 2021 WMP Update evaluation. Upon receipt of the utility's response to the Revision Notice, the WSD could determine that the response was sufficient to warrant approval, although additional ongoing reporting or other conditions may be required, or the response was insufficient such that denial of the WMP is warranted due to the utility inadequately reducing wildfire risk and its potential impact to public safety. The WSD did not issue a Revision Notice to Liberty for its 2021 WMP Update.

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

- Completeness: The WMP is complete and comprehensively responds to the WMP statutory requirements and WMP Guidelines.
- Technical feasibility and effectiveness: Initiatives proposed in the WMP are technically feasible and are effective in addressing the risks that exist in the utility's service territory.
- Resource use efficiency: Initiatives are an efficient use of utility resources and focus on achieving the greatest risk reduction at the lowest cost.
- Demonstrated year-over-year progress: The utility has demonstrated sufficient progress on objectives and program targets reported in the prior annual WMP.

¹⁸ www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/WSD/Liberty%20QR%20Action%20Statement.pdf.

¹⁹ See <https://www.cpuc.ca.gov/wildfiremitigationplans> for adopted 2021 WMP Update Guidelines.

²⁰ The three large utilities are PG&E, SCE, and SDG&E.

- Forward-looking growth: The utility demonstrates a clear action plan to continue reducing utility-related wildfires and the scale, scope, and frequency of Public Safety Power Shutoff (PSPS) events.²¹ In addition, the utility is sufficiently focused on long-term strategies to build the overall maturity of its wildfire mitigation capabilities while reducing reliance on shorter-term strategies such as PSPS and vegetation management.

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

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

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

4. Cost Recovery

This document does not approve costs attributable to WMPs, as statute requires electrical corporations to seek cost recovery and prove all expenditures are just and reasonable at a future time in their General Rate Cases (GRC) or an appropriate application. Nothing in this Action Statement nor CPUC’s Resolution should be construed as approval of any WMP-related costs.²²

1. Summary of key findings

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

1.1. Areas of Significant Progress

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

²¹ 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.

²² The WSD’s approval and the Commission’s ratification do not relieve the electrical corporation from any and all otherwise applicable permitting, ratemaking, or other legal and regulatory obligations.

- Liberty has implemented a risk-based decision-making framework and improved its risk modeling capabilities.
- Liberty has completed its wildfire risk model and can now perform risk quantification methodologies including calculating Risk Spend Efficiency of key initiatives.
- Liberty’s new risk assessment methods will be used to prioritize projects beginning in 2022.
- Liberty has developed a Fire Potential Index tailored to its service territory which provides greater insight into the risk within its territory.
- Liberty will be the first utility to fully integrate Light Detection and Ranging (LiDAR) for use in vegetation compliance inspections for distribution circuits.

1.2. Revision Notice

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

1.3. Key Areas for Improvement and Remedies

The WSD evaluated 2021 WMP Updates with a particular focus on how the utility’s chosen mitigations and strategies will drive down the risk of utility-related wildfires as well as the scale, scope, and frequency of PSPS events. The WSD approves Liberty’s 2021 WMP Update; however, the WSD finds that Liberty must focus over the next year on the following areas set forth in Table 1 below. While continued progress toward maturity is important in all areas of a utility’s WMP, the WSD finds these areas to be key for Liberty to continue to drive down utility-related wildfire risk. The WSD expects Liberty to take action to address these key areas and report on progress made over the year in a Progress Report due by 5:00 p.m. on November 1, 2021, and in its 2022 WMP Update. The WSD will closely monitor progress in each of these areas over the coming year.

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

Table 1: Key areas for improvements and remedies

Utility-#	Issue title	Issue description	Remedies required and alternative timeline if applicable
Liberty-1	No Climate-Driven Risk Mapping	Liberty does not have a program that addresses climate-driven risk mapping as required in the WMP guidelines.	Liberty must describe how it applies existing risk analysis models to consider future climate projections.

Utility- #	Issue title	Issue description	Remedies required and alternative timeline if applicable
Liberty-2	Lack of consistency in approach to wildfire risk modeling across utilities	The utilities do not have a consistent approach to wildfire risk modeling. For example, in their wildfire risk models, utilities use different types of data, use their individual data sets in different ways, and use different third-party vendors. The WSD recognizes that the utilities have differing service territory characteristics, differing data availability, and are at different stages in developing their wildfire risk models. However, the utilities face similar enough circumstances that there should be some level of consistency in their approaches to wildfire risk modeling statewide.	<p>The utilities²³ must collaborate through a working group facilitated by the WSD²⁴ to develop a more consistent statewide approach to wildfire risk modeling. After Energy Safety completes its evaluation of all the utilities’ 2021 WMP Updates, it will provide additional detail on the specifics of this working group.</p> <p>A working group to address wildfire risk modeling will allow for:</p> <ol style="list-style-type: none"> 1. Collaboration among the utilities; 2. Stakeholder and academic expert input; and 3. Increased transparency.
Liberty-3	Limited evidence to support the effectiveness of covered conductor	The rationale to support the selection of covered conductor as a preferred initiative to mitigate wildfire risk lacks consistency among the utilities, leading some	The utilities ²⁶ must coordinate to develop a consistent approach to evaluating the long-term risk reduction and cost-effectiveness of covered conductor deployment, including:

²³ Here “utilities” refers to SDG&E and Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), PacifiCorp, Bear Valley Electric Service, Inc. (BVES), and Liberty Utilities; although this may not be the case every time “utilities” is used through the document.

²⁴ The WSD is transitioning to the Office of Energy Infrastructure Safety (Energy Safety) on July 1, 2021.

²⁶ Here “utilities” refers to SDG&E and Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), PacifiCorp, Bear Valley Electric Service, Inc. (BVES), and Liberty Utilities; although this may not be the case every time “utilities” is used through the document.

Utility- #	Issue title	Issue description	Remedies required and alternative timeline if applicable
		<p>utilities to potentially expedite covered conductor deployment without first demonstrating a full understanding of its long-term risk reduction and cost-effectiveness. The utilities’ current covered conductor pilot efforts are limited in scope²⁵ and therefore fail to provide a full basis for understanding how covered conductor will perform in the field. Additionally, utilities justify covered conductor installation by alluding to reduced PSPS risk but fail to provide adequate comparison to other initiatives’ ability to reduce PSPS risk.</p>	<ol style="list-style-type: none"> 1. The effectiveness of covered conductor in the field in comparison to alternative initiatives. 2. How covered conductor installation compares to other initiatives in its potential to reduce PSPS risk.
Liberty-4	Lack of current inspection QA/QC Program	<p>While some Quality Assurance/Quality Control (QA/QC) measures are conducted by Liberty personnel, Liberty does not currently have a formal QA/QC program in place for its asset inspections, with one currently in development for completion by January 2022.</p>	<p>Liberty must:</p> <ol style="list-style-type: none"> 1. In its Progress Report, explain how it currently conducts quality checks of its asset inspections. 2. Develop an interim QA/QC procedure for asset inspections between now and the establishment of its new QA/QC program by January 2022 in order to ensure that work is being completed accurately and effectively. 3. Provide updates on the development of its QA/QC

²⁵ Limited in terms of mileage installed, time elapsed since initial installation, or both.

Utility- #	Issue title	Issue description	Remedies required and alternative timeline if applicable
			<p>program in its Progress Report, including:</p> <ul style="list-style-type: none"> a. The scope of the QA/QC program; b. Procedures of the QA/QC program that Liberty and/or its contractor have developed; and c. The implementation status of the QA/QC program.
Liberty-5	Lack of improvement to visual and detailed asset inspections that specifically target assets and asset components with high ignition risk and areas of highest wildfire risk	Liberty makes minimal improvements to enhance asset inspections outside of meeting GO 165 requirements, with little focus specifically on wildfire risk. Given Liberty’s high instance of ignitions due to equipment failures, as well as large number of Level 3 ²⁷ findings in 2020, Liberty must work to improve upon its current inspection practices.	<p>Liberty must enhance its current asset inspection process and maintenance programs in order to specifically target:</p> <ul style="list-style-type: none"> 1. Assets and asset components with higher ignition risk; and 2. Areas of highest wildfire risk.
Liberty-6	Inadequate Justification of Vegetation Management Inspection Frequency	Quarterly Report Action LIB-9 (Class B) requires Liberty to “provide a justification with supporting data of its three-year vegetation inspection cycle outside of Tier 3 HFTD areas.” ²⁸ Liberty has not provided such justification.	<p>Liberty must:</p> <ul style="list-style-type: none"> 1. Clearly detail its VM inspection frequency by inspection type and HFTD Tier. 2. Fully and completely justify its 3-year detailed inspection cycle for all circuits. 3. Describe the implementation of any findings from the third-party evaluation.

²⁷ In accordance with GO 95, an low safety and/or reliability risk.

²⁸ Wildfire Safety Division Evaluation of Liberty Utilities’ First Quarterly Report, January 21, 2021, p. 15

Utility- #	Issue title	Issue description	Remedies required and alternative timeline if applicable
		<p>Additionally, Liberty does not provide a clear or consistent explanation of its VM inspection frequency. Liberty states that it performs detailed inspections of entire once every three years per circuit.²⁹ In its 2020 WMP, Liberty stated that it “plans to inspect its overhead system within Tier 3 of the High Fire-Threat District on an annual basis.”³⁰ It is unclear whether Liberty implemented this plan to inspect its overhead system in HFTD Tier 3 for VM compliance annually as it is not mentioned in its 2021 WMP Update. Liberty does state that is “conducts annual inspections of its facilities in order to identify needed vegetation management work”³¹ but does not specify any HFTD Tier.</p> <p>In 2020, Liberty engaged a third-party to “provide a comprehensive assessment of the</p>	<p>4. Provide the third-party’s evaluation of Liberty’s VM program as an appendix.</p>

²⁹ Liberty 2021 WMP Update p. 107

³⁰ Liberty 2020 WMP p. 89

³¹ Liberty 2021 WMP Update p. 119

Utility- #	Issue title	Issue description	Remedies required and alternative timeline if applicable
		vegetation management program,” ³² but does not detail in its WMP any finding regarding the effectiveness of its VM inspection frequency.	
Liberty-7	Equivocating Language Used to Describe Risk-Based Decision-Making Improvements	Liberty uses noncommittal and equivocating language to describe improvements to its risk-based decision-making process in section 7.3.7.1.	Liberty must report on its risk-based decision-making in measurable, quantifiable, and verifiable language and discuss its progress and future improvements to the risk-based decision-making process.
Liberty-8	Limited Discussion on Reduction of Size, Scale, and Frequency of PSPS	Liberty has limited discussion on its progress for reduction in size, scope, and frequency of PSPS. Liberty stated that due to its minimal use of PSPS in the past, it is unnecessary or impossible to further reduce PSPS. Nevertheless, Liberty must still report its plans to minimize PSPS scope, scale, and frequency normalized for weather events and climatic conditions.	Liberty must report on its plan to minimize the size, scope, and frequency of PSPS events normalized for weather events and climatic conditions, and fully describe how its planned initiatives minimize PSPS impact.

In many evaluation sections, the WSD lists additional issues for continued improvement to increase maturity in addition to the key areas for improvement. Additional issues are denoted by bullet points and must be addressed in Liberty’s subsequent WMP Update.

³² Liberty 2021 WMP Update p. 111

1.4. Maturity Model Evaluation

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

The ten maturity and mitigation initiative categories are listed below in Section 5, with further details in Appendix 10.3.

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

- Overall, Liberty reports steady growth towards its projected 2022 maturity, largely in line with the other Small and Multi-Jurisdictional Utilities.
- Liberty reports significant growth in Emergency Planning and Preparedness, and Stakeholder Cooperation and Community Engagement categories.
- Liberty reports lower current maturity in Situation Awareness and Forecasting than it reported in 2020. This has been attributed to a possible misrepresentation in Liberty's 2020 maturity survey.

2. Wildfire Safety Advisory Board Input

The Wildfire Safety Advisory Board (WSAB) provided recommendations on the WMP Updates of Bear Valley Electric Service, Inc (BVES), PacifiCorp, and Liberty Utilities on May 12, 2021.³³ The WSD has considered the WSAB's recommendations and incorporates its input throughout this Action Statement. The WSAB's recommendations focused on the following areas:

- Risk Assessment and Resource Allocation
- Vegetation Management
- System Design and Grid Hardening
- Emergency Planning and Communication

³³ The WSAB's "Recommendations on the 2021 Wildfire Mitigation Plan Updates of Small and Multi-Jurisdictional Utilities," approved May 12, 2021, can be read here: https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/WSD/Draft%20SMJU%20Recommendations%204-30-21.pdf

3. Public and Stakeholder Comment

The following individuals and organizations submitted comments by April 14, 2021, on Liberty's WMP:

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

On April 21, 2021, Liberty submitted reply comments.

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

- The Small and Multi-Jurisdictional Utilities (SMJUs) (Bear Valley, PacificCorp, and Liberty) have substantial differences in PSPS thresholds, costs of covered conductors, and inspection practices. (Cal Advocates, GPI, and RCRC)
- Liberty follows in the footsteps of the larger utilities (PG&E, SCE, and SDG&E) with its covered conductor program, however Liberty's research into risk reduction from covered conductor in its own service territory is limited. (GPI and RCRC)
- Prioritization of hardening and inspections are not well explained. (GPI and RCRC)
- Long detailed inspection cycles which are significantly less frequent than the large utilities. (Cal Advocates)
- Overall limited oversight of programs and contractors. (Cal Advocates, GPI, and RCRC)

4. Discussion

The following sections discuss in detail the WMP, progress over the past year, issues, and remedies to address by the next annual submission.

4.1. Introductory sections of the WMP

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

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

Liberty has met the letter of the 22 requirements of Public Utilities Code Section 8386(c)

4.2. Actuals and planned spending for Mitigation Plan

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

- Liberty provided the three required tables, Table 3-1: Summary of WMP Expenditures - Total, Table 3-2: Summary of WMP Expenditures by Category, and Table 3-3: WMP Electricity Cost Increase to Ratepayers.
- Liberty reports an increase in 2020 actual spend of 8.6% over its 2020 planned spend as reported in its 2020 WMP (\$33,331,000 from \$30,699,000).
- Liberty reports a notable spend increase from its 2020 planned spend in five categories.
 - Risk Assessment and Mapping (\$0 to \$67,000)
 - Grid Design and System Hardening (15.7% increase, \$13,241,000 to \$15,325,000)
 - Vegetation Management (44.6% increase, \$8,770,000 to \$12,685,000)
 - Grid Operations (\$0 to \$371,000)
 - Emergency Planning (109.2% increase, \$240,000 to \$502,000)
- Liberty reports a notable spend decrease from its 2020 planned spend in two categories.
 - Asset Management and Inspections (47.1% decrease, \$7,259,000 to \$3,842,000)
 - Data Governance (99.8% decrease, \$665,000 to \$1,000)

³⁴ WSD-011 Attachment 2.2, 2021 Wildfire Mitigation Plan Guidelines Template, Section 3.2 "Summary of ratepayer impact", p.23 (accessed June 2, 2021):
<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M352/K460/352460864.pdf>

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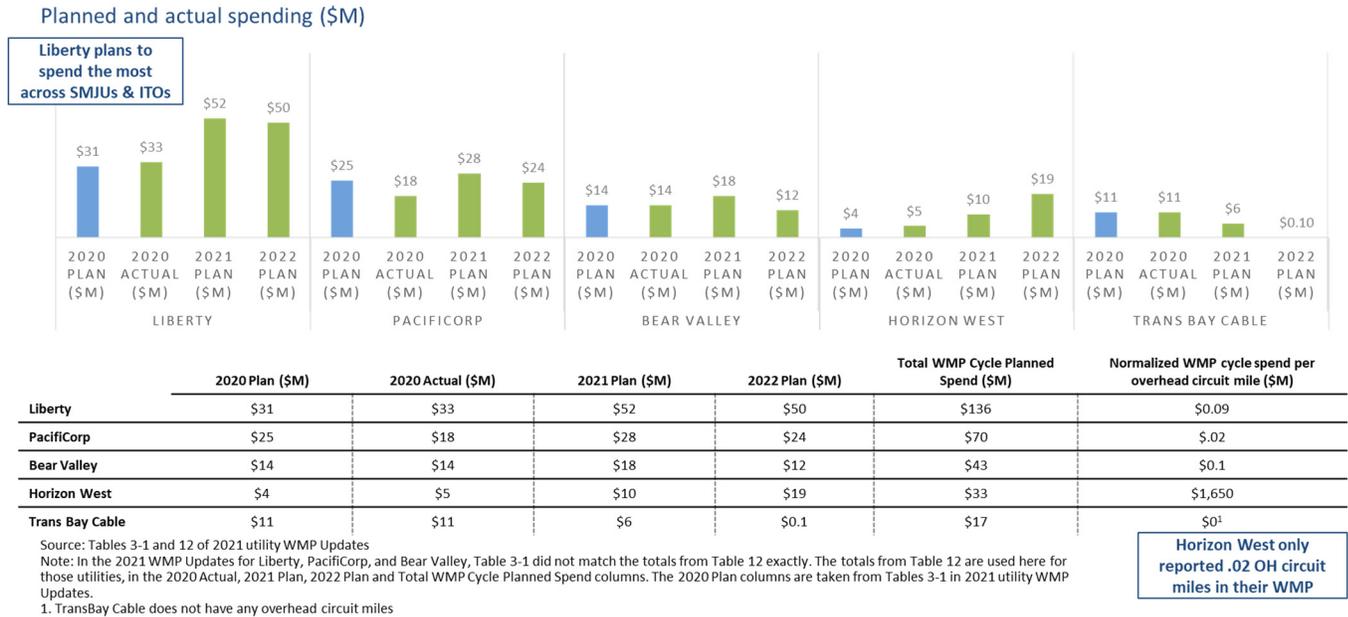
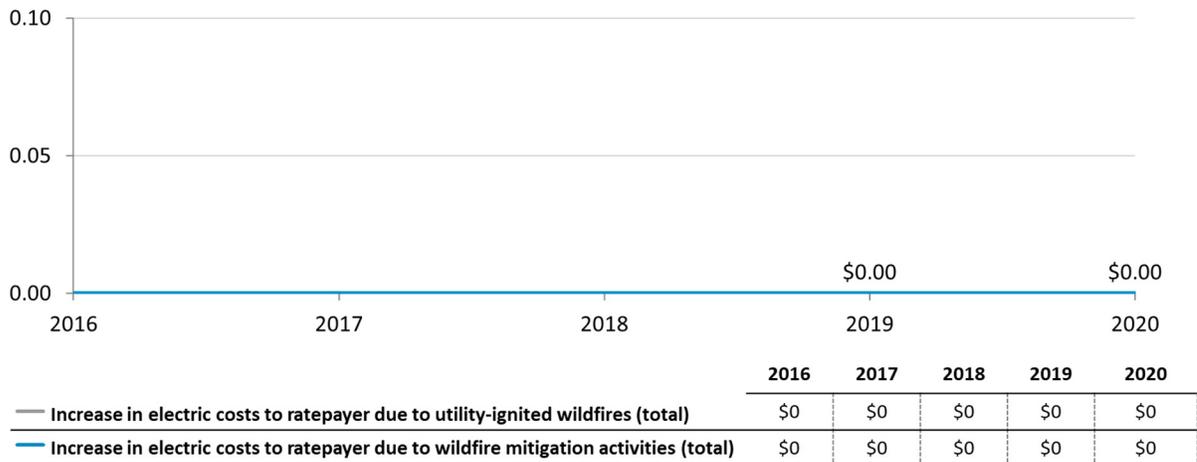


Figure 4.2.a: Overview of total WMP spend across SMJUs and ITOs.

Average increase to monthly electricity bill (\$)



Source: Table 3-3 of utility 2021 WMPs

Figure 4.2.b: Cumulative increase in cost to ratepayers due to utility-ignited wildfires and mitigation activities, Liberty.

4.3. Lessons learned and risk trends

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

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

1. Describe how it monitors and accounts for the contribution of weather and fuel to ignition probability and wildfire consequence.
2. Identify any areas where the Commission's High Fire Threat District (HFTD) should be modified.
3. Explain any "high fire threat" areas the utility considers that differ from Commission-adopted HFTD, and why such areas are so classified.
4. Rank trends anticipated to have the greatest impact on ignition probability and wildfire consequence.

Liberty provides all required Lessons Learned and Risk Trends information.

- Liberty primarily relies on its Fire Potential Index (FPI) model to account for the contributions of weather to ignition probability.
- Liberty tracks fuel moisture levels through a combination of analysis and field sampling.
- Liberty has completed an analysis of wildfire risk in its service territory. The analysis finds that fire risk in its service territory largely aligns with the Commission's HFTD in except for the Fallen Leaf region which was identified as "Very High" fire risk but falls within HFTD Tier 2.
- Liberty only has reliable outage data going back until 2015 and its WMP strategies prior to 2020 were mainly routine providing a suboptimal foundation to investigate long term trends. Liberty is increasing its focus on accuracy and detail of its outage reporting.
- Liberty reports that vegetation-related outages and animal-related contacts have been increasing in recent years.

4.4. Inputs to the plan and directional vision for WMP

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

Goal, objectives, and program targets:

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

The WMP requires utilities to provide their objectives which are unique to each utility and reflect its 1, 3, and 10-year projections of progress toward the WMP goal. The WMP also requires utilities to report their unique program targets, which are quantifiable measurements of activity identified in WMPs and subsequent updates used to show progress toward reaching the objectives, such as number of trees trimmed or miles of power lines hardened.

Liberty provides all required information on its overall objectives and WMP program targets in Tables 5-1 and 5-2.

Workforce planning:

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

1. Vegetation inspections
2. Vegetation management projects
3. Asset inspections
4. Grid hardening
5. Risk event inspection

Liberty provides all required information regarding worker qualifications within each listed role.

4.5. Metrics and underlying data

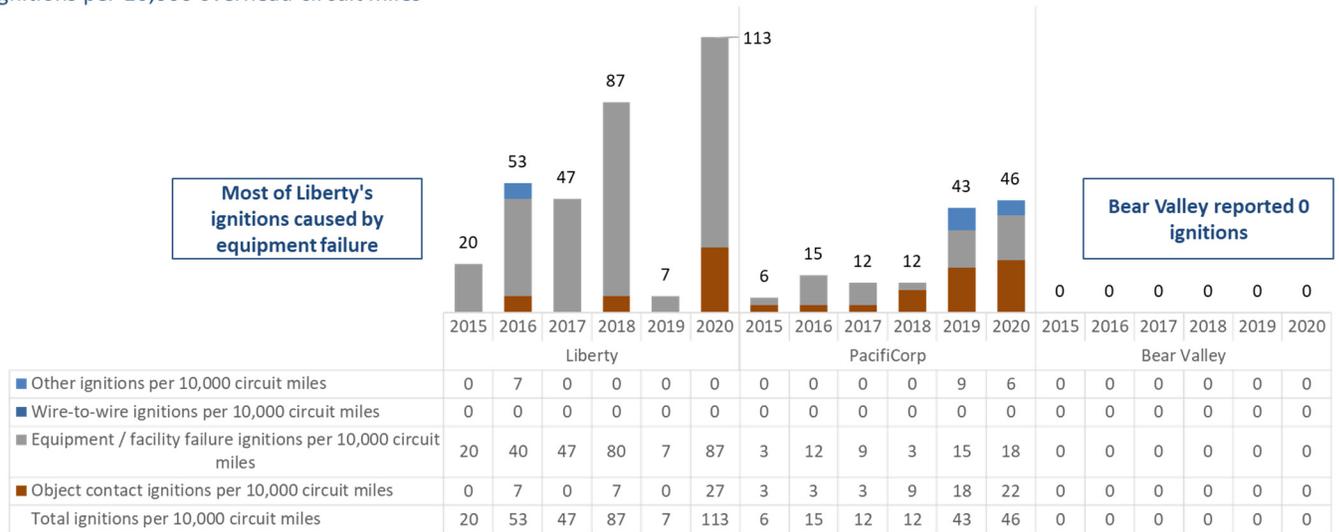
The WMP Guidelines require utilities to report metrics and program targets as follows:

- *Progress metrics* that track how much utility wildfire mitigation activity has managed to change the conditions of a utility's wildfire risk exposure in terms of drivers of ignition probability.
- *Outcome metrics* that measure the performance of a utility and its service territory in terms of both leading and lagging indicators of wildfire risk, PSPS risk, and other direct and indirect consequences of wildfire and PSPS, including the potential unintended consequences of wildfire mitigation work.

- *Program targets* measure tracking of proposed wildfire mitigation activities used to show progress toward a utility’s specific objectives.³⁵ Program targets track the utility’s pace of completing activities as laid out in the WMPs but do not track the efficacy of those activities. The primary use of these program targets in 2021 will be to gauge utility follow-through on existing WMPs.

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

Ignitions per 10,000 overhead circuit miles



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

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

³⁵ Objectives are unique to each utility and reflect the 1, 3, and 10-year projections of progress toward the WMP goal. See section 5.4 for review of the utility’s objectives.

Risk events per overhead circuit mile, *excluding ignitions*

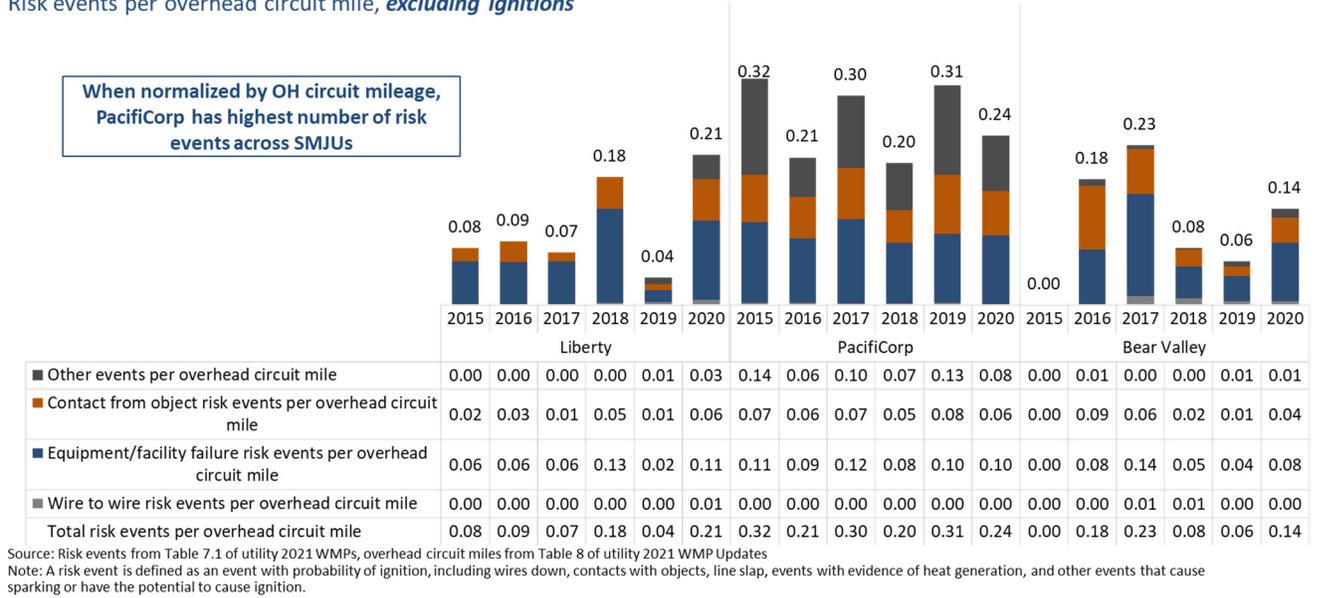
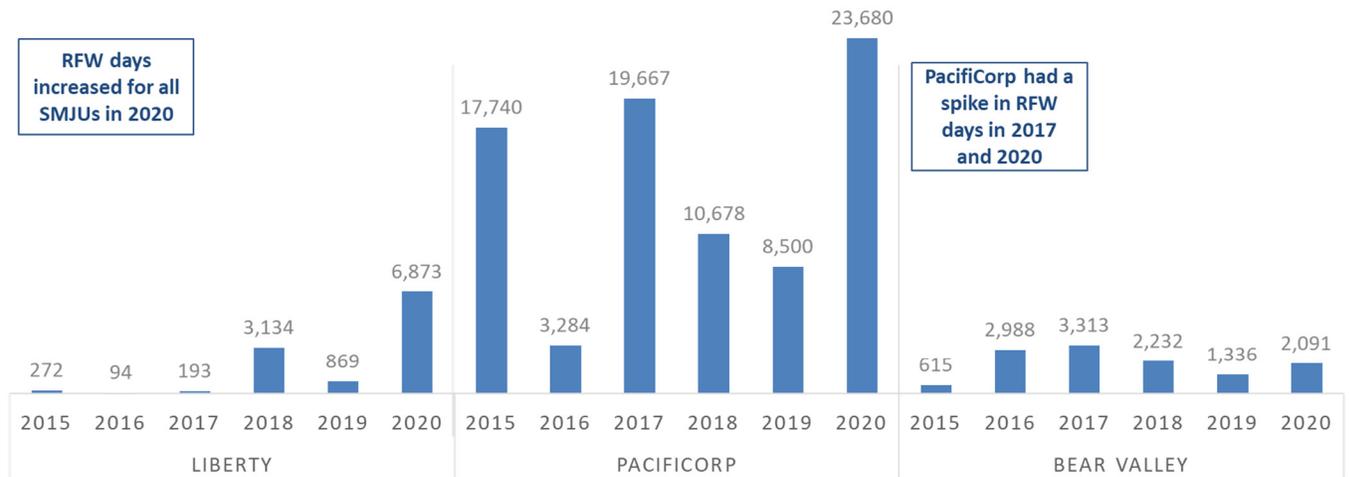


Figure 4.5.b: Risk events per overhead circuit mile.

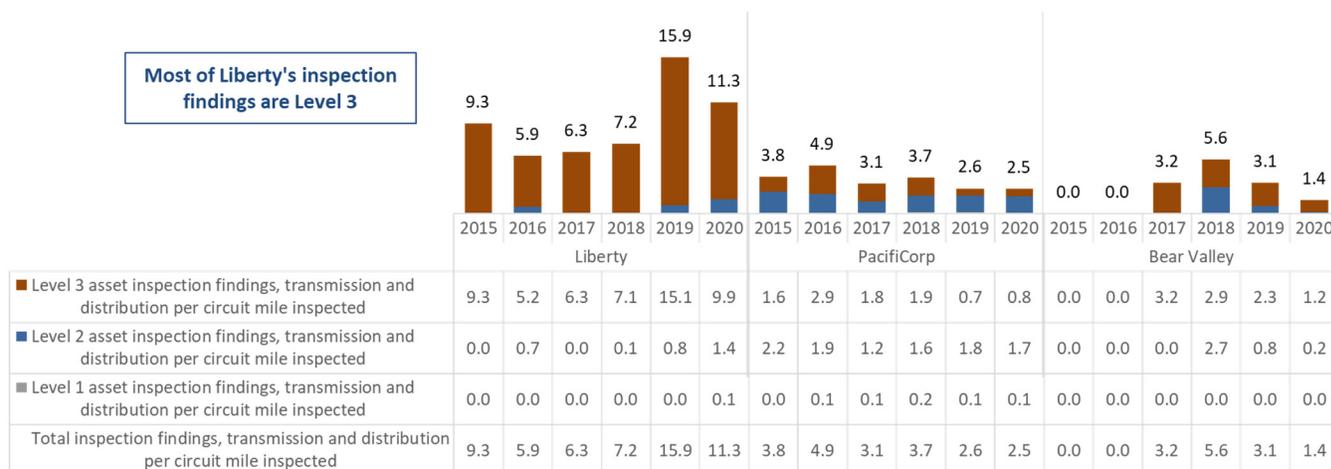
Red Flag Warning (RFW) overhead circuit mile days per year – entire utility territory



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

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

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



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

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

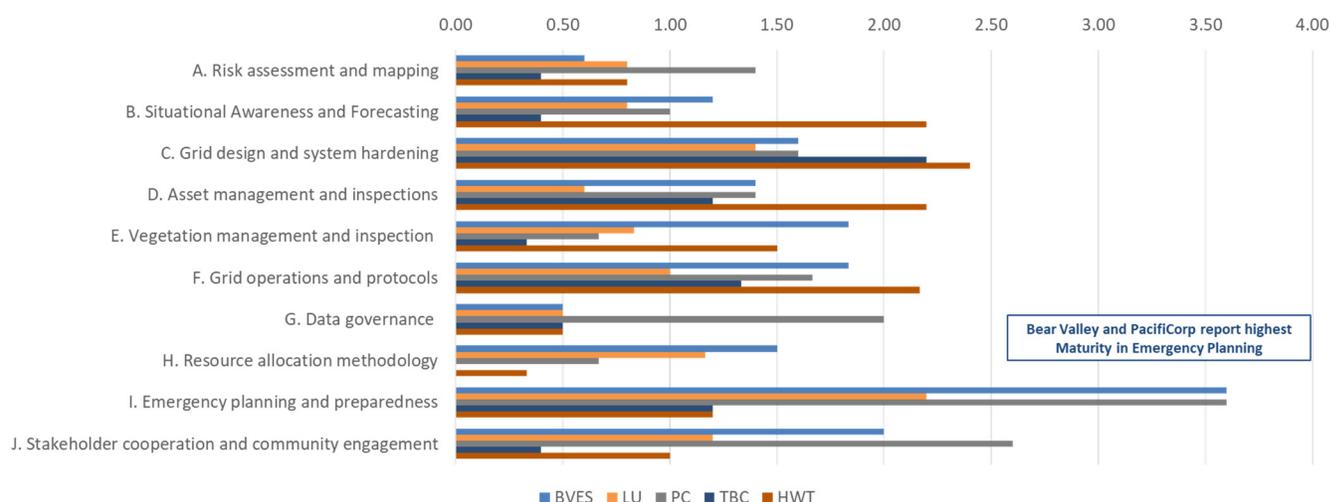
5. Mitigation initiatives and maturity evaluation

This section of the WMP is the heart of the plan and requires the utility to describe each mitigation initiative it will undertake to reduce the risk of catastrophic wildfire. The utility is also required to self-report its current and projected progress to mitigate wildfire risk effectively,³⁶ a capability referred to in this document as “maturity” and measured by the WSD Utility Wildfire Mitigation Maturity Model (“Maturity Model”). Utility maturity is measured across the same categories used to report mitigation initiatives listed below, allowing WSD to evaluate a utility’s reported and projected maturity in wildfire mitigation in the context of its corresponding current and planned initiatives. The ten maturity and mitigation initiative categories are listed below, with further details in Appendix 10.3:

³⁶ Utilities that filed a WMP were required to complete a survey in which they answered specific questions which assessed their existing and future wildfire mitigation practices across 52 capabilities at the time of filing and at the end of the three-year plan horizon. The 52 capabilities are mapped to the same ten categories identified for mitigation initiatives. The results of the survey can be found in Attachment 11.1. The most recent survey for each utility can be found on the WSD website here: <https://www.cpuc.ca.gov/wildfiremitigationplans/>.

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

Maturity score (0 – 4) actual and projected



Source: 2021 Maturity Model survey data

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

Maturity score (0 – 4) actual and projected

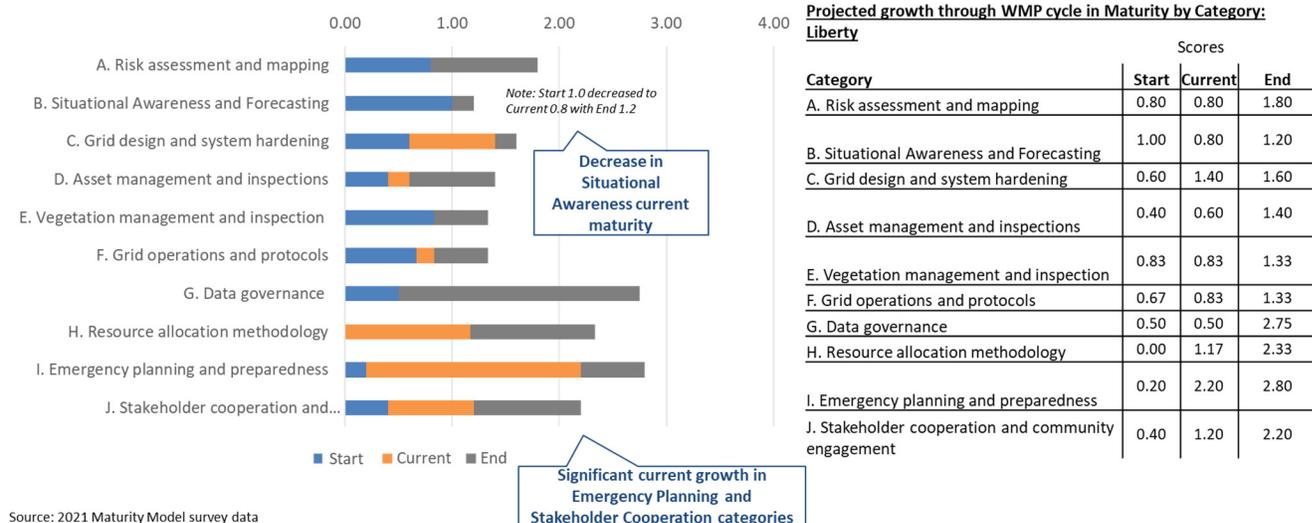


Figure 5.b: Projected growth through WMP cycle in maturity by category, Liberty.

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

5.1. Risk Assessment and Mapping

Introduction

This section of the WMP requires the utility to discuss the risk assessment and mapping initiatives implemented to minimize the risk of its causing wildfires. Utilities must describe initiatives related to equipment maps and modelling of overall wildfire risk, ignition probability, wildfire consequence, risk-reduction impact, match-drop simulations,³⁷ and climate/weather-driven risks. This section also requires the utility to provide data on spending, miles of infrastructure treated, spend per treated line mile, ignition probability drivers targeted, projected risk reduction achieved from implementing the initiative, and other (i.e., non-ignition) risk drivers addressed by the initiative.

The parameters of risk assessment (discussed here) and resource allocation (discussed later in the “Resource Allocation Methodology” section) to reduce wildfire risk derive from the S-MAP and RAMP proceedings.

³⁷ Simulations of the potential wildfire consequences of ignitions that occur along electric lines and equipment effectively showing the potential consequences if an ignition or “match was dropped” at a specific point in a utility’s territory.

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

Overview

Liberty has made significant progress in implementing risk-based decision-making; however, it must work to incorporate climate projections into its risk models and minimize the number of ignitions caused by equipment failure.

Progress over the past year

The WSD finds that Liberty has made the following progress:

- In 2020, Liberty had no risk-based decision making in place. Liberty has since formed a risk assessment team and models the larger IOU's³⁸ risk framework by utilizing Multi-Attribute Risk Score (MARS) and Multi-Attribute Value Function (MAVF) methodologies for wildfire risk modeling.
- Liberty's risk modeling approach now includes risk factors such as tree risk, asset risk, wildfire risk, and performance risk to target areas of concern.
- While still in the early stages of risk mapping efforts, Liberty is at a point where it is able to use its risk mapping at the span and circuit level to prioritize mitigation efforts.
- Liberty added 19 weather stations and added fuel moisture sensors to new and existing weather stations. With the improvement to its weather station network, Liberty should see improvement in its weather data in support of its FPI and risk-based decision-making.

Liberty has room for improvement on the following points:

- Liberty's risk mapping does not include a climate-driven risk mapping program. Liberty must describe how it considers future climate projections in its risk models.
- Liberty contracted with a wildland fire modeling vendor previously used by other utilities to conduct fire spread and consequence modeling and completed a fire risk mapping tool that will be utilized as a baseline for Liberty's wildfire risk assessment. The large IOUs have all moved away from the vendor that Liberty is currently using and have contracted with a new modeling vendor. Some of the reasons for this shift include that the first vendor has limitations with some of the critical inputs such as outdated asset and fuel data, leading to a less granular output. The new vendor uses more recent weather, fuels, and census data; leading to a more advanced fire propagation modeling techniques such as urban encroachment. It is unclear why Liberty chose to use a model

³⁸ "Larger IOUs" consisting of Pacific Gas & Electric (PG&E), San Diego Gas & Electric (SDG&E), and Southern California Edison (SCE).

with more limitations. The use of this vendor results in a lack of consistency with other IOUs’ models.

- The majority of ignitions with a categorized cause are due to transformer failures, as seen in Figure 5.c below, yet Liberty fails to identify a program to specifically target transformer failures within its 2021 WMP. Liberty must adequately address reoccurring issues seen such as transformer failures.
- Liberty’s reported main ignition driver is from equipment failure, with the majority of causes from “Other” equipment failures as shown in Figure 5.1.a below. Within its 2021 WMP Update, Liberty does not provide any details on programs to further minimize the number of “Other” equipment failure ignition causes. Liberty therefore fails to properly identify its systems’ risks since it cannot target reducing ignitions from unidentified causes. Liberty must develop a program to investigate and identify cause of ignitions from equipment failures in order to fully understand the risks its system poses.

Ignitions by probability driver type

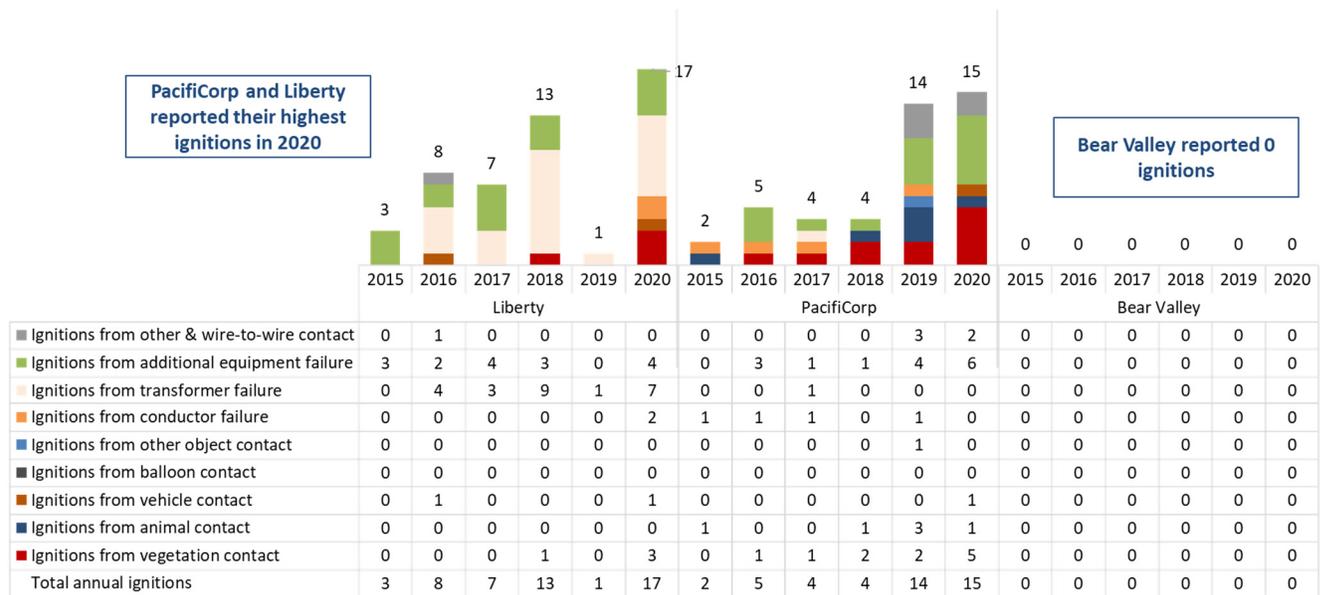


Figure 5.1.a: Ignitions by ignition probability driver type.

Key Areas for Improvement and Remedies

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

Utility-#	Issue title	Issue description	Remedies required
Liberty-1	No Climate-Driven Risk Mapping	Liberty does not have a program that addresses climate-driven risk mapping.	In its 2022 WMP Update, Liberty must describe how it applies existing risk analysis models to consider future climate projections.
Liberty-2	Lack of consistency in approach to wildfire risk modeling across utilities	The utilities do not have a consistent approach to wildfire risk modeling. For example, in their wildfire risk models, utilities use different types of data, use their individual data sets in different ways, and use different third-party vendors. The WSD recognizes that the utilities have differing service territory characteristics, differing data availability, and are at different stages in developing their wildfire risk models. However, the utilities face similar enough circumstances that there should be some level of consistency in their approaches to wildfire risk modeling statewide.	<p>The utilities³⁹ must collaborate through working group facilitated by Energy Safety⁴⁰ to develop a more consistent statewide approach to wildfire risk modeling. After the WSD completes its evaluation of all the utilities’ 2021 WMP Updates, it will provide additional detail on the specifics of this working group.</p> <p>A working group to address wildfire risk modeling will allow for:</p> <ol style="list-style-type: none"> 1. Collaboration among the utilities; 2. Stakeholder and academic expert input; 3. Increased transparency.

Additional Issues and Remedies

In addition to the key areas listed above, the WSD finds the following issue and associated remedies. All remedies must be addressed in Liberty’s 2022 WMP Update.

- ISSUE: Targeting Equipment Failures: Liberty reports a high number of ignitions due to transformer and other equipment failures but does not have a program that specifically addresses reducing such ignitions.

³⁹ Here “utilities” refers to SDG&E and Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), PacifiCorp, Bear Valley Electric Service, Inc. (BVES), and Liberty Utilities; although this may not be the case every time “utilities” is used through the document.

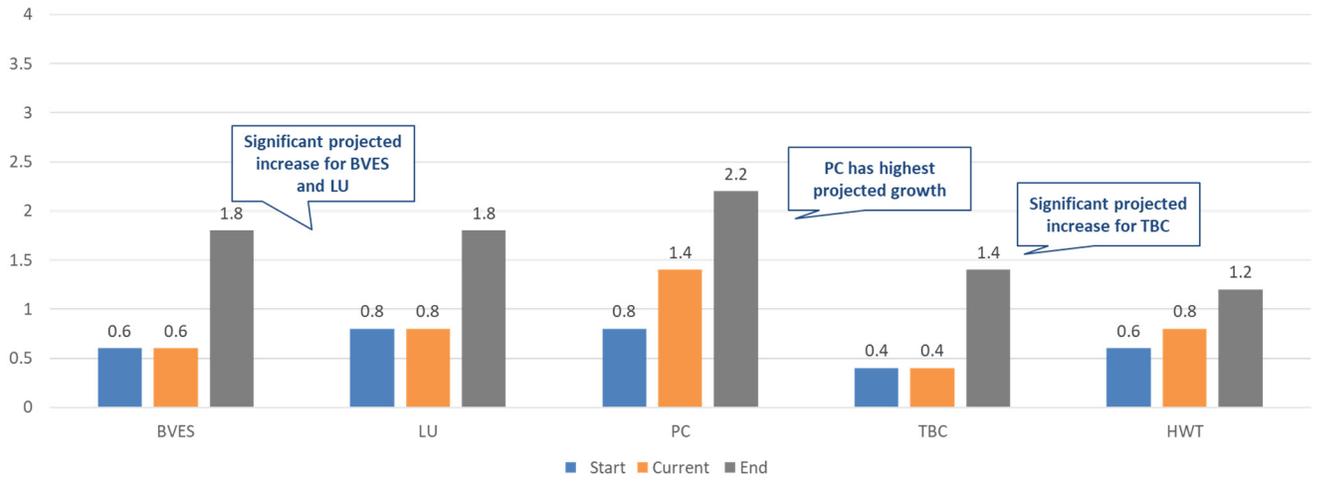
⁴⁰ The WSD is transitioning to the Office of Energy Infrastructure Safety (Energy Safety) on July 1, 2021.

- REMEDY: Liberty shall develop a program to target and reduce equipment failures, specifically detailing what “other” equipment consists of.
- REMEDY: Liberty shall develop a program to specifically target and reduce transformer failures.

Additional figures

Below are additional charts, maps and tables used as part of the WSD’s review of Liberty’s risk assessment and mapping section:

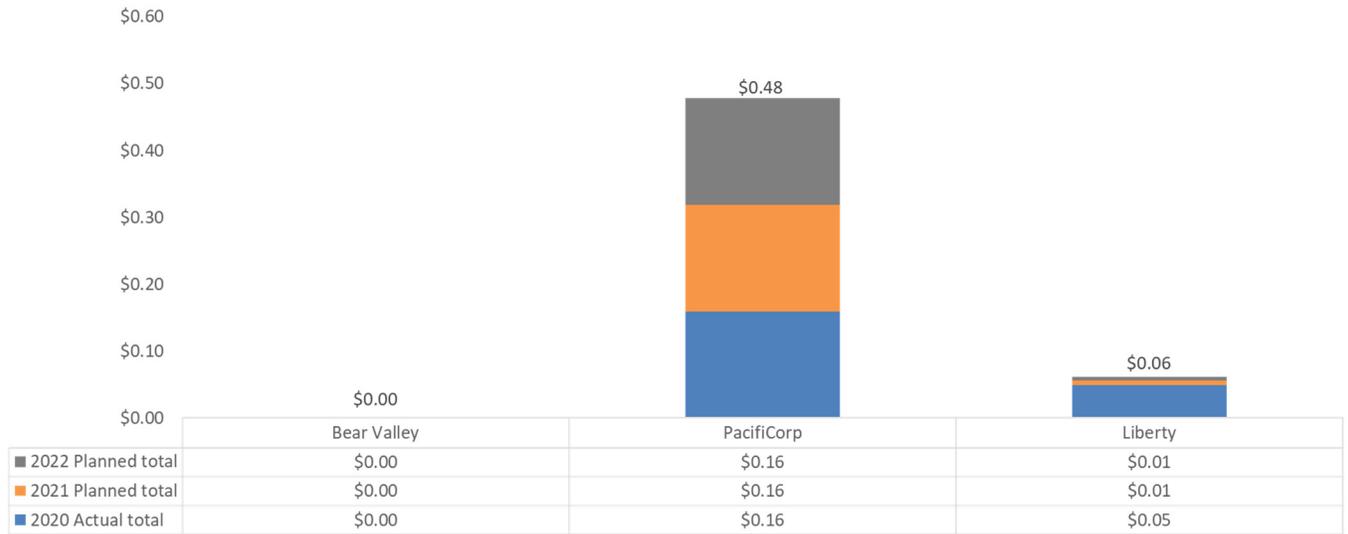
Maturity score (0 – 4) actual and projected



Source: 2021 Maturity Model survey data

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

Actual and projected spend (\$K) per HFTD overhead circuit mile



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

Figure 5.1.b: Risk assessment and mapping spend per HFTD overhead circuit mile: SMJUs 2020-22.

5.2. Situational Awareness and Forecasting

Introduction

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

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

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

1. Installation of advanced weather monitoring and weather stations that collect data on weather conditions so as to develop weather forecasts and predict where ignition and wildfire spread are likely;
2. Installation of high-definition cameras throughout a utility’s service territory, with the ability to control the camera’s direction and magnification remotely;
3. Use of continuous monitoring sensors that can provide near-real-time information on grid conditions;

4. Use of a fire risk or fire potential index that takes numerous data points in given weather conditions and predicts the likelihood of wildfire; and
5. Use of personnel to physically monitor areas of electric lines and equipment in elevated fire risk conditions.

Overview

Liberty has made significant progress in its Situational Awareness and Forecasting and WSD finds this portion of Liberty's 2021 WMP Update to be sufficient subject to remedies. Liberty has expanded its weather station network and has developed its own FPI model tailored to its service territory.

Progress over the past year

The WSD finds that Liberty has made the following progress:

- As highlighted in the Risk Assessment and Mapping section above, Liberty has improved its weather station network by adding more stations and fuel moisture sensors.
- Liberty plans to have sufficient coverage and adequate data with 40 total weather stations with full implementation by end of 2022.
- Liberty is piloting a Distribution Fault Anticipation (DFA) project with Texas A&M University and expecting to install it on ten distribution feeders by the end of 2022. This is also being tested by other utilities and is a promising technology to help detect issues prior to failure.
- Liberty is also piloting a High Impedance Fault Detection (HIFD) project with the University of Nevada, Reno. The deployment of HIFD is scheduled for 2021 and has the potential to clear faults quickly prior to an ignition.
- In 2020, Liberty developed its own FPI for each of its 11 zones. Each zone has its own FPI thresholds based on historical weather analysis. Liberty's FPI uses similar methodologies as the larger IOU's, such as SDGE and PGE.
- Liberty is adopting eight Alert Wildfire HD Cameras which will aid in fire detection and the monitoring of its assets. This is in line with peer utilities and its maturity assessment.
- Liberty proactively patrols power lines and deploys personnel to observe conditions along the electrical system by using its FPI and PSPS forecasting tools.

Liberty has room for improvement on the following points:

- Liberty did not provide Risk Spend Efficiency (RSE) values for nearly all initiatives within the Situational Awareness and Forecasting section.

- Liberty currently installs fault indicators on an as-needed basis and does not have a specific plan or program target for installations.
- Liberty fell one weather station installation short of its targeted 20 for 2020. However, Liberty installed more than its peer utilities.
- Liberty is showing a decrease in its Maturity Assessment in 2021 for situational awareness and forecasting capabilities compared to 2020. Liberty scored a higher value in 2020 by reporting to have had well-equipped equipment for detecting ignitions along the grid, including remote detection capabilities, and HD cameras with ignition detection software that can be used to augment ignition detection procedures in (Figure 5.2.a). Liberty does not appear to have this capability in its 2021 WMP update and its rating in 2021 appears to be a better representation of its actual Situational Awareness capacity, which resulted in a lower score when comparing 2020 to 2021 below (Figure 5.2.a).

Issues and Remedies

While the WSD did not identify key areas for improvement in this category, the WSD finds the following issue and associated remedy. All remedies must be addressed in Liberty's 2022 WMP Update.

- ISSUE: Liberty installs fault indicators on an as-needed basis and does not have a specific plan or program targets for installation of fault indicators.
 - REMEDY: Liberty shall describe a plan for prioritizing and installing fault indicators including program targets.

Additional figures

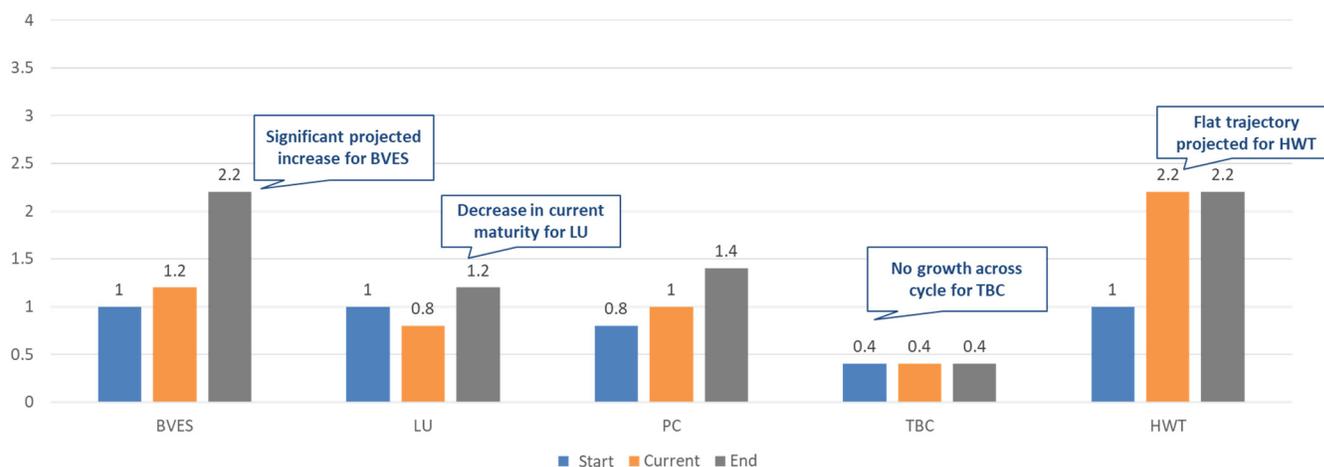
Below are additional charts, maps and tables used as part of the WSD's review of Liberty's situational awareness and forecasting section:

**WSD-018 Attachment A:
Draft Action Statement on Liberty Utilities’s 2021 Wildfire Mitigation Plan Update**

Capability 10. Wildfire detection processes and capabilities				
Responses to survey questions				
Survey questions and the utility's responses are shown below				
Automated maturity level based on Maturity Rubric (0 - 4)	Question	Starting state as of 2020	Current state as of 2021	Planned state by start of next cycle (2023)
2020: 0	10 : Are there well-defined procedures for detecting ignitions along the grid?	i. No	i. No	ii. Yes
2021: 0				
2022: TBD	10b: What equipment is used to detect ignitions?	iii. Well-defined equipment for detecting ignitions along grid, including remote detection equipment including cameras	i. No consistent set of equipment for detecting ignitions along grid	ii. Well-defined equipment for detecting ignitions along grid
2023: 1 (projected)	10 : How is information on detected ignitions reported?	iii. Procedure exists for notifying suppression forces and key stakeholders	ii. Procedure exists for notifying suppression forces	ii. Procedure exists for notifying suppression forces
	10d: What role does ignition detection software play in wildfire detection?	ii. Ignition detection software in cameras used to augment ignition detection procedures	i. Ignition detection software not currently deployed	ii. Ignition detection software in cameras used to augment ignition detection procedures

Figure 5.2.a: Wildfire detection processes and capabilities, Capability 10 of the Utility Maturity Survey.

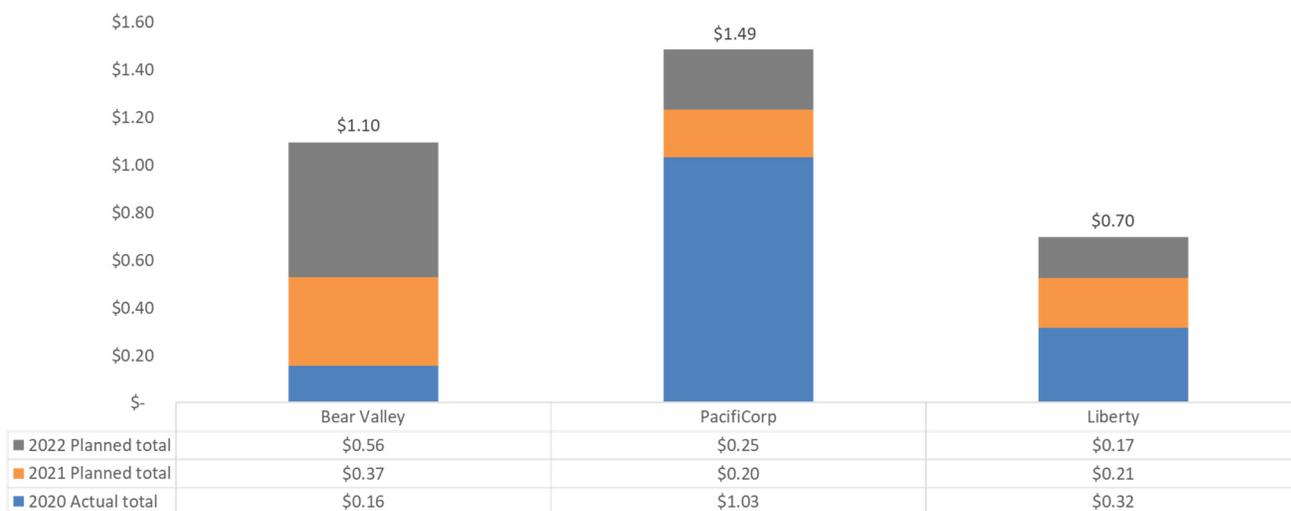
Maturity score (0 – 4) actual and projected



Source: 2021 Maturity Model survey data

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

Actual and projected spend (\$K) per HFTD overhead circuit mile



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

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

5.3. Grid Design and System Hardening

Introduction

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

1. Capacitor maintenance and replacement,
2. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault,
3. Covered conductor installation,
4. Covered conductor maintenance,
5. Crossarm maintenance, repair, and replacement,
6. Distribution pole replacement and reinforcement, including with composite poles,
7. Expulsion fuse replacement,

8. Grid topology improvements to mitigate or reduce PSPS events,
9. Installation of system automation equipment,
10. Maintenance, repair, and replacement of connectors, including hotline clamps,
11. Mitigation of impact on customers and other residents affected during PSPS event,
12. Other corrective action,
13. Pole loading infrastructure hardening and replacement program based on pole loading assessment program,
14. Transformer maintenance and replacement,
15. Transmission tower maintenance and replacement,
16. Undergrounding of electric lines and/or equipment,
17. Updates to grid topology to minimize risk of ignition in HFTDs, and,
18. Other/not listed items if an initiative cannot feasibly be classified within those listed above.

Overview

The WSD finds that Liberty has made progress in Grid Design and System Hardening, and finds this portion of PC's 2021 WMP Update to be sufficient. Liberty's progress includes developing an expulsion fuse specific replacement program, increasing sectionalization of its system, and progressing on pilot programs.

Progress over the past year

The WSD finds that Liberty has made the following progress:

- Liberty installed 6.82 miles of covered conductor in 2020 and plans to install 10.1 miles in 2021 and 12.7 miles in 2022. While locations for planned installation were not prioritized by using its wildfire models, Liberty identified areas of wildfire risk based on wildland/urban interface location, HFTD, asset condition, and egress. Liberty states that projects post-2022 will be determined using Liberty's new risk assessment methods. Liberty is also supplementing its covered conductor projects by piloting microgrids in Angora Ridge in order to minimize PSPS impacts.
- Liberty has a specific expulsion fuse replacement program to replace fuses with CAL FIRE-approved non-expulsion fuses. Fuses are prioritized for replacement using fire risk maps produced by Liberty's wildland fire model vendor, with areas of very high wildfire risk prioritized first. Since the implementation of the program in 2019, Liberty has not had any ignitions from non-expulsion fuses. Liberty plans on replacing 1,500 fuses a year until all 9,000 fuses within the HFTD are replaced.
- Liberty is installing additional line reclosers to better sectionalize its system. It installed four additional line reclosures in 2020, plans to install three more in 2021, and plans to install a minimum of three per year starting in 2022.

- Liberty began a Distribution Automation (“DA”) pilot in 2021, which will continue into 2022. Installation of DA controllers will allow for FLISR (Fault Location, Isolation, and Service Restoration) that allows for fault isolation and faster restoration times after a PSPS event.
- Liberty is installing “Green Jackets” that protect substation equipment from object and animal contact due to an increase in squirrel- and bird- related outages observed in 2020.

Liberty has room for improvement on the following points:

- Liberty does not have separate inspection and maintenance programs for much of its asset types, instead relying on GO 165. Liberty should develop specific programs for any assets that prove to be of higher wildfire risk, such as transformers, as described in Section 5.1 above. For example, Liberty includes covered conductor maintenance as part of its standard GO 165 inspections and does not have a separate maintenance program at this time. Liberty should demonstrate a full understanding of maintaining covered conductor given that it is relatively new to Liberty’s system. Failure to properly identify needs for repair and improvement may lead to premature failure of covered conductor and therefore presenting an ignition risk. Liberty also currently only performs case-by-case work for the following replacement programs:
 - CAL FIRE exempt hardware
 - Tree attachment removals
 - Open wire secondary/grey wire replacement with tree wire TPX or QPX secondary/service wire
 - Equipment and conductor guardsSome of this equipment has shown to have direct correlations with heightened wildfire risk, and Liberty does not demonstrate that it is sufficiently moving these replacement programs forward to reduce such risk.
- Liberty does not have a wildfire-specific undergrounding program, and all current undergrounding projects are due to Rule 20A. While such projects will reduce wildfire risk in the areas implemented, Liberty should include evaluating undergrounding as part of its wildfire risk reduction mitigations to ensure all alternatives are being considered for fire mitigation, given the high risk-reduction benefits of undergrounding.

Key Areas for Improvement and Remedies

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

Utility- #	Issue title	Issue description	Remedies required
Liberty-3	Limited evidence to support the effectiveness of covered conductor	The rationale to support the selection of covered conductor as a preferred initiative to mitigate wildfire risk lacks consistency among the utilities, leading some utilities to potentially expedite covered conductor deployment without first demonstrating a full understanding of its long-term risk reduction and cost-effectiveness. The utilities’ current covered conductor pilot efforts are limited in scope ⁴¹ and therefore fail to provide a full basis for understanding how covered conductor will perform in the field. Additionally, utilities justify covered conductor installation by alluding to reduced PSPS risk but fail to provide adequate comparison to other initiatives’ ability to reduce PSPS risk.	The utilities ⁴² must coordinate to develop a consistent approach to evaluating the long-term risk reduction and cost-effectiveness of covered conductor deployment, including: 1. The effectiveness of covered conductor in the field in comparison to alternative initiatives. 2. How covered conductor installation compares to other initiatives in its potential to reduce PSPS risk.

Issues and Remedies

While the WSD did not identify key areas for improvement in this area, the WSD finds the following issues and associated remedies. All remedies must be addressed in Liberty’s 2022 WMP Update.

- ISSUE: Liberty lacks separate maintenance programs and does not demonstrate that its GO 165 programs adequately cover maintenance specific to wildfire risk. Liberty also

⁴¹ Limited in terms of mileage installed, time elapsed since initial installation, or both.

⁴² Here “utilities” refers to SDG&E and Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), PacifiCorp, Bear Valley Electric Service, Inc. (BVES), and Liberty Utilities; although this may not be the case every time “utilities” is used through the document.

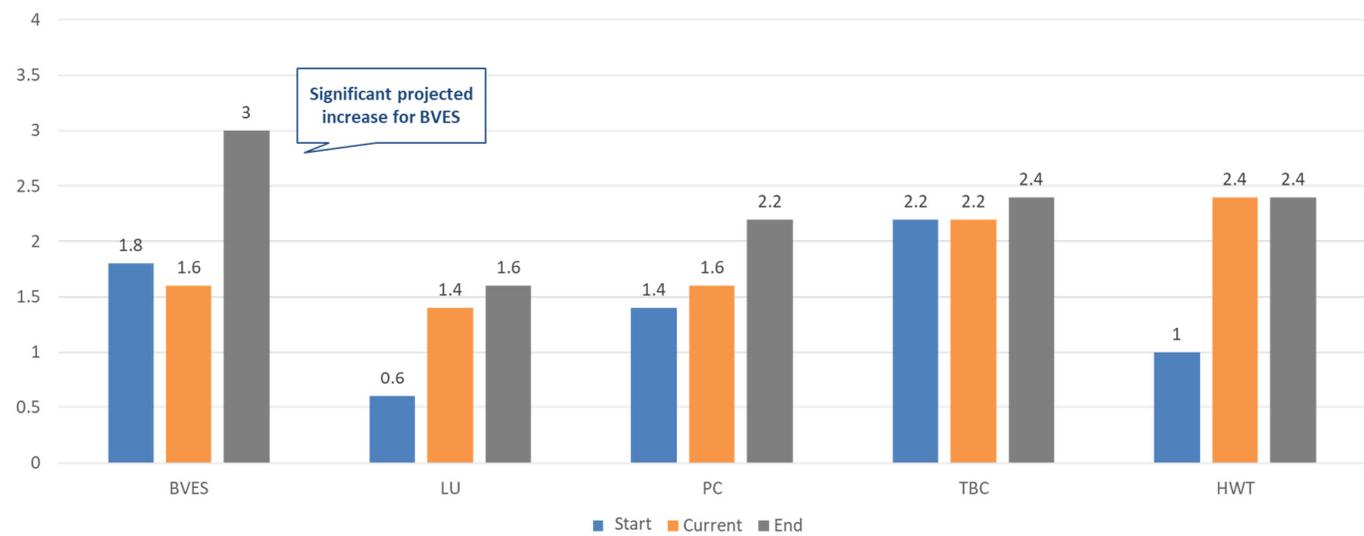
does not demonstrate that its maintenance programs effectively maintain its covered conductor.

- REMEDY: Liberty shall describe how it plans to expand specific equipment replacement programs for equipment known to increase wildfire risk, instead of relying on case-by-case replacements. These replacement programs include, but are not limited to:
 - CAL FIRE exempt hardware
 - Tree attachment removals
 - Open wire secondary/grey wire replacement with tree wire TPX or QPX secondary/service wire
 - Equipment and conductor guards
- REMEDY: Liberty shall enhance its maintenance programs for assets and asset components with high ignition risk and in high wildfire risk areas. Liberty shall develop and deploy these enhancements in conjunction with the inspection enhancements discussed in Section 5.4, in Issue Liberty-5.
- REMEDY: Liberty shall provide all supporting material to demonstrate that its maintenance programs effectively maintain its covered conductor. If its existing maintenance programs do not provide maintenance specific to covered conductor, Liberty shall enhance its current operations to provide such maintenance and provide supporting material to detail the enhancements to its existing programs.
- ISSUE: Liberty has no planned wildfire-specific undergrounding program at this time.
 - REMEDY: Liberty shall evaluate undergrounding as a potential mitigation as part of its full wildfire risk reduction analysis.

Additional figures

Below are additional charts, maps and tables used as part of the WSD's review of Liberty's grid design and system hardening section:

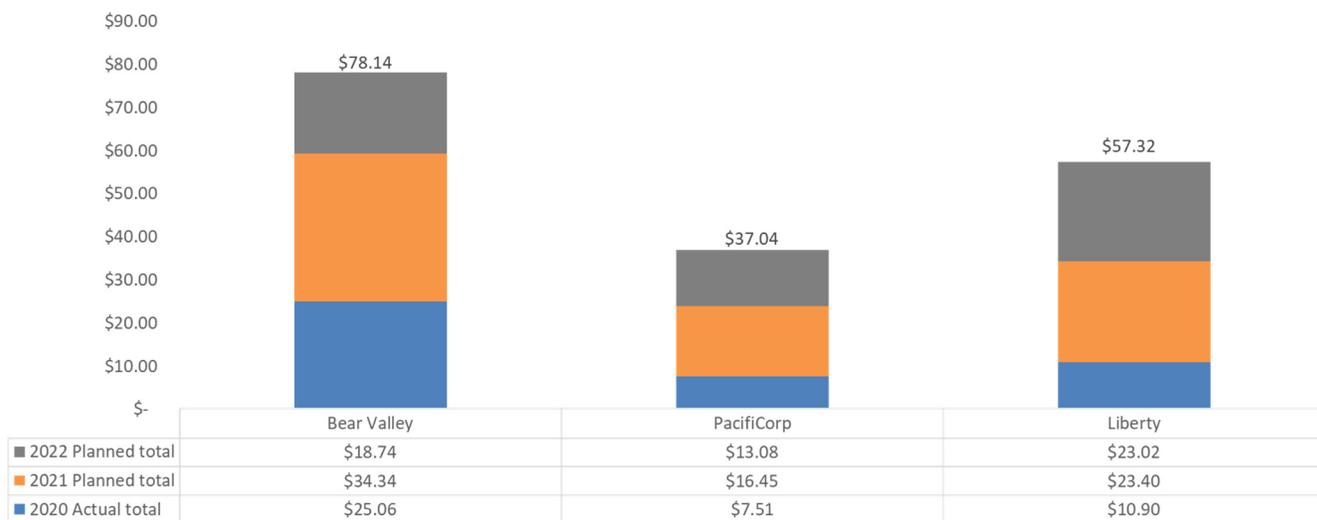
Maturity score (0 – 4) actual and projected



Source: 2021 Maturity Model survey data

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

Actual and projected spend (\$K) per HFTD overhead circuit mile



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

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

5.4. Asset Management and Inspections

Introduction

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

Overview

The WSD finds that Liberty has made progress in Asset Management and Inspections and finds this portion of Liberty's 2021 WMP Update to be sufficient. However, while Liberty moved to an app-based approach for conducting inspections, Liberty has otherwise made limited improvements to enhance its standard inspection process and is still in the process of developing a QA/QC program.

Progress over the past year

The WSD finds that Liberty has made the following progress:

- Liberty implemented an app for completion of asset inspections, moving away from physical copies of records and allowing for better data collection on findings.
- Liberty hired contractors to complete a system-wide survey in 2020 for all assets within its territory, therefore creating a baseline for future inspections and catching several wildfire risk related findings.

Liberty has room for improvement on the following points:

- Liberty does not currently have a formally established QA/QC process. Liberty is developing a QA/QC program through a contractor with an expected completion date of January 2022.⁴³ Currently, Liberty performs some form of quality checks by re-inspecting documentation from its data collection platform to ensure inspections are completed accurately. However, it does not have an established minimum percentage of documents for which it performs this re-inspection.⁴⁴ Additionally, Liberty verifies a percentage of in-field inspections completed by contractors. However, it does not plan

⁴³ Liberty Response to Data Request No. 3 Q. 1, received May 3, 2021.

⁴⁴ Provided verbally on a call with WSD on May 20, 2021; Liberty Response to Data Request No. 5 Q. 2, received May 24, 2021

on using contractors for asset inspections in 2021.⁴⁵ These processes are not formally established procedures and need further development and maturation. While the establishment of Liberty’s QA/QC program in 2022 may address and alleviate these issues, Liberty must demonstrate that it is adequately checking the quality and accuracy of its inspections in the interim. Additionally, Liberty must show that it is making progress towards establishing an effective QA/QC program.

- Liberty has made limited improvements to enhance current visual and detailed inspection practices, primarily following GO 165 requirements. Liberty has a high number of ignitions due to equipment failures, as seen in Figure 5.j below. This demonstrates that Liberty needs to enhance its current inspection practices to better identify assets that need repair or replacement before failure of these assets could lead to an ignition.
- Liberty identified a high number of Level 3⁴⁶ work orders in 2020, as seen in Figure 5.k below, likely as part of the system-wide survey in 2020. This further demonstrates that Liberty needs to improve upon its current inspection practices in order to accurately identify these findings in the future. Additionally, Liberty does not provide adequate information regarding how it plans to act on such findings.

Key Areas for Improvement and Remedies

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

Utility-#	Issue title	Issue description	Remedies required
Liberty-4	Lack of current inspection QA/QC Program	While some QA/QC measures are conducted by Liberty personnel, Liberty does not currently have a formal QA/QC program in place for its asset inspections, with one currently in development for completion by January 2022.	Liberty must: 4. In its Progress Report, explain how it currently conducts quality checks of its asset inspections. 5. Develop an interim QA/QC procedure for asset inspections between now and the establishment of its new QA/QC program by January 2022 in order to ensure that

⁴⁵ Liberty Response to Data Request No. 3 Q. 2, received May 3, 2021.

⁴⁶ In accordance with GO 95, “Any risk of low potential impact to safety or reliability. For Level 3, the condition is not structural, with low likelihood of failure; the condition does not have a significant impact to structural integrity; there is little potential for injury or reliability issues; failure or exposure does not present a significant impact to operations or customers; work procedures mitigate safety concerns.”

Utility- #	Issue title	Issue description	Remedies required
			<p>work is being completed accurately and effectively.</p> <ol style="list-style-type: none"> 1. Provide updates on the development of its QA/QC program in its Progress Report, including: <ol style="list-style-type: none"> d. The scope of the QA/QC program; e. Procedures of the QA/QC program that Liberty and/or its contractor have developed; and a. The status of the QA/QC program implementation.
Liberty-5	Lack of improvement to visual and detailed asset inspections that specifically target assets and asset components with high ignition risk and areas of highest wildfire risk	Liberty makes minimal improvements to enhance asset inspections outside of meeting GO 165 requirements, with little focus specifically on wildfire risk. Given Liberty’s high instance of ignitions due to equipment failures, as well as large number of Level 3 ⁴⁷ findings in 2020, Liberty must work to improve upon its current inspection practices.	<p>Liberty must enhance its current asset inspection process and maintenance programs accordingly in order to specifically target:</p> <ol style="list-style-type: none"> 1. Assets and asset components with higher ignition risk; and 2. Areas of highest wildfire risk.

Additional Issues and Remedies

In addition to the key areas listed above, the WSD finds the following issue and associated remedy. All remedies must be addressed in Liberty’s 2022 WMP Update.

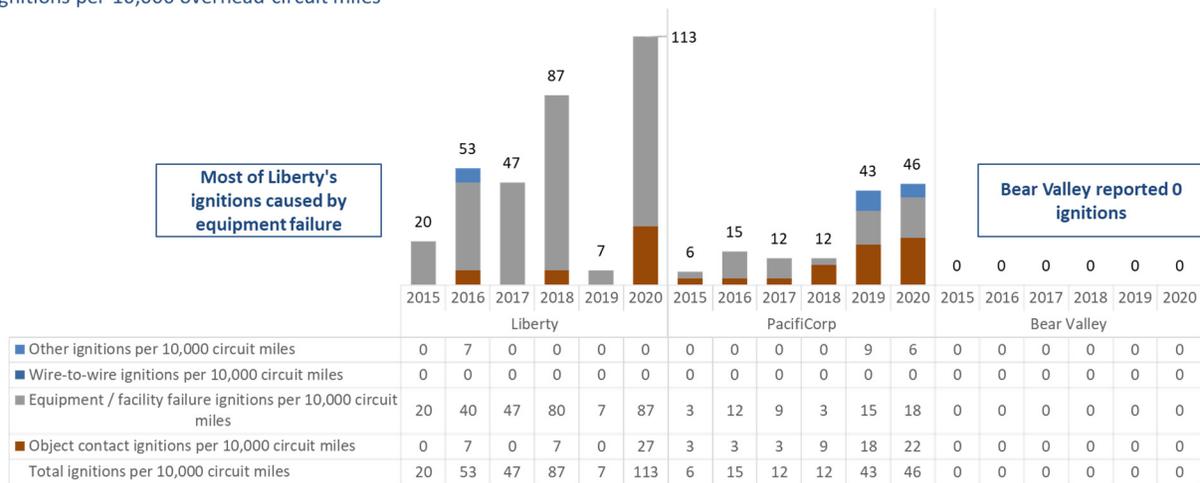
⁴⁷ In accordance with GO 95, a low safety and/or reliability risk.

- ISSUE: Liberty identified a high number of Level 3 findings.
 - REMEDY: Liberty shall resolve the high number of Level 3 findings, both by enhancements in inspections described in Liberty-5 above, as well as a specific plan to correct all of the open Level 3 findings.
 - If the high number of Level 3 findings is not remediated by the 2022 WMP Update, Liberty must submit a plan to target and decrease their occurrence, especially those related to wildfire risk.

Additional figures

Below are additional charts, maps and tables used as part of the WSD’s review of Liberty’s asset management and inspections section:

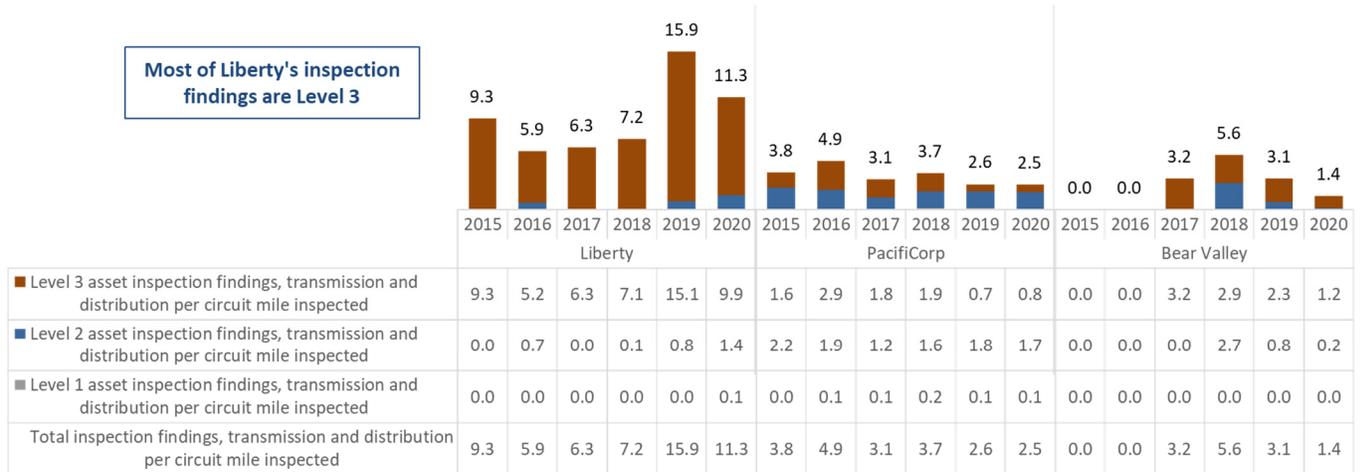
Ignitions per 10,000 overhead circuit miles



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

Figure 5.4.a: Number of ignitions per 10,000 overhead circuit miles.

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



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

Figure 5.4.b: Asset inspection findings per circuit mile inspected.

a. Vegetation Management and Inspections

Introduction

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

The WSD finds that Liberty has made the following progress:

- In 2020, Liberty completed several projects focused on fuel management in coordination with the community and agency partners, such as the California Tahoe Conservancy. The fuel reduction work included 33 parcels, maintenance of defensible space around substations, and hauling of wood over four inches diameter to relieve the burden on customers.
- Liberty developed a customer pre-notification letter about vegetation management work as part of broader improvements to customer communications. The letter explains the purpose of vegetation management and provides helpful websites for local information.

- Liberty continues to develop a “formal”⁴⁸ QA/QC program and has developed a Post Work Verification Procedure. Liberty acknowledged its lack of a “formal”⁴⁹ QA/QC program in its 2020 WMP and plans to implement Post Work Verification in “Q1 of 2021 for all inspections and tree work performed in 2020.”⁵⁰ Additionally, Liberty commits to evaluating and adjusting its QA/QC initiatives throughout 2021 and reporting any material changes made to its QA/QC program to the WSD in Liberty’s 2021 quarterly reports.⁵¹ Although Liberty has made progress towards implementing a QA/QC program, its lack of such a program remains an issue. See Additional Issues and Remedies, below.
- Liberty has a centralized Vegetation Management System (VMS) that includes individual tree identification numbers to granularly track vegetation management activities.
- Liberty’s LiDAR pilot program has been successful in detecting vegetation-to-conductor clearance issues.
- In 2021, Liberty plans to “transition to annual compliance inspections of 100% of its service territory to assess the vegetation around electrical lines,” using LiDAR as the “preferred method.”⁵²
- Liberty requires ISA Arborist certification or California registered professional forester license for the positions of Utility Forester I and above. To help improve the availability of qualified VM personnel Liberty is supporting the development of vegetation management training offered by the University of Wisconsin; the two-year program offers a certification in utility vegetation management.
- Liberty prioritizes its VM distribution patrol inspections based on “vegetation density, maintenance history, regional fire risk rating based on CPUC fire threat areas and REAX fire risk ratings, customer tree inspection requests, observations from field employees and contractors, and vegetation caused outages.”⁵³ Using this multi-layered prioritization approach may allow Liberty to effectively mitigate ignition risk from vegetation contact.

Key Areas for Improvement and Remedies

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

⁴⁸ Liberty 2021 WMP Update p. 114

⁴⁹ Liberty 2020 WMP p. 101

⁵⁰ Liberty 2021 WMP Update p. 115

⁵¹ Liberty 2021 WMP Update p. 115

⁵² Liberty 2021 WMP Update p. 112

⁵³ Liberty 2021 WMP Update p. 114

Utility-#	Issue title	Issue description	Remedies required
Liberty-6	Inadequate Justification of VM Inspection Frequency	<p>Quarterly Report Action LIB-9 (Class B) requires Liberty to “provide a justification with supporting data of its three-year vegetation inspection cycle outside of Tier 3 HFTD areas.”⁵⁴ Liberty has not provided such justification.</p> <p>Additionally, Liberty does not provide a clear or consistent explanation of its VM inspection frequency. Liberty states that it performs detailed inspections of entire once every three years per circuit.¹ In its 2020 WMP, Liberty stated that it “plans to inspect its overhead system within Tier 3 of the High Fire-Threat District on an annual basis.”¹ It is unclear whether Liberty implemented this plan to inspect its overhead system in HFTD Tier 3 for VM compliance annually as it is not mentioned in its 2021 WMP Update. Liberty does state that is “conducts annual inspections of its facilities in order to identify needed vegetation management work”¹ but does not specify any HFTD Tier. In 2020, Liberty engaged a third-party to “provide a comprehensive assessment of the vegetation management program,”¹ but does not detail</p>	<p>Liberty must:</p> <ol style="list-style-type: none"> 1. Clearly detail its VM inspection frequency by inspection type (e.g., detailed, patrol, CEMA, HTMP, LiDAR, etc.) and HFTD Tier. 2. Fully and completely justify, with supporting data, its 3-year detailed inspection cycle for all circuits. 3. Detail the implementation of any findings from the third-party evaluation. 4. Provide the third-party’s evaluation of Liberty’s VM program as an appendix.

⁵⁴ Wildfire Safety Division Evaluation of Liberty Utilities’ First Quarterly Report, January 21, 2021, p. 15

Utility- #	Issue title	Issue description	Remedies required
		in its WMP any finding regarding the effectiveness of its VM inspection frequency.	

Additional Issues and Remedies

The WSD finds the following additional issues and associated remedies. The WSD expects Liberty to take action to address these issues and report on progress made over the year in its 2022 WMP Update.

- ISSUE: Liberty intends to work closely with local, state, and federal partners to develop best practices for an effective fuel management program to reduce fire ignition risk and fire spread potential. However, Liberty does not have any specific projects or targets for fuel management and reduction of slash from VM activities in 2021. For example, Liberty does not include program targets for Public Resources Code (PRC) 4292, pole clearance, for its service territory in its WMP.
 - REMEDY: In Section 7.3.5.5 (or equivalent) of its 2022 WMP Update, Liberty must detail any specific projects and quantitative targets related to fuel management, including any targets related to PRC 4292.
- ISSUE: In Section 7.3.5.13, quality assurance/quality control of inspections, Liberty uses equivocating terms such as “statistical sampling” and “appropriate sample sizes” rather than defining QA/QC targets for the coming year.⁵⁵ Similarly, Liberty stated “QA/QC Inspections will be performed in higher percentages in Tier 3 and Tier 2 HFTD with smaller percentage being performed in non-HFTD areas.”⁵⁶ Equivocating language, such as “higher percentages” and “smaller percentages,” lack quantitative definition required for this initiative.
 - REMEDY: In its 2022 WMP Update, Liberty must provide quantitative QA/QC targets and sample sizes.
- ISSUE: In section 7.3.5.11, Liberty uses equivocating language to describe the effectiveness of its distribution VM patrol inspection stating “Liberty’s patrol inspections have been successful in mitigating risk posed by dead and dying trees. Liberty will continue to perform these inspections to maintain reliability and safe operation of its electrical assets.”⁵⁷

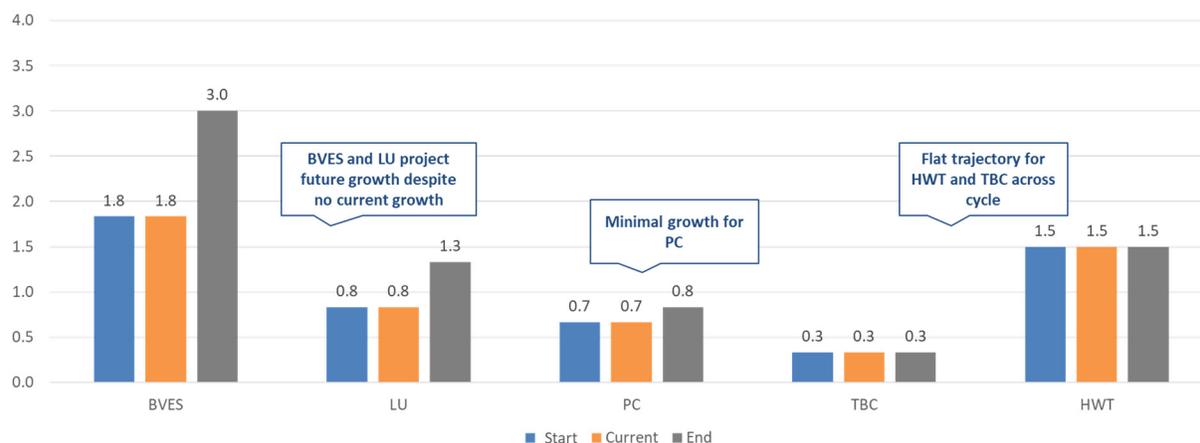
⁵⁵ Liberty 2021 WMP Update p. 115

⁵⁶ Liberty 2021 WMP Update p. 115

⁵⁷ Liberty 2021 WMP Update p. 114

- REMEDY: In its 2022 WMP Update, Liberty must provide quantitative proof that its patrol inspections have been “successful in mitigating risk posed by dead and dying trees.”⁵⁸
- ISSUE: In Section 7.3.5.15, Liberty states that it “may perform separate pre-fire season hazard tree inspections in designated Public Resource Code areas, Extreme (Tier 3) and Very High (Tier 2) fire areas as needed.”⁵⁹ This commitment to supplemental pre-fire season inspections is vague and poorly defined.
 - REMEDY: In its 2022 WMP Update, Liberty must detail what thresholds (i.e., a set of conditions that need to be met) exist to trigger performance of separate pre-fire season hazard tree inspections. If thresholds do not exist, Liberty must develop such thresholds.

Maturity score (0 – 4) actual and projected



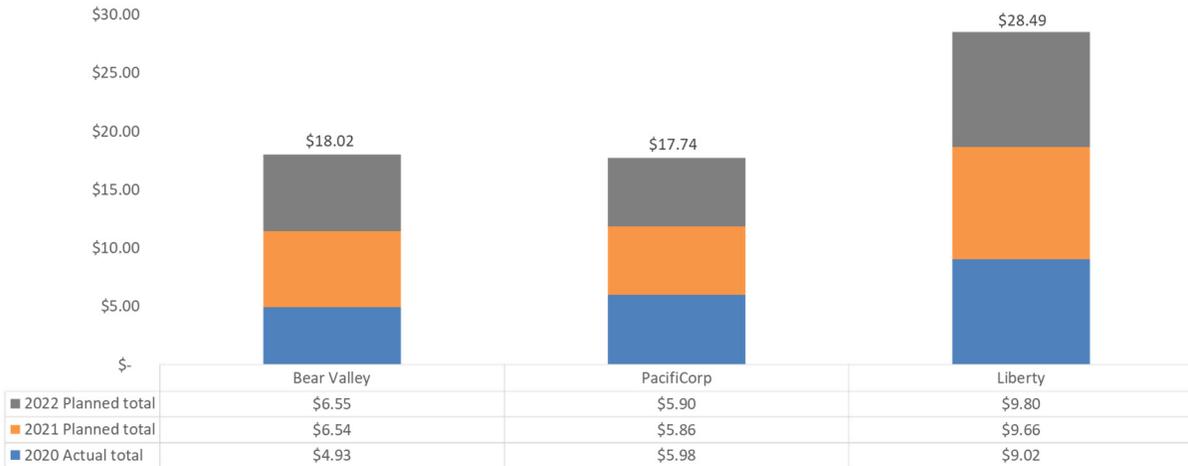
Source: 2021 Maturity Model survey data

Figure a.a: Vegetation management and inspections maturity score progress.

⁵⁸ Liberty 2021 WMP Update p. 114

⁵⁹ Liberty 2021 WMP Update p. 117

Actual and projected spend (\$K) per HFTD overhead circuit mile



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

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

5.5. Grid Operations and Operating Protocols

Introduction

The grid operations and operating protocols section of the WMP requires discussion of ways the utility operates its system to reduce wildfire risk. For example, disabling the reclosing function of automatic reclosers⁶⁰ during periods of high fire danger (e.g., during Red Flag Warning conditions) can reduce utility ignition potential by minimizing the duration and amount of energy released when there is a fault. This section also requires discussion of work procedures in elevated fire risk conditions and protocols to reduce the frequency and scope of de-energization including PSPS events (e.g., through sectionalization, etc.). This section also requires the utility to report whether it has stationed and/or on-call ignition prevention and suppression resources and services.

Overview

The WSD finds that Liberty has made progress in Grid Operations and Operating protocols and finds this portion of Liberty’s 2021 WMP Update to be sufficient. Progress includes

⁶⁰ 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.

improvements to Liberty’s line recloser system, although Liberty needs to provide additional detail on operations.

Progress over the past year

The WSD finds that Liberty has made the following progress:

- As discussed in Section 5.3 above, Liberty is making improvements to its line recloser system by piloting DA to move towards FLISR capability, which should lessen PSPS impacts in the future.
- Liberty updated its Operating Conditions in 2020, which are based on Liberty’s FPI, to reflect changes based on risk. Liberty is conducting training and review of the procedures annually.

Liberty needs further improvement in the following areas:

- While Liberty briefly discusses line reclosers in general, Liberty does not detail the actual settings used during times of high fire risk, instead only briefly discussing that remote reclosers present the ability to change settings as needed.

Issues and Remedies

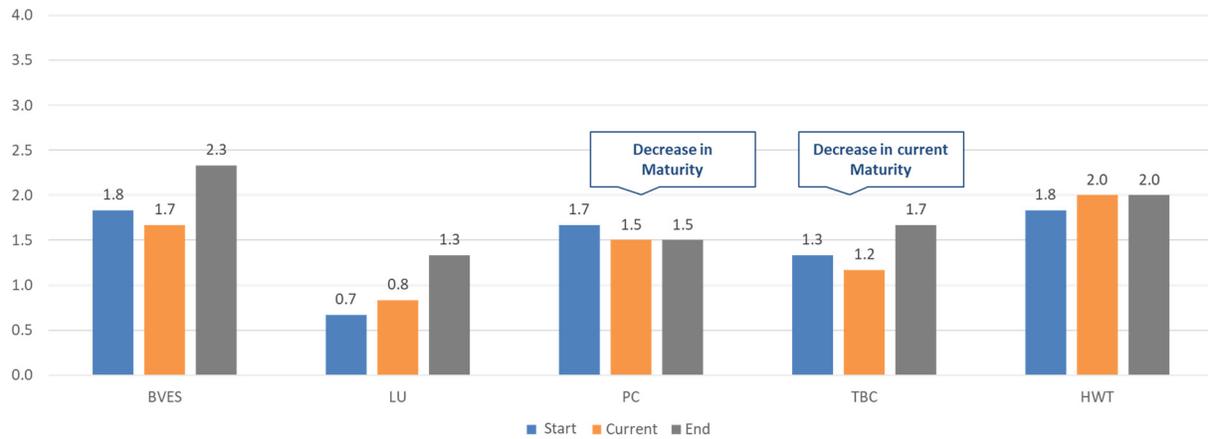
While the WSD did not identify key areas for improvement in this category, the WSD finds the following issue and associated remedy. All remedies must be addressed in Liberty’s 2022 WMP Update.

- ISSUE: Liberty’s 2021 WMP lacks information on the specific settings used for reclosers during times of high fire risk.
 - REMEDY: In its 2022 WMP Update, Liberty shall provide procedures and settings used for line reclosers during times of high fire risk days, including its thresholds and qualifiers for high fire risk.

Additional figures

Below are additional charts, maps and tables used as part of the WSD’s review of Liberty’s grid operations and operating protocols section:

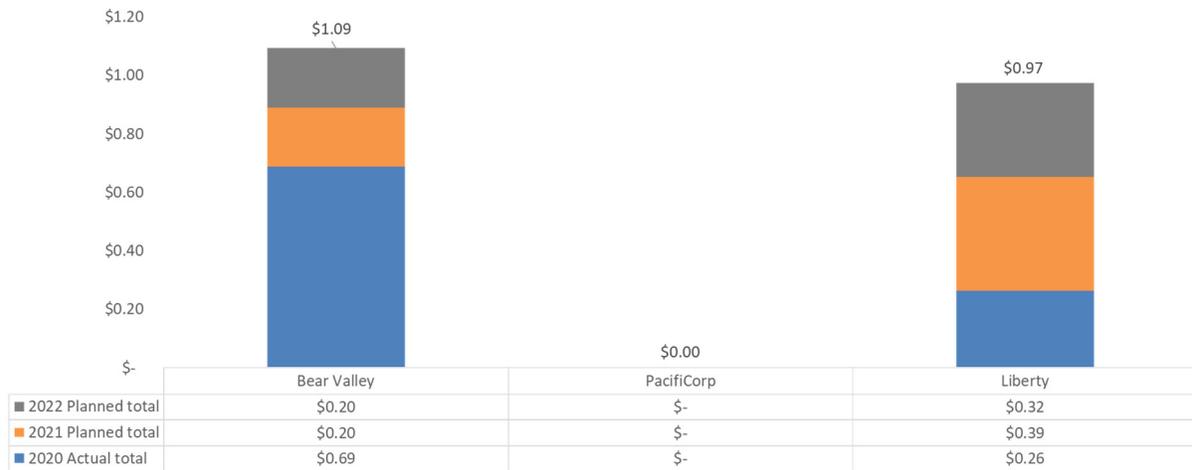
Maturity score (0 – 4) actual and projected



Source: 2021 Maturity Model survey data

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

Actual and projected spend (\$K) per HFTD overhead circuit mile



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

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

5.6. Data Governance

Introduction

The data governance section of the WMP seeks information on the utility’s initiatives to create a centralized wildfire-related data repository, conduct collaborative research on utility ignition and wildfire, document and share wildfire-related data and algorithms, and track and analyze near-miss data. In addition, this section discusses the quality and completeness of Quarterly

Data Reports (QDR) consisting of spatial and non-spatial data submitted as required by condition Guidance-10 in resolution WSD-002. Initial submissions of data were received in September 2020, and QA/QC reports were issued for the spatial data component of those submissions in December 2020. Since those initial QA/QC reports, WSD has received two more QDR submissions, in December 2020 and in February or March 2021 (submitted with the utility's 2021 WMP update (in February or March)). The spatial data are subject to the WSD GIS Data Reporting Standard (GIS Standard), the first version of which was published by the WSD on August 21, 2020, and which was updated on February 4, 2021.⁶¹ The analysis of spatial data in this section focuses on specific areas where the data Liberty submitted with its 2021 WMP do not meet the GIS Standard.

Overview

Liberty does not yet have sufficient data governance capabilities for acceptable wildfire mitigation. Among Liberty's targets are a centralized data repository and dashboard capabilities for driving risk-based decision making. Liberty also maintains research collaborations with Texas A&M and Nevada-Reno on fault anticipation and detection. WSD recognizes Liberty's incremental progress, and finds multiple areas for improvement in terms of Liberty's WMP data submissions, as detailed below.

Progress over the past year

The WSD finds that Liberty made incremental progress in developing its data governance program.

Liberty has room for improvement regarding the following points:

- Spatial data in the QDR submission: Liberty has not made significant progress compared to the previous quarterly data submission. The data submitted for Q4 2020 have several fundamental issues which negatively affect the useability of the data and do not meet the GIS Standard. Many of the issues indicate a lack of internal quality control review of data. Some of the more significant problems were:
 - Missing primary keys: primary key/unique ID fields are fundamental, and data submitted without a unique primary key are not useable. A primary key is a value in a data table that is unique for each entry (record) and does not change. Primary keys allow data in tables to be linked or referenced from other tables and tracked through time and multiple submissions. The listed feature classes or

⁶¹ The most recent version of the standard, version 2, is available at:
<ftp://ftp.cpuc.ca.gov/WMP/2021/GIS/WSD%20GIS%20Data%20Reporting%20Standard.pdf>

tables had some records with missing primary keys or values in primary key fields that are not unique to each record:

- Connection Device
 - Customer Meter
 - Fuse
 - Substation
 - Support Structure
 - Switchgear
 - Transformer (field contains multiple values)
 - Grid Hardening Point
 - Grid Hardening Line
- Missing age data: Liberty did not provide estimated age data for any features which did not have more specific dates or years of installation.
 - Domain values not used: the WSD specified coded-value domains for 196 fields in the data schema, in order to receive data with universally understood values which can be compared across utilities. In several cases, Liberty submitted data which did not conform to the domains specified. One example of this is the "Conductor Material" field in both distribution line feature classes.
 - Missing data: Separate from the overall incompleteness of Liberty's spatial data, which are understood to be a work in progress, Liberty provided Grid Hardening point and line data without providing any data in the Grid Hardening Log, which should contain most of the important information relevant to grid hardening projects, other than location.
- Non-spatial data: Liberty submitted their QDR non-spatial data (Tables 1-12) in PDF format, which is not editable by WSD reviewers.

Issues and Remedies

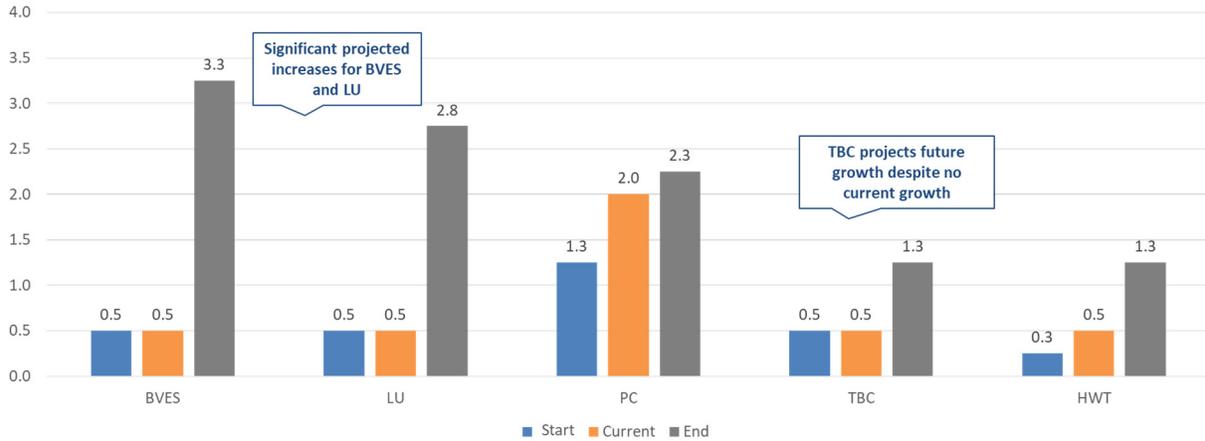
While the WSD did not identify key areas for improvement in this category, the WSD finds the following issues and associated remedies.

- ISSUE: Liberty's spatial QDR data submissions have shortcomings that must be remedied. Liberty lacks internal quality control on its data submissions. Data are sometimes incomplete or unexplained.
 - REMEDY: Liberty must submit primary keys and complete age data including estimated age in ranges specified, where more specific date or year of installation are not known.
 - REMEDY: Liberty must use domain values.
 - REMEDY: Liberty must provide log tables for all feature classes it is submitting, which have associated log tables specified in the data standard.
- ISSUE: Liberty's non-spatial QDR data were submitted in PDF format.
 - REMEDY: Liberty must submit its non-spatial QDR data in Microsoft Excel format.

Additional figures

Below are additional charts, maps and tables used as part of the WSD’s review of Liberty’s data governance section:

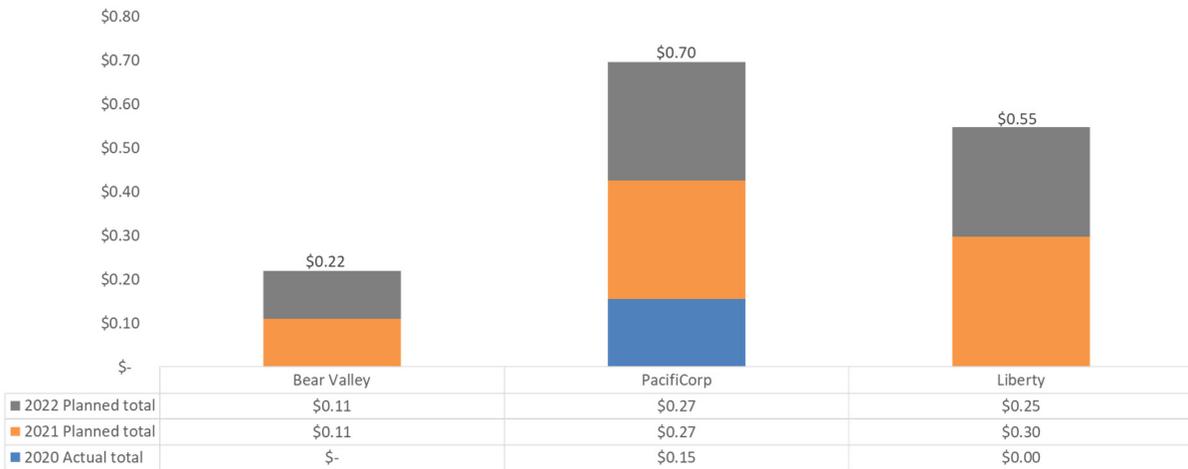
Maturity score (0 – 4) actual and projected



Source: 2021 Maturity Model survey data

Figure 5.6.a: Data governance maturity score progress.

Actual and projected spend (\$K) per HFTD overhead circuit mile



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

Figure 5.67.b: Data governance spend per HFTD overhead circuit mile, SMJUs 2020-2022.

5.7. Resource Allocation Methodology

Introduction

The resource allocation methodology section of the WMP requires the utility to describe its methodology for prioritizing programs by cost-efficiency. This section requires utilities to discuss risk reduction scenario analysis and provide a risk-spend efficiency (RSE) analysis for each aspect of the plan.

Overview

Since the 2020 WMP, Liberty has made progress in its risk modeling capabilities. Specifically, Liberty can quantify the cost-effectiveness of several key initiatives by calculating their respective RSE estimates. Shortly before the 2021 WMP filing, Liberty completed its wildfire risk model with assistance from its wildfire engineering consultant. The completion of the wildfire risk model is a big step for the utility to perform more quantitative risk analysis that will inform the initiative-selection process. However, even with the recent developments, it is still unclear how RSE estimates are weighted against other decision-making factors. Liberty must bring clarity to its decision-making process by providing a thorough overview of the initiative-selection procedure from beginning to implementation.

Progress over the past year

The WSD finds that Liberty has made the following progress:

- Liberty has completed its wildfire risk model with the support of its wildfire engineering consultant. The completion of the wildfire risk model will allow the utility to perform risk quantification methodologies such as Multi-Attribute Risk Score (MARS)/Multi-Attribute Value Function (MAVF) and RSE.
- In 2021, Liberty plans to increase its modeling capabilities by hiring up to two additional positions to help with the quantitative aspects of managing the RBDM program.⁶²
- Liberty can calculate RSEs for the following initiatives:
 - Covered conductor
 - Undergrounding
 - Targeted G.O.95 intrusive inspection and remediation (replace/repair schedules)
 - Enhanced vegetation management
 - Microgrid
 - Fuse Expulsion Replacement Program
 - Distribution fault anticipation technology
- Liberty has demonstrated risk-based decision making with its expulsion fuse replacement program. The utility is prioritizing expulsion fuse replacement in areas

⁶² Liberty's 2021 WMP Update, p. 24

identified with high or very high wildfire risk according to the wildfire engineering consultant generated fire risk maps.⁶³

Key Areas for Improvement and Remedies

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

Utility-#	Issue title	Issue description	Remedies required
Liberty-7	Equivocating Language Used to Describe Risk-Based Decision-Making Improvements	Liberty uses noncommittal and equivocating language to describe improvements to its risk-based decision-making process in section 7.3.7.1.	Liberty must report on its risk-based decision-making in measurable, quantifiable, and verifiable language and discuss its progress and future improvements to the risk-based decision-making process.

Resolution WSD-002 states, “A continuing issue from 2019 that persists in 2020 WMPs is the extensive use of non-committal equivocating language. The prevalent use of equivocating language results in sparse commitment from utilities for achieving the intended goal of WMPs – reducing the risk of catastrophic wildfire posed by electrical lines and equipment.”⁶⁴Resolution WSD-002 further states, “[c]ontinued use of equivocating language may result in denial of future WMPs.”⁶⁵

In its 2021 WMP Update, Liberty continues to use noncommittal and equivocating language to describe future improvements to its risk-based decision-making process. For example, Liberty states, “Other risk-based decision making data sources, such as environmental impacts, work planning and tracking using wildfire engineering consultant generated fire map overlays, system hardening efforts, and overall systems analysis *will improve* with integration of data from all systems.”⁶⁶ Liberty also states, “As Liberty moves forward with new methods of integration, analysis and reporting, Liberty’s risk-based decision making process *will continue to add efficiency and sophistication.*”⁶⁷ Lastly, Liberty states, “Liberty can also *increasingly utilize* this data framework for system hardening, battery storage and microgrid projects.”⁶⁸

⁶³ Liberty’s 2021 WMP Update, p. 91

⁶⁴ Resolution WSD-002, p. 26

⁶⁵ Resolution WSD-002, p. 27

⁶⁶ Liberty’s 2021 WMP Update, p. 124

⁶⁷ Liberty’s 2021 WMP Update, p. 124

⁶⁸ Liberty’s 2021 WMP Update, p. 124

The phrases “will improve”, “will continue”, “add efficiency and sophistication”, and “increasingly utilize” are not measurable, quantifiable, or verifiable by the WSD. The usage of these phrases indicts a lack of commitment for Liberty to improve its risk-based decision-making process.

Additional Issues and Remedies

In addition to the key areas listed above, the WSD finds the following issues and associated remedies. All remedies must be addressed in Liberty’s 2022 WMP Update.

- **ISSUE:** While Liberty did provide more RSE estimates and lists several decision-making factors such as climate, reliability, and asset conditions, the utility does not clearly explain the role of RSE estimates in the initiative selection process. To bring clarity and rigor to the initiative selection process, Liberty must elaborate on their decision-making process by providing a thorough overview of the initiative selection procedure from beginning to implementation.
 - **REMEDY:** In its 2022 WMP Update, Liberty must elaborate on its decision-making process to include a thorough overview of the initiative selection procedure. The overview must show the rankings of the decision-making factors (i.e., climate, reliability, asset conditions, etc.) and pinpoint where RSE estimates are considered in the initiative selection process. The WSD recommends a cascading, dynamic “If-Then” style flowchart to accomplish this prioritization requirement.

Additional figures

Below are additional charts, maps and tables used as part of the WSD’s review of Liberty’s resource allocation methodology section:

WSD-018 Attachment A: Draft Action Statement on Liberty Utilities's 2021 Wildfire Mitigation Plan Update

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

Significant discrepancies between 2020 Plan and 2020 Actual

All 3 SMJUs had 7.3.3.3 as their highest-spend initiative

Initiative Activity	Category	2020 Plan From 2020 WMP	2020 Actual From 2021 WMP	2021 Plan	2022 Plan	Total WMP Cycle Planned Spend	Initiative Spend as % of Total Planned Spend
1 7.3.3.3 Covered conductor installation	Grid Design & System Hardening	\$3,198	\$7,820	\$16,564	\$12,034	\$36,419	27%
2 7.3.5.15 Remediation of at-risk species	Vegetation Management & Inspections	\$4,500	\$7,338	\$5,500	\$5,150	\$17,988	13%
3 7.3.3.6 Distribution pole replacement and reinforcement, including with composite poles	Grid Design & System Hardening	\$0	\$3,652	\$10,605	\$2,610	\$16,867	12%
4 7.3.3.16 Undergrounding of electric lines and/or equipment	Grid Design & System Hardening	\$1,758	\$522	\$1,445	\$7,654	\$9,622	7%
5 7.3.5.16 Removal and remediation of trees with strike potential to electric lines and equipment	Vegetation Management & Inspections	\$0	\$2,723	\$2,200	\$2,200	\$7,123	5%
Total spend for top 5 initiatives		\$9,456	\$22,055	\$36,315	\$29,649	\$88,019	65%

Source: Table 12 of 2021 utility WMP Updates, Tables 21-30 of 2020 utility WMPs, and subsequent data requests.

Highest spend in 2021

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

Actual and planned spend by initiative category (\$K)



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

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

WSD-018 Attachment A: Draft Action Statement on Liberty Utilities's 2021 Wildfire Mitigation Plan Update

Top 3 categories are the same across SMJUs

Total WMP Cycle Planned Spend (\$K)

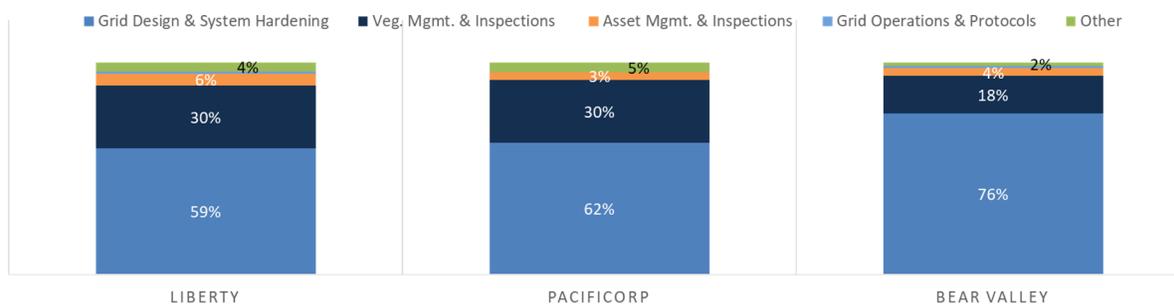
	Liberty Plan Total	PacifiCorp Plan Total	Bear Valley Plan Total
Grid Design & System Hardening	\$80,592 (59%)	\$43,338 (62%)	\$32,976 (76%)
Veg Mgmt. & Inspections	\$40,050 (30%)	\$20,754 (30%)	\$7,603 (18%)
Asset Mgmt. & Inspections	\$7,881 (6%)	\$2,338 (3%)	\$1,635 (4%)
Grid Operations & Protocols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

Source: Table 12 of 2021 utility WMP Updates

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

Total WMP Cycle Planned Spend (\$M)

Grid Design is highest-spend category across SMJUs, especially Bear Valley

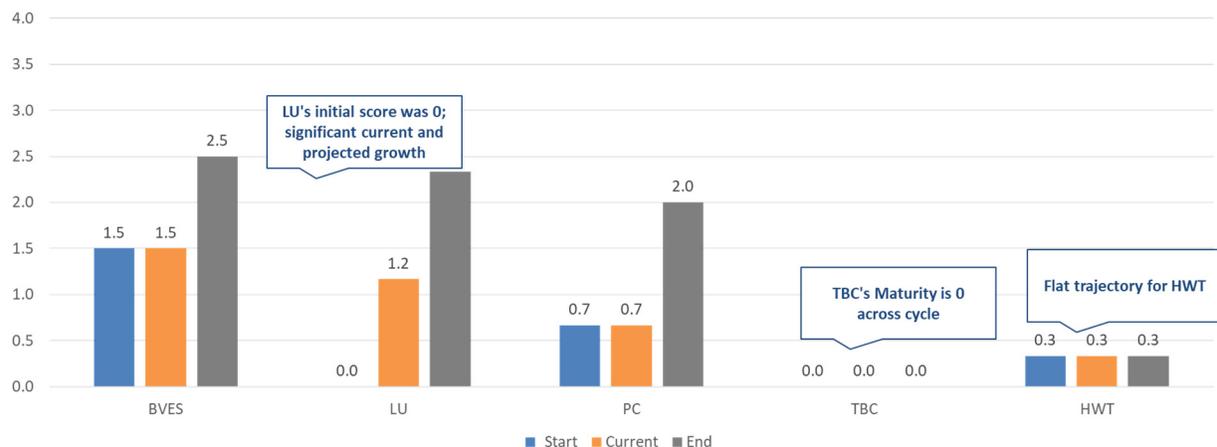


	Liberty (\$M)	PacifiCorp (\$M)	Bear Valley (\$M)
Grid Design & System Hardening	\$81	\$43	\$33
Veg. Mgmt. & Inspections	\$40	\$21	\$8
Asset Mgmt. & Inspections	\$8	\$2	\$2
Grid Operations & Protocols	\$2	\$0	\$.46
Other	\$6	\$3	\$.682

Source: Table 12 of 2021 utility WMP Updates

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

Maturity score (0 – 4) actual and projected



Source: 2021 Maturity Model survey data

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

Actual and projected spend (\$K) per HFTD overhead circuit mile



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

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

5.8. Emergency Planning and Preparedness

Introduction

This section of the WMP requires a general description of the utility’s overall emergency preparedness and response plan, including discussion of how the plan is consistent with legal requirements for customer support before, during, and after a wildfire, including support for

low-income customers, billing adjustments, deposit waivers, extended payment plans, suspension of disconnection and nonpayment fees, and repairs. Utilities are also required to describe emergency communications before, during, and after a wildfire in languages deemed prevalent in a utility’s territory (D.19-05-036, supplemented by D.20-03-004),⁶⁹ and other languages required by the Commission.

This section of the WMP 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 repositioning 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.

Progress over the past year

The WSD finds that Liberty has made the following progress:

- Liberty has entered into mutual aid agreements to address resourcing constraints. Its mutual assistance entities include NV Energy, Western Region Mutual Assistance Agreement (“WRMAA”), and the California Utilities Emergency Association (“CUEA”).
- For its public education and communication efforts Liberty focuses on areas most at risk of PSPS or wildfire and areas with elevated percentage of at-risk customers, such as Medical Baseline and Access and Functional Needs (AFN) customers.
- Liberty executes a robust, year-round communications and outreach effort to increase community resiliency to wildfires and educate customers and the public about PSPS and how to prepare for potential energization events.
- In 2020, Liberty focused on outreach to its most medical baseline customers and worked to update contact records for wildfire event communications.
- Liberty adding additional crew members to improve emergency restoration and normal day-to-day work.

Issues and Remedies

While the WSD did not identify key areas for improvement in this category, the WSD finds the following issue and associated remedy. All remedies must be addressed in Liberty’s 2022 WMP Update.

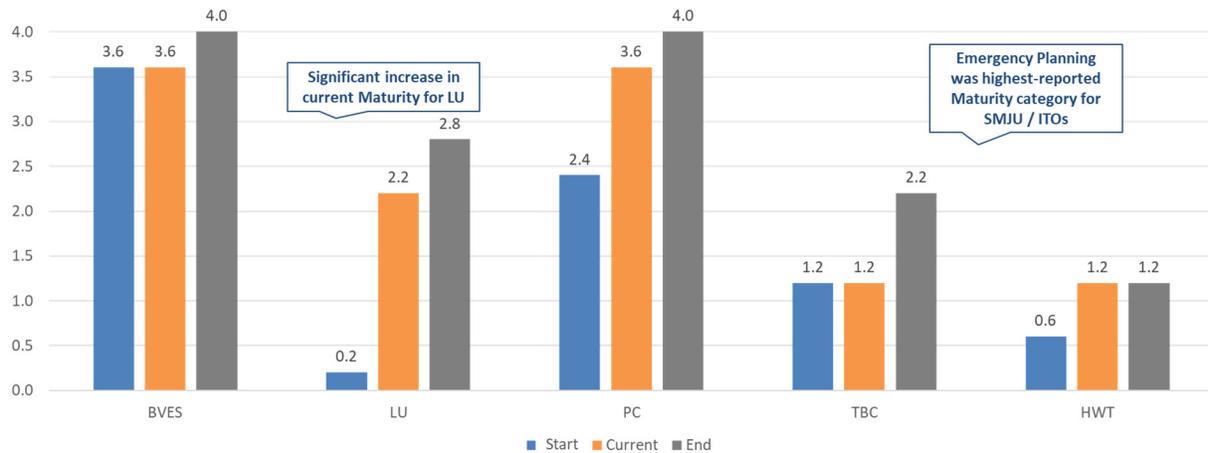
⁶⁹ A language is prevalent if it is spoken by 1,000 or more persons in the utility’s territory or if it is spoken by 5% or more of the population within a “public safety answering point” in the utility territory. See Cal. Government Code § 53112.

- ISSUE: Adequacy of Restoration Workforce: Liberty does not demonstrate the adequacy of its service restoration workforce.
 - REMEDY: Liberty shall discuss the type and number of personnel classifications it employs and the number of contractors in place for service restoration.

Additional figures

Below are additional charts, maps and tables used as part of the WSD’s review of Liberty’s emergency planning and preparedness section:

Maturity score (0 – 4) actual and projected



Source: 2021 Maturity Model survey data

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

Actual and projected spend (\$K) per 1000 customers



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

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

5.9. Stakeholder Cooperation and Community Engagement

Introduction

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

Progress over the past year

The WSD finds that Liberty has made the following progress over the past year in this area:

- Liberty implemented an external communication strategy, reflecting lessons learned and best practices.
- Liberty leverages its partnerships with Community Based Organizations and stakeholders to amplify and disseminate emergency preparedness information.
- Liberty designs, translates, distributes, and evaluates communications, including AFN and non-English speaking customers, to help facilitate the following:
 - Customers and communities are aware wildfire mitigation efforts;
 - Customers and communities increase their personal PSPS preparedness;
 - Balanced communication to customer populations, where the most vulnerable populations have access to information in the format best suited for their needs
- To increase public awareness and support of utility wildfire mitigation activities, Liberty executes wildfire safety and PSPS preparedness outreach throughout the year, using lessons learned and feedback from other IOUs, customers, and stakeholders.
- Liberty developed a three-part series of short videos detailing how customers can prepare before, during, and after a PSPS event
- To evaluate effectiveness of communications, Liberty seeks feedback on communication from public safety partners, community stakeholders and customers throughout the year, using informal engagements and informal conversations.
- Liberty collects feedback prior to and after wildfire and/or PSPS events. Liberty states that it uses the feedback to determine where improvements can be made, however it does not provide specific details on how feedback is incorporated or weighed into its wildfire mitigation planning.

Issues and Remedies

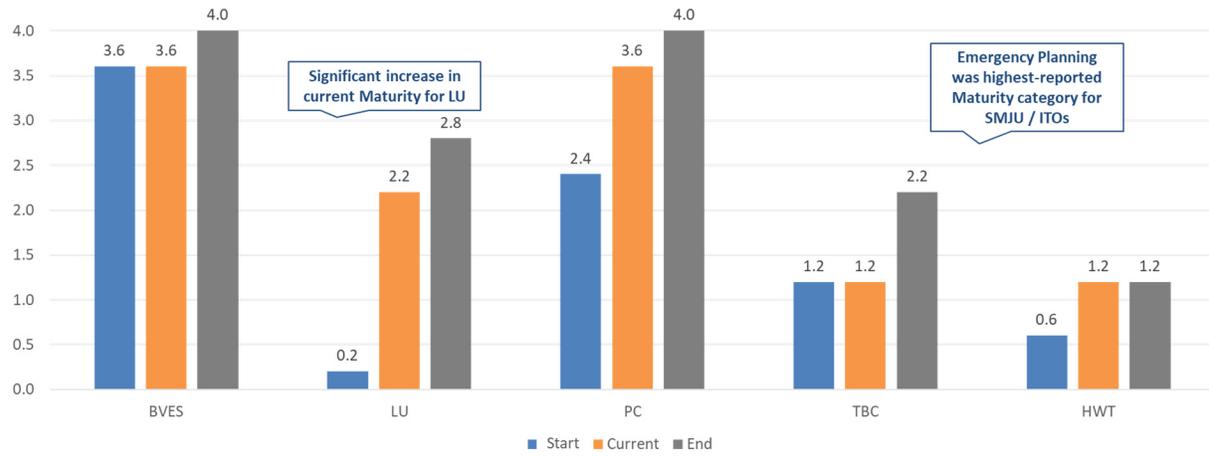
While the WSD did not identify key areas for improvement in this category, the WSD finds the following issue and associated remedy. All remedies must be addressed in Liberty's 2022 WMP Update.

- ISSUE: Liberty does not explain how it uses stakeholder feedback and incorporates learning into its community engagement efforts and wildfire mitigation planning.
 - REMEDY: In its 2022 WMP Update, Liberty must detail how stakeholder feedback is incorporated into community engagement and wildfire planning efforts.

Additional figures

Below are additional charts, maps and tables used as part of the WSD’s review of Liberty’s stakeholder cooperation and community engagement section:

Maturity score (0 – 4) actual and projected



Source: 2021 Maturity Model survey data

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

Actual and projected spend (\$K) per 1000 customers



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

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

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

Introduction

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

In 2021, WSD separated the reporting of PSPS from the reporting of mitigations and progress metrics to reflect the definition of PSPS as a measure of last resort rather than a mitigation option (pursuant to Guidance Resolution WSD-002 and PSPS decisions D.19-05-036 and D.20-03-004).⁷⁰ This section of the WMP requires utilities to report their current and projected progress in PSPS mitigation, including lessons learned from the prior year, de-energization and re-energization protocols, PSPS outcome metrics, plans to reduce future PSPS impacts, and community engagement.

Overview

Liberty anticipates an increase in fire weather conditions over the next 10 years, but overall expects the scope, scale, and frequency of PSPS events to decrease as grid hardening, microgrids, and sectionalizing devices are installed. Liberty must support its expectations with quantitative analysis on how its initiatives will minimize the impact of PSPS.

Progress over the past year

The WSD finds that Liberty has made the following progress:

- Liberty has expanded its weather station network which it claims will lead to smaller and more precise PSPS events.
- For the 2021 fire season, Liberty will utilize both the current formula and its new enhanced model (including Burning Index) to assess and evaluate the necessity of de-energization of a line.
- Liberty has refined its re-energization protocols to better communicate with customers.

Key Areas for Improvement and Remedies

⁷⁰ 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.

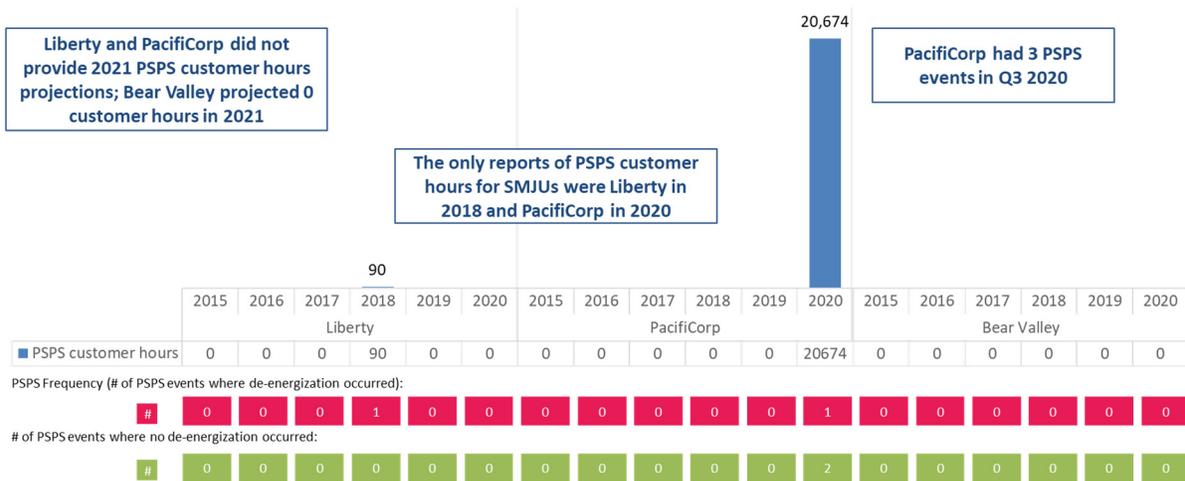
The WSD finds that Liberty must focus on the following areas as significant to reducing utility-related PSPS risk:

Utility-#	Issue title	Issue description	Remedies required
Liberty-8	Limited Discussion on Reduction of Size, Scale, and Frequency of PSPS	Liberty has limited discussion on its progress for reduction in size, scope, and frequency of PSPS. Liberty stated that due to its minimal use of PSPS in the past, it is unnecessary or impossible to further reduce PSPS. Nevertheless, Liberty must still report its plans to minimize PSPS scope, scale, and frequency normalized for weather events and climatic conditions.	Liberty must report on its plan to minimize the size, scope, and frequency of PSPS events normalized for weather events and climatic conditions, and fully describe how its planned initiatives minimize PSPS impact.

Additional figures

Below are additional charts, maps and tables used as part of the WSD’s review of Liberty’s Public Safety Power Shutoff section:

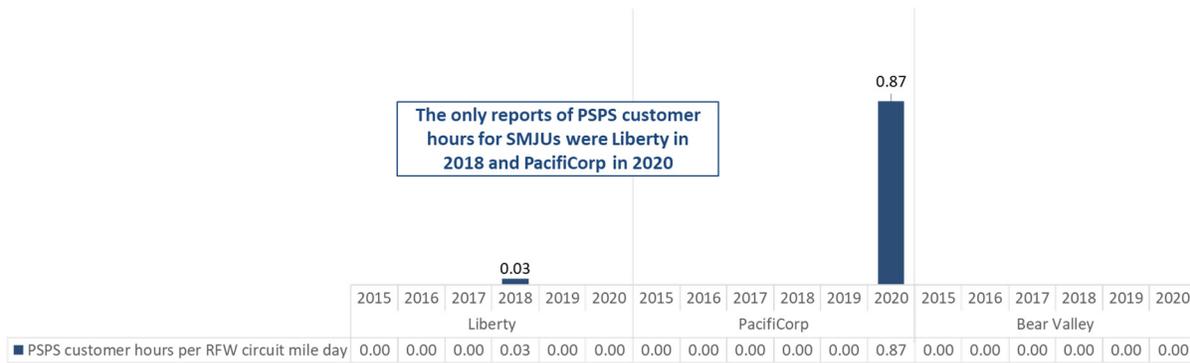
Customer hours of PSPS, total



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

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

Customer hours of PSPS per Red Flag Warning (RFW) overhead circuit mile day



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

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

7. Next steps

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

Change Orders

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

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

A “significant” change to a utility’s WMP that would trigger the change order process is defined below:

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

Or

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

And

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

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

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

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

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

- iii. Change in prioritization
- iv. Change in deployment timing
- v. Change in work being done
- vi. Other change (described)
- d. A detailed description of the proposed change
- ii. Justification for the proposed change
 - a. In what way, if any, does the change address or improve:
 - i. Completeness
 - ii. Technical feasibility of the initiative
 - iii. Effectiveness of the initiative
 - iv. Resource use efficiency over portfolio of WMP initiatives
- iii. Change in expected outcomes from the proposed change
 - a. What outcomes, including quantitative ignition probability and PSPS risk reduction, was the changed initiative expected to achieve in the 2021 WMP Update?
 - b. What outcomes, including quantitative ignition probability and PSPS risk reduction, will the initiative deliver with the proposed adjustment?

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

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

8. Consultation with CAL FIRE

Pub. Util. Code Section 8386.3(a) requires the WSD to consult with CAL FIRE in reviewing electrical corporations' 2020 WMPs. The Commission and CAL FIRE have a memorandum of understanding in place to facilitate this consultation (Pub. Util. Code Section 8386.5). The Commission and the WSD have met these requirements, but this Action Statement does not purport to speak for CAL FIRE.

9. Conclusion

Liberty's 2021 WMP Update is approved.

Catastrophic wildfires remain a serious threat to the health and safety of Californians. Electrical corporations, including Liberty, must continue to make progress toward reducing utility-related

wildfire risk. Through the approval of Liberty’s 2021 WMP submission, the WSD expects Liberty 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. Liberty must meet the commitments in its 2021 WMP and fully comply with the conditions listed in this Action Statement to ensure it is achieving a meaningful reduction of utility-related wildfire and PSPS risk within its service territory.

 /S/ CAROLINE THOMAS JACOBS

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

10. Appendix

10.1. Status of 2020 WMP Deficiencies

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

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

Class A deficiencies were of the highest concern and required a utility to develop and submit to the WSD a Remedial Compliance Plan (RCP) to resolve the identified issue within 45 days of Commission ratification of the Resolution. Class B deficiencies were of medium concern and required reporting by the utility to provide missing data or a progress update in its Quarterly Report. Such reporting was either on a one-time basis or ongoing as set forth in each condition. Class C deficiencies required the utility to submit additional detail and information or otherwise come into compliance in its following annual WMP Update. Detailed descriptions of the RCP and quarterly reports are contained in Resolution WSD-002, the Guidance Resolution on Wildfire Mitigation Plans.⁷¹

Deficiencies have either been resolved or are folded into 2021 issues, as detailed in the table below.

Deficiency	Description	2020 RCP/QR Determination	Status
Guidance-1, Class B	Lack of risk spend efficiency (RSE) information	Insufficient (QR), Action LIB-1	Conditions met: deficiency resolved
Guidance-2, Class B	Lack of alternatives analysis for chosen initiatives	Sufficient (QR)	Deficiency resolved in QR
Guidance-3, Class A:	Lack of risk modeling to inform decision-making	Insufficient (RCP), Actions Liberty-1 – Liberty-11	Conditions not met: progress being monitored
Guidance-4, Class B	Lack of discussion on PSPS impacts	QR Insufficient (QR), Action LIB-1	Conditions not met: progress being monitored

⁷¹ The Draft Guidance Resolution WSD-002 can be found here on the CPUC website: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M336/K461/336461968.pdf>

Deficiency	Description	2020 RCP/QR Determination	Status
Guidance-5, Class B	Aggregation of initiatives into programs	Sufficient (QR)	Deficiency resolved in QR
Guidance-6, Class B	Failure to disaggregate WMP initiatives from standard operations	Insufficient (QR), Action LIB-3	Conditions met: deficiency resolved
Guidance-7, Class B	Lack of detail on effectiveness of "enhanced" inspection programs	Sufficient (QR)	Deficiency resolved in QR
Guidance-8, Class C	Prevalence of Equivocating Language – failure of commitment	-	Conditions not met: progress being monitored
Guidance-9, Class B	Insufficient discussion of pilot programs	Insufficient (QR), Action LIB-4	Conditions met: deficiency resolved
Guidance-10, Class B	Data issues – general	Sufficient (QR)	Deficiency resolved in QR
Guidance-11, Class B	Lack of detail on plans to address personnel shortages	Insufficient (QR), Actions LIB-5 – LIB-7	Conditions met: deficiency resolved
Guidance-12, Class B	Lack of detail on long-term planning	Sufficient (QR)	Deficiency resolved in QR
LIB-1, Class B	Liberty did not describe methods for tracking effectiveness of its covered conductor initiative	Insufficient (QR), Action LIB-8	Conditions not met: progress being monitored

11. Attachments

11.1. Attachment 1: Liberty's 2021 Maturity Survey

11.1.1. Liberty: Description of Data Sources

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

All source data (the WMP and the Survey responses) are available at:

<https://www.cpuc.ca.gov/wildfiremitigationplans/>.

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

11.1.2. Liberty: Introduction to Maturity Model Scoring⁷²

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

The levels were calculated using an "all or nothing" binary approach. That is, levels are reported as whole numbers only.⁷³ Thus, in order to reach a specific maturity level, an electrical corporation would have to meet 100 percent of the threshold requirements for that level, as detailed in the maturity model rubric. In general, the maturity model rubric outlines numerous elements that are required to be met to achieve a given level, and the sophistication of requirements to reach a level typically increases with each successively higher maturity level.

For example, to obtain a level of 1 in Capability 24 of the 52 total capabilities, titled "Vegetation grow-in mitigation," the electrical corporation (or utility) must demonstrate

⁷² From WSD-002 p. 10-11

⁷³ Note: The category averages shown in 11.1.3 (below) average the capability scores and may include decimals.

the following: “[u]tility maintains vegetation around lines and equipment according to minimum statutory and regulatory clearances. Utility: i) removes vegetation waste along right of ways and ii) within 1 week of cutting vegetation across entire grid.”

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

11.1.3. Liberty: Maturity detail by capability

Legend: *Maturity Model Scores*



Category A. Risk Assessment and Mapping

	Avg cycle start maturity: 0.8	Avg current maturity: 0.8	Avg projected cycle end maturity: 1.8
Capability 1. Climate scenario modeling			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
1a: How sophisticated is utility's ability to estimate the risk of weather scenarios?	ii. Wildfire risk can be reliably determined based on weather and its impacts	iv. Risk for various weather scenarios can be reliably estimated	iv. Risk for various weather scenarios can be reliably estimated
1b: How are scenarios assessed?	iii. Independent expert assessment, supported by historical data of incidents and near misses	iii. Independent expert assessment, supported by historical data of incidents and near misses	iii. Independent expert assessment, supported by historical data of incidents and near misses
1c: How granular is utility's ability to model scenarios?	ii. Regional	iii. Circuit-based	iv. Span-based
1d: How automated is the tool?	iv. Fully	ii. Partially (<50%)	iii. Mostly (>=50%)
1e: What additional information is used to estimate model weather scenarios and their risk?	ii. Weather, how weather effects failure modes and propagation	ii. Weather, how weather effects failure modes and propagation	ii. Weather, how weather effects failure modes and propagation

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1f: To what extent is future change in climate taken into account for future risk estimation?	ii. Future risk estimates take into account generally higher risk across entire service territory due to changing climate	iii. Basic temperature modeling used to estimate effects of a changing climate on future weather and risk, taking into account difference in geography and vegetation	iii. Basic temperature modeling used to estimate effects of a changing climate on future weather and risk, taking into account difference in geography and vegetation
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Capability 2. Ignition risk estimation			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 1	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
2a: How is ignition risk calculated?	ii. Tools and processes can reliably categorize the risk of ignition across the grid into at least two categories based on characteristics and condition of lines, equipment, surrounding vegetation, and localized weather patterns	iii. Tools and processes can quantitatively and accurately assess the risk of ignition across the grid based on characteristics and condition of lines, equipment, surrounding vegetation, and localized weather patterns	iii. Tools and processes can quantitatively and accurately assess the risk of ignition across the grid based on characteristics and condition of lines, equipment, surrounding vegetation, and localized weather patterns
2b: How automated is the ignition risk calculation tool?	iii. Mostly (>=50%)	ii. Partially (<50%)	iii. Mostly (>=50%)
2c: How granular is the tool?	ii. Regional	iii. Circuit-based	iv. Span-based
2d: How is risk assessment confirmed? Select all that apply.	i. By experts ii. By historical data	i. By experts ii. By historical data	i. By experts ii. By historical data

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2e: What confidence interval, in percent, does the utility use in its wildfire risk assessments?	>60%, or no quantified confidence interval	>60%, or no quantified confidence interval	>60%, or no quantified confidence interval

Capability 3. Estimation of wildfire consequences for communities

Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	Planned state by end of cycle: 1 (projected)
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Responses to survey questions
Survey questions and the utility's responses are shown below

Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
3a: How is estimated consequence of ignition relayed?	i .No translation of ignition risk estimates to potential consequences for communities	i .No translation of ignition risk estimates to potential consequences for communities	ii. Ignition events categorized as low or high risk to communities
3b: What metrics are used to estimate the consequence of ignition risk?	i. As a function of at least one of the following: structures burned, potential fatalities, or area burned	ii. As a function of at least potential fatalities, and one or both of structures burned, or area burned	ii. As a function of at least potential fatalities, and one or both of structures burned, or area burned
3c: Is the ignition risk impact analysis available for all seasons?	ii. Yes	ii. Yes	ii. Yes
3d: How automated is the ignition risk estimation process?	ii. Partially (<50%)	ii. Partially (<50%)	iii. Mostly (>=50%)
3e: How granular is the ignition risk estimation process?	ii. Regional	iii. Circuit-based	iv. Span-based
3f: How are the outputs of the ignition risk impact assessment tool evaluated?	ii. Outputs independently assessed by experts	iii. Outputs independently assessed by experts and confirmed by historical data	iii. Outputs independently assessed by experts and confirmed by historical data

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3g: What other inputs are used to estimate impact?	i. Level and conditions of vegetation and weather, including the vegetation specifies immediately surrounding the ignition site	iii. Level and conditions of vegetation and weather, including the vegetation specifies immediately surrounding the ignition site and up-to-date moisture content, local weather patterns	iii. Level and conditions of vegetation and weather, including the vegetation specifies immediately surrounding the ignition site and up-to-date moisture content, local weather patterns
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Capability 4. Estimation of wildfire and PSPS risk-reduction impact

Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 2	Planned state by end of cycle: 3 (projected)
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Responses to survey questions
Survey questions and the utility's responses are shown below

Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
4a: How is risk reduction impact estimated?	ii. Approach accurately estimates risk reduction potential of initiatives categorically (e.g. High, Medium, Low)	iii. Approach reliably estimates risk reduction potential of initiatives on an interval scale (e.g. specific quantitative units)	iv. Approach reliably estimates risk reduction potential of initiatives on an interval scale (e.g. specific quantitative units) with a quantitative confidence interval
4b: How automated is your ignition risk reduction impact assessment tool?	iii. Mostly (>=50%)	ii. Partially (<50%)	iii. Mostly (>=50%)
4c: How granular is the ignition risk reduction impact assessment tool?	ii. Regional	iii. Circuit-based	iv. Span-based
4d: How are ignition risk reduction impact assessment tool estimates assessed?	ii. With evidence and logical reasoning	iv. Independent expert assessment, supported by historical data of incidents and near misses	iv. Independent expert assessment, supported by historical data of incidents and near misses

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4e: What additional information is used to estimate risk reduction impact?	ii. Existing hardware type and condition	iv. Existing hardware type and condition, including operating history; level and condition of vegetation; weather	v. Existing hardware type and condition, including operating history; level and condition of vegetation; weather; and combination of initiatives already deployed
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Capability 5. Risk maps and simulation algorithms			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	Planned state by end of cycle: 2 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
5a: What is the protocol to update risk mapping algorithms?	i. No defined process for updating risk mapping algorithms	i. No defined process for updating risk mapping algorithms	ii. Risk mapping algorithms updated based on detected deviations of risk model to ignitions and propagation
5b: How automated is the mechanism to determine whether to update algorithms based on deviations?	i. Not automated	ii. Partially (<50%)	iii. Mostly (>=50%)
5c: How are deviations from risk model to ignitions and propagation detected?	i. Not currently calculated	ii. Manually	iii. Semi-automated process
5d: How are decisions to update algorithms evaluated?	i. Not currently evaluated	i. Not currently evaluated	ii. Independently evaluated by experts

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5e: What other data is used to make decisions on whether to update algorithms?	v. None of the above	iii. Current and historic ignition and propagation data; near-miss data	iv. Current and historic ignition and propagation data; near-miss data; data from other utilities and other sources
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Category B. Situational Awareness and Forecasting

	Avg cycle start maturity: 1	Avg current maturity: 0.8	Avg projected cycle end maturity: 1.2
Capability 6. Weather variables collected			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 1	Planned state by end of cycle: 2 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
6a: What weather data is currently collected?	iii. Range of accurate weather variables (e.g. humidity, precipitation, surface and atmospheric wind conditions) that impact probability of ignition and propagation from utility assets	iii. Range of accurate weather variables (e.g. humidity, precipitation, surface and atmospheric wind conditions) that impact probability of ignition and propagation from utility assets	iii. Range of accurate weather variables (e.g. humidity, precipitation, surface and atmospheric wind conditions) that impact probability of ignition and propagation from utility assets
6b: How are measurements validated?	ii. Manual field calibration measurements	i. Measurements not currently validated	ii. Manual field calibration measurements
6c: Are elements that cannot be reliably measured in real time being predicted (e.g., fuel moisture content)?	ii. Yes	ii. Yes	ii. Yes
6d: How many sources are being used to provide data on weather metrics being collected?	iii. More than one	iii. More than one	iii. More than one

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Capability 7. Weather data resolution			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
7a: How granular is the weather data that is collected?	ii. Weather data has sufficient granularity to reliably measure weather conditions in HFTD areas	iii. Weather data has sufficient granularity to reliably measure weather conditions in HFTD areas, and along the entire grid and in all areas needed to predict weather on the grid	iii. Weather data has sufficient granularity to reliably measure weather conditions in HFTD areas, and along the entire grid and in all areas needed to predict weather on the grid
7b: How frequently is data gathered	iii. At least four times per hour	iv. At least six times per hour	iv. At least six times per hour
7c: How granular is the tool?	ii. Regional	ii. Regional	ii. Regional
7d: How automated is the process to measure weather conditions?	iv. Fully	iv. Fully	iv. Fully

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Capability 8. Weather forecasting ability			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
8a: How sophisticated is the utility's weather forecasting capability?	ii. Utility has independent weather forecasting ability sufficiently accurate to fulfill PSPS requirements	iii. Utility has the ability to use a combination of accurate weather stations and external weather data to make accurate forecasts	iii. Utility has the ability to use a combination of accurate weather stations and external weather data to make accurate forecasts
8b: How far in advance can accurate forecasts be prepared?	i. Less than two weeks in advance	i. Less than two weeks in advance	i. Less than two weeks in advance
8c: At what level of granularity can forecasts be prepared?	ii. Regional	ii. Regional	ii. Regional
8d: How are results error-checked?	ii. Results are error checked against historical weather patterns	ii. Results are error checked against historical weather patterns	ii. Results are error checked against historical weather patterns
8e: How automated is the forecast process?	iv. Fully	iv. Fully	iv. Fully

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

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

Category C. Grid design and system hardening

	Avg cycle start maturity: 0.6	Avg current maturity: 1.4	Avg projected cycle end maturity: 1.6
Capability 11. Approach to prioritizing initiatives across territory			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 2 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
11a: How are wildfire risk reduction initiatives prioritized?	iii. Plan prioritizes wildfire risk reduction initiatives based on local geography and conditions within only HFTD areas	iii. Plan prioritizes wildfire risk reduction initiatives based on local geography and conditions within only HFTD areas	iii. Plan prioritizes wildfire risk reduction initiatives based on local geography and conditions within only HFTD areas

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

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Capability 13. Grid design for resiliency and minimizing PSPS			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
13a: What level of redundancy does the utility’s transmission architecture have?	i. Many single points of failure	i. Many single points of failure	i. Many single points of failure
13b: What level of redundancy does the utility’s distribution architecture have?	ii. n-1 redundancy covering at least 50% of customers in HFTD	ii. n-1 redundancy covering at least 50% of customers in HFTD	ii. n-1 redundancy covering at least 50% of customers in HFTD
13c: What level of sectionalization does the utility’s distribution architecture have?	ii. Switches in HFTD areas to individually isolate circuits	ii. Switches in HFTD areas to individually isolate circuits	ii. Switches in HFTD areas to individually isolate circuits
13d: How does the utility consider egress points in its grid topology?	i. Does not consider	ii. Egress points used as an input for grid topology design	ii. Egress points used as an input for grid topology design

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Capability 14. Risk-based grid hardening and cost efficiency			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 2	Planned state by end of cycle: 3 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
14a: Does the utility have an understanding of the risk spend efficiency of hardening initiatives?	i. Utility has no clear understanding of the relative risk spend efficiency of hardening initiatives	ii. Utility has an accurate understanding of the relative cost and effectiveness of different initiatives	ii. Utility has an accurate understanding of the relative cost and effectiveness of different initiatives
14b: At what level can estimates be prepared?	v. Asset-based	iii. Circuit-based	iv. Span-based
14c: How frequently are estimates updated?	iii. Annually or more frequently	iii. Annually or more frequently	iii. Annually or more frequently
14d: What grid hardening initiatives does the utility include within its evaluation?	iv. All	iv. All	iv. All
14e: Can the utility evaluate risk reduction synergies from combination of various initiatives?	i. No	ii. Yes	ii. Yes

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

Category D. Asset management and inspections

	Avg cycle start maturity: 0.4	Avg current maturity: 0.6	Avg projected cycle end maturity: 1.4
Capability 16. Asset inventory and condition assessments			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
16a: What information is captured in the equipment inventory database?	i. There is no service territory-wide inventory of electric lines and equipment including their state of wear or disrepair	ii. There is an accurate inventory of equipment that may contribute to wildfire risk, including age, state of wear, and expected lifecycle	iii. There is an accurate inventory of equipment that may contribute to wildfire risk, including age, state of wear, and expected lifecycle, including records of all inspections and repairs
16 : How frequently is the condition assessment updated?	i. Never	ii. Annually	ii. Annually
16c: Does all equipment in HFTD areas have the ability to detect and respond to malfunctions?	i. No system and approach are in place to detect or respond to malfunctions	i. No system and approach are in place to detect or respond to malfunctions	ii. A system and approach are in place to reliably detect incipient malfunctions likely to cause ignition
16 : How granular is the inventory?	ii. At the span level	ii. At the span level	iii. At the asset level

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

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Capability 18. Asset inspection effectiveness			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
18a: What items are captured within inspection procedures and checklists?	i. Patrol, detailed, enhanced, and other inspection procedures and checklists do not include all items required by statute and regulations	ii. Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations	ii. Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations
18b: How are procedures and checklists determined?	i. Based on statute and regulatory guidelines only	i. Based on statute and regulatory guidelines only	i. Based on statute and regulatory guidelines only
18c: At what level of granularity are the depth of checklists, training, and procedures customized?	iv. At the span level	i. Across the service territory	i. Across the service territory

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Capability 19. Asset maintenance and repair			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 3 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
19a: What level are electrical lines and equipment maintained at?	ii. Electrical lines and equipment maintained as required by regulation	ii. Electrical lines and equipment maintained as required by regulation	iii. Electrical lines and equipment maintained as required by regulation, and additional maintenance done in areas of grid at highest wildfire risk based on detailed risk mapping
19b: How are service intervals set?	iv. None of the above	iv. None of the above	ii. Based on wildfire risk in relevant circuit
19c: What do maintenance and repair procedures take into account?	iii. None of the above	iii. None of the above	i. Wildfire risk

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Capability 20. QA/QC for asset management			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	Planned state by end of cycle: 2 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
20a: How is contractor activity audited?	i. Lack of controls for auditing work completed, including inspections, for employees or subcontractors	i. Lack of controls for auditing work completed, including inspections, for employees or subcontractors	ii. Through an established and functioning audit process to manage and confirm work completed by subcontractors
20b: Do contractors follow the same processes and standards as utility's own employees?	ii. Yes	ii. Yes	ii. Yes
20c: How frequently is QA/QC information used to identify deficiencies in quality of work performance and inspections performance?	i. Never	i. Never	iv. Regularly
20d: How are work and inspections that do not meet utility-prescribed standards remediated?	i. Lack of effective remediation for ineffective inspections or low-quality work	i. Lack of effective remediation for ineffective inspections or low-quality work	ii. QA/QC information is used to identify systemic deficiencies in quality of work and inspections
20e: Are workforce management software tools used to manage and confirm work completed by subcontractors?	i. No	i. No	ii. Yes

Category E. Vegetation management and inspections

	Avg cycle start maturity: 0.8	Avg current maturity: 0.8	Avg projected cycle end maturity: 1.3
Capability 21. Vegetation inventory and condition assessments			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 2	Planned state by end of cycle: 3 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
21a: What information is captured in the inventory?	iv. Centralized inventory of vegetation clearances, including individual vegetation species and their expected growth rate, as well as individual high risk-trees across grid	iv. Centralized inventory of vegetation clearances, including individual vegetation species and their expected growth rate, as well as individual high risk-trees across grid	iv. Centralized inventory of vegetation clearances, including individual vegetation species and their expected growth rate, as well as individual high risk-trees across grid
21b: How frequently is inventory updated?	v. Within 1 day of collection	v. Within 1 day of collection	v. Within 1 day of collection
21c: Are inspections independently verified by third party experts?	i. No	i. No	ii. Yes
21d: How granular is the inventory?	iii. Span-based	iv. Asset-based	iv. Asset-based

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

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Capability 23. Vegetation inspection effectiveness			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
23a: What items are captured within inspection procedures and checklists?	iii. Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations, and includes vegetation types typically responsible for ignitions and near misses	ii. Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations	ii. Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations
23b: How are procedures and checklists determined?	i. Based on statute and regulatory guidelines only	i. Based on statute and regulatory guidelines only	i. Based on statute and regulatory guidelines only
23c: At what level of granularity are the depth of checklists, training, and procedures customized?	i. Across the service territory	i. Across the service territory	i. Across the service territory

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Capability 24. Vegetation grow-in mitigation			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
24a: How does utility clearance around lines and equipment perform relative to expected standards?	ii. Utility meet minimum statutory and regulatory clearances around all lines and equipment	ii. Utility meet minimum statutory and regulatory clearances around all lines and equipment	ii. Utility meet minimum statutory and regulatory clearances around all lines and equipment
24b: Does utility meet or exceed minimum statutory or regulatory clearances during all seasons?	ii. Yes	ii. Yes	ii. Yes
24c: What modeling is used to guide clearances around lines and equipment?	iii. None of the above	iii. None of the above	iii. None of the above
24d: What biological modeling is used to guide clearance around lines and equipment	iii. None of the above	i. Species growth rates and species limb failure rates	i. Species growth rates and species limb failure rates
24e: Are community organizations engaged in setting local clearances and protocols?	i. No	i. No	i. No
24f: Does the utility remove vegetation waste along its right of way across the entire grid?	i. No	i. No	i. No
24g: How long after cutting vegetation does the utility remove vegetation waste along right of way?	iv. On the same day	iv. On the same day	iv. On the same day

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

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Capability 25. Vegetation fall-in mitigation			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
25a: Does the utility have a process for treating vegetation outside of right of ways?	iii. Utility systematically removes vegetation outside of right of way	iv. Utility systematically removes vegetation outside of right of way, informing relevant communities of removal	iv. Utility systematically removes vegetation outside of right of way, informing relevant communities of removal
25b: How is potential vegetation that may pose a threat identified?	ii. Based on the height of trees with potential to make contact with electric lines and equipment	ii. Based on the height of trees with potential to make contact with electric lines and equipment	ii. Based on the height of trees with potential to make contact with electric lines and equipment
25c: Is vegetation removed with cooperation from the community?	ii. Yes	ii. Yes	ii. Yes
25d: Does the utility remove vegetation waste outside its right of way across the entire grid?	i. No	i. No	i. No
25e: How long after cutting vegetation does the utility remove vegetation waste outside its right of way?	iii. Within 1 week or less	iii. Within 1 week or less	iii. Within 1 week or less
25f: Does the utility work with local landowners to provide a cost-effective use for cutting vegetation?	ii. Yes	ii. Yes	ii. Yes
25g: Does the utility work with partners to identify new cost-effective uses for vegetation, taking into consideration environmental impacts and emissions of vegetation waste?	i. No	ii. Yes	ii. Yes

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Capability 26. QA/QC for vegetation management			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 1	Planned state by end of cycle: 3 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
26a: How is contractor and employee activity audited?	i. Lack of controls for auditing work completed, including inspections, for employees or subcontractors	ii. Through an established and functioning audit process to manage and confirm work completed by subcontractors	iii. Through an established and demonstrably functioning audit process to manage and confirm work completed by subcontractors, where contractor activity is subject to semi-automated audits using technologies capable of sampling the contractor’s work (e.g., LiDAR scans, photographic evidence)
26b: Do contractors follow the same processes and standards as utility's own employees?	ii. Yes	ii. Yes	ii. Yes
26c: How frequently is QA/QC information used to identify deficiencies in quality of work performance and inspections performance?	ii. Sporadically	ii. Sporadically	iv. Regularly
26d: How is work and inspections that do not meet utility-prescribed standards remediated?	ii. QA/QC information is used to identify systemic deficiencies in quality of work and inspections	ii. QA/QC information is used to identify systemic deficiencies in quality of work and inspections	iii. QA/QC information is used to identify systemic deficiencies in quality of work and inspections, and recommend training based on weaknesses
26e: Are workforce management software tools used to manage and confirm work completed by subcontractors?	ii. Yes	ii. Yes	ii. Yes

Category F. Grid operations and protocols

	Avg cycle start maturity: 0.7	Avg current maturity: 0.8	Avg projected cycle end maturity: 1.3
Capability 27. Protective equipment and device settings			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 3 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
27a: How are grid elements adjusted during high threat weather conditions?	ii. Utility increases sensitivity of risk reduction elements during high threat weather conditions	ii. Utility increases sensitivity of risk reduction elements during high threat weather conditions	iii. Utility increases sensitivity of risk reduction elements during high threat weather conditions and monitors near misses
27b: Is there an automated process for adjusting sensitivity of grid elements and evaluating effectiveness?	i. No automated process	ii. Partially automated process	ii. Partially automated process
27c: Is there a predetermined protocol driven by fire conditions for adjusting sensitivity of grid elements?	ii. Yes	i. No	ii. Yes

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

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

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Capability 30. Protocols for PSPS initiation			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 2	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
30a: Does the utility have explicit thresholds for activating a PSPS?	ii. Utility has explicit policies and explanation for the thresholds above which PSPS is activated as a measure of last resort	ii. Utility has explicit policies and explanation for the thresholds above which PSPS is activated as a measure of last resort	iii. Utility has explicit policies and explanation for the thresholds above which PSPS is activated, but maintains grid in sufficiently low risk condition to not require any PSPS activity, though may de-energize specific circuits upon detection of damaged condition of electrical lines and equipment, or contact with foreign objects
30b: Which of the following does the utility take into account when making PSPS decisions? Select all that apply	i. SME opinion ii. A partially automated system which recommends circuits for which PSPS should be activated and is validated by SMEs	i. SME opinion	i. SME opinion
30c: Under which circumstances does the utility de-energize circuits? Select all that apply.	i. Upon detection of damaged conditions of electric equipment ii. When circuit presents a safety risk to suppression or other personnel iii. When equipment has come into contact with foreign objects posing ignition risk iv. Additional reasons not listed	ii. When circuit presents a safety risk to suppression or other personnel iii. When equipment has come into contact with foreign objects posing ignition risk iv. Additional reasons not listed	ii. When circuit presents a safety risk to suppression or other personnel iii. When equipment has come into contact with foreign objects posing ignition risk iv. Additional reasons not listed
30d: Given the condition of the grid, with what probability does the utility expect any large scale PSPS events affecting more than 10,000 people to occur in the coming year?	i. Less than 5% - Grid is in sufficiently low risk condition that PSPS events will not be required, and the only circuits which may require de-energization have sufficient redundancy that energy supply to customers will not be disrupted	ii. Greater than 5% - Grid condition paired with risk indicates that PSPS may be necessary in 2020 in some areas	ii. Greater than 5% - Grid condition paired with risk indicates that PSPS may be necessary in 2020 in some areas

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Capability 31. Protocols for PSPS re-energization			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
31a: Is there a process for inspecting de-energized sections of the grid prior to re-energization?	i. Inadequate process for inspecting de-energized sections of the grid prior to re-energization	ii. Existing process for accurately inspecting de-energized sections of the grid prior to re-energization	iii. Existing process for accurately inspecting de-energized sections of the grid prior to re-energization, augmented with sensors and aerial tools
31b: How automated is the process for inspecting de-energized sections of the grid prior to re-energization?	i. Manual process, not automated at all	ii. Partially automated (<50%)	ii. Partially automated (<50%)
31c: What is the average amount of time that it takes you to re-energize your grid from a PSPS once weather has subsided to below your de-energization threshold?	i. Longer than 24 hours	ii. Within 24 hours	iii. Within 18 hours
31d: What level of understanding of probability of ignitions after PSPS events does the utility have across the grid?	i. No probability estimate of after event ignitions	i. No probability estimate of after event ignitions	i. No probability estimate of after event ignitions

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

Category G. Data governance

	Avg cycle start maturity: 0.5	Avg current maturity: 0.5	Avg projected cycle end maturity: 2.8
Capability 33. Data collection and curation			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	Planned state by end of cycle: 4 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
33a: Does the utility have a centralized database of situational, operational, and risk data?	i. No	i. No	ii. Yes
33b: Is the utility able to use advanced analytics on its centralized database of situational, operational, and risk data to make operational and investment decisions?	i. No	i. No	iii. Yes, for both short term and long-term decision making
33c: Does the utility collect data from all sensed portions of electric lines, equipment, weather stations, etc.?	ii. Yes	ii. Yes	ii. Yes
33d: Is the utility's database of situational, operational, and risk data able to ingest and share data using real-time API protocols with a wide variety of stakeholders?	i. No	i. No	ii. Yes
33e: Does the utility identify highest priority additional data sources to improve decision making?	ii. Yes	i. No	iii. Yes, with plans to incorporate these into centralized database of situational, operational and risk data

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33f: Does the utility share best practices for database management and use with other utilities in California and beyond?	i. No	i. No	ii. Yes
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Capability 34. Data transparency and analytics			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	Planned state by end of cycle: 2 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
34a: Is there a single document cataloging all fire-related data and algorithms, analyses, and data processes?	i. No	i. No	ii. Yes
34b: Is there an explanation of the sources, cleaning processes, and assumptions made in the single document catalog?	i. No	i. No	ii. Yes
34c: Are all analyses, algorithms, and data processing explained and documented?	i. Analyses, algorithms, and data processing are not documented	i. Analyses, algorithms, and data processing are not documented	iii. Analyses, algorithms, and data processing are documented and explained
34d: Is there a system for sharing data in real time across multiple levels of permissions?	i. No system capable of sharing data in real time across multiple levels of permissions	i. No system capable of sharing data in real time across multiple levels of permissions	ii. System is capable of sharing across at least two levels of permissions, including a.) utility-regulator permissions, and b.) first responder permissions
34e: Are the most relevant wildfire related data algorithms disclosed?	i. No	i. No	ii. Yes, disclosed to regulators and other relevant stakeholders upon request

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

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Capability 36. Data sharing with research community			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 1 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
36a: Does the utility make disclosures and share data?	ii. Utility makes required disclosures, but does not share data beyond what is required	ii. Utility makes required disclosures, but does not share data beyond what is required	ii. Utility makes required disclosures, but does not share data beyond what is required
36b: Does the utility in engage in research?	i. Utility does not participate in collaborative research	ii. Utility participates in collaborative research	ii. Utility participates in collaborative research
36c: What subjects does utility research address?	iii. None of the above	ii. Utility ignited wildfires and risk reduction initiatives	ii. Utility ignited wildfires and risk reduction initiatives
36d: Does the utility promote best practices based on latest independent scientific and operational research?	i. No	i. No	ii. Yes

Category H. Resource allocation methodology

	Avg cycle start maturity: 0	Avg current maturity: 1.2	Avg projected cycle end maturity: 2.3
Capability 37. Scenario analysis across different risk levels			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	Planned state by end of cycle: 3 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
37a: For what risk scenarios is the utility able to provide projected cost and total risk reduction potential?	i. Utility does not project proposed initiatives or costs across different levels of risk scenarios	i. Utility does not project proposed initiatives or costs across different levels of risk scenarios	iii. Utility provides an accurate high-risk reduction and low risk reduction scenario, in addition to their proposed scenario, and the projected cost and total risk reduction potential
37b: For what level of granularity is the utility able to provide projections for each scenario?	ii. Region level	iv. Span level	iv. Span level
37c: Does the utility include a long term (e.g., 6-10 year) risk estimate taking into account macro factors (climate change, etc.) as well as planned risk reduction initiatives in its scenarios?	i. No	i. No	ii. Yes
37d: Does the utility provide an estimate of impact on reliability factors in its scenarios?	i. No	ii. Yes	ii. Yes

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Capability 38. Presentation of relative risk spend efficiency for portfolio of initiatives			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 2	Planned state by end of cycle: 3 (projected)

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

Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
38a: Does the utility present accurate qualitative rankings for its initiatives by risk spend efficiency?	i. No	ii. Yes	ii. Yes
38b: What initiatives are captured in the ranking of risk spend efficiency?	iv. None of the above	iii. All commercial initiatives and emerging initiatives	iii. All commercial initiatives and emerging initiatives
38c: Does the utility include figures for present value cost and project risk reduction impact of each initiative, clearly documenting all assumptions (e.g. useful life, discount rate, etc.)?	i. No	ii. Yes	ii. Yes
38d: Does the utility provide an explanation of their investment in each particular initiative?	i. No	ii. Yes, including the expected overall reduction in risk	iii. Yes, including the expected overall reduction in risk and estimates of impact on reliability factors
38e: At what level of granularity is the utility able to provide risk efficiency figures?	ii. Region level	iii. Circuit level	iv. Span level

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Capability 39. Process for determining risk spend efficiency of vegetation management initiatives			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 2	Planned state by end of cycle: 2 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
39a: How accurate of a risk spend efficiency calculation can the utility provide?	ii. Utility has an accurate relative understanding of the cost and effectiveness to produce a reliable risk spend efficiency estimate	iii. Utility has accurate quantitative understanding of cost and effectiveness to produce a reliable risk spend efficiency estimate	iv. Utility has accurate quantitative understanding of cost, including sensitivities and effectiveness to produce a reliable risk spend efficiency estimate
39b: At what level can estimates be prepared?	ii. Regional	iii. Circuit-based	iv. Span-based
39c: How frequently are estimates updated?	i. Never	iii. Annually or more frequently	iii. Annually or more frequently
39d: What vegetation management initiatives does the utility include within its evaluation?	i. None	iii. Most	iii. Most
39e: Can the utility evaluate risk reduction synergies from combination of various initiatives?	i. No	ii. Yes	ii. Yes

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Capability 40. Process for determining risk spend efficiency of system hardening initiatives			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 2	Planned state by end of cycle: 3 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
40a: How accurate of a risk spend efficiency calculation can the utility provide?	ii. Utility has accurate relative understanding of cost and effectiveness to produce a reliable risk spend efficiency estimate	iv. Utility has accurate quantitative understanding of cost, including sensitivities, and effectiveness to produce a reliable risk spend efficiency estimate	iv. Utility has accurate quantitative understanding of cost, including sensitivities, and effectiveness to produce a reliable risk spend efficiency estimate
40b: At what level can estimates be prepared?	iii. Circuit-based	iii. Circuit-based	iv. Span-based
40c: How frequently are estimates updated?	i. Never	iii. Annually or more frequently	iii. Annually or more frequently
40d: What grid hardening initiatives are included in the utility risk spend efficiency analysis?	i. None	iii. Most commercially available grid hardening initiatives	iv. All commercially available grid hardening initiatives
40e: Can the utility evaluate risk reduction effects from the combination of various initiatives?	i. No	ii. Yes	ii. Yes

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Capability 41. Portfolio-wide initiative allocation methodology			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	Planned state by end of cycle: 1 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
41a: To what extent does the utility allocate capital to initiatives based on risk-spend efficiency (RSE)?	i. Utility does not base capital allocation on RSE	i. Utility does not base capital allocation on RSE	iii. Accurate RSE estimates for all initiatives are used to determine capital allocation within categories only (e.g. to choose the best vegetation management initiative)
41b: What information does the utility take into account when generating RSE estimates?	i. Average estimate of RSE by initiative category	ii. Specific information by initiative, including state of equipment and location where initiative will be implemented	ii. Specific information by initiative, including state of equipment and location where initiative will be implemented
41c: How does the utility verify RSE estimates?	i. Utility does not verify RSE estimates	i. Utility does not verify RSE estimates	ii. RSE estimates are verified by historical or experimental pilot data
41d: Does the utility take into consideration impact on safety, reliability, and other priorities when making spending decisions?	ii. Yes	ii. Yes	ii. Yes

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

Category I. Emergency planning and preparedness

	Avg cycle start maturity: 0.2	Avg current maturity: 2.2	Avg projected cycle end maturity: 2.8
Capability 43. Wildfire plan integrated with overall disaster/ emergency plan			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 4	Planned state by end of cycle: 4 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
43a: Is the wildfire plan integrated with overall disaster and emergency plans?	i. No	iii. Wildfire plan is an integrated component of overall plan	iii. Wildfire plan is an integrated component of overall plan
43b: Does the utility run drills to audit the viability and execution of its wildfire plans?	i. No	ii. Yes	ii. Yes
43c: Is the impact of confounding events or multiple simultaneous disasters considered in the planning process?	ii. Yes	ii. Yes	ii. Yes
43d: Is the plan integrated with disaster and emergency preparedness plans of other relevant stakeholders (e.g., CAL FIRE, Fire Safe Councils, etc.)?	i. No	ii. Yes	ii. Yes
43e: Does the utility take a leading role in planning, coordinating, and integrating plans across stakeholders?	i. No	ii. Yes	ii. Yes

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

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Capability 45. Emergency community engagement during and after wildfire			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 1	By end of year 1 (current): 1	Planned state by end of cycle: 2 (projected)
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
45a: Does the utility provide clear and substantially complete communication of available information relevant to affected customers?	ii. Yes	iii. Yes, along with referrals to other agencies	iii. Yes, along with referrals to other agencies
45b: What percent of affected customers receive complete details of available information?	ii. >95% of customers	ii. >95% of customers	iii. >98% of customers
45c: What percent of affected medical baseline customers receive complete details of available information?	ii. >99% of medical baseline customers	iv. >99.9% of medical baseline customers	v. >99.9% of medical baseline customers
45d: How does the utility assist where helpful with communication of information related to power outages to customers?	i. Through availability of relevant evacuation information and links on website and toll-free telephone number	ii. Through availability of relevant evacuation information and links on website and toll-free telephone number, and assisting disaster response professionals as requested	ii. Through availability of relevant evacuation information and links on website and toll-free telephone number, and assisting disaster response professionals as requested
45e: How does the utility with engage other emergency management agencies during emergency situations?	ii. Utility engages with other agencies in an ad hoc manner	iii. Utility has detailed and actionable established protocols for engaging with emergency management organizations	iii. Utility has detailed and actionable established protocols for engaging with emergency management organizations
45f: Does the utility communicate and coordinate resources to communities during emergencies (e.g., shelters, supplies, transportation etc.)?	i. No	ii. Yes	ii. Yes

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Capability 46. Protocols in place to learn from wildfire events			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 4	Planned state by end of cycle: 4 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
46a: Is there a protocol in place to record the outcome of emergency events and to clearly and actionably document learnings and potential process improvements?	i. No	ii. Yes	ii. Yes
46b: Is there a defined process and staff responsible for incorporating learnings into emergency plan?	i. No	ii. Yes	ii. Yes
46c: Once updated based on learnings and improvements, is the updated plan tested using "dry runs" to confirm its effectiveness?	i. No	ii. Yes	ii. Yes
46d: Is there a defined process to solicit input from a variety of other stakeholders and incorporate learnings from other stakeholders into the emergency plan?	i. No	ii. Yes	ii. Yes

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Capability 47. Processes for continuous improvement after wildfire and PSPS			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 0	
Responses to survey questions Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
47a: Does the utility conduct an evaluation or debrief process after a wildfire?	ii. Yes	ii. Yes	ii. Yes
47b: Does the utility conduct a customer survey and utilize partners to disseminate requests for stakeholder engagement?	ii. One or the other	ii. One or the other	ii. One or the other
47c: In what other activities does the utility engage?	iv. Public listening sessions, debriefs with partners, and others	iv. Public listening sessions, debriefs with partners, and others	iv. Public listening sessions, debriefs with partners, and others
47d: Does the utility share with partners findings about what can be improved?	ii. Yes	ii. Yes	ii. Yes
47e: Are feedback and recommendations on potential improvements made public?	i. No	i. No	ii. Yes
47f: Does the utility conduct proactive outreach to local agencies and organizations to solicit additional feedback on what can be improved?	ii. Yes	ii. Yes	ii. Yes
47g: Does the utility have a clear plan for post-event listening and incorporating lessons learned from all stakeholders?	i. No	ii. Yes	ii. Yes

47h: Does the utility track the implementation of recommendations and report upon their impact?	i. No	i. No	ii. Yes
47i: Does the utility have a process to conduct reviews after wildfires in other the territory of other utilities and states to identify and address areas of improvement?	i. No	i. No	ii. Yes

Category J. Stakeholder cooperation and community engagement

	Avg cycle start maturity: 0.4	Avg current maturity: 1.2	Avg projected cycle end maturity: 2.2
Capability 48. Cooperation and best practice sharing with other utilities			
Capability maturity level based on Maturity Rubric (0 - 4)	Start of cycle: 0	By end of year 1 (current): 2	Planned state by end of cycle: 4 (projected)
Responses to survey questions			
Survey questions and the utility's responses are shown below			
Question	Start of cycle	By end of year 1 (current)	Planned state by end of cycle
48a: Does the utility actively work to identify best practices from other utilities through a clearly defined operational process?	i. No	iii. Yes, from other global utilities	iii. Yes, from other global utilities
48b: Does the utility successfully adopt and implement best practices identified from other utilities?	ii. Yes	ii. Yes	ii. Yes
48c: Does the utility seek to share best practices and lessons learned in a consistent format?	i. No	ii. Yes	ii. Yes

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48d: Does the utility share best practices and lessons via a consistent and predictable set of venues/media?	i. No	ii. Yes	ii. Yes
48e: Does the utility participate in annual benchmarking exercises with other utilities to find areas for improvement?	i. No	i. No	ii. Yes
48f: Has the utility implemented a defined process for testing lessons learned from other utilities to ensure local applicability?	i. No	i. No	ii. Yes

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

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49c: What percent of landowners are non-compliant with utility initiatives (e.g., vegetation management)?	iv. Less than 1 %	iv. Less than 1 %	iv. Less than 1 %
49d: What percent of landowners complain about utility initiatives (e.g., vegetation management)?	i. More than 5%	i. More than 5%	i. More than 5%
49e: Does the utility have a demonstratively cooperative relationship with communities containing >90% of the population in HFTD areas (e.g. by being recognized by other agencies as having a cooperative relationship with those communities in HFTD areas)?	i. No	i. No	ii. Yes
49f: Does utility have records of landowners throughout communities containing >90% of the population in HFTD areas reaching out to notify of risks, dangers or issues in the past year?	ii. Yes	ii. Yes	ii. Yes

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

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

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

11.1.4. Liberty: Numerical maturity summary

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

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



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