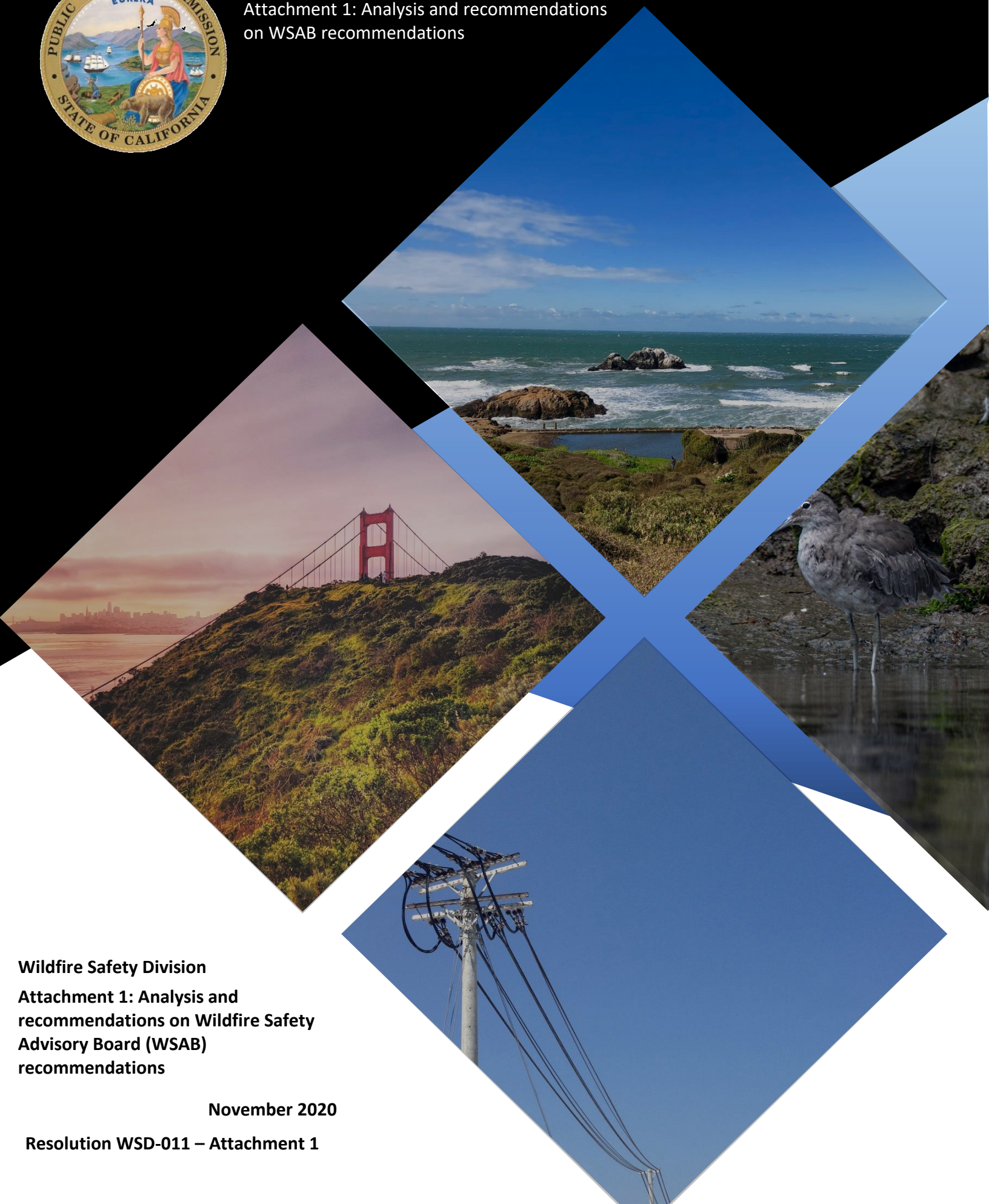
ATTACHMENT 1

Attachment 1: Analysis and recommendations on WSAB recommendations



Wildfire Safety Division

Attachment 1: Analysis and recommendations on Wildfire Safety Advisory Board (WSAB) recommendations

November 2020

Resolution WSD-011 – Attachment 1

0. Introduction

Public Utilities Code (Pub. Util. Code) § 8389(b) directs the Wildfire Safety Advisory Board (WSAB) to make recommendations to the Wildfire Safety Division (WSD) by June 30, 2020 and annually thereafter regarding:

- Appropriate performance metrics and processes for determining each electrical corporation's compliance with its approved Wildfire mitigation Plan (WMP)
- Appropriate requirements in addition to the requirements set forth in Pub. Util. Code Section 8386 for the Wildfire Mitigation Plans (WMP)
- The appropriate scope and process for assessing the safety culture of an electrical corporation

Pursuant to statute, the WSAB issued its recommendations on the 2021 WMP guidelines, performance metrics and the scope and process for the WSD's annual safety culture assessment on June 24, 2020.[1] Pursuant to Pub. Util. Code § 8389(c), the WSD is required to issue an analysis and recommendation to the California Public Utilities Commission (Commission) on the recommendations provided by the WSAB. This document contains the WSD's analysis and recommendations on the WSAB recommendations for the Commission's consideration.

In its analysis of the WSAB's recommendations regarding WMP metrics, process and requirements, the WSD prioritized recommendations based on value and feasibility. The WSD evaluated value by assessing each recommendation's alignment with the vision outlined in the WSD's Strategic Roadmap from May 2020: "a sustainable California, with no catastrophic utility-ignited wildfires, that has access to safe, affordable and reliable electricity."[2] The WSD evaluated feasibility by assessing each recommendation's expected implementation timeframe: by the 2021 WMP update, by the 2023 WMP cycle, or later. These analyses allowed the WSD to determine prioritized recommendations for the 2021 WMP guidelines. The WSD incorporated a majority of the WSAB's recommendations into Attachment 2.1[3]: Changes to Wildfire Mitigation Plan (WMP) Guidelines. The WSD recommends incorporating six WSAB recommendations without modification, nine recommendations with adjustments, and the WSD recommends not incorporating four of the WSAB's recommendations at this time. The four recommendations that the WSD recommends not incorporating are largely structural recommendations that go beyond WMPs or that require additional time to implement beyond the 2021 WMP cycle. For example, some recommendations require the development of longer-term processes that utilities may not be able to fully develop before the 2021 WMP update.

In Attachment 4 to WSD Resolution WSD-011, the WSD, pursuant to Pub. Util. Code 8389(d)(4), presents the framework for a process to conduct its annual Safety Culture Assessments. In Attachment 1 herein, the WSD provides analysis of the WSAB's recommendations on the WSD's annual Safety Culture Assessments. The WSD does not plan to incorporate most WSAB recommendations into its first annual Safety Culture Assessment, as many are more appropriate for other

[1] https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/WSD/WSAB%20Recommendations%20on%202021%20WMP%20Guidelines%20APPROVED%20CONCURRENCES%206.24.2020.pdf
[2] https://www.cpuc.ca.gov/WSD/roadmap/
[3] All references to attachments refer to Attachments to Resolution WSD-011.

Commission proceedings or forums. However, the WSD sought to take into account the intent behind the recommendations provided and, where appropriate, to ensure that intent was captured in the proposed process for conducting annual Safety Culture Assessments described in Attachment 4.

This attachment is structured according to the six sections of the WSAB recommendations report issued in June 2020. Tables 0.1 and 0.2 present a summary of WSAB's recommendations on 2021 WMPs and the Safety Culture Assessment, respectively, according to the WSD's recommendations on whether to incorporate the recommendations in 2021. Subsequent tables detail each WSAB recommendation in the left column, the WSD's recommendation on incorporation for the 2021 WMP in the middle column and the WSD's rationale for its recommendation in the right column.

Table 0.1: A summary of how WSD assessed WMP-related WSAB recommendations is as follows:

Fully incorporate	Incorporate with adjustments	Do not incorporate at this time
• 1.2 State and Federal Rules and Requirements Should Be Included and Explained in the Narrative of WMPs • 1.4 Strike a Balance Between Data Submission Requirements, Quarterly Reporting and Program Implementation • 2.4 Standardized Data to Allow Cross-Utility Comparisons • 3.3 Reporting Expert Qualifications and Scientific Justification for Decision-Making • 4.2 Community Outreach and Emergency Preparedness Performance Metrics and Data Reporting	• 1.1 Topical Organization by WMP Program with a Focus on Lessons Learned • 1.3 Submission Schedules that Set Up All Parties for Success • 2.1 Risk Spend Efficiency (RSE) Analysis Required for Each Mitigation Measure • 2.2 Train and Retain Qualified Electrical Workers • 2.3 Risk Assessment and Mapping to Determine Location of Wildfire Mitigation Measures and Update CPUC Fire-Threat Maps More Frequently • 3.1 Scientific Review of Modeling Methods and Assumptions • 3.2 Development of a Data Access Portal for Interconnected Data Repositories (interim step) • 3.4 Robust Training Programs and Workforce Equity • 3.5 Aligning Vegetation Management Practices with Best Available Science • 3.7 Wildfire Mitigation Program Cost Review and Costs Recovery (interim step)[4]	• 3.6 Resolving California Utilities' Resource Constraints • 4.1 Develop an Electric Utility Resiliency and Risk Reduction Threshold (SHEUR) • 6.1 The Wildfire Safety Division Should Remain at the CPUC • 6.2 Future Issues for Consideration

[4]Cost-reasonableness review is statutorily precluded for the WMP. 2021 WMP guideline recommendations intend to identify each electrical corporation's ratepayer cost increases for implementing its WMP programs and initiatives.

Table 0.2: A summary of how WSD assessed Safety Culture-related WSAB recommendations is as follows:

Fully incorporate	Incorporate with adjustments	Do not incorporate at this time
• N/A	• 5.1 Develop a Unit Within or Outside of the Utility, to Study Black Swan Events and Predict Potential Future Events	• 5.2 Insert Safety Language into Investor Owned Utility Board Member Job Descriptions • 5.3 Ensure Consistent Compliance with High-Level Safety Standard • 5.4 Post-Accident Debriefing and Learning

See Attachment 2.1 for a complete overview of the 2021 WMP Guideline changes, Attachment 2.2 for a complete set of 2021 WMP Guidelines and Attachment 3 for information on the 2021 WMP Process, including a preliminary schedule.

1. WSD Analysis of WSAB Recommendations: Structural Recommendations

1. Structural Recommendations to the 2021 WMP Guidelines

WSAB Recommendation	WSD Recommendation for 2021	Analysis
1.1 Topical Organization (10 categories) by WMPs with a Focus on Lessons Learned • 2021 WMP Guidelines should be organized around each of the 10 categories being used for the WMPs and the Maturity Model. • The organization should highlight Public Safety Power Shutoffs, workforce training, and stakeholder cooperation and community engagement. • Each of the Wildfire Mitigation Program sections of the 2021 WMP Guidelines start with lessons learned.	• Organization by 10 categories **not incorporated** in 2021 recommendations • Recommendation to create a **separate PSPS section incorporated** in 2021 guideline recommendations • Recommendation to create a **separate section for Lessons Learned incorporated** in 2021 guideline recommendations	• Some sections of the WMP (e.g., initiatives) should still be organized around 10 initiative categories, but the WMP itself does not need to be organized by 10 categories since there is valuable information that is relevant to multiple initiative categories (e.g., outcome metrics) • Separate PSPS section should include all PSPS-related data and narrative for ease of access • Lessons Learned should be a separate section
1.2 State and Federal Rules and Requirements Should Be Included and Explained in the Narrative of WMPs • The 2021 WMP Guidelines should require the utilities to briefly describe the state and federal rules and proceedings that are associated with each wildfire mitigation program area in the narrative of the WMPs	• **Recommendation incorporated**, with adjustments • Relevant state and federal statutes, orders and proceedings must be cited where relevant in WMP narrative, and explained in a new WMP Appendix section – In the WMP appendix, utilities should include a brief description or summary of the relevant portion of the statute	• Going forward, could provide significant value to WSD in tracking compliance to legislative requirements

WSAB Recommendation	WSD Recommendation for 2021	Analysis
1.3 Submission Schedules that Set Up All Parties for Success • WSD should set a WMP submission schedule that promotes the success of all parties. The CPUC could set the deadline for 2021 WMP submissions at least four months after the approval of the final 2021 WMP Guidelines, for example	• **Recommendation incorporated with adjustments**; WMP submissions plan to follow a phased approach in 2021 • Near-final version of WMP guidelines to be released October 2020; first WMP submissions due February 2021	• Phased WMP submissions allow for more robust WSD analysis of WMPs • Additional months for clarifying reporting requirements should improve the quality of utility submissions
1.4 Strike a Balance Between Data Submission Requirements, Quarterly Reporting and Program Implementation • The 2021 WMP Guidelines should require simplified and streamlined reporting requirements to include the data that is critical for WSD staff to complete its evaluation • WSD should consider the 2020 WMP review findings to be components of the next year's WMP Update	• **Recommendation incorporated** with an emphasis on data collection in quarterly reports and explanation in annual updates • Integrating relevant information from 2020 Supplemental Data Requests into the quarterly reports and annual updates and removing duplicative requirements	• Quarterly reporting provides more frequent reporting of key metrics on utility progress and outcomes • Removing duplication across requirements streamlines reporting and review process

2. WSD Analysis of WSAB Recommendations: Aligned with WSD-002

2. Recommendations for 2021 WMP Guidelines Generally Aligned with Findings in Guidance Resolution WSD-002

WSAB Recommendation	WSD Recommendation for 2021	Analysis
2.1 Risk Spend Efficiency (RSE) Analysis Required for Each Mitigation Measure • The 2021 WMP Guidelines should require utilities to complete an RSE analysis for each mitigation measure, at a circuit level, so that each measure can be considered individually, in aggregate, and against each other, to determine optimal appropriation of wildfire mitigation efforts • The 2021 WMP Guidelines should require PSPS to be treated as a risk for the purposes of the RSE calculations in order to encourage utilities to prioritize reducing the number, scope, duration, and reenergization timeline of PSPS events	• **Recommendation incorporated** to improve RSE analysis for each mitigation measure • Recommendation to improve RSE analysis in allocating mitigation resources at a circuit level was **partially incorporated** by requiring RSE at the HFTD tier level • Additional efforts to standardize RSE, impact, and risk for vegetation management is being **incorporated** by PG&E, SDG&E, and SCE • **Recommendation incorporated:** PSPS should be treated as a risk with associated consequences[5]	• RSE methodology should be better tied to improving resource allocation • Standardized RSE definition across utilities enables cross-utility comparison of initiatives • PSPS consequences currently unaccounted for in utility risk modelling despite substantial societal costs

[5] Per WSD-002, "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."

WSAB Recommendation	WSD Recommendation for 2021	Analysis
2.2 Train and Retain Qualified Electrical Workers • The 2021 WMP Guidelines should require the utilities to demonstrate that their training programs properly train wildfire mitigation workers. • Guidelines should require that the utilities hire Qualified Electrical Workers (QEW), defined at a high level as "electrical asset inspectors with qualifications that go beyond a basic knowledge of General Order 95 requirements, to perform wildfire mitigation related inspections"	• **Recommendation incorporated**: WMP to require reporting of qualifications of workers associated with wildfires and PSPS mitigation. • Requirement for **utilities to hire only QEW not incorporated for 2021** – the WSD first needs to analyze the baseline of utility workforce qualifications in 2021	• Qualified workers are essential for proper execution of mitigation efforts (e.g., requiring vegetation management inspectors to be ISA-certified as outlined in WMP Resolution Condition PGE-22) • Baseline utility worker qualifications need to be clearly presented
2.3 Risk Assessment and Mapping to Determine Location of Wildfire Mitigation Measures and Update CPUC Fire-Threat Maps More Frequently • WMP Guidelines should require that utilities rely on both infrastructure risk assessment and mapping and the relationship to the HFTD when determining where to focus mitigation measures • WSD should consider developing a more streamlined process to update the CPUC Fire-Threat maps relative to how fast the input variables (e.g., vegetation conditions, construction development) are changing	• Requiring utilities to better consider infrastructure risk assessment & mapping, HFTD mapping, and additional risk mapping in **determining RSE and where to allocate resources is incorporated** through expanding the scope of RSE calculations • Ownership of HFTD map and update schedule is **outside scope of WSD's work**. See proceeding R.15-05-006 for more information.	• SCE filed with the Commission an active Petition for Modification (PFM) regarding map changes • Any future changes to the HFTD map updating process should be deferred to the appropriate Commission proceedings

WSAB Recommendation	WSD Recommendation for 2021	Analysis
2.4 Standardized Data to Allow Cross-Utility Comparisons • Commission should consider WSD's recommendation for data taxonomy & data schema to streamline data reporting and ensuring data is comparable across utilities • WSD should hold data working groups to support the generation of utility reporting data standards	• **Recommendation is incorporated**. WSD has developed a preliminary schema for all spatial data relevant to WMP requirements (e.g., initiatives, risk events, asset locations, critical infrastructure). Utilities and stakeholders provided input on the data schema.	• Standardized data ensure consistent tracking of utility progress, compliance, and outcome trends • Standardized historical data can eventually enable an evaluation of the effectiveness of mitigation initiatives

3. WSD Analysis of WSAB Recommendations: Addressing broader WMP process

3. Recommendations that address the broader WMP process

WSAB Recommendation	WSD Recommendation for 2021	Analysis
3.1 Scientific Review of Modeling Methods and Assumptions • The 2021 WMP Guidelines should require the utilities to disclose detailed modeling methods and assumptions. • An independent scientific advisory panel should be created to vet modeling methods	• Recommendation to require utilities to disclose more **detailed modelling methods and assumptions is incorporated** through a more detailed requirement of RSE calculations, assumptions and methodology • Recommendation to develop **independent scientific advisory panel is not incorporated** but may consider for future WMPs	• WSD needs a better understanding of utility risk modelling and assumptions to ensure mitigation initiatives are targeting risk effectively and ultimately reducing risk of wildfires and PSPS • Technical expertise for WSD to review models and assumptions is being developed internally
3.2 Development of a Data Access Portal for Interconnected Data Repositories and a Hierarchy of Permission to Access Wildfire Data and Modeling Methods • WSD should require the utilities to contribute to a data repository where data sources can be accessed by interested parties through a portal with varying levels of data access and security	• Development of a data access portal for interconnected data repositories and permission hierarchy is **to be incorporated following** standardization of data metrics, processing, and analysis • WSD engaged in a potential shared data access initiative with several other state agencies (e.g., CAL FIRE, Cal OES, CARB, CNRA)	• Data access portal requires standardized data reporting and upload frequencies, which is still in process
3.3 Reporting Expert Qualifications and Scientific Justification for Decision-Making • The 2021 WMP Guidelines should require the utilities to disclose the qualifications of scientific personnel relied upon to prepare the WMPs	• **Recommendation incorporated** by requiring qualifications of experts and citations to relevant scientific research in WMP	• Provides increased transparency regarding experts and research referenced for WMP preparation

WSAB Recommendation	WSD Recommendation for 2021	Analysis
• The Guidelines should direct the utilities to include a citation to the peer-reviewed scientific literature and associated scientific works		
3.4 Robust Training Programs and Workforce Equity • The 2021 WMP Guidelines should require the utilities to develop more robust outreach and onboarding training programs for new electric workers that (A) train workers to identify hazards that could ignite wildfires, and (B) increase the pool of Qualified Electrical Workers • The 2021 WMP Guidelines should require the utilities to create pre-inspection vegetation management training programs to increase the pool of certified arborists • The 2021 WMP Guidelines should require the utilities to assess whether they offer competitive pay to both unionized and non-unionized workers and whether that contributes to the limited pool of workers. • The 2021 WMP Guidelines should require the utilities to report and assess whether there are enough ecological and forest management scientists on staff to develop a coordinated vegetation management strategy	• **Recommendation Incorporated** as new WMP Section, to include utility worker qualifications and require utilities to report training practices • WMP will additionally require utilities to write a narrative explaining the qualifications of utility workers regarding wildfire & PSPS mitigation, for workers conducting: – Vegetation inspections – Vegetation management projects – Asset inspections • WMP will **require utilities to describe their training programs for electric workers** and explain how the programs train workers to identify hazards that could ignite wildfires • Additional information must be provided on any plans to improve qualifications of workers relevant to wildfire/PSPS mitigation • As utilities need ecological and forest management expertise, WMPs must require reporting on expertise and qualifications of workers	• Previous WMPs did not require information on qualifications of utility workers (direct employees, contractors, etc.), as well as descriptions of training programs for utility workers as it pertains to wildfire mitigation. Inclusion of this information enables progress tracking on utility workforce qualifications moving forward

WSAB Recommendation	WSD Recommendation for 2021	Analysis
3.5 Aligning Vegetation Management Practices with Best Available Science • All utilities should coordinate and complete an ongoing study, that goes beyond what is ordered in WSD-005, that would ensure vegetation management practices align with best available science. The research should be reviewed by an independent scientific advisory panel or developed as part of a working group process overseen by WSD. • The 2021 WMP Guidelines should request additional details about the utility's vegetation management decision-making process and how the utility assesses the tradeoffs between vegetation fuel load versus flammability. Utilities should justify the removal of species, particularly shrubs, that will not reach a height to touch or contact electrical lines. • The 2021 WMP Guidelines should require the utilities to develop explicit vegetation management residue plans that ensure that vegetation	• **Not incorporated in 2021 Guideline updates** beyond requirements in WSD-003, 004 and 005, but will be **considered for future updates** • Ongoing study across utilities on the effectiveness of increased (i.e., beyond minimum regulatory requirements) vegetation clearances and other vegetation practices has been outlined in Conditions SDGE-13, SCE-12 and PGE-26 in Appendix A of the Wildfire Mitigation Plan Final Resolution Appendices • Utilities should provide evidence that they are using best vegetation management practices and detail a plan for how they handle residue (e.g., how utility manages relations with property owners during tree removal)	• Conditions[6] SDGE-13, SCE-12 and PGE-26 provide an initial direction to develop this recommendation further, with a goal to implement by 2023. PG&E, SCE and SDG&E are required to collaborate and develop consensus methodology for measuring post-trim vegetation clearance impacts on the probability of vegetation caused ignitions and outages. • As the process to develop a working group to oversee utility vegetation management study requires more time, it should be a longer-term initiative

[6] Conditions refer to the deficiencies outlined in the conditions of approval from 2020 WMP Resolutions. See Appendix A for each utility's final resolution from WSD-002 for specific condition descriptions and requirements.

WSAB Recommendation	WSD Recommendation for 2021	Analysis
management itself does not contribute to increased fuel load and increased risk of fire. • The 2021 WMP Guidelines should also require reporting descriptions of the tree characteristics that justify any "at risk" designation since growth rates for trees vary depending on age and environmental conditions.		
3.6 Resolving California Utilities' Resource Constraints • California utilities should collaborate and exercise their economic power to form partnerships with suppliers to store critical infrastructure equipment. • The 2021 WMP Guidelines should require the utilities to report on procurement challenges such as equipment shortages, price increases in equipment and delays, and efforts to mitigate these challenges	• **Not incorporated** in 2021 WMP guideline updates	• This is a longer-term process (e.g., utilities forming a partnership to exercise economic power and improve procurement) that utilities may not be able to fully implement by 2021 WMP update

WSAB Recommendation	WSD Recommendation for 2021	Analysis
3.7 Wildfire Mitigation Program Cost Review and Costs Recovery • WSD should assist in the reasonableness review of utility wildfire mitigation expenditures because that evaluation occurs in CPUC-managed General Rate Case (GRC) proceedings. Subject matter experts must be available to collaborate.	• Ownership of Cost Review and Costs Recovery is **outside scope of WSD's work** • WSD intends to require some details of ratepayer impacts from WMP programs; metrics to include are: – Electricity Cost Increase to Ratepayers from Wildfires – Electricity Cost Increase to Ratepayers from Mitigations	• Cost reasonableness review is not statutorily an area of focus for WSD • Cost review is outside the mandate of WSD • Statute requires costs to be considered in utility General Rate Case or other application and not with WMP

4. Incorporation of WSAB Recommendations: Performance Metrics

4. Recommendations on Performance Metrics

WSAB Recommendation	WSD Recommendation for 2021	Analysis
4.1 Develop an Electric Utility Resiliency and Risk Reduction Threshold • WSD and stakeholders should begin developing a new System Hardening for Electric Utility Resiliency (SHEUR) threshold, that sets an acceptable level of electric operation risk and establishes the risk reduction that a utility should assume so that it can design its systems accordingly. • The future demonstration of compliance with the newly developed SHEUR threshold could become an achievable condition of approval of a utilities' WMP	• **Not incorporated for 2021** - Utilities and parties should collaborate in development of SHEUR threshold and give sufficient time for deliberation	• Development of new metrics that tie risk to cost is better addressed in S-MAP proceeding, as implications go beyond WMPs
4.2 Community Outreach and Emergency Preparedness Performance Metrics and Data Reporting • The 2021 WMP Guidelines should include progress metrics on community outreach and emergency preparedness	• **Incorporated** in 2021 guideline updates as a requirement to report relevant quarterly metrics regarding community outreach for wildfires and PSPS - E.g., # of customers impacted by PSPS - E.g., # of customers notified prior to initiation of PSPS event	• 2020 WMPs did not prioritize progress metrics for community outreach; these are critical metrics to determine community safety outcomes and progress • D.20-03-004 issues guidance on community awareness and public outreach before, during and after a wildfire and issues requirements for in-language communication and outreach

5. Analysis of WSAB Recommendations: Utility Safety Culture

5. Recommendations on Utility Safety Culture

WSAB Recommendation	WSD Recommendation for 2021	Analysis
5.1 Develop a Unit Within or Outside of the Utility, to Study Black Swan Events and Predict Potential Future Events • Require utilities to create engineering teams to surface and flag black swan events for future consideration and remediation	• **Incorporate with adjustments**: Recommended approach is to encourage utility industry collaboration via research institutions (i.e., EPRI), and assess electrical corporations' learning processes in response to weak signals	• WSD approach gives electrical corporations flexibility to build on existing capabilities and develop plans that are effective in their context, while holding electrical corporations responsible for determining how to best achieve improvement
5.2 Insert Safety Language into Investor Owned Utility Board Member Job Descriptions • The Board recommends that the WSD help create position descriptions for utility boards of directors.	• **Not incorporated at this time:** For electrical corporations seeking a Safety Certification, the WSD plans to verify whether Board members on the Safety Committee have relevant safety expertise pursuant to Pub. Util. Code §8389(e)(3)	• For an electrical corporation to be issued a Safety Certification, its Board must have a Safety Committee composed of members with relevant safety expertise.[7] • The Commission in D.20-05-053 has specified broad categories of safety expertise that Board members should hold but has declined to impose more specific requirements, stating that "the Commission neither wants to dilute the meaning of Safety Expertise nor over-focus on

[7] Pub. Util. Code §8389(e)(3)

		the precise experience held by each individual board member."[8]
5.3 Ensure Consistent Compliance with High-Level Safety Standard • Maintain a high bar when performing its safety culture assessments and set the bar so that that utilities maintain high standards as utilities hire, grow and adapt their safety culture	• **Not incorporated at this time**.	• Not appropriate for this forum. The WSD's Safety Culture Assessment plans to focus on setting a transparent baseline for Safety Culture and driving continuous improvement against that baseline.
5.4 Post-Accident Debriefing and Learning • The Board recommends that the WSD assess the effectiveness of the utilities' processes and post-accident evaluation, including whether the learnings from the evaluations are incorporated into future planning	• **Not incorporated at this time,** as the Commission already has a process for investigations and requiring root-cause analysis.	• Might revisit this after a body of data is developed from Risk Event[9] analysis.

6. WSD Analysis of WSAB Recommendations: Legislative/Gubernatorial Action

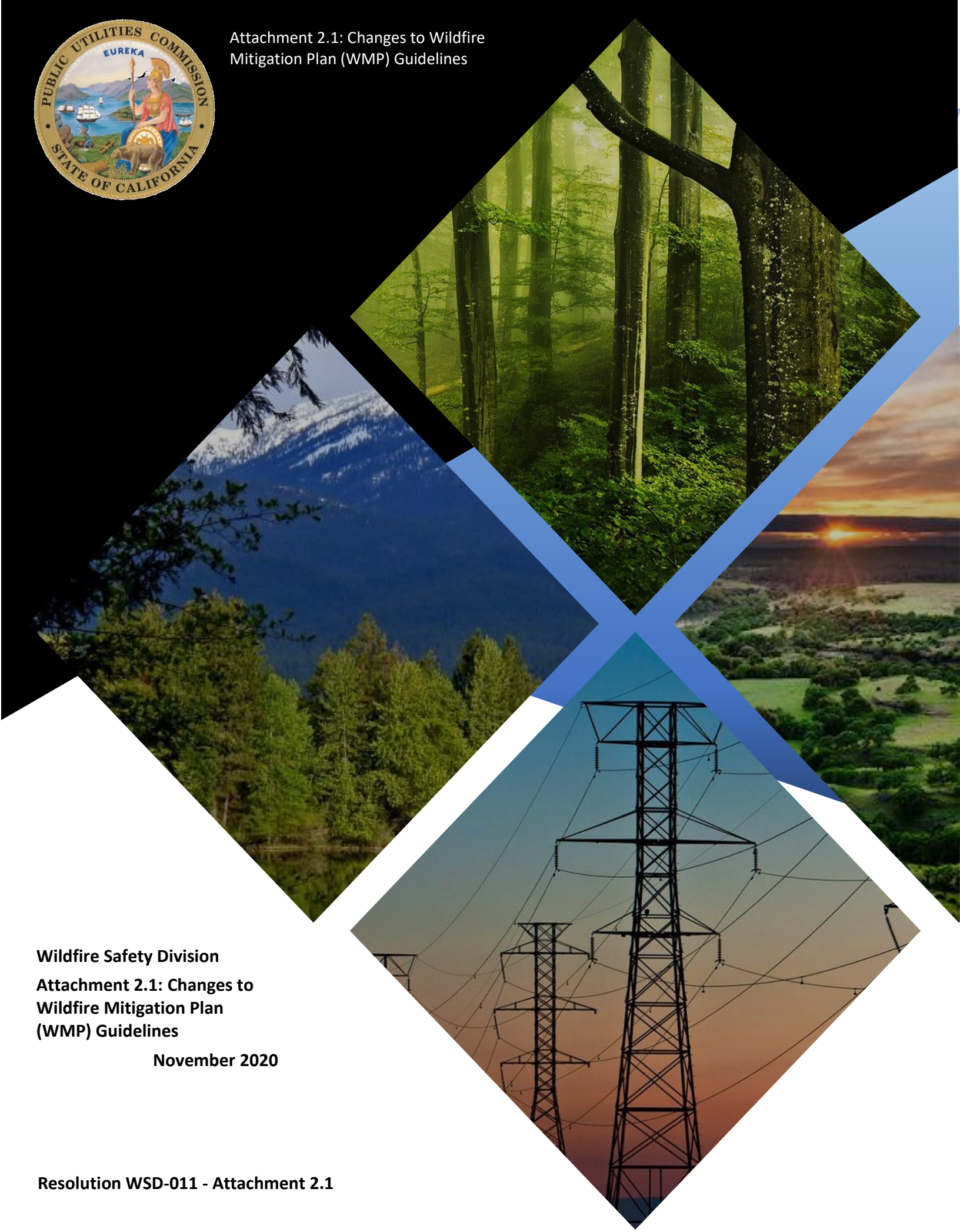
6. Recommendations Likely Needing Legislative or Gubernatorial Action to Implement

[8] D.20-05-053, Order Instituting Investigation on the Commission's Own Motion to Consider the Ratemaking and Other Implications of a Proposed Plan for Resolution of Voluntary Case filed by Pacific Gas and Electric Company, available here

[9] Reference WSD's Draft GIS Data Reporting Requirements and Schema for California Electrical Corporations for further detail on types of data collected for Risk Events

WSAB Recommendation	WSD Recommendation for 2021	Analysis
6.1 The Wildfire Safety Division Should Remain at the CPUC • The WSD continue performing the important wildfire safety work at the CPUC instead of spending time, energy, and money moving to a different agency in July 2021	• Not part of WMP guidelines	• Statute provides for move to Office of Energy Infrastructure Safety, so statutory change would be required.
6.2 Future Issues for Consideration • The Board recommends for the 2022 cycle that it conduct further study with associated due diligence on issues that are related to utility wildfire mitigation efforts that will aid implementation, enhance effectiveness, eliminate unnecessary barriers or eliminate inefficiencies following adoption of the 2021 recommendations	• Yes, the Board should continue to conduct further study and recommendations that will improve utility wildfire mitigation efforts for the 2022 cycle and beyond	• Statutory requirement for WSAB to provide recommendations by June 30 every year; WSD looks forward to future recommendations.

ATTACHMENT 2.1



Wildfire Safety Division

Attachment 2.1: Changes to Wildfire Mitigation Plan (WMP) Guidelines

November 2020

Resolution WSD-011 - Attachment 2.1

Executive Summary

In order to streamline and clarify certain reporting requirements for the 2021 Wildfire Mitigation Plan (WMP) Update, and to fill in identified gaps in data submissions, staff of the Wildfire Safety Division (WSD) have reviewed the WMP Guidelines used in 2020 and recommend several changes.[1] The 2021 Guidelines Update (commonly referred in WSD-011 and attachments as "2021 WMP", "WMP", "2021 WMP Guidelines" or "Guidelines") serve as an update for the 2020-2022 plan period; recommended changes clarify and better organize existing requirements while ensuring data collected is still comparable to the 2020 WMP. These changes satisfy the requirements under Public Utilities Code (Pub. Util. Code) Sections 8389(b) and (c).

Recommended changes take the form of **Structural** changes (reordering sections to improve the ability to evaluate WMPs, readability, and adding some new elements), and **Substantive** changes to the tables of data and metrics.

An example of a structural change is the creation of a separate section for Public Safety Power Shutoff data and information as the last chapter of the WMP Update. Data for this section is now found in separate tables that previously appeared in the Outcome Metrics Table 2.3 and 2.10, in Table 12 of the WMP, and in several tables that were part of the Supplemental Data Request (SDR), notably Tables 2, 5, 11, 12 & 13.

Examples of substantive changes can be found in changes to section 6: Progress and Outcome Metrics reporting Tables 1 – 18. These tables establish the body of metrics that will be considered in evaluation of utility progress in reducing the risks and consequences associated with utility-caused wildfires. Most recommendations for 2021 clarify definitions and/or units of measurement used in reporting. WSD made additional changes to eliminate duplicate tables or line items in tables that are not necessary for 2021 WMPs.

The recommendations below are a summary of the major changes to the 2021 WMP and are NOT exhaustive. Refer to Attachment 2.2 for the complete 2021 Guidelines template, Attachment 2.3 for the non-spatial metrics data template and Attachment 2.4 for the complete Maturity Model template.

[1] Link to previously operative 2020 WMP Guidelines can be found here - https://www.cpuc.ca.gov/wildfiremitigationplans/

Overview of WMP Recommendations

Pursuant to California Public Utilities Code Sections 8389(c)-(d), the Wildfires Safety Division (WSD), by October 31, 2020, will issue proposed updated 2021 Wildfire Mitigation Plan (WMP) Update Guidelines for approval by the Commission by December 1.

This document is based on lessons learned in the 2020 WMP review process, recommendations from the Wildfire Safety Advisory Board (WSAB), comments received on the 2020 Guidance ruling issued in Rulemaking (R.)18-10-007 on December 16, 2019,[2] workshop discussion and comments.

WSD has organized this document by section in the WMP, including new sections to the Guidelines. The WMP requirements are fundamentally the same as in 2020 but are restructured for streamlined reporting and evaluation. Definitions of metrics are clarified, and tables are altered to improve overall reporting structure. New Guidelines content primarily focuses on a higher granularity in reporting requirements to better understand resource allocation, local community conditions and other detailed information previously requested at a more aggregated level. Further, the Guidelines have been expanded to ask for additional detail on how utilities are mitigating the impact of wildfires and PSPS on vulnerable, marginalized and/or at-risk communities. The Guidelines are also adjusted to serve as an update to the 2020 WMP, rather than reporting for an entirely new plan.

[2] Comments were received in January 2020 and can be viewed on the docket card for R.18-10-007

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A. WMP Section 1: Persons responsible for executing the WMP

Issue: In the initial filing of 2020 WMPs, most utilities did not fully identify the individuals responsible for components of the WMP, necessitating a follow-up data request or revision.

Recommendations:

- **Recommended change 1a**: Provide contact information of the responsible person(s) executing the plan, including
  - Executive level with overall responsibility, with position title and contact information (telephone and email).
  - Program owners, individually identified with position title contact information (telephone and email) specific to each component of the plan

- **Recommended change 1b:** All experts consulted in the preparation of the WMP are cited by name and include their relevant background/credentials.

Note: Utilities are required to disclose position title and credentials for individuals responsible. Name and other contact information deemed confidential may be provided in a redacted supplement.

B. NEW: WMP Section 2: Adherence to statutory requirements

Issue: Section 8386 (c) of the Public Utilities Code specifies 22 requirements for inclusion in the WMPs. WSD conducted a first-step "completeness" review to ensure required information was included in the WMPs. There were many instances where information was lacking or difficult to find in the WMP. This necessitated a very large volume of Data Requests before WSD could begin verifying that the plans complied with all applicable rules, regulations, and standards, as specified in Section 8386 (d).

Recommendations:

- **Recommended change 2a:** Section 2 will comprise of a "check list" of the Sec. 8386 (c) requirements and subparts. Each utility shall both affirm that the WMP addresses each requirement AND cite the Section or Page Number where it is more fully described (whether in Executive Summary or other section of the WMP). If a requirement is mentioned in multiple sections, utilities must separate by a new line (as shown below).

Illustrative Table 2-1 check-list:

Requirement	Description	WMP Section/Page
2	The objectives of the plan	Section 4.1 / Page 13
10	Protocols for the de-energization of the electrical corporation's transmission infrastructure, etc.	Section 5 overview / Page 30 Section 5.2 / Page 32 Section 6.2 / Pages 37-39

C. NEW Section 3: Actuals and Planned Spending for Mitigation Plan

Issue: In the 2020 WMPs, utilities presented inconsistent reporting of projected expenditures associated with the 10 categories of mitigation initiatives. In some cases, utilities gave few cost estimates, and in others, utilities appeared to double-count some expenditures among categories.

Although the WMP is not the proper forum for approving projected expenditures or finding them to be reasonable for cost recovery purposes, it is fundamental to the analysis of the WMP to understand expected costs of different mitigation initiatives, especially as it pertains to effectiveness and feasibility. Additionally, expected initiative costs are an essential component of the risk-spend efficiency estimations required for all initiatives.[3]

Recommendations:

- **Recommended change 3a***:* Add summary tables presented below, new to the 2021 WMPs, but derived from the cost summary tables used in Resolutions WSD-003-009. In the new Table 3-1, summarize the projected costs per year over the three-year WMP cycle. The table also includes a new row to report actual expenditures for the prior year (2020). Table 3-2 breaks out projected costs per category of mitigation initiatives over the three-year WMP cycle.

Table 3-1: Summary of WMP Expenditures	
2020 WMP	$3.15 billion
2020 actual	$3.14 billion
Difference	-$10 million
2021 Planned	$3.13 billion
2022 Planned	$3.41 billion
2020-22 Planned	$9.68 billion

[3] Pub. Util. Code § 8386.4 (costs assessed in general rate case or other application); *see also* Commission Decision 19-05-036 (WMP approval does not approve costs)

Table 3-2 Summary of WMP Expenditures						
WMP Category	2020 WMP Planned	2020 Actual	Difference	2021 Planned	2022 Planned	2020-22 (w/ 2020 Actual)
Risk and Mapping						
Situational Awareness						
Grid Design & System Hardening						
Asset Management & Inspections						
Vegetation Management						
Grid Operations						
Data Governance						
Resource Allocation						
Emergency Planning						
Stakeholder Cooperation Community Engagement						
Total						

- The 2021 WMP is more direct in requiring risk-spend efficiency calculations for initiatives, both for individual initiatives and for aggregated categories of initiatives. Along with RSE calculations, utilities will be required to report their methodology behind RSE numbers, including data used & calculations conducted to determine RSE values in the WMP. However, utilities will not rely on RSE calculations as a tool to justify the use of PSPS (see Resolution WSD-002).[4]
- **Recommended Change 3b**: 2021 WMP to include fields from the Supplemental Data Request that are relevant to Costs:
  - SDR Table 2 Field 3a – Estimated Electricity Cost Increase to Ratepayers from utility-ignited Wildfires
  - SDR Table 2 Field 3c – Estimated Electricity Cost Increase to Ratepayers from Mitigations
  - Fields are shown below for reference

[4] Further, RSE is not an appropriate tool for justifying the use of PSPS. 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.

Utilities will be required to report their methodology for calculating the increase costs to ratepayers, clearly showing how they derived each value. Utilities may also include a narrative section describing how ratepayer impacts of mitigation expenditures might be expected to be phased over time beyond the WMP 2020-2022 cycle.

	Annual performance actuals					
Outcome metric name	2016	2017	2018	2019	2020	Unit(s)
Increase in electric costs to ratepayer due to utility-ignited wildfires (total)						Dollar value of average monthly rate increase attributable to utility-ignited wildfires per year (e.g., $3/month on average across customers for utility-ignited wildfires occurring in 20XX)
Increase in electric costs to ratepayer due to wildfire mitigation activities (total)						Dollar value of average monthly rate increase attributable to WMPs per year

D. Section 4: Lessons Learned and Risk Trends

Lessons learned

Issue: Section 4 in the WMP currently serves as a catch-all for narrative and reporting of trends. Section 4 should be more focused to improve the evaluation process. Moreover, relevant narrative portions to risk trends, such as "Lessons learned" were either missing or placed within the larger narrative portion of Section 2, Metrics.

Recommendations:

- **Recommended Change 4a:** Move "Lessons Learned" into Section 4 with no changes to the instructions.
- **Recommended Change 4b:** Keep the following sections in Section 4:
    - 4.1 – Objectives of the plan (1, 3, and 10 years out)
    - 4.2 – Understanding major trends impacting ignition probability and wildfire consequence
    - 4.3 – Change in ignition probability drivers
- **Recommended Change 4c:** Move 4.4 – Directional Vision for PSPS and Table 20 to PSPS section.

Research proposals and findings

Issue: Utilities are initiating research projects, such as the SCE-SDG&E-PG&E joint study on enhanced vegetation management, that they plan to report on in their annual WMPs. The utilities were inconsistent in how they structured their proposal for the study and are likely to report findings in a similarly inconsistent format if no structure is provided.

Recommendations:

- **Recommended Change 4d:** Organize research proposals and subsequent findings reports into a subsection 4.4. Organize each study under the sub-headers provided in recommendation 4e. Within section 4.4, number studies 4.4.1, 4.4.2, …, with proposals listed first followed by updates and findings reports from research studies.
- **Recommended Change 4e:** Organize each research proposal/report into the following structure:
    1. Purpose of research
    2. Definitions of relevant terms (e.g., defining "enhanced vegetation management" for research on enhanced vegetation management)
    3. Details of all data sources and elements used for analysis, including scope and granularity of data in time & location (i.e., date range, reporting frequency & spatial granularity for each data element, see example table below)
    4. Methodology for analysis, including list of analyses to perform; section will include statistical models, equations, etc. behind analyses
    5. Project timeline and reporting frequency to WSD
    6. Results and discussion if a completed or ongoing study, highlighting new results and changes to conclusions
    7. If a completed or ongoing study, follow up research or action planned as a result of the research

Example table reporting data elements

Data Element	Data Source	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Comments
Ignitions from contact with vegetation in non-enhanced vegetation areas	Vegetation Management database; Ignition database	2014 – 2020+ (ongoing)	Per ignition	Lat/lon per ignition	Date, hour of ignition (estimated)	-
Ignitions from contact with vegetation in enhanced vegetation areas		2019 – 2020+ (ongoing)	Per ignition	Lat/lon per ignition	Date, hour of ignition (estimated)	-

Model and metric calculation methodologies

Issue: Some defined metrics and models require additional steps to calculate than have been reported in prior WMPs (e.g., Wildland Urban Interface circuit miles, Access and Functional Needs population size, ignition probability models). Without a standardized format to report methodologies, WSD lacks a full understanding of how utilities are generating their modelled and calculated metrics.

Recommendations

Recommended Change 4f: Add the following section for utilities to report additional models for ignition probability, wildfire risk & the risk of implementing PSPS events[5]:

Report details on methodology used to calculate or model ignition probability, potential impact of ignitions and / or PSPS, including list of all input used in impact simulation; data selection and treatment methodologies; assumptions, including Subject Matter Expert (SME) input; equation(s), functions, or other algorithms used to obtain output; output type(s), e.g., wind speed model; and comments.

For each model, organize details under the following headings:

1. **Purpose of model** – Brief summary of context and goals of model
2. **Relevant terms** - Definitions of relevant terms (e.g., defining "enhanced vegetation management" for a model on vegetation-related ignitions)
3. **Data elements** - Details of data elements used for analysis, including scope and granularity of data in time & location (i.e., date range, reporting frequency & spatial granularity for each data element, see example table above)
4. **Methodology** - Methodology and assumptions for analysis, including Subject Matter Expert (SME) input; equation(s), functions, statistical models, or other algorithms used to obtain output
5. **Timeline** – Model initiation and development progress over time. If updated in last WMP, provide update to changes since prior report.

[5] Also referred to as “PSPS risk” in this document.

6. **Application and results** – Explain where the model has been applied, how it has informed decisions, and any metrics or information on model accuracy and effectiveness collected in the prior year.

Recommended Change 4g: Add the following section for utilities to report their process for calculating specific metrics:

Report details on the calculation of the metrics below. For each metric, a standard definition is provided with statute cited where relevant. The utility must follow the definition provided and detail the procedure used to calculate the metric values aligned with these definitions. Utilities must cite all data sources used in calculating the metrics below.

1. **Red Flag Warning overhead circuit mile days** – Detail the steps to calculate the annual number of red flag warning (RFW) overhead (OH) circuit mile days. Calculated as the number of overhead circuit miles that were under an RFW multiplied by the number of days those miles were under said RFW. Refer to Red Flag Warnings as issued by the National Weather Service (NWS). For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings.[6] Detail the steps used to determine if a circuit mile was under a Red Flag Warning, providing an example of how the RFW OH circuit mile days were calculated for a Red Flag Warning that occurred within utility territory over the last five years.
2. **High Wind Warning overhead circuit mile days** – Detail the steps used to calculate the annual number of High Wind Warning (HWW) overhead circuit mile days. Calculated as the number of overhead circuit miles that were under an HWW multiplied by the number of days those miles were under said HWW. Refer to High Wind Warnings as issued by the National Weather Service (NWS). For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings.[7] Detail the steps used to determine if an overhead circuit mile was under a High Wind Warning, providing an example of how the OH HWW circuit mile days were calculated for a High Wind Warning that occurred within utility territory over the last five years.
3. **Access and Functional Needs population** – Detail the steps to calculate the annual number of customers that are considered part of the Access and Functional Needs (AFN) population. Defined in Government Code § 8593.3 and D.19-05-042 as individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking, older adults, children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant.
4. **Wildland Urban Interface** – Detail the steps to calculate the annual number of circuit miles and customers in Wildland Urban Interface (WUI) territory. WUI is defined as the area where houses exist at more than 1 housing unit per 40 acres and (1) wildland vegetation covers more than 50% of the land area (intermix WUI) or (2) wildland vegetation covers less than 50% of the land area, but a large area (over 1,235 acres) covered with more than 75% wildland vegetation is within 1.5 mi (interface WUI) (Radeloff et al, 2005).[8]
5. **Urban, rural and highly rural** – Detail the steps for calculating the number of customers and circuit miles in utility territory that are in highly rural, rural, and urban regions for each year. Use the following definitions for classifying an area highly rural/rural/urban (also referenced in glossary):
    a. Highly rural – In accordance with 38 CFR 17.701, "highly rural" shall be defined as those areas with a population of less than 7 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" shall be defined as census tracts.

[6] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml

[7] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml

[8] Paper can be found here - https://www.fs.fed.us/pnw/pubs/journals/pnw_2005_radeloff001.pdf with the latest WUI map (from 2010) found here - http://silvis.forest.wisc.edu/data/wui-change/

b. Rural – In accordance with GO 165, "rural" shall be defined as those areas with a population of less than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, “area” shall be defined as census tracts.
c. Urban – In accordance with GO 165, "urban" shall be defined as those areas with a population of more than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, “area” shall be defined as census tracts.

Population density numbers are calculated using the American Community Survey (ACS) 1-year estimates on population density by census tract for each corresponding year (2016 ACS 1-year estimate for 2016 metrics, 2017 ACS 1-year estimate for 2017 metrics, etc.). For years with no ACS 1-year estimate available, use the 1-year estimate immediately before the missing year (use 2019 estimate if 2020 estimate is not yet published, etc.)

Recommended Change 4g: Add the following section for utilities to report their progress on 2020 deficiencies:

Report progress on all deficiencies provided in the 2020 WMP relevant to the utility. This includes deficiencies in Resolution WSD-002.

Response: Summarize how the utility has responded and addressed the conditions in the table below. Reference documents that serve as part of the utility’s response (e.g. submitted in the utility’s Remedial Compliance Plan, location in 2021 WMP update, etc.). Note action taken by the WSD for Class A and B deficiencies (e.g. response found sufficient, response found insufficient and further action required, etc.).

Table 4.6-1: List of utility deficiencies and summary of response, 2020

Deficiency number	Deficiency title	Utility response (brief summary)	Referenced documents	WSD Action

Add additional rows as needed

E. Section 5: Inputs to the plan and directional vision for WMP

Goals, Objectives and Targets

Issue: In the 2020 WMPs, utilities were inconsistent in usage of the words: WMP Goals, Objectives, and Program Targets.

Recommendations:

- **Recommended Change 5a:** The goal of WMP is the same for all: Documented reductions in the number of ignitions caused by utility actions or equipment and minimization of the societal consequences (with specific consideration to the impact on Access and Functional Needs populations and marginalized communities) of both wildfires and the mitigations employed to reduce them, including PSPS.

- **Recommended Change 5b:** Objectives are unique to each utility and reflect the 1, 3, and 10-Year projections of progress towards the WMP goal, as described in Section 4 of the WMP. Objectives are determined by the portfolio of mitigation initiative strategies proposed in the WMP.
- **Recommended Change 5c:** Program targets are quantifiable measurements of activity identified in WMPs and subsequent updates used to show progress towards reaching the objectives, such as number of trees trimmed or miles of power lines hardened. More information on program targets can be found in 2020 WMP Table 4 – List and Description of Program Targets, Last 5 Years.

Addition to Section 5.4: Planning for Workforce and Other Limited Resources

Issue: Previous WMP reports lacked information on qualifications of utility workers (direct employees, contractors, etc.), as well as information on utility training programs to properly train wildfire mitigation workers.

- **Recommended change 5d:** Section 5.4, Planning for Workforce and Other Limited Resources, will include a narrative explaining the qualifications of utility workers in the target roles (below) as they relate to wildfire & PSPS mitigation:
    1. Vegetation inspections
    2. Vegetation management projects
    3. Asset inspections
    4. Grid hardening projects
    5. Risk event inspections

- **Recommended Change 5e:** For each of the target roles listed above:
    1. List all worker titles relevant to target role (target roles listed above)
    2. For each worker title, list and explain minimum qualifications with an emphasis on qualifications relevant to wildfire and PSPS mitigation. Specify the following:
        - Listing of required courses, including the subject and hours required for each course
        - # of hours trainee works under another worker until allowed to work independently
        - Certifications, education and other trainings required
    3. Report percentage of Full Time Employees (FTEs) in target role with specific job title
    4. Provide a summarized report detailing the overall percentage of FTEs with qualifications listed in (2) for each of the target roles.
    5. Report plans to improve qualifications of workers relevant to wildfire and PSPS mitigation. Utilities must explain how they are developing more robust outreach and onboarding training programs for new electric workers to identify hazards that could ignite wildfires.

F. Section 6: Performance Metrics and Underlying Data

Issue: WSD determined that some metrics in the 2020 WMP were misunderstood or poorly reported by utilities and were less useful than expected.

Recommendations overview:
In a few cases, a specific Table or line item can be added, edited, or eliminated. Some examples of general edits are shown below: (not comprehensive, see write up of each table below for details):

- The table or specific data inputs are duplicative of other tables (Table 18 Ignition Drivers);
- Geospatial data is required at a higher granularity to provide metrics at a local level;
- Refinement of the non-spatial data templates would allow WSD staff to undertake normalization of data without relying on the utilities to do so in tables (Portions of Table 2);
- Going forward, most data requirements plan to be submitted to the WSD on a quarterly basis, and the annual WMP updates intend to provide the narrative to explain changes in the data. Much of the data currently reported in the WMPs will therefore come outside of the WMP submission itself.
- Some tables ask for information that should reference other sources such as Incident Reports to CPUC (Table 5 Accidental Deaths);
- Some requested information does not lend itself to inputs to a table but is better in a narrative form (Table 7 Methodology).

The following are brief descriptions of proposed changes to specific tables:

Table 1: Recent Performance on Progress Metrics –

Issue: WSD received mixed or poor results from utilities on grid condition findings; adjustment is necessary for 2021.

As formulated, the metrics do not account for the effectiveness of inspections because the numbers are normalized by total circuit miles, not circuit miles inspected.

In addition, 2020 WMPs lacked relevant progress metrics for community outreach.

Recommendations:

- **Recommended change T1a**: Remove "findings / total circuit miles" metric and instead request two metrics for each inspection type and finding level –
  - # of findings by inspection type and level (e.g., Level 1 findings inspected from patrol inspections)
  - # of circuit miles inspected by inspection type (e.g., X miles inspected from patrol inspections)

- **Recommended change T1b:** Delete line 3 - Grid Modularization (better reported spatially since aggregate sectionalization does not accurately reflect sectionalization in high PSPS risk areas) and Delete line 4 - Data Collection (little useful data provided in tables).

- **Recommended change T1c:** Add relevant quarterly metrics regarding community outreach for PSPS into the PSPS section (see H. NEW Section 8)

Table 2: Recent Performance on Outcome Metrics –

Overall, the data in Table 2 is useful and auditable, but requires some clarifications detailed below.

2.1. Near Misses

Issue: The Near Misses definition needs refinement.

In the 2020 Guidelines, Near Misses were defined: "An event with significant probability of ignition, including wires down, contacts with objects, line slap, events with evidence of significant heat generation, and other events that could cause sparking or have the potential to cause ignition." Although this general definition was believed to be sufficient to capture the types of risk events that could potentially result in an ignition, the 2020 WMP review process revealed that greater specificity and guidance is required to obtain the intended data in a consistent and meaningful manner.

Through its spatial data reporting standards, the WSD plans to standardize the reporting of risk events and other pertinent data to ensure that relevant data attributes are collected and provided for analysis. The risk events data can then be filtered for specific information pertinent to the types of risk events that are informative of "nearly missed" ignitions (e.g., fault events cleared by an expulsion type fuse, outages caused by vegetation contact, etc.). This subset of risk events can then be categorized, when warranted, as "near-misses," but the totality of all risk events needs to be understood and analyzed before such a determination can be made. This enables WSD to account for spatial and temporal risk factors that can exacerbate the inherent wildfire ignition risk of risk events (i.e., location in HFTD, incidence during extreme fire weather conditions, etc.).

The WSD looks forward to working with electrical corporations and stakeholders to identify all the permutations of risk events that can identify "near-misses," as intended in the 2020 WMP Guidelines.

Recommendations:

- **Recommendation T2a:** WSD recommends keeping the broad definition of "near-misses," but renaming to "risk events" and clarifying that the below events all count as risk events:
  - Ignitions
  - Outages not caused by vegetation
  - Vegetation-caused outages
  - Wire-down events
  - Faults
  - Other events with significant probability of ignition

  Further details on risk events are reported in the new risk events table 7 (see Attachment 2.2, 2021 WMP Update Guidelines template).

2.2. Utility Inspection Findings

Issue: The metrics in Table 1 did not account for the effectiveness of inspections because they were normalized by total circuit miles rather than total circuit miles inspected. Moreover, several normalization errors on utility-reported data lead to difficulties comparing metrics across utilities.

Recommendations:

- **Recommended Change T2b:** Remove "findings / total circuit miles" metric, and instead request two metrics for each finding level –
  - # of findings by level (e.g., Level 1 findings)
  - # of circuit miles inspected (e.g., X miles)

- **Recommended Change T2c:** WSD plans to conduct normalization calculations across utilities. Normalization parameters are provided in relevant tables (e.g., Red Flag Warning Overhead Circuit Mile Days from Table 10)

2.3. Customer Hours of PSPS

Issue: Need to ensure consistency in the reporting of planned outages.

Recommendations:

- **Recommended Change T2d:** Metric added into Table 12 PSPS data and moved to the separate PSPS section (section 8).

2.4. Utility Ignited Wildfire Fatalities

Issue: No citation to disaggregated data of wildfire fatality reports.

Recommendation:

- R**ecommended Change T2e:** Cite Incident Reports for disaggregated data of fatalities in Appendix. Reference reports made to the Commission.

2.5. Accidental deaths resulting from utility wildfire mitigation initiatives

Issue: Phrasing - Deaths are presumed to be accidental.

Recommendation:

- **Recommended Change T2f:** Drop word Accidental, change to Fatalities.

2.8. Number of Structures Destroyed

Issue: Reporting of critical infrastructure damages not included in prior WMP.

Recommendation:

- **Recommended Change T2h:** Add reporting of critical infrastructure damaged or destroyed by wildfires.

2.11 Critical Infrastructure Impacted by PSPS

Issue: Normalization numbers raised unnecessary confusion and calculation errors.

Recommendations:

- **Recommended Change T2i:** Delete line item for normalization.
- **Recommended Change T2j:** Consolidate with Table 12 as a stand-alone PSPS table.

If all the above changes are adopted, Table 2 would be significantly different. The new example Table 2, reflecting the proposed changes, is below. Normalization is deleted and PSPS data is moved to the PSPS section.

Metric	#	Description	2016	…	2020	Units	Comments
1. Risk events	1a	Number of all risk events (under revised definition)				Number per Year	normalized rows deleted
	1b	Number of wires down (total)				Number per year	
	1c	Number of outages not caused by contact with vegetation				Number per year	
	1d	Number of outages caused by contact with vegetation				Number per year	
2. Utility Inspection Findings	2a	Number of Level 1 findings, etc.				Number of Level 1 findings	
	2b	Level 2 findings				Number of Level 2 findings.	
	2c	Level 3 findings				Number of Level 3 findings.	
	2d	Circuit miles inspected				Circuit miles	Row added

Metric	#	Description	2016	…	2020	Units	Comments
3. Customer Hours of PSPS	3a -3e					Hours per year	Moved to PSPS section, normalized rows deleted
4. Utility Ignited wildfire fatalities	4a	Fatalities (total)				Fatalities per year	normalized rows deleted
5. Fatalities from mitigation initiatives	5a	Deaths due to mitigation activities				Deaths per year	normalized rows deleted
6. OSHA reportable injuries	6a	Injuries per year					normalized rows deleted
7. Value of Assets destroyed	7a	Value of Assets destroyed by utility ignited wildfire					normalized rows deleted
8. Structures Damaged	8a	Number of Structures Damaged by utility ignited wildfire					normalized rows deleted
9. Acreage Burned	9a	Acreage burned by utility ignited wildfire					normalized rows deleted
10. Number of Utility wildfire ignitions	10a	Number of Ignitions (total)				# Ignitions	normalized rows deleted
	10b	Ignitions in HFTD 1				# Ignitions	
	10c	Ignitions in HFTD 2				# Ignitions	
	10d	Ignitions in HFTD 3				# Ignitions	
	10e	Ignitions in non-HFTD				# Ignitions	

Table 3: Additional Metrics –

Issue: Data reported in this table was highly inconsistent among utilities and did not necessarily lead to usable data.

Recommendation:

- **Recommended Change T3a:** WSD to standardize table for utilities to describe additional metrics. Similar to Table 3 in the 2020 WMP.

Table 4: Program Targets –

Issue: Great variation among utilities made for difficulty in assessing items.

Recommendation:

- **Recommended Change T4a:** Remove from metrics section and add to section 5 under "program targets" with the following text and table:

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

List and describe all program targets the electrical corporation uses to track utility WMP implementation and utility performance over the last five years. For all program targets, list the 2019 and 2020 performance, units on the metrics reported, the assumptions that underlie the use of those metrics, update frequency, and how the performance reported could be validated by third parties outside the utility, such as analysts or academic researchers. Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of each targeted preventive strategy and program.

List and description of program targets, last 5 years

Program target	2019 performance	2020 performance	Units	Underlying assumptions	Update frequency	Third-party validation

Add additional rows as needed

Table 5: Accidental Deaths due to Mitigations –

Issue: Important to capture all fatalities associated with mitigations. Table 5 also needs clarification of "wildfire mitigation initiatives" in instructions.

Recommendation:

- **Recommended Change T5a:** Change language to "Fatalities associated with all initiatives reported in previous or current WMP filings."

Table 6: Occupational Safety and Health Administration (OSHA) Reportable Injuries due to Mitigations

Issue: Table 6 needs clarification of what is meant by "wildfire mitigation initiatives" in instructions.

Recommendation:

- **Recommended Change T6a:** Change language to "Injuries associated with all initiatives reported in previous or current WMP filings."

Table 7: Methodology

Issue: Information better captured in narrative format.

Recommendation:

- **Recommended Change T7a:** Eliminate table; add methodology reporting to section 4: Lessons learned and risk trends.

Table 8: Map File Requirements for Weather Conditions

Issue: Mapping data not appropriate for WMP tables but instead should be presented as GIS data.

Recommendation:

- **Recommended Change T8a:** Eliminate table; Not appropriate for WMP tables but must be included as part of GIS data submissions.

Table 9: Map File Baseline

Issue: Mapping data not appropriate for WMP tables but instead should be presented as GIS data.

Recommendation:

- **Recommended change T9a:** Eliminate table; not appropriate for WMP tables but must be included as part of GIS data submissions.

Table 10: Weather

Issue: Inconsistent weather reporting from utilities. Utilities used proprietary or inconsistent methodologies for weather calculations, most relevant being Red Flag Warning (RFW) circuit-mile days.

Recommendation:

- **Recommended Change T10a:** Clarify Table 10 to use standardized methodologies for calculating weather variables such as Red-Flag-Warning days to make weather data comparable across utilities.
- **Recommended Change T10b:** Update the definition of RFW circuit-mile days to "RFW overhead (OH) circuit miles" defined as: "intended to capture the duration and scope of the fire weather within a given time period and is calculated as the number of overhead circuit miles that were under an RFW multiplied by the number of days those miles were under said RFW. For example, if 100 overhead circuit miles were under an RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW OH circuit mile days would be 110."
- **Recommended Change T10c:** Remove the requirements for "95th / 99th percentile wind conditions" and replace with "High Wind Warning" as defined by the National Weather Service. Add the metric "High Wind Warning (HWW) circuit mile days" which is defined as: Sum of overhead circuit miles of utility grid subject to High Wind Warning each day within a given time period, calculated as the number of overhead circuit miles that were under an HWW multiplied by the number of days those miles were under said HWW. For example, if 100 overhead circuit miles were under an HWW for 1 day, and 10 of those miles were under HWW for an additional day, then the total HWW OH circuit mile days would be 110.

Table 11 a & b: Key Drivers of Ignition metrics

Issue: Duplicative with Tables 2 and 18.

Recommendations:

- **Recommended Change T11a**: Change to "rate of ignition" from "probability of ignition."
- **Recommended Change T11b:** Combine with Table 18 into a single table.

Table 12: Recent Use of PSPS –

Issue: Utilities defined PSPS events differently, making cross-comparison difficult.

Recommendations:

- **Recommended Change T12a:** Ensure utilities uniformly define PSPS "event" based on existing definition of PSPS: the time-period from the first customer notified of a planned public safety de-energization to the final customer re-energized.
- **Recommended change T12b**: Move to PSPS section.

Table 15: Fault Locators –

Issue: This is a lagging technology that is being replaced by better sensors.

Recommendation:

- **Recommended Change T15a:** Eliminate in WMP.

Table 18: Drivers of Ignition 5-year Avg –

Issue: Although important, this is duplicative of data provided in Table 11a & b and can be combined.

Recommendation:

- **Recommended Change T18a:** Combine with Table 11a & b; change to "rate of ignitions" as unit.

G. Section 7: Mitigations

Issue: Some columns were not used in mitigation Tables (21-30): “Line miles to be treated” and “Other risk drivers addressed”.

Recommendation:

- **Recommended Change 7a:** In most tables, the column “Line Miles to Be Treated” is not relevant and will be eliminated. Column “Spend per treated line mile” will be kept.
- **Recommended Change 7b:** In most tables “Other Risk Drivers Addressed” was not relevant and will be eliminated.

Issue: There was misalignment between financial spend reporting across electrical corporations. Based on utility financial disaggregated reports, electrical corporations categorize their activity spending differently from WSD’s initiative activity categorization.

Recommendation:

- **Recommended Change 7c:** Allow aggregation across financial spend activities when spend cannot be disaggregated. Require reasoning as to why spend cannot be disaggregated. Explicit directions are as follows:
    - Add a column (for purposes of example, referenced as “column XYZ”) in financials data for utilities to mark where sub-categories are being aggregated, or where a specific sub-category are a part of normal operation spending unrelated to wildfire mitigation initiatives.
    - In a situation where a utility cannot disaggregate the financial spend of a specific category, the utility will enter $0 into that category's spend field and in column XYZ note into which subcategory the spending has been consolidated or mark that spend is a part of general operations. In the comments section the utility will explain why spend cannot be disaggregated.
    - Example 1: If a utility does not disaggregate mitigation spending between activities "Ignition probability mapping showing the probability of ignition along the electric lines and equipment" and "Climate-driven risk map and modelling based on various relevant weather scenarios", then the utility will mark all spending across both categories into "Climate-driven risk map…", mark $0 for spending in "Ignition probability mapping…", and in column XYZ mark in the "Ignition probability mapping…" row that it's spend is included in the spend for Climate-driven risk map…" (or vice-versa, marking all spend in “Ignition probability mapping” and $0 in “Climate-driven risk map…”).
    - Example 2: If a utility does not track spending in activity "Centralized repository for data" in how it relates to wildfire / PSPS mitigation, then utility should report $0 in spend and mark in column XYZ - "general operations".

- **Recommended Change 7d:** Align risk mitigation drivers with high-level "cause categories" from spatial schema. All initiative activities shall be reported to target one or more of the ignition drivers mentioned in the high-level “cause categories” in the risk events spatial schema. List of categories below:
    - Object contact – vegetation
    - Object contact – other
    - Equipment failure

- Wire-to-wire contact
- Contamination
- Normal operation
- Vandalism / Theft
- Unknown
- Other

Issue: Limited details provided on each of the initiative activities and current progress.

Recommendation:

- **Recommended Change 7e:** Each initiative activity with spending above $0 in financials tables will require a brief narrative sub-section describing it with the following elements as headers:
  - Risk to be mitigated / problem to be addressed
  - Initiative selection ("why" engage in activity) – include some reference to a risk informed analysis on empirical (or projected) impact of initiative in comparison to alternatives
  - Region prioritization ("where" to engage activity) – include some reference to a risk informed analysis in allocation of initiative (e.g., veg clearance is done for trees tagged as "high-risk")
  - Progress on initiative (amount spent, regions covered) and plans for next year
  - Future improvements to initiative

Issue: Risk-Spend-Efficiency (RSE) of an initiative can vary based on where it is applied; however, current reporting requires RSE be reported by initiative regardless of regional conditions.

Recommendation:

- **Recommended Change 7f:** RSE for each initiative shall be reported as 3 numbers:
  - RSE in HFTD tier 3 areas
  - RSE in HFTD tier 2 areas
  - RSE in non-HFTD regions

Issue: Section 7.2d is ambiguous and limited in value relative for the volume of information and work this would require for utilities to write and for WSD to review properly. Requirement in footnote for reference.[9]

Recommendation:

- **Recommended Change 7g:** Remove Section 7.2d

[9] 7.2D: For all data that is used to drive wildfire-related decisions, including grid operations, capital allocation, community engagement, and other areas, provide a thorough description of the utility's data architecture and flows. List and describe 1) all dashboards and reports directly or indirectly related to ignition probability and estimated wildfire consequences and reduction, and 2) all available GIS data and products. For each, include metadata and a data dictionary that defines all information about the data. For each, also describe how the utility collects data, including a list of all wildfire-related data elements, where it is stored, how it is accessed, and by whom. Explain processes for QA/QC, cleaning and analyzing, normalizing, and utilizing data to drive internal decisions. Include list of internal data standards and cross-reference for they datasets or map products to which the standards apply.

H. NEW Public Safety Power Shutoff Section 8, including Directional Vision

Issue: PSPS information is scattered throughout WMP.

Recommendation: Create a separate section in the WMP for PSPS data and information.

- **Recommended Change 8a**: Consolidate data requirements that previously appeared in the Outcome Metrics Tables 2.3 and 2.10, in Table 12, of the WMP and in several tables that were part of the Supplemental Data Request (SDR):
    - Table 2a Percent of Customers impacted by PSPS
    - Table 5b Number and impact of PSPS
    - Table 11 PSPS Events
    - Table 12 Ignitions avoided by PSPS
    - Table 13 a-c Frequency, Scope and Duration of PSPS

- **Recommended Change 8b:** Add new metrics regarding community outreach of PSPS. Report the following metrics quarterly at the bottom of the PSPS metrics section if not reported earlier in the tables above
    - # of customers impacted by PSPS (if multiple PSPS events impact the same customer, count each event as a separate customer) – segment population by HFTD tier & medical baseline status
    - # of customers notified prior to initiation of PSPS event (if customer notified for multiple PSPS events, count each event as a separate customer contact. Only count a customer once per event if contacted multiple times regarding the same PSPS event) – segment population by HFTD tier & medical baseline status
    - # of customers who found utility's PSPS notification and education resources effective. Reported via survey of a representative sample of the utility's population – metric to be considered for longer-term
    - % of customers notified prior to a PSPS event impacting them – segment population by HFTD tier & medical baseline status

- **Recommended Change 8c**: In the WMP glossary, clarify the definition of critical facilities / infrastructure based on the interim definition adopted in Decision (D.) 19-05-042.

- **Recommended Change 8d**: Require utilities to report protocols for mitigating the public safety impacts of PSPS on vulnerable, marginalized and/or at-risk communities disproportionately impacted by PSPS. Add the following text to Section 8.3 of the WMP:
    - Describe protocols for Public Safety Power Shut-off (PSPS or de-energization) that are intended to mitigate the public safety impacts of PSPS on vulnerable, marginalized and/or at-risk communities. Describe how the utility is identifying these communities.

- **Recommended Change 8e:** to ensure utilities comply with D.20-03-004 to engage communities in all languages "prevalent"[10] in their respective territories, add the following text to Section 8.3 of the WMP:
    - List all languages which are "prevalent" in utility's territory. A language is prevalent if it is spoken by 1,000 or more persons in the utility's territory (D.20-03-004) 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.
    - List all languages for which public outreach material is available
    - Detail the community outreach efforts for PSPS and wildfire-related outreach. Include efforts to reach all languages prevalent in utility territory.

[10] A language is "prevalent" if it is spoken by 1,000 or more persons in the territory of an Investor Owned Utility or Small or Multijurisdictional Utility, 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 – D.20-03-004

I. NEW WMP Directive: Citing relevant statutes and orders in narrative and initiatives

Issue: In previous WMP reports, references to relevant statutes, orders, and proceedings were missing or placed in disparate locations.

Recommendation:

- **Recommended change 9a**: Throughout the WMP, cite relevant state and federal statutes, orders, and proceedings (title of statute in parentheses next to comment, or placed in relevant area in table), with a brief description or summary of the relevant portion of the statute provided in the appendix.

J. NEW Commission Directive:

A recent Commission decision in the PSPS rulemaking (D.20-05-051) ordered:

- "Beginning in 2021, each electric investor-owned utility Wildfire Mitigation Plan shall include specific short, medium, and long-term actions the utility will take to reduce the impact of and need for de-energization events to mitigate wildfire risk."

- **Recommendation for Directive 10a:** Move existing section 4.4 from 2020 WMP Guidelines to PSPS section, keep instructions as is for narrative and table, but require narrative be organized under subheadings for short (1 year), medium (3 years), and long-term (10 years) plans.

K. Maturity Model: Maintain general structure to enable progress tracking

The 2020 WMP maturity model enabled WSD to collect key baseline information on the utilities. To enable progress tracking against the 2020 baseline, it is essential that the maturity model remains consistent over the three-year plan period. Language is updated to improve clarity and align with 2021 definitions (e.g., changing “near-miss” to “risk event”), but more foundational changes will be considered for the Maturity Model in its 2023-2025 WMP update. Refer to Attachment 2.4 for the complete Maturity Model.

ATTACHMENT 2.2

Wildfire Safety Division

Attachment 2.2: 2021 Wildfire Mitigation Plan Guidelines Template

November 2020

I. Wildfire Mitigation Plan (WMP) submission and review process

The California Public Utilities Commission (henceforth the CPUC or the Commission) Guidance in Decision (D.19-05-036) included substantive and procedural requirements for future Wildfire Mitigation Plans (WMP) based on lessons learned during the first WMP (2019) evaluation and established an expectation for improvement in the WMPs each year. Several improvements were made for the 2020 WMP and highlighted the need for continuous improvement moving forward.

The experience of the 2020 WMP submission and review process points towards the benefit of streamlined structure and consistency in data, receiving supporting data earlier in the WMP process, and utilizing a structured and consistent approach to evaluate utility wildfire mitigation. Several guiding principles based on lessons learned, comments from stakeholders, and input from the Wildfire Safety Advisory Board, inform the WMP Update Guidelines for 2021: frontloading the WMP review cycle where possible, standardizing information collection, systematizing qualitative information, and tracking utility progress towards wildfire and PSPS risk reduction.

Accordingly, the WSD will consider these four key elements for the 2021 WMP Update submission and review process:

1. **Frontload data collection.** This would extend the timeframe for WSD and stakeholder review of relevant utility data in advance of the WMP submission and review period, in addition to reducing the need for follow-up data requests. This means some data is collected prior to the annual WMP through Quarterly Reports.
2. **Standardize templates for utility WMP submission.** Templates help WSD staff more easily uncover relevant supporting information and facilitate comparison across utilities. Utilities will organize their annual WMP Updates based on narrative sections and through additional sub-headings. Utilities will be required to follow a specific schema and pass automated calculation checks for data provided in Quarterly Reports.
3. **Systematize qualitative evaluation.** An assessment framework increases the objectivity of review and allows the WSD to more efficiently conduct a thorough review.
4. **Tracking utility progress towards wildfire and PSPS risk reduction.** The 2021 WMP Update serves as the year one update to three-year plans established in 2020. The 2021 WMP update highlights the progress utilities have made to their existing plans and is reviewed in relation to the claims made in 2020, change orders and other required filings.

II. Wildfire Mitigation Plan (WMP) Update Guidelines Template

Structure

The WMP Update (commonly referred to as "WMP" in this document) itself is composed of eight sections plus an appendix:

1. Persons responsible for executing the plan - Contact information for executives responsible, program owners and experts
2. Adherence to statutory requirements - Checklist for each requirement and cite where it was addressed in WMP
3. Actuals and planned spending - Cost summary tables and impacts to ratepayers
4. Lessons learned and risk trends - 1, 3 and 10-year investor-owned utility (IOU) outlook, projected trends in wildfire risk, research reports and proposals, and model and metric calculation methodologies
5. Inputs to the plan and directional vision - goals, objectives, program targets, and worker qualifications
6. Metrics and underlying data – Placeholder for quarterly submissions of WMP metrics. To be filled in by data from prior submissions and Quarterly Reports
7. Mitigation initiatives - Reporting of initiative progress, spend and Risk-Spend Efficiency (RSE)
8. Public Safety Power Shutoff - Separate section for PSPS narrative and data, including customer impact and cost
9. Appendix – Citations to relevant statutes, Commission directives, proceedings and orders

Instructions for filling out the WMP are given with each section of the WMP. Sections of the WMP contain a portion for the utility to provide narrative responses. This narrative response may include quantitative and qualitative explanations, as well as supporting documentation including relevant maps, spreadsheets, photographs, and other relevant information. Many sections also instruct the utility to provide a separate quantitatively-focused response, where tables must be filled out by utilities according to the instructions provided in each section.

Some tables include comment boxes. Utilities may extend the size of comment boxes as needed to provide an adequate description for each aspect of the WMP. Some tables, such as those in section 3, are required to be filled out directly in the WMP report alongside the narrative content. Other tables, which require data to be filled out in a separate spreadsheet document, are reported through the Quarterly Reports. Edits to the Quarterly Report metrics can be provided in the attached spreadsheet document as needed. For any table to be edited, report all data required in that table, not just the data to be edited, and note in the narrative of the corresponding section that the table has been updated.

If any portion of the WMP requires information that the utility has not collected itself nor could ascertain based on information that the utility does collect, the utility shall work with federal, state, and local agencies, stakeholders, and partners to collect or compile the information.

Where the information in question is not collected by any stakeholder and cannot be collected by the utility, the utility shall indicate this and include a description of the information that the utility and/or other stakeholders do track that most closely fits the requirement. Clearly cite all source data used in lieu of the data requested in the requirement.

For example, by the WMP deadline, the utility may not have a full accounting of the value of property destroyed by utility-ignited wildfire in a given year due to ongoing investigation into the cause of one or more wildfires within its service territory. In this example, the utility shall indicate 1) the known sum of the value of property determined by fire Authorities having jurisdiction (AHJs) to have been destroyed by utility-ignited wildfire in that year, albeit incomplete, and 2) a list of the wildfires in that year for which utility facilities are being investigated as a potential source of ignition

but for which the cause is still undetermined and an estimation of value of property destroyed by each. The utility shall cite all data sources used in the calculations.

Finally, the utility shall describe its plan to improve its data collection and/or cooperation with partners with the goal of collecting the required information, including the timeline to implementation.

In the event that any of the requested information is confidential, the utility shall provide two versions to the WSD, one which includes all of the information and a second that does not include the confidential information.

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0 Glossary of defined terms

Term	Definition
10-hour dead fuel moisture content	Moisture content of small dead vegetation (e.g. grass, leaves, which burn quickly but not intensely), which can respond to changes in atmospheric moisture content within 10 hours.
Access and functional needs populations	Per Government Code § 8593.3 and D.19-05-042, individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking, older adults, children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant.
Authority Having Jurisdiction	AHJ, party with assigned responsibility, depending on location and circumstance.
Asset (utility)	Electric lines, equipment, or supporting hardware.
At-risk species	Species of vegetation that are particularly likely to contact power lines in the event of high winds and/or ignite if they catch a spark.
Baseline (ignition probability, maturity)	A measure, typically of the current state, to establish a starting point for comparison.
Carbon dioxide equivalent	Tons of greenhouse gases (GHG) emitted, multiplied by the global warming potential relative to carbon dioxide.
Circuit mile	The total length in miles of separate circuits regardless of the number of conductors used per circuit
Contractor	Any individual in the temporary and/or indirect employ of the utility whose limited hours and/or time-bound term of employment are not considered as “full-time” for tax and/or any other purposes.

Critical facilities and infrastructure	For brevity in the 2021 WMP, “critical facilitates and infrastructure” may be shortened to “critical infrastructure” and/or “critical facilities” throughout the WMP. Critical facilities and infrastructure is defined in accordance with the definition adopted in D.19-05-042 and modified in D.20-05-051: those facilities and infrastructure that are essential to the public safety and that require additional assistance and advance planning to ensure resiliency during de energization events. Namely:
	• Emergency Services Sector
	  ○ Police Stations
	  ○ Fire Station
	  ○ Emergency Operations Centers
	  ○ Public safety answering points
	• Government Facilities Sector
	  ○ Schools
	  ○ Jails and prisons
	• Healthcare and Public Health Sector
	  ○ Public Health Departments

	○ Medical facilities, including hospitals, skilled nursing facilities, nursing homes, blood banks, health care facilities, dialysis centers and hospice facilities (excluding doctor offices and other non-essential medical facilities) • Energy Sector ○ Public and private utility facilities vital to maintaining or restoring normal service, including, but not limited to, interconnected publicly-owned utilities and electric cooperatives • Water and Wastewater Systems Sector ○ Facilities associated with the provision of drinking water or processing of wastewater including facilities used to pump, divert, transport, store, treat and deliver water or wastewater • Communications Sector ○ Communication carrier infrastructure including selective routers, central offices, head ends, cellular switches, remote terminals and cellular sites • Chemical Sector ○ Facilities associated with the provision of manufacturing, maintaining, or distributing hazardous materials and chemicals (including Category N-Customers as defined in D.01-06-085) • Transportation Sector ○ Facilities associated with automobile, rail, aviation, major public transportation, and maritime transportation for civilian and military purposes
Customer hours	Total number of customers, multiplied by the average number of hours (e.g. of power outage).
Data cleaning	Calibrating raw data to remove errors (including typographical and numerical mistakes).
Dead fuel moisture content	Moisture content of dead vegetation, which responds solely to current environmental conditions and is critical in determining fire potential.
Detailed inspection	In accordance with GO 165, an inspection where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.
Enhanced inspection	Inspection whose frequency and thoroughness exceeds the requirements of the detailed inspection, particularly if driven by risk calculations.
Evacuation impact	Number of people evacuated, with the duration for which they are evacuated, from homes and businesses, due to wildfires.
Evacuation zone	Areas designated by CAL FIRE and local fire agency evacuation orders, to include both “voluntary” and “mandatory” in addition to other orders such as “precautionary” and “immediate threat”.
Fuel density	Mass of fuel (vegetation) per area which could combust in a wildfire.
Fuel management	Removing or thinning vegetation to reduce the potential rate of propagation or intensity of wildfires.
Fuel moisture content	Amount of moisture in a given mass of fuel (vegetation), measured as a percentage of its dry weight.
Full-time employee	Any individual in the ongoing and/or direct employ of the utility whose hours and/or term of employment are considered as “full-time” for tax and/or any other purposes.

GO 95 nonconformance	Condition of a utility asset that does not meet standards established by General Order 95.
Greenhouse gas (GHG) emissions	Health and Safety Code 38505 identifies seven greenhouse gases that ARB is responsible to monitor and regulate in order to reduce emissions: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF3).
Grid hardening	Actions (such as equipment upgrades, maintenance, and planning for more resilient infrastructure) taken in response to the risk of undesirable events (such as outages) or undesirable conditions of the electrical system in order to reduce or mitigate those events and conditions, informed by an assessment of the relevant risk drivers or factors.
Grid topology	General design of an electric grid, whether looped or radial, with consequences for reliability and ability to support de-energization (e.g., being able to deliver electricity from an additional source).
High Fire Threat District (HFTD)	Per D.17-01-009, areas of the State designated by the CPUC and CAL FIRE to have elevated wildfire risk, indicating where utilities must take additional action (per GO 95, GO 165, and GO 166) to mitigate wildfire risk.
Highly rural region	In accordance with 38 CFR 17.701, "highly rural" shall be defined as those areas with a population of less than 7 persons per square mile. For the purposes of the WMP, "area" shall be defined as census tracts.
High Wind Warning (HWW)	Level of wind risk from weather conditions, as declared by the National Weather Service. For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings.[1]
HWW overhead (OH) Circuit Mile Day	Sum of overhead circuit miles of utility grid subject to High Wind Warnings (HWW, as defined by the National Weather Service) each day within a given time period, calculated as the number of overhead circuit miles that were under an HWW multiplied by the number of days those miles were under said HWW. For example, if 100 overhead circuit miles were under an HWW for 1 day, and 10 of those miles were under HWW for an additional day, then the total HWW OH circuit mile days would be 110.
Ignition probability	The relative possibility that an ignition will occur, probability is quantified as a number between 0% and 100% (where 0% indicates impossibility and 100% indicates certainty). The higher the probability of an event, the more certainty there is that the event will occur. (Often informally referred to as likelihood or chance).
Ignition-related deficiency	Any condition which may result in ignition or has previously resulted in ignition, even if not during the past five years.
Impact/consequence of ignitions	The effect or outcome of a wildfire ignition, affecting objectives, which may be expressed by terms including, although not limited to health, safety, reliability, economic and/or environmental damage.
Initiative	Measure or activity proposed or in process designed to reduce the consequences and/or probability of wildfire or PSPS.
Inspection protocol	Documented procedures to be followed in order to validate that a piece of equipment is in good condition and expected to operate safely and effectively.
Invasive species	Non-native species whose proliferation increases the risk of wildfires.

[1] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml

Level 1 finding	In accordance with GO 95, an immediate safety and/or reliability risk with high probability for significant impact.
Level 2 finding	In accordance with GO 95, a variable (non-immediate high to low) safety and/or reliability risk.
Level 3 finding	In accordance with GO 95, an acceptable safety and/or reliability risk.
Life expectancy	Anticipated years that a piece of equipment can be expected to meet safety and performance requirements.
Limited English Proficiency (LEP)	Populations with limited English working proficiency based on the International Language Roundtable scale.
Line miles	The number of miles of transmission and/or distribution line. Differs from circuit miles because individual circuits, such as the two circuits of a double-circuit line, are not counted separately in circuit miles but are counted as separate total miles of line.
Live fuel moisture content	Moisture content within living vegetation, which can retain water longer than dead fuel.
Lost energy	Energy that would have been delivered were it not for an outage.
Major roads	Interstate highways, U.S. highways, state and county routes.
Match drop simulation	Wildfire simulation method that takes an arbitrary ignition and forecasts propagation and consequence/impact.
Member of the public	Any individual not employed by the utility.
Multi-attribute value function	Risk calculation methodology introduced during CPUC's S-MAP and RAMP proceedings.
Near miss	Previously used to define an event with probability of ignition. Redefined under “Risk event.”
Need for PSPS	When utilities' criteria for utilizing PSPS are met.
Noncompliant clearance	Rights-of-way whose vegetation is not trimmed in accordance with the requirements of GO 95.
Outages of the type that could ignite a wildfire	Outages that, in the judgement of the utility, could have ignited a wildfire.
Outcome metrics	Measurements of the performance of the utility and its service territory in terms of both leading and lagging indicators of wildfire, PSPS, and other consequences of wildfire risk, including the potential unintended consequences of wildfire mitigation work, such as acreage burned by utility-ignited wildfire.
Overcapacity	When the energy transmitted by utility equipment exceeds that of its nameplate capacity.
Patrol inspection	In accordance with GO 165, a simple visual inspection of applicable utility equipment and structures that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.
Percentile conditions	Top X% of a particular set (e.g. wind speed), based on a historical data set with sufficient detail. For example, “Top 95 percentile wind speeds in the last 5 years” would refer to the 5% of avg daily wind speeds recorded by each weather station. If 1,000 weather stations recorded average daily wind speeds over 10 days, then the 95th percentile wind speed would be the top 5% of weather station-days. In this example, there will be 10 days each with 1,000 weather station reports and a total of 10,000 weather station-days, so 50 observations will be in the top 5%. The lowest wind speed in this top 5% would be the “95th percentile wind speed”.
Planned outage	Electric outage announced ahead of time by the utility.

Preventive maintenance (PM)	The practice of maintaining equipment on a regular schedule, based on risk, elapsed time, run-time meter readings, or number of operations. The intent of PM is to "prevent" maintenance problems or failures before they take place by following routine and comprehensive maintenance procedures. The goal is to achieve fewer, shorter, and more predictable outages.
Priority essential services	Critical first responders, public safety partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water utilities/agencies.
Program targets	Quantifiable measurements of activity identified in WMPs and subsequent updates used to show progress towards reaching the objectives, such as number of trees trimmed or miles of power lines hardened.
Progress metrics	Measurements that track how much utility wildfire mitigation activity has changed the conditions of utility wildfire risk exposure or utility ability to manage wildfire risk exposure, in terms of leading indicators of ignition probability and wildfire consequences.
Property	Private and public property, buildings and structures, infrastructure, and other items of value that were destroyed by wildfire, including both third-party property and utility assets.
PSPS event	Defined as the time period from the first public safety partner notified of a planned public safety de-energization to the final customer re-energized.
PSPS risk	The potential for the occurrence of a PSPS event expressed in terms of a combination of various outcomes of the event and their associated probabilities.
PSPS weather	Weather that exceeds a utility's risk threshold for initiating a PSPS.
Red Flag Warning (RFW)	Level of wildfire risk from weather conditions, as declared by the National Weather Service. For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings.[2]
RFW OH Circuit Mile Day	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 miles were under said RFW. For example, if 100 overhead circuit miles were under an RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW OH circuit mile days would be 110.
Risk event	An event with probability of ignition, including wires down, contacts with objects, line slap, events with evidence of heat generation, and other events that cause sparking or have the potential to cause ignition. The following risk events all qualify as risk event: • Ignitions • Outages not caused by vegetation • Vegetation-caused outages • Wire-down events • Faults • Other risk events with potential to cause ignitions
Risk event simulation	Simulation of what the consequence would have been of an ignition had it occurred.
Risk-spend efficiency (RSE)	An estimate of the cost-effectiveness of initiatives, calculated by dividing the mitigation risk reduction benefit by the mitigation cost estimate based on the full set of risk reduction benefits estimated from the incurred costs. For ongoing initiatives, the RSE can be calculated by determining the "marginal benefit" of additional spending in the ongoing

[2] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml

	initiative. For example, the RSE of an ongoing initiative could be calculated by dividing the mitigation risk reduction benefit from a 5% increase in spend by the cost associated with a 5% increase in spend.
Rule	Section of public utility code requiring a particular activity or establishing a particular threshold.
Run-to-failure	A maintenance approach that replaces equipment only when it fails.
Rural region	In accordance with GO 165, "rural" shall be defined as those areas with a population of less than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, “area” shall be defined as census tracts.
Safety Hazard	A condition that poses a significant threat to human life or property.
Simulated wildfire	Propagation and impact/consequence of a wildfire ignited at a particular point ('match drop'), as simulated by fire spread software.
Span	The space between adjacent supporting poles or structures on a circuit consisting of electric lines and equipment. "Span level" refers to asset-scale granularity.
System Average Interruption Duration Index (SAIDI)	System-wide total number of minutes per year of sustained outage per customer served.
Third-party contact	Contact between a piece of electrical equipment and another object, whether natural (tree branch) or human (vehicle).
Time to expected failure	Time remaining on the life expectancy of a piece of equipment.
Top 30% of proprietary fire potential index	Top 30% of FPI or equivalent scale (e.g., “Extreme” on SCE’s FPI; “extreme”, 15 or greater, on SDG&E’s FPI; and 4 or above on PG&E’s FPI).
Trees with strike potential / hazard trees	Trees that could either 'fall in' to a power line, or have branches detach and 'fly in' to contact a power line in high-wind conditions.
Unplanned outage	Electric outage that occurs with no advance notice from the utility (e.g. blackout).
Urban region	In accordance with GO 165, "urban" shall be defined as those areas with a population of more than 1,000 persons per square mile as determined by the United States Bureau of the Census.
Utility-ignited wildfire	Wildfires ignited by utility infrastructure or employees, including all wildfires determined by AHJ investigation to originate from ignition caused by utility infrastructure. For the purposes of the WMP, “area” shall be defined as census tracts.
Vegetation management	Trimming and clearance of trees, branches, and other vegetation that poses the risk of contact with electric equipment.
Vegetation risk index	Risk index indicating the probability of vegetation-related outages along a particular circuit, based on the vegetation species, density, height, and growth rate.
Weather normalization	Adjusting metrics based on relative weather risk factors or indices
Wildfire impact/ consequence	The effect or outcome of a wildfire affecting objectives, which may be expressed, by terms including, although not limited to health, safety, reliability, economic and/or environmental damage.
Wildfire risk	The potential for the occurrence of a wildfire event expressed in terms of ignition probability, wildfire impact/consequence.
Wildfire-only WMP programs	Activities, practices, and strategies that are only necessitated by wildfire risk, unrelated to or beyond that required by minimum reliability and/or safety requirements. Such programs are not indicated or in common use in areas where wildfire risk is minimal (e.g., territory

	with no vegetation or fuel) or under conditions where wildfires are unlikely to ignite or spread (e.g., when rain is falling).
Wildland urban interface (WUI)	A geographical area identified by the state as a "Fire Hazard Severity Zone", or other areas designated by the enforcing agency to be a significant risk from wildfires, established pursuant to Title 24, Part 2, Chapter 7A.
Wire down	Instance where an electric transmission or distribution conductor is broken and falls from its intended position to rest on the ground or a foreign object.

1 Persons responsible for executing the WMP

Provide an accounting of the responsibilities of the responsible person(s) executing the plan, including:

1. Executive level with overall responsibility
2. Program owners specific to each component of the plan

Title, credentials and components of responsible must be released publicly, but other contact information may be provided in a redacted file attached to the WMP submission.

Executive-level owner with overall responsibility

- Name and title:
- Email:
- Phone number:

Program owners specific to each section of the plan

Note: A program owner may own multiple sections, and multiple components across sections, but each section must have a program owner accountable.

Section 1: Persons responsible for executing the plan

Program owner (add additional program owners if separated by component in section)

- Name and title:
- Email:
- Phone number:
- Component (if entire section, put "entire section"):

Section 2: Adherence to statutory requirements

Program owner (add additional program owners if separated by component in section)

- Name and title:
- Email:
- Phone number:
- Component (if entire section, put "entire section"):

Section 3: Actuals and planned spending

Program owner (add additional program owners if separated by component in section)

- Name and title:
- Email:

- Phone number:
- Component (if entire section, put “entire section”):

Section 4: Lessons learned and risk trends

Program owner (add additional program owners if separated by component in section)

- Name and title:
- Email:
- Phone number:
- Component (if entire section, put “entire section”):

Section 5: Inputs to the plan and directional vision

Program owner (add additional program owners if separated by component in section)

- Name and title:
- Email:
- Phone number:
- Component (if entire section, put “entire section”):

Section 6: Metrics and underlying data

Program owner (add additional program owners if separated by component in section)

- Name and title:
- Email:
- Phone number:
- Component (if entire section, put “entire section”):

Section 7: Mitigation initiatives

Program owner (add additional program owners if separated by component in section)

- Name and title:
- Email:
- Phone number:
- Component (if entire section, put “entire section”):

Section 8: Public Safety Power Shutoff

Program owner (add additional program owners if separated by component in section)

- Name and title:
- Email:
- Phone number:
- Component (if entire section, put “entire section”):

Section 9: Appendix

Program owner (add additional program owners if separated by component in section)

- Name and title:
- Email:

- Phone number:
- Component (if entire section, put “entire section”):

1.1 Verification

Complete the following verification for the WMP submission:

(See Rule 1.11)
(Where Applicant is a Corporation)

I am an officer of the applicant corporation herein, and am authorized to make this verification on its behalf. The statements in the foregoing document are true of my own knowledge, except as to matters which are therein stated on information or belief, and as to those matters I believe them to be true.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on _____ at _____, California.
(Date) (Name of city)

_____
(Signature and Title of Corporate Officer)

2 Adherence to statutory requirements

Section 2 comprises a "check list" of the CPUC Code Sec. 8386 (c) requirements and subparts. Each utility shall both affirm that the WMP addresses each requirement AND cite the Section or Page Number where it is more fully described (whether in Executive Summary or other section of the WMP).

Illustrative Table 2-1 check-list:

Requirement	Description	WMP Section/Page
2	The objectives of the plan	Section 4.1 pg. 13
10	Protocols for the de-energization of the electrical corporation's transmission infrastructure, etc.	Section 5 overview, pg. 30-31

Mark the following table with the location of each requirement. If requirement is located in multiple areas, mention all WMP sections and pages, separated by semi-colon (e.g., Section 5, pg. 30-32; Section 7, pg. 43)

Requirement	Description	WMP Section/Page
1	An accounting of the responsibilities of persons responsible for executing the plan	
2	The objectives of the plan	
3	A description of the preventive strategies and programs to be adopted by the electrical corporation to minimize the risk of its electrical lines and equipment causing catastrophic wildfires, including consideration of dynamic climate change risks	
4	A description of the metrics the electrical corporation plans to use to evaluate the plan's performance and the assumptions that underlie the use of those metrics	
5	A discussion of how the application of previously identified metrics to previous plan performances has informed the plan	
6	Protocols for disabling reclosers and deenergizing portions of the electrical distribution system that consider the associated impacts on public safety. As part of these protocols, each electrical corporation shall include protocols related to mitigating the public safety impacts of disabling reclosers and deenergizing portions of the electrical distribution system that consider the impacts on all of the aspects listed in PU Code 8386c	
7	Appropriate and feasible procedures for notifying a customer who may be impacted by the deenergizing of electrical lines, including procedures for those customers receiving a medical baseline allowance as described in paragraph (6). The procedures shall direct notification to all public safety offices, critical first responders, health care facilities, and operators of telecommunications infrastructure with premises within the footprint of potential deenergization for a given event	
8	Plans for vegetation management	
9	Plans for inspections of the electrical corporation's electrical infrastructure	
10	Protocols for the deenergization of the electrical corporation's transmission infrastructure, for instances when the deenergization may impact customers who, or entities that, are dependent upon the infrastructure	

11	A list that identifies, describes, and prioritizes all wildfire risks, and drivers for those risks, throughout the electrical corporation's service territory, including all relevant wildfire risk and risk mitigation information that is part of the Safety Model Assessment Proceeding and the Risk Assessment Mitigation Phase filings	
12	A description of how the plan accounts for the wildfire risk identified in the electrical corporation's Risk Assessment Mitigation Phase filing	
13	A description of the actions the electrical corporation will take to ensure its system will achieve the highest level of safety, reliability, and resiliency, and to ensure that its system is prepared for a major event, including hardening and modernizing its infrastructure with improved engineering, system design, standards, equipment, and facilities, such as undergrounding, insulation of distribution wires, and pole replacement	
14	A description of where and how the electrical corporation considered undergrounding electrical distribution lines within those areas of its service territory identified to have the highest wildfire risk in a commission fire threat map	
15	A showing that the electrical corporation has an adequately sized and trained workforce to promptly restore service after a major event, taking into account employees of other utilities pursuant to mutual aid agreements and employees of entities that have entered into contracts with the electrical corporation	
16	Identification of any geographic area in the electrical corporation's service territory that is a higher wildfire threat than is currently identified in a commission fire threat map, and where the commission should consider expanding the high fire threat district based on new information or changes in the environment	
17	A methodology for identifying and presenting enterprise wide safety risk and wildfire-related risk that is consistent with the methodology used by other electrical corporations unless the commission determines otherwise	
18	A description of how the plan is consistent with the electrical corporation's disaster and emergency preparedness plan prepared pursuant to Section 768.6, including plans to restore service and community outreach	
19	A statement of how the electrical corporation will restore service after a wildfire	

20	Protocols for compliance with requirements adopted by the commission regarding activities to support customers during and after a wildfire, outage reporting, support for low-income customers, billing adjustments, deposit waivers, extended payment plans, suspension of disconnection and nonpayment fees, repair processing and timing, access to electrical corporation representatives, and emergency communications	
21	A description of the processes and procedures the electrical corporation will use to do the following: (A) Monitor and audit the implementation of the plan. (B) Identify any deficiencies in the plan or the plan's implementation and correct those deficiencies. (C) Monitor and audit the effectiveness of electrical line and equipment inspections, including inspections performed by contractors, carried out under the plan and other applicable statutes and commission rules.	

(22) Cites "Any other information that the Wildfire Safety Division might require. While it is assumed such information will be incorporated into the WMP, substantive additions will be identified for easier reference.

3 Actuals and Planned Spending for Mitigation Plan

3.1 Summary of WMP initiative expenditures

In the Table 3-1, summarize the projected costs (in thousands) per year over the three-year WMP cycle, including actual expenditures for years passed. In Table 3-2 break out projected costs per category of mitigations, over the three-year WMP cycle. The financials represented in the summary tables below equal the aggregate spending listed in the mitigations financial tables reported quarterly. Nothing in this document shall be construed as a statement that costs listed are approved or deemed reasonable if the WMP is approved, denied, or otherwise acted upon.

Table 3-1: Summary of WMP Expenditures - Total

	Spend in thousands $
2020 WMP Planned	
2020 Actual	
Difference	
2021 Planned	
2022 Planned	
2020-22 Planned	

Table 3-2: Summary of WMP Expenditures by Category

WMP Category	2020 WMP Planned	2020 Actual	Difference	2021 Planned	2022 Planned	2020-22 Planned (w/ 2020 Actual)
Risk and Mapping						
Situational Awareness						
Grid Design and System Hardening						
Asset Management and Inspections						
Vegetation Management						
Grid Operations						
Data Governance						
Resource Allocation						
Emergency Planning						
Stakeholder Cooperation and Community Engagement						
Total						

3.2 Summary of ratepayer impact

Report the projected cost increase to ratepayers due to utility-ignited wildfires and wildfire mitigation activities engaged in each of the years below. Account for all expenditure incurred in that year due to utility-ignited wildfires / mitigation activities and provide methodology behind calculation below Table 3-3.

Table 3-3: WMP Electricity cost increase to ratepayers

	Annual performance - Actual					
Outcome metric name	2016	2017	2018	2019	2020	Unit(s)
Increase in electric costs to ratepayer due to utility-ignited wildfires (total)						Dollar value of average monthly rate increase attributable to utility-ignited wildfires per year (e.g., $3/month on average across customers for utility-ignited wildfires occurring in 20XX)
Increase in electric costs to ratepayer due to wildfire mitigation activities (total)						Dollar value of average monthly rate increase attributable to WMPs per year

4 Lessons Learned and Risk Trends

4.1 Lessons Learned: how tracking metrics on the 2020 plan has informed the 2021 plan

Describe how the utility's plan has evolved since the 2020 WMP submission. Outline any major themes and lessons learned from the 2020 plan and subsequent implementation of the initiatives. In particular, focus on how utility performance against the metrics used has informed the utility's 2021 WMP.

4.2 Understanding major trends impacting ignition probability and wildfire consequence

Describe how the utility assesses wildfire risk in terms of ignition probability and estimated wildfire consequence, including use of Multi-Attribute Risk Score (MARS) and Multi-Attribute Value Function (MAVF) as in the Safety Model and Assessment Proceeding (S-MAP)[3] and Risk Assessment Mitigation Phase (RAMP), highlighting changes since the 2020 WMP report. Include description of how the utility distinguishes between these risks and the risks to safety and reliability. List and describe each "known local condition" that the utility monitors per GO 95, Rule 31.1, including how the condition is monitored and evaluated. In addition:

A. Describe how the utility monitors and accounts for the contribution of weather to ignition probability and estimated wildfire consequence in its decision-making, including describing any utility-generated Fire Potential Index or other measure (including input variables, equations, the scale or rating system, an explanation of how uncertainties are accounted for, an explanation of how this index is used to inform operational decisions, and an explanation of how trends in index ratings impact medium-term decisions such as maintenance and longer-term decisions such as capital investments, etc.).
B. Describe how the utility monitors and accounts for the contribution of fuel conditions to ignition probability and estimated wildfire consequence in its decision-making, including describing any proprietary fuel condition index (or other measures tracked), the outputs of said index or other measures, and the methodology used for projecting future fuel conditions. Include discussion of measurements and units for live fuel moisture content,

[3] Updates to S-MAP are currently in deliberation under proceeding R. 20-07-013 – Order Instituting Rulemaking to Further Develop a Risk-based Decision-making Framework for Electric and Gas Utilities

dead fuel moisture content, density of each fuel type, and any other variables tracked. Describe the measures and thresholds the utility uses to determine extreme fuel conditions, including what fuel moisture measurements and threshold values the utility considers "extreme" and its strategy for how fuel conditions inform operational decision-making.

4.2.1 Service territory fire-threat evaluation and ignition risk trends

Discuss fire-threat evaluation of the service territory to determine whether an expanded High Fire Threat District (HFTD) is warranted (i.e., beyond existing Tier 2 and Tier 3 areas). Include a discussion of any fire threat assessment of its service territory performed by the electrical corporation, highlighting any changes since the prior WMP report. In the event that the electrical corporation's assessment determines the fire threat rating for any part of its service territory is insufficient (i.e., the actual fire threat is greater than what is indicated in the CPUC Fire Threat Map and High Fire Threat District designations), the corporation shall identify those areas for consideration of HFTD modification, based on the new information or environmental changes. To the extent this identification relies upon a meteorological or climatological study, a thorough explanation and copy of the study shall be included.

List and describe any macro trends impacting ignition probability and estimated wildfire consequence within utility service territory, highlighting any changes since the 2020 WMP report:

1. Change in ignition probability and estimated wildfire consequence due to climate change
2. Change in ignition probability and estimated wildfire consequence due to relevant invasive species, such as bark beetles
3. Change in ignition probability and estimated wildfire consequence due to other drivers of change in fuel density and moisture
4. Population changes (including Access and Functional Needs population) that could be impacted by utility ignition
5. Population changes in HFTD that could be impacted by utility ignition
6. Population changes in WUI that could be impacted by utility ignition
7. Utility infrastructure location in HFTD vs non-HFTD
8. Utility infrastructure location in urban vs rural vs highly rural areas

4.3 Change in ignition probability drivers

Based on the implementation of the above wildfire mitigation initiatives, explain how the utility sees its ignition probability drivers evolving over the 3-year term of the WMP, highlighting any changes since the 2020 WMP report. Focus on ignition probability and estimated wildfire consequence reduction by ignition probability driver, detailed risk driver, and include a description of how the utility expects to see incidents evolve over the same period, both in total number (of occurrence of a given incident type, whether resulting in an ignition or not) and in likelihood of causing an ignition by type. Outline methodology for determining ignition probability from events, including data used to determine likelihood of ignition probability, such as past ignition events, number of risk events, and description of events (including vegetation and equipment condition).

4.4 Research proposals and findings

Report all utility-sponsored research proposals, findings from ongoing studies and findings from studies completed in 2020 relevant to wildfire and PSPS mitigation.

4.4.1 Research proposals

Report proposals for future utility-sponsored studies relevant to wildfire and PSPS mitigation. Organize proposals under the following structure:

1. **Purpose of research** – brief summary of context and goals of research
2. **Relevant terms** - Definitions of relevant terms (e.g., defining "enhanced vegetation management" for research on enhanced vegetation management)
3. **Data elements** - Details of data elements used for analysis, including scope and granularity of data in time and location (i.e., date range, reporting frequency and spatial granularity for each data element, see example table below)
4. **Methodology** - Methodology for analysis, including list of analyses to perform; section shall include statistical models, equations, etc. behind analyses
5. **Timeline** - Project timeline and reporting frequency to WSD

Example table reporting data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Comments
Ignitions from contact with vegetation in non-enhanced vegetation areas	2014 – 2020+ (ongoing)	Per ignition	Lat/lon per ignition	Date, hour of ignition (estimated)	-
Ignitions from contact with vegetation in enhanced vegetation areas	2019 – 2020+ (ongoing)	Per ignition	Lat/lon per ignition	Date, hour of ignition (estimated)	-

4.4.2 Research findings

Report findings from ongoing and completed studies relevant to wildfire and PSPS mitigation. Organize findings reports under the following structure:

1. **Purpose of research** – Brief summary of context and goals of research
2. **Relevant terms** - Definitions of relevant terms (e.g., defining "enhanced vegetation management" for research on enhanced vegetation management)
3. **Data elements** - Details of data elements used for analysis, including scope and granularity of data in time and location (i.e., date range, reporting frequency and spatial granularity for each data element, see example table above)
4. **Methodology** - Methodology for analysis, including list of analyses to perform; section shall include statistical models, equations, etc. behind analyses
5. **Timeline** - Project timeline and reporting frequency to WSD. Include any changes to timeline since last update
6. **Results and discussion** – Findings and discussion based on findings, highlighting new results and changes to conclusions since last update
7. **Follow-up planned** – Follow up research or action planned as a result of the research

4.5 Model and metric calculation methodologies

4.5.1 Additional models for ignition probability, wildfire and PSPS risk

Report details on methodology used to calculate or model ignition probability, potential impact of ignitions and / or PSPS, including list of all input used in impact simulation; data selection and treatment methodologies; assumptions, including Subject Matter Expert (SME) input; equation(s), functions, or other algorithms used to obtain output; output type(s), e.g., wind speed model; and comments.
For each model, organize details under the following headings:

1. **Purpose of model** – Brief summary of context and goals of model
2. **Relevant terms** - Definitions of relevant terms (e.g., defining "enhanced vegetation management" for a model on vegetation-related ignitions)
3. **Data elements** - Details of data elements used for analysis, including scope and granularity of data in time and location (i.e., date range, reporting frequency and spatial granularity for each data element, see example table above)
4. **Methodology** - Methodology and assumptions for analysis, including Subject Matter Expert (SME) input; equation(s), functions, statistical models, or other algorithms used to obtain output
5. **Timeline** – Model initiation and development progress over time. If updated in last WMP, provide update to changes since prior report.
6. **Application and results** – Explain where the model has been applied, how it has informed decisions, and any metrics or information on model accuracy and effectiveness collected in the prior year.

4.5.2 Calculation of key metrics

Report details on the calculation of the metrics below. For each metric, a standard definition is provided with statute cited where relevant. The utility must follow the definition provided and detail the procedure they used to calculate the metric values aligned with these definitions. Utilities must cite all data sources used in calculating the metrics below.

1. **Red Flag Warning overhead circuit mile days** – Detail the steps to calculate the annual number of red flag warning (RFW) overhead (OH) circuit mile days. Calculated as the number of circuit miles that were under an RFW multiplied by the number of days those miles were under said RFW. Refer to Red Flag Warnings as issued by the National Weather Service (NWS). For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings.[4] Detail the steps used to determine if an overhead circuit mile was under a Red Flag Warning, providing an example of how the RFW OH circuit mile days were calculated for a Red Flag Warning that occurred within utility territory over the last five years.
2. **High Wind Warning overhead circuit mile days** – Detail the steps used to calculate the annual number of High Wind Warning (HWW) overhead circuit mile days. Calculated as the number of overhead circuit miles that were under an HWW multiplied by the number of days those miles were under said HWW. Refer to High Wind Warnings as issued by the National Weather Service (NWS). For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings.[5] Detail the steps used to determine if an overhead circuit mile was under a High Wind Warning, providing an example of how the OH HWW circuit mile days were calculated for a High Wind Warning that occurred within utility territory over the last five years.

[4] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml
[5] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml

3. **Access and Functional Needs population** – Detail the steps to calculate the annual number of customers that are considered part of the Access and Functional Needs (AFN) population. Defined in Government Code § 8593.3 and D.19-05-042 as individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking,[6] older adults, children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant.
4. **Wildlife Urban Interface** – Detail the steps to calculate the annual number of circuit miles and customers in Wildlife Urban Interface (WUI) territory. WUI is defined as the area where houses exist at more than 1 housing unit per 40 acres and (1) wildland vegetation covers more than 50% of the land area (intermix WUI) or (2) wildland vegetation covers less than 50% of the land area, but a large area (over 1,235 acres) covered with more than 75% wildland vegetation is within 1.5 mi (interface WUI) (Radeloff et al, 2005).[7]
5. **Urban, rural and highly rural** – Detail the steps for calculating the number of customers and circuit miles in utility territory that are in highly rural, rural, and urban regions for each year. Use the following definitions for classifying an area highly rural/rural/urban (also referenced in glossary):
    a. Highly rural – In accordance with 38 CFR 17.701, "highly rural" shall be defined as those areas with a population of less than 7 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" shall be defined as census tracts.
    b. Rural – In accordance with GO 165, "rural" shall be defined as those areas with a population of less than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" shall be defined as census tracts.
    c. Urban – In accordance with GO 165, "urban" shall be defined as those areas with a population of more than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, "area" shall be defined as census tracts.

    Population density numbers are calculated using the American Community Survey (ACS) 1-year estimates on population density by census tract for each corresponding year (2016 ACS 1-year estimate for 2016 metrics, 2017 ACS 1-year estimate for 2017 metrics, etc.). For years with no ACS 1-year estimate available, use the 1-year estimate immediately before the missing year (use 2019 estimate if 2020 estimate is not yet published, etc.)

4.6 Progress reporting on past deficiencies

Report progress on all deficiencies provided in the 2020 WMP relevant to the utility. This includes deficiencies in Resolution WSD-002.

Response: Summarize how the utility has responded and addressed the conditions in the table below. Reference documents that serve as part of the utility's response (e.g. submitted in the utility's Remedial Compliance Plan, location in 2021 WMP update, etc.). Note action taken by the WSD for Class A and B deficiencies (e.g. response found sufficient, response found insufficient and further action required, etc.).

Table 4.6-1: List of utility deficiencies and summary of response, 2020

[6] Guidance on calculating number of households with limited or no English proficiency can be found in D.20-04-003

[7] Paper can be found here - https://www.fs.fed.us/pnw/pubs/journals/pnw_2005_radeloff001.pdf with the latest WUI map (form 2010) found here - http://silvis.forest.wisc.edu/data/wui-change/

Deficiency number	Deficiency title	Utility response (brief summary)	Referenced documents	WSD Action

Add additional rows as needed

5 Inputs to the plan and directional vision for WMP

5.1 Goal of Wildfire Mitigation Plan

The goal of the Wildfire Mitigation Plan 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 to the impact on Access and Functional Needs populations and marginalized communities) of both wildfires and the mitigations employed to reduce them, including PSPS.

In the following sub-sections report utility-specific objectives and program targets towards the WMP goal. No utility response required for section 5.1.

5.2 The objectives of the plan

Objectives are unique to each utility and reflect the 1, 3, and 10-Year projections of progress towards the WMP goal. Objectives are determined by the portfolio of mitigation strategies proposed in the WMP. The objectives of the plan shall, at a minimum, be consistent with the requirements of California Public Utilities Code §8386(a) –

Each electrical corporation shall construct, maintain, and operate its electrical lines and equipment in a manner that will minimize the risk of catastrophic wildfire posed by those electrical lines and equipment.

Describe utility WMP objectives, categorized by each of the following timeframes, highlighting changes since the prior WMP report:

1. Before the next Annual WMP Update
2. Within the next 3 years
3. Within the next 10 years – long-term planning beyond the 3-year cycle

5.3 Plan program targets

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

List and describe all program targets the electrical corporation uses to track utility WMP implementation and utility performance over the last five years. For all program targets, list the 2019 and 2020 performance, a numeric target value that is the projected target for end of year 2021 and 2022, units on the metrics reported, the assumptions that underlie the use of those metrics, update frequency, and how the performance reported could be validated by third parties outside the utility, such as analysts or academic researchers. Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of each targeted preventive strategy and program.

Table 5.3-1: List and description of program targets, last 5 years

Program target	2019 performance	2020 performance	Projected target by end of 2021	Projected target by end of 2022	Units	Underlying assumptions	Update frequency	Third-party validation

Add additional rows as needed

5.4 Planning for Workforce and Other Limited Resources

Report on worker qualifications and training practices regarding wildfire and PSPS mitigation for workers in the following target roles:

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

For each of the target roles listed above:

1. List all worker titles relevant to target role (target roles listed above)
2. For each worker title, list and explain minimum qualifications with an emphasis on qualifications relevant to wildfire and PSPS mitigation. Note if the job requirements include the following:
    a. Going beyond a basic knowledge of General Order 95 requirements to perform relevant types of inspections or activities in the target role
    b. Being a "Qualified Electrical Worker" (QEW) and define what certifications, qualifications, experience, etc. is required to be a QEW for the target role for the utility.
    c. Include special certification requirements such as being an International Society of Arboriculture (ISA) Certified Arborist with specialty certification as a Utility Specialist
3. Report percentage of Full Time Employees (FTEs) in target role with specific job title
4. Provide a summarized report detailing the overall percentage of FTEs with qualifications listed in (2) for each of the target roles.
5. Report plans to improve qualifications of workers relevant to wildfire and PSPS mitigation. Utilities will explain how they are developing more robust outreach and onboarding training programs for new electric workers to identify hazards that could ignite wildfires.

5.4.1 Target role: Vegetation inspections

1. Worker titles in target role
2. Minimum qualifications
3. FTE percentages by title in target role
4. Percent of FTEs by high-interest qualification
5. Plans to improve worker qualifications

5.4.2 Target role: Vegetation management projects

1. Worker titles in target role
2. Minimum qualifications
3. FTE percentages by title in target role
4. Percent of FTEs by high-interest qualification
5. Plans to improve worker qualifications

5.4.3 Target role: Asset Inspections

1. Worker titles in target role
2. Minimum qualifications
3. FTE percentages by title in target role
4. Percent of FTEs by high-interest qualification
5. Plans to improve worker qualifications

5.4.4 Target role: Grid hardening

1. Worker titles in target role
2. Minimum qualifications
3. FTE percentages by title in target role
4. Percent of FTEs by high-interest qualification
5. Plans to improve worker qualifications

5.4.5 Target role: Risk event inspections

1. Worker titles in target role
2. Minimum qualifications
3. FTE percentages by title in target role
4. Percent of FTEs by high-interest qualification
5. Plans to improve worker qualifications

6 Performance metrics and underlying data

Instructions: Section to be populated from Quarterly Reports. Tables to be populated are listed below for reference.
NOTE: Report updates to projected metrics that are now actuals (e.g., projected 2020 spend will be replaced with actual unless otherwise noted). If an actual is substantially different from the projected (>10% difference), highlight the corresponding metric in light green.

6.1 Recent performance on progress metrics, last 5 years

Instructions for Table 1:

In the attached spreadsheet document, report performance on the following metrics within the utility's service territory over the past five years as needed to correct previously-reported data. Where the utility does not collect its own data on a given metric, the utility shall work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in the "Comments" column.

Table 1: Recent performance on progress metrics, last 5 years – reference only, fill out attached spreadsheet to correct prior reports

Metric type	#	Progress metric name	2015	2016	2017	2018	2019	2020	Unit(s)
1. Grid condition findings from inspection - Distribution lines in HFTD	1.a.	Number of circuit miles inspected from patrol inspections in HFTD - Distribution lines							# miles
	1.b.	Number of circuit miles inspected from detailed inspections in HFTD - Distribution lines							# miles
	1.c.	Number of circuit miles inspected from other inspections in HFTD - Distribution lines							# miles
	…	…	…						…

6.2 Recent performance on outcome metrics, annual and normalized for weather, last 5 years

Instructions for Table 2:

In the attached spreadsheet document, report performance on the following metrics within the utility's service territory over the past five years as needed to correct previously-reported data. Where the utility does not collect its own data on a given metric, the utility shall work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in "Comments" column.

Provide a list of all types of findings and number of findings per type, in total and in number of findings per circuit mile.

Table 2: Recent performance on outcome metrics, last 5 years– reference only, fill out attached spreadsheet to correct prior reports

Metric type	#	Progress metric name	2015	2016	2017	2018	2019	2020	Unit(s)
1. Risk events	1.a.	Number of all events with probability of ignition, including wires down, contacts with objects, line slap, events with evidence of heat generation, and other events that cause sparking or have the potential to cause ignition							
	1.b.	Number of wires down (total)							
2. Utility inspection findings - Distribution	2.a.	Number of Level 1 findings that could increase the probability of ignition discovered							
	…	…	…						…

6.3 Description of additional metrics

Instructions for Table 3:

In addition to the metrics specified above, list and describe all other metrics the utility uses to evaluate wildfire mitigation performance, the utility's performance on those metrics over the last five years, the units reported, the assumptions that underlie the use of those metrics, and how the performance reported could be validated by third parties outside the utility, such as analysts or academic researchers. Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of each preventive strategy and program.

Table 3: List and description of additional metrics, last 5 years – reference only, fill out attached spreadsheet to correct prior reports

Metric	Definition	Purpose	Assumptions made to connect metric to purpose	Third-party validation (if any)	2015	2016	2017	2018	2019	2020	Unit(s)

Note: Add more rows as needed.

6.4 Detailed information supporting outcome metrics

Enclose detailed information as requested for the metrics below.

Instructions for Table 4:
In the attached spreadsheet document, report numbers of fatalities attributed to any utility wildfire mitigation initiatives, as listed in the utility's previous or current WMP filings or otherwise, according to the type of activity in column one, and by the victim's relationship to the utility (i.e., full-time employee, contractor, of member of the general public), for each of the last five years as needed to correct previously-reported data. For fatalities caused by initiatives beyond these categories, add rows to specify accordingly. The relationship to the utility statuses of full-time employee, contractor, and member of public are mutually exclusive, such that no individual can be counted in more than one category, nor can any individual fatality be attributed to more than one initiative.

Table 4: Fatalities due to utility wildfire mitigation initiatives, last 5 years – reference only, fill out attached spreadsheet to correct prior reports

Metric type	#	Progress metric name	2015	2016	2017	2018	2019	2020	Unit(s)
1. Fatalities - Full-time Employee	1.a.	Fatalities due to inspection - Full-time employee							
	1.b.	Fatalities due to vegetation management - Full-time employee							
	1.c.	Fatalities due to utility fuel management - Full-time employee							
	…	…	…						…

Instructions for Table 5:

In the attached spreadsheet document, report numbers of OSHA-reportable injuries attributed to any utility wildfire mitigation initiatives, as listed in the utility's previous or current WMP filings or otherwise, according to the type of activity in column one, and by the victim's relationship to the utility (i.e., full-time employee, contractor, of member of the general public), for each of the last five years as needed to correct previously-reported data. For members of the public, all injuries that meet OSHA-reportable standards of severity (i.e., injury or illness resulting in loss of consciousness or requiring medical treatment beyond first aid) shall be included, even if those incidents are not reported to OSHA due to the identity of the victims.

For OSHA-reportable injuries caused by initiatives beyond these categories, add rows to specify accordingly. The victim identities listed are mutually exclusive, such that no individual victim can be counted as more than one identity, nor can any individual OSHA-reportable injury be attributed to more than one activity.

Table 5: OSHA-reportable injuries due to utility wildfire mitigation initiatives, last 5 years – reference only, fill out attached spreadsheet to correct prior reports

Metric type	#	Progress metric name	2015	2016	2017	2018	2019	2020	Unit(s)
1. OSHA injuries - Full-time Employee	1.a.	OSHA injuries due to inspection - Full-time employee							
	1.b.	OSHA injuries due to vegetation management - Full-time employee							
	1.c.	OSHA injuries due to utility fuel management - Full-time employee							
	…	…	…						…

6.5 Mapping recent, modelled, and baseline conditions

Underlying data for recent conditions (over the last five years) of the utility service territory in a downloadable shapefile GIS format, following the schema provided in the spatial reporting schema attachment. All data is reported quarterly, this is a placeholder for quarterly spatial data.

6.6 Recent weather patterns, last 5 years

Instructions for Table 6:

In the attached spreadsheet document, report weather measurements based upon the duration and scope of NWS Red Flag Warnings, High wind warnings and upon proprietary Fire Potential Index (or other similar fire risk potential measure if used) for each year. Calculate and report 5-year historical average as needed to correct previously-reported data.

Table 6: Weather patterns, last 5 years – reference only, fill out attached spreadsheet to correct prior reports

Metric type	#	Progress metric name	2015	2016	2017	2018	2019	2020	Unit(s)
1. Red Flag Warning overhead Circuit Mile Days	1.a.	Red Flag Warning overhead Circuit Mile days - entire utility territory							RFW OH circuit mile days
	1.b.	Red Flag Warning overhead Circuit Mile days - HFTD Zone 1							RFW OH circuit mile days
	1.c.	Red Flag Warning overhead Circuit Mile days - HFTD Tier 2							RFW OH circuit mile days
	…	…	…						…

Note: Add additional rows as needed.

6.7 Recent and projected drivers of ignition probability

Instructions for Table 7:
In the attached spreadsheet document, report recent drivers of ignition probability according to whether or not risk events of that type are tracked, the number of incidents per year (e.g., all instances of animal contact regardless of whether they caused an outage, an ignition, or neither), the rate at which those incidents (e.g., object contact, equipment failure, etc.) cause an ignition in the column, and the number of ignitions that those incidents caused by category, for each of last five years as needed to correct previously-reported data.

Calculate and include 5-year historical averages. This requirement applies to all utilities, not only those required to submit annual ignition data. Any utility that does not have complete 2020 ignition data compiled by the WMP deadline shall indicate in the 2020 columns that said information is incomplete.

Table 7.1: Key recent and projected drivers of ignition probability, last 5 years and projections – reference only, fill out attached spreadsheet to correct prior reports

					Number of risk events								Projected risk events
				Quarter:							Q1	Q2	Q3	Q4
Risk Event category	**Cause category**	**#**	**Sub-cause category**	**Are risk events tracked?**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2020**	**2020**	**2020**
Wire down event - Distribution	1. Contact from object - Distribution	1.a.	Veg. contact-Distribution										
		1.b.	Animal contact-Distribution										
		1.c.	Balloon contact-Distribution										
…	…	…	…	…	…								

Table 7.2: Key recent and projected drivers of ignition probability by HFTD status, last 5 years and projections – reference only, fill out attached spreadsheet to correct prior reports

Risk Event category	Cause category	#	Sub-cause category	Are ignitions tracked?	Non-HFTD **2015**	HFTD Zone 1 **2015**	HFTD Tier 2 **2015**	HFTD Tier 3 **2015**	Non-HFTD **2016**
Wire down event - Distribution	1. Contact from object - Distribution	1.a.	Veg. contact-Distribution						
		1.b.	Animal contact-Distribution						
		1.c.	Balloon contact-Distribution						
…	…	…	…	…	…				

6.8 Baseline state of equipment and wildfire and PSPS event risk reduction plans

6.8.1 Current baseline state of service territory and utility equipment

Instructions for Table 8:
In the attached spreadsheet document, provide summary data for the current baseline state of HFTD and non-HFTD service territory in terms of circuit miles; overhead transmission lines, overhead distribution lines, substations, weather stations, and critical facilities located within the territory; and customers by type, located in urban versus rural versus highly rural areas and including the subset within the Wildland-Urban Interface (WUI) as needed to correct previously-reported data.

The totals of the cells for each category of information (e.g., “circuit miles (including WUI and non-WUI)”) would be equal to the overall service territory total (e.g., total circuit miles). For example, the total of number of customers in urban, rural, and highly rural areas of HFTD plus those in urban, rural, and highly rural areas of non-HFTD would equal the total number of customers of the entire service territory.

Table 8: State of service territory and utility equipment – reference only, fill out attached spreadsheet to correct prior reports

Metric type	#	Outcome metric name	Non-HFTD 2015	HFTD Zone 1 2015	HFTD Tier 2 2015	HFTD Tier 3 2015	Non-HFTD 2016
1. State of service territory and equipment in urban areas	1.a.	Circuit miles (including WUI and non-WUI)					
	1.b.	Circuit miles in WUI					
	1.c.	Number of critical facilities (including WUI and non-WUI)					
	1.d.	Number of critical facilities in WUI					
…	…	…	…				

6.8.2 Additions, removal, and upgrade of utility equipment by end of 3-year plan term

Instructions for Table 9:
In the attached spreadsheet document, input summary information of plans and actuals for additions or removals of utility equipment as needed to correct previously-reported data. Report net additions using positive numbers and net removals and undergrounding using negative numbers for circuit miles and numbers of substations. Report changes planned or actualized for that year – for example, if 10 net overhead circuit miles were added in 2020, then report "10" for 2020. If 20 net overhead circuit miles are planned for addition by 2022, with 15 being added by 2021 and 5 more added by 2022, then report "15" for 2022 and "5" for 2021. Do not report cumulative change across years. In this case, do not report "20" for 2022, but instead the number planned to be added for just that year, which is "5".

Table 9: Location of actual and planned utility equipment additions or removal year over year – reference only, fill out attached spreadsheet to correct prior reports

Metric type	#	Outcome metric name	Non-HFTD 2020	HFTD Zone 1 2020	HFTD Tier 2 2020	HFTD Tier 3 2020	Non-HFTD 2021
1. Planned utility equipment net addition (or removal) year over year - in urban areas	1.a.	Circuit miles of overhead transmission lines (including WUI and non-WUI)					
	1.b.	Circuit miles of overhead distribution lines (including WUI and non-WUI)					

	1.c.	Circuit miles of overhead transmission lines in WUI	
	1.d.	Circuit miles of overhead distribution lines in WUI	
…	…	…	…

Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV.

Instructions for Table 10:

Referring to the program targets discussed above, report plans and actuals for hardening upgrades in detail in the attached spreadsheet document. Report in terms of number of circuit miles or stations to be upgraded for each year, assuming complete implementation of wildfire mitigation activities, for HFTD and non-HFTD service territory for circuit miles of overhead transmission lines, circuit miles of overhead distribution lines, circuit miles of overhead transmission lines located in Wildland-Urban Interface (WUI), circuit miles of overhead distribution lines in WUI, number of substations, number of substations in WUI, number of weather stations and number of weather stations in WUI as needed to correct previously-reported data.

If updating previously-reported data, separately include a list of the hardening initiatives included in the calculations for the table.

Table 10: Location of actual and planned utility infrastructure upgrades year over year – reference only, fill out attached spreadsheet to correct prior reports

Metric type	**#**	**Outcome metric name**	Non-HFTD **2020**	HFTD Zone 1 **2020**	HFTD Tier 2 **2020**	HFTD Tier 3 **2020**	Non-HFTD **2021**
1. Planned utility infrastructure upgrades year over year - in urban areas	1.a.	Circuit miles of overhead transmission lines planned for upgrades (including WUI and non-WUI)					
	1.b.	Circuit miles of overhead distribution lines planned for upgrades (including WUI and non-WUI)					
	1.c.	Circuit miles of overhead transmission lines planned for upgrades in WUI					
	1.d.	Circuit miles of overhead distribution lines planned for upgrades in WUI					
…	…	…	…				

Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV.

7 Mitigation initiatives

7.1 Wildfire mitigation strategy

Describe organization-wide wildfire mitigation strategy and goals for each of the following time periods, highlighting changes since the prior WMP report:

1. By June 1 of current year
2. By Sept 1 of current year
3. Before the next Annual WMP Update
4. Within the next 3 years
5. Within the next 10 years

The description of utility wildfire mitigation strategy shall:

A. Discuss the utility's approach to determining how to manage wildfire risk (in terms of ignition probability and estimated wildfire consequence) as distinct from managing risks to safety and/or reliability. Describe how this determination is made both for (1) the types of activities needed and (2) the extent of those activities needed to mitigate these two different groups of risks. Describe to what degree the activities needed to manage wildfire risk may be incremental to those needed to address safety and/or reliability risks.
B. Include a summary of what major investments and implementation of wildfire mitigation initiatives achieved over the past year, any lessons learned, any changed circumstances for the 2020 WMP term (i.e., 2020-2022), and any corresponding adjustment in priorities for the upcoming plan term. Organize summaries of initiatives by the wildfire mitigation categories listed in Section 7.3.
C. List and describe all challenges associated with limited resources and how these challenges are expected to evolve over the next 3 years.
D. Outline how the utility expects new technologies and innovations to impact the utility's strategy and implementation approach over the next 3 years, including the utility's program for integrating new technologies into the utility's grid. Include utility research listed above in Section 4.4.

7.2 Wildfire Mitigation Plan implementation

Describe the processes and procedures the electrical corporation will use to do all the following:

A. Monitor and audit the implementation of the plan. Include what is being audited, who conducts the audits, what type of data is being collected, and how the data undergoes quality assurance and quality control.
B. Identify any deficiencies in the plan or the plan's implementation and correct those deficiencies.
C. Monitor and audit the effectiveness of inspections, including inspections performed by contractors, carried out under the plan and other applicable statutes and commission rules.
D. Ensure that across audits, initiatives, monitoring, and identifying deficiencies, the utility will report in a format that matches across WMPs, Quarterly Reports, Quarterly Advice Letters,[8] and annual compliance assessment.

[8] General Rule for filing Advice Letters are available in General Order 96-B: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M023/K381/23381302.PDF

7.3 Detailed wildfire mitigation programs

In this section, describe how the utility's specific programs and initiatives plan to execute the strategy set out in Section 5. The specific programs and initiatives are divided into 10 categories, with each providing a space for a narrative description of the utility's initiatives and a summary table for numeric input in the subsequent tables in this section. The initiatives are organized by the following categories provided in this section:

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 protocols
7. Data governance
8. Resource allocation methodology
9. Emergency planning and preparedness
10. Stakeholder cooperation and community engagement

7.3.1 Financial data on mitigation initiatives, by category

In the following section (7.3.2) is a list of potential wildfire and PSPS mitigation activities which fit under the 10 categories listed above. While it is not necessary to have initiatives within all activities, all mitigation initiatives will fit into one or more of the activities listed below. Financial information—including actual / projected spend, spend per line-miles treated, and risk-spend-efficiency for activity by HFTD tier (all regions, non-HFTD, HFTD tier 2, HFTD tier 3) for all HFTD tiers which the activity has been or plans to be applied—is reported in the attached file quarterly. Report any updates to the financial data in the spreadsheet attached in Table 12.

7.3.2 Detailed information on mitigation initiatives by category and activity

Report detailed information for each initiative activity in which spending was above $0 over the course of the current WMP cycle (2020-2022). For each activity, organize details under the following headings:

1. **Risk to be mitigated** / problem to be addressed
2. **Initiative selection** ("why" engage in activity) – include reference to a risk informed analysis on empirical (or projected) impact of initiative in comparison to alternatives
3. **Region prioritization** ("where" to engage activity) – include reference to a risk informed analysis in allocation of initiative (e.g., veg clearance is done for trees tagged as "high-risk")
4. **Progress on initiative** (amount spent, regions covered) and plans for next year
5. **Future improvements to initiative**

List of initiative activities by category - Detailed definitions for each mitigation activity are provided in the appendix

Risk assessment and mapping

1. A summarized risk map showing the overall ignition probability and estimated wildfire consequence along electric lines and equipment
2. Climate-driven risk map and modelling based on various relevant weather scenarios
3. Ignition probability mapping showing the probability of ignition along the electric lines and equipment

4. Initiative mapping and estimation of wildfire and PSPS risk-reduction impact
5. Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment
6. Weather-driven risk map and modelling based on various relevant weather scenarios

Situational awareness and forecasting

7. Advanced weather monitoring and weather stations
8. Continuous monitoring sensors
9. Fault indicators for detecting faults on electric lines and equipment
10. Forecast of a fire risk index, fire potential index, or similar
11. Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions
12. Weather forecasting and estimating impacts on electric lines and equipment

Grid design and system hardening

13. Capacitor maintenance and replacement program
14. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault
15. Covered conductor installation
16. Covered conductor maintenance
17. Crossarm maintenance, repair, and replacement
18. Distribution pole replacement and reinforcement, including with composite poles
19. Expulsion fuse replacement
20. Grid topology improvements to mitigate or reduce PSPS events
21. Installation of system automation equipment
22. Maintenance, repair, and replacement of connectors, including hotline clamps
23. Mitigation of impact on customers and other residents affected during PSPS event
24. Other corrective action
25. Pole loading infrastructure hardening and replacement program based on pole loading assessment program
26. Transformers maintenance and replacement
27. Transmission tower maintenance and replacement
28. Undergrounding of electric lines and/or equipment
29. Updates to grid topology to minimize risk of ignition in HFTDs

Asset management and inspections

30. Detailed inspections of distribution electric lines and equipment
31. Detailed inspections of transmission electric lines and equipment
32. Improvement of inspections
33. Infrared inspections of distribution electric lines and equipment
34. Infrared inspections of transmission electric lines and equipment
35. Intrusive pole inspections
36. LiDAR inspections of distribution electric lines and equipment
37. LiDAR inspections of transmission electric lines and equipment
38. Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations
39. Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations
40. Patrol inspections of distribution electric lines and equipment
41. Patrol inspections of transmission electric lines and equipment

42. Pole loading assessment program to determine safety factor
43. Quality assurance / quality control of inspections
44. Substation inspections

Vegetation management and inspections

45. Additional efforts to manage community and environmental impacts
46. Detailed inspections of vegetation around distribution electric lines and equipment
47. Detailed inspections of vegetation around transmission electric lines and equipment
48. Emergency response vegetation management due to red flag warning or other urgent conditions
49. Fuel management and reduction of "slash" from vegetation management activities
50. Improvement of inspections
51. LiDAR inspections of vegetation around distribution electric lines and equipment
52. LiDAR inspections of vegetation around transmission electric lines and equipment
53. Other discretionary inspection of vegetation around distribution electric lines and equipment, beyond inspections mandated by rules and regulations
54. Other discretionary inspection of vegetation around transmission electric lines and equipment, beyond inspections mandated by rules and regulations
55. Patrol inspections of vegetation around distribution electric lines and equipment
56. Patrol inspections of vegetation around transmission electric lines and equipment
57. Quality assurance / quality control of inspections
58. Recruiting and training of vegetation management personnel
59. Remediation of at-risk species
60. Removal and remediation of trees with strike potential to electric lines and equipment
61. Substation inspections
62. Substation vegetation management
63. Vegetation inventory system
64. Vegetation management to achieve clearances around electric lines and equipment

Grid operations and protocols

65. Automatic recloser operations
66. Crew-accompanying ignition prevention and suppression resources and services
67. Personnel work procedures and training in conditions of elevated fire risk
68. Protocols for PSPS re-energization
69. PSPS events and mitigation of PSPS impacts
70. Stationed and on-call ignition prevention and suppression resources and services

Data governance

71. Centralized repository for data
72. Collaborative research on utility ignition and/or wildfire
73. Documentation and disclosure of wildfire-related data and algorithms
74. Tracking and analysis of risk event data

Resource allocation methodology

75. Allocation methodology development and application
76. Risk reduction scenario development and analysis
77. Risk spend efficiency analysis – not to include PSPS

Emergency planning and preparedness

78. Adequate and trained workforce for service restoration
79. Community outreach, public awareness, and communications efforts
80. Customer support in emergencies
81. Disaster and emergency preparedness plan
82. Preparedness and planning for service restoration
83. Protocols in place to learn from wildfire events

Stakeholder cooperation and community engagement

84. Community engagement
85. Cooperation and best practice sharing with agencies outside CA
86. Cooperation with suppression agencies
87. Forest service and fuel reduction cooperation and joint roadmap

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

8.1 Directional vision for necessity of PSPS

Describe any lessons learned from PSPS since the utility's last WMP submission and expectations for how the utility's PSPS program will evolve over the coming 1, 3, and 10 years. Be specific by including a description of the utility's protocols and thresholds for PSPS implementation. Include a quantitative description of how the circuits and numbers of customers that the utility expects will be impacted by any necessary PSPS events is expected to evolve over time. The description of protocols must be sufficiently detailed and clear to enable a skilled operator to follow the same protocols.

When calculating anticipated PSPS, consider recent weather extremes, including peak weather conditions over the past 10 years as well as recent weather years and how the utility's current PSPS protocols would be applied to those years.

Instructions for Table 8-1:

Rank order the characteristic of PSPS events (in terms of numbers of customers affected, frequency, scope, and duration) anticipated to change the most and have the greatest impact on reliability (be it to increase or decrease) over the next ten years. Rank in order from 1 to 9, where 1 means greatest anticipated change or impact and 9 means minimal change or impact on ignition probability and estimated wildfire consequence. To the right of the ranked magnitude of impact, indicate whether the impact is to significantly increase reliability, moderately increase reliability, have limited or no impact, moderately decrease reliability, or significantly decrease reliability. For each, include comments describing expected change and expected impact, using quantitative estimates wherever possible.

Table 8-1: Anticipated characteristics of PSPS use over next 10 years

Rank order 1-9	PSPS characteristic	Significantly increase; increase; no change; decrease; significantly decrease	Comments
	Number of customers affected by PSPS events (total)		
	Number of customers affected by PSPS events (normalized by fire		

	weather, e.g., Red Flag Warning line mile days)		
	Frequency of PSPS events in number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability (total)		
	Frequency of PSPS events in number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability (normalized by fire weather, e.g., Red Flag Warning line mile days)		
	Scope of PSPS events in circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization (total)		
	Scope of PSPS events in circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization (normalized by fire weather, e.g., Red Flag Warning line mile days)		
	Duration of PSPS events in customer hours (total)		
	Duration of PSPS events in customer hours (normalized by fire weather, e.g., Red Flag Warning line mile days)		
	Other		

8.2 Protocols on Public Safety Power Shut-off

Describe protocols on Public Safety Power Shut-off (PSPS or de-energization), highlighting changes since the previous WMP report:

1. Strategy to minimize public safety risk during high wildfire risk conditions and details of the considerations, including but not limited to list and description of community assistance locations and services provided during a de-energization event.
2. Outline of tactical and strategic decision-making protocol for initiating a PSPS/de-energization (e.g., decision tree).
3. Strategy to provide for safe and effective re-energization of any area that was de-energized due to PSPS protocol.

4. Company standards relative to customer communications, including consideration for the need to notify priority essential services – critical first responders, public safety partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water utilities/agencies. This section, or an appendix to this section, shall include a complete listing of which entities the electrical corporation considers to be priority essential services. This section shall also include a description of strategy and protocols to ensure timely notifications to customers, including access and functional needs populations, in the languages prevalent within the utility's service territory.
5. Protocols for mitigating the public safety impacts of these protocols, including impacts on first responders, health care facilities, operators of telecommunications infrastructure, and water utilities/agencies.

8.3 Projected changes to PSPS impact

Describe organization-wide plan to reduce scale, scope and frequency of PSPS for each of the following time periods, highlighting changes since the prior WMP report and including key program targets used to track progress over time,

1. By June 1 of current year
2. By September 1 of current year
3. By next Annual WMP Update

8.4 Engaging vulnerable communities

Report on the following:

1. Describe protocols for PSPS that are intended to mitigate the public safety impacts of PSPS on vulnerable, marginalized and/or at-risk communities. Describe how the utility is identifying these communities.
2. List all languages which are "prevalent" in utility's territory. 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[9] (D.20-03-004).
3. List all languages for which public outreach material is available, in written or oral form.
4. Detail the community outreach efforts for PSPS and wildfire-related outreach. Include efforts to reach all languages prevalent in utility territory.

8.5 PSPS-specific metrics

PSPS data reported quarterly. Placeholder tables below to be filled in based on quarterly data.

Instructions for PSPS table:

In the attached spreadsheet document, report performance on the following PSPS metrics within the utility's service territory over the past five years as needed to correct previously-reported data. Where the utility does not collect its own data on a given metric, the utility shall work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in the "Comments" column.

Table 11: Recent use of PSPS and other PSPS metrics – reference only, fill out attached spreadsheet to correct prior reports

[9] See Cal. Government Code § 53112

Metric type	#	Outcome metric name	2015	2016	2017	2018	2019	2020	2021 Q1, Q2…,Q4 projected	Comments
1. Recent use of PSPS	1.a.	Frequency of PSPS events (total)								
	1.b.	Scope of PSPS events (total)								
	1.c.	Duration of PSPS events (total)								
…	…	…	…							

9 Appendix

9.1 Definitions of initiative activities by category

Category	Initiative activity	Definition
A. Risk mapping and simulation	A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment	Development and use of tools and processes to develop and update risk map and simulations and to estimate risk reduction potential of initiatives for a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.
	Climate-driven risk map and modelling based on various relevant weather scenarios	Development and use of tools and processes to estimate incremental risk of foreseeable climate scenarios, such as drought, across a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.
	Ignition probability mapping showing the probability of ignition along the electric lines and equipment	Development and use of tools and processes to assess the risk of ignition across regions of the grid (or more granularly, e.g., circuits, spans, or assets).
	Initiative mapping and estimation of wildfire and PSPS risk-reduction impact	Development of a tool to estimate the risk reduction efficacy (for both wildfire and PSPS risk) and risk-spend efficiency of various initiatives.
	Match drop simulations showing the potential wildfire consequence of ignitions that	Development and use of tools and processes to assess the impact of potential ignition and risk to communities (e.g., in terms of potential fatalities, structures burned, monetary

	occur along the electric lines and equipment	damages, area burned, impact on air quality and greenhouse gas, or GHG, reduction goals, etc.).
B. Situational awareness and forecasting	Advanced weather monitoring and weather stations	Purchase, installation, maintenance, and operation of weather stations. Collection, recording, and analysis of weather data from weather stations and from external sources.
	Continuous monitoring sensors	Installation, maintenance, and monitoring of sensors and sensorized equipment used to monitor the condition of electric lines and equipment.
	Fault indicators for detecting faults on electric lines and equipment	Installation and maintenance of fault indicators.
	Forecast of a fire risk index, fire potential index, or similar	Index that uses a combination of weather parameters (such as wind speed, humidity, and temperature), vegetation and/or fuel conditions, and other factors to judge current fire risk and to create a forecast indicative of fire risk. A sufficiently granular index shall inform operational decision-making.
	Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	Personnel position within utility service territory to monitor system conditions and weather on site. Field observations shall inform operational decisions.
	Weather forecasting and estimating impacts on electric lines and equipment	Development methodology for forecast of weather conditions relevant to utility operations, forecasting weather conditions and conducting analysis to incorporate into utility decision-making, learning and updates to reduce false positives and false negatives of forecast PSPS conditions.
C. Grid design and system hardening	Capacitor maintenance and replacement program	Remediation, adjustments, or installations of new equipment to improve or replace existing capacitor equipment.
	Circuit breaker maintenance and installation to de-energize lines upon detecting a fault	Remediation, adjustments, or installations of new equipment to improve or replace existing fast switching circuit breaker equipment to improve the ability to protect electrical circuits from damage caused by overload of electricity or short circuit.
	Covered conductor installation	Installation of covered or insulated conductors to replace standard bare or unprotected conductors (defined in accordance with GO 95 as supply conductors, including but not limited to lead wires, not enclosed in a grounded metal pole or not covered by: a “suitable protective covering” (in accordance with Rule 22.8), grounded metal conduit, or grounded metal sheath or shield). In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact

		strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.
	Covered conductor maintenance	Remediation and adjustments to installed covered or insulated conductors. In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.
	Crossarm maintenance, repair, and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing crossarms, defined as horizontal support attached to poles or structures generally at right angles to the conductor supported in accordance with GO 95.
	Distribution pole replacement and reinforcement, including with composite poles	Remediation, adjustments, or installations of new equipment to improve or replace existing distribution poles (i.e., those supporting lines under 65kV), including with equipment such as composite poles manufactured with materials reduce ignition probability by increasing pole lifespan and resilience against failure from object contact and other events.
	Expulsion fuse replacement	Installations of new and CAL FIRE-approved power fuses to replace existing expulsion fuse equipment.
	Grid topology improvements to mitigate or reduce PSPS events	Plan to support and actions taken to mitigate or reduce PSPS events in terms of geographic scope and number of customers affected, such as installation and operation of electrical equipment to sectionalize or island portions of the grid, microgrids, or local generation.
	Installation of system automation equipment	Installation of electric equipment that increases the ability of the utility to automate system operation and monitoring, including equipment that can be adjusted remotely such as automatic reclosers (switching devices designed to detect and interrupt momentary faults that can reclose automatically and detect if a fault remains, remaining open if so).
	Maintenance, repair, and replacement of connectors, including hotline clamps	Remediation, adjustments, or installations of new equipment to improve or replace existing connector equipment, such as hotline clamps.
	Mitigation of impact on customers and other residents affected during PSPS event	Actions taken to improve access to electricity for customers and other residents during PSPS events, such as installation and operation of local generation equipment (at the community, household, or other level).

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

	Infrared inspections of transmission electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using infrared (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.
	Intrusive pole inspections	In accordance with GO 165, intrusive inspections involve movement of soil, taking samples for analysis, and/or using more sophisticated diagnostic tools beyond visual inspections or instrument reading.
	LiDAR inspections of distribution electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	LiDAR inspections of transmission electric lines and equipment	Inspections of overhead electric distribution lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric transmission lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric distribution lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Patrol inspections of distribution electric lines and equipment	In accordance with GO 165, simple visual inspections of overhead electric distribution lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.
	Patrol inspections of transmission electric lines and equipment	Simple visual inspections of overhead electric transmission lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.
	Pole loading assessment program to determine safety factor	Calculations to determine whether a pole meets pole loading safety factor requirements of GO 95, including planning and information collection needed to support said calculations. Calculations shall consider many factors including the size, location, and type of pole; types of attachments; length of conductors attached; and number and design of supporting guys, per D.15-11-021.
	Quality assurance / quality control of inspections	Establishment and function of audit process to manage and confirm work completed by employees or subcontractors,

		including packaging QA/QC information for input to decision-making and related integrated workforce management processes.
	Substation inspections	In accordance with GO 175, inspection of substations performed by qualified persons and according to the frequency established by the utility, including record-keeping.
E. Vegetation management and inspection	Additional efforts to manage community and environmental impacts	Plan and execution of strategy to mitigate negative impacts from utility vegetation management to local communities and the environment, such as coordination with communities to plan and execute vegetation management work or promotion of fire-resistant planting practices
	Detailed inspections of vegetation around distribution electric lines and equipment	Careful visual inspections of vegetation around the right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded.
	Detailed inspections of vegetation around transmission electric lines and equipment	Careful visual inspections of vegetation around the right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded.
	Emergency response vegetation management due to red flag warning or other urgent conditions	Plan and execution of vegetation management activities, such as trimming or removal, executed based upon and in advance of forecast weather conditions that indicate high fire threat in terms of ignition probability and wildfire consequence.
	Fuel management and reduction of “slash” from vegetation management activities	Plan and execution of fuel management activities that reduce the availability of fuel in proximity to potential sources of ignition, including both reduction or adjustment of live fuel (in terms of species or otherwise) and of dead fuel, including "slash" from vegetation management activities that produce vegetation material such as branch trimmings and felled trees.
	Improvement of inspections	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
	LiDAR inspections of vegetation around distribution electric lines and equipment	Inspections of right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	LiDAR inspections of vegetation around transmission electric lines and equipment	Inspections of right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	Other discretionary inspections of vegetation around distribution electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Other discretionary inspections of vegetation around transmission electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and

		response to problems identified, or other aspects of inspection or records kept.
	Patrol inspections of vegetation around distribution electric lines and equipment	Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business.
	Patrol inspections of vegetation around transmission electric lines and equipment	Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business.
	Quality assurance / quality control of vegetation inspections	Establishment and function of audit process to manage and confirm work completed by employees or subcontractors, including packaging QA/QC information for input to decision-making and related integrated workforce management processes.
	Recruiting and training of vegetation management personnel	Programs to ensure that the utility is able to identify and hire qualified vegetation management personnel and to ensure that both full-time employees and contractors tasked with vegetation management responsibilities are adequately trained to perform vegetation management work, according to the utility's wildfire mitigation plan, in addition to rules and regulations for safety.
	Remediation of at-risk species	Actions taken to reduce the ignition probability and wildfire consequence attributable to at-risk vegetation species, such as trimming, removal, and replacement.
	Removal and remediation of trees with strike potential to electric lines and equipment	Actions taken to remove or otherwise remediate trees that could potentially strike electrical equipment, if adverse events such as failure at the ground-level of the tree or branch breakout within the canopy of the tree, occur.
	Substation inspection	Inspection of vegetation surrounding substations, performed by qualified persons and according to the frequency established by the utility, including record-keeping.
	Substation vegetation management	Based on location and risk to substation equipment only, actions taken to reduce the ignition probability and wildfire consequence attributable to contact from vegetation to substation equipment.
	Vegetation inventory system	Inputs, operation, and support for centralized inventory of vegetation clearances updated based upon inspection results, including (1) inventory of species, (2) forecasting of growth, (3) forecasting of when growth threatens minimum right-of-way clearances (“grow-in” risk) or creates fall-in/fly-in risk.
	Vegetation management to achieve clearances around electric lines and equipment	Actions taken to ensure that vegetation does not encroach upon the minimum clearances set forth in Table 1 of GO 95, measured between line conductors and vegetation, such as trimming adjacent or overhanging tree limbs.
F. Grid operations and protocols	Automatic recloser operations	Designing and executing protocols to deactivate automatic reclosers based on local conditions for ignition probability and wildfire consequence.

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

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

		in real-time, including information-sharing, dispatch of resources, and dedicated staff.
	Forest service and fuel reduction cooperation and joint roadmap	Strategy and actions taken to engage with local, state, and federal entities responsible for or participating in forest management and fuel reduction activities; and design utility cooperation strategy and joint stakeholder roadmap (plan for coordinating stakeholder efforts for forest management and fuel reduction activities).

9.2 Citations for relevant statutes, Commission directives, proceedings and orders

Throughout the WMP, cite relevant state and federal statutes, Commission directives, orders, and proceedings. Place the title or tracking number of the statute in parentheses next to comment, or in the appropriate column if noted in a table. Provide in this section a brief description or summary of the relevant portion of the statute. Track citations as end-notes and order (1, 2, 3…) across sections (e.g., if section 1 has 4 citations, section 2 begins numbering at 5).

ATTACHMENT 2.3

Wildfire Safety Division Attachment 2.3

Wildifire Mitigation Plan Quarterly report - non-spatial data template

Resolution WSD-011 Attachment 2.3

Instructions for use	
1.	Fill out the tan cells (color represented here) starting with the cell below (D17: Utility). The Utility name will populate the Table tabs to follow. Date modified will vary by table.
2.	Cells will only accept valid entries. For most cells, this is positive numbers
3.	For each Table tab, after a modification is made, denote the date of the change in cell C4 for each Table tab.
4.	Some columns have an additional header in row 5 to serve as clarification for several columns. With the exception of projected data, row 5 will be highlighted in blue (color represented here)
5.	Some required metrics are future projections. For these, row 5, above the projections will be highlighted light green (color represented here)
	In future submissions, report updated projected numbers if / when projections have changed, and report actuals once the quarter / year has passed.
6.	For data required annually rather than quarterly (see Tables 7.3 - 10), report for entire year even if part of the year is projected. Once year has passed, update cell with actuals
7.	Some tables will have additional instructions provided in a **Notes** box located in cells D2 - D4
	Notes will explain terms, signal where projections are required, and provide other useful information.
8.	For the initial quarterly submission, utilities are required to submit data on annual metrics for 2015 - 2020, which should represent the most updated data from the 2020 WMP for years 2015-2019
*	Do not add or manipulate the template for any of the tabs

Update the below table to establish which year, quarter of the WMP cycle this submission this represents.

Utility	X
First year of 3-year WMP cycle	2020
Submission year	2021
Submission quarter	Q4
Date Modified	Will update once date modified is added to individual tables

Utility	X
Table No.	1
Date Modified	

Notes:
Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV.

Note: These columns are placeholders for future QR submissions.

Table 1: Recent performance on progress metrics

Metric type	#	Progress metric name	2015	2016	2017	2018	2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Unit(s)	Comments
1. Grid condition findings from inspection - Distribution lines in HFTD	1.a.	Number of circuit miles inspected from patrol inspections in HFTD - Distribution lines																		# circuit miles	
	1.b.	Number of circuit miles inspected from detailed inspections in HFTD - Distribution lines																		# circuit miles	
	1.c.	Number of circuit miles inspected from other inspections (list types of "other" inspections in comments) in HFTD - Distribution lines																		# circuit miles	
	1.d.	Level 1 findings in HFTD for patrol inspections - Distribution lines																		# findings	
	1.e.	Level 1 findings in HFTD for detailed inspections - Distribution lines																		# findings	
	1.f.	Level 1 findings in HFTD for other inspections (list types of "other" inspections in comments) - Distribution lines																		# findings	
	1.g.	Level 2 findings in HFTD for patrol inspections - Distribution lines																		# findings	
	1.h.	Level 2 findings in HFTD for detailed inspections - Distribution lines																		# findings	
	1.i.	Level 2 findings in HFTD for other inspections (list types of "other" inspections in comments) - Distribution lines																		# findings	
	1.j.	Level 3 findings in HFTD for patrol inspections - Distribution lines																		# findings	
	1.k.	Level 3 findings in HFTD for detailed inspections - Distribution lines																		# findings	
	1.l.	Level 3 findings in HFTD for other inspections (list types of "other" inspections in comments) - Distribution lines																		# findings	
1. Grid condition findings from inspection - Distribution lines total	1.a.ii.	Number of total circuit miles inspected from patrol inspections - Distribution lines																		# circuit miles	
	1.b.ii.	Number of total circuit miles inspected from detailed inspections - Distribution lines																		# circuit miles	
	1.c.ii.	Number of total circuit miles inspected from other inspections (list types of "other" inspections in comments) - Distribution lines																		# circuit miles	
	1.d.ii.	Level 1 findings for patrol inspections - Distribution lines																		# findings	
	1.e.ii.	Level 1 findings for detailed inspections - Distribution lines																		# findings	
	1.f.ii.	Level 1 findings for other inspections (list types of "other" inspections in comments) - Distribution lines																		# findings	
	1.g.ii.	Level 2 findings for patrol inspections - Distribution lines																		# findings	
	1.h.ii.	Level 2 findings for detailed inspections - Distribution lines																		# findings	
	1.i.ii.	Level 2 findings for other inspections (list types of "other" inspections in comments) - Distribution lines																		# findings	
	1.j.ii.	Level 3 findings for patrol inspections - Distribution lines																		# findings	
	1.k.ii.	Level 3 findings for detailed inspections - Distribution lines																		# findings	
	1.l.ii.	Level 3 findings for other inspections (list types of "other" inspections in comments) - Distribution lines																		# findings	
1. Grid condition findings from inspection - Transmission lines in HFTD	1.a.iii.	Number of circuit miles inspected from patrol inspections in HFTD - Transmission lines																		# circuit miles	
	1.b.iii.	Number of circuit miles inspected from detailed inspections in HFTD - Transmission lines																		# circuit miles	
	1.c.iii.	Number of circuit miles inspected from other inspections (list types of "other" inspections in comments) in HFTD - Transmission lines																		# circuit miles	
	1.d.iii.	Level 1 findings in HFTD for patrol inspections - Transmission lines																		# findings	
	1.e.iii.	Level 1 findings in HFTD for detailed inspections - Transmission lines																		# findings	
	1.f.iii.	Level 1 findings in HFTD for other inspections (list types of "other" inspections in comments) - Transmission lines																		# findings	
	1.g.iii.	Level 2 findings in HFTD for patrol inspections - Transmission lines																		# findings	
	1.h.iii.	Level 2 findings in HFTD for detailed inspections - Transmission lines																		# findings	
	1.i.iii.	Level 2 findings in HFTD for other inspections (list types of "other" inspections in comments) - Transmission lines																		# findings	
	1.j.iii.	Level 3 findings in HFTD for patrol inspections - Transmission lines																		# findings	
	1.k.iii.	Level 3 findings in HFTD for detailed inspections - Transmission lines																		# findings	
	1.l.iii.	Level 3 findings in HFTD for other inspections (list types of "other" inspections in comments) - Distribution lines																		# findings	
1. Grid condition findings from inspection - Transmission lines total	1.a.iv.	Number of total circuit miles inspected from patrol inspections - Transmission lines																		# circuit miles	
	1.b.iv.	Number of total circuit miles inspected from detailed inspections - Transmission lines																		# circuit miles	
	1.c.iv.	Number of total circuit miles inspected from other inspections (list types of "other" inspections in comments) - Transmission lines																		# circuit miles	
	1.d.iv.	Level 1 findings for patrol inspections - Transmission lines																		# findings	
	1.e.iv.	Level 1 findings for detailed inspections - Transmission lines																		# findings	
	1.f.iv.	Level 1 findings for other inspections (list types of "other" inspections in comments) - Transmission lines																		# findings	
	1.g.iv.	Level 2 findings for patrol inspections - Transmission lines																		# findings	
	1.h.iv.	Level 2 findings for detailed inspections - Transmission lines																		# findings	
	1.i.iv.	Level 2 findings for other inspections (list types of "other" inspections in comments) - Transmission lines																		# findings	
	1.j.iv.	Level 3 findings for patrol inspections - Transmission lines																		# findings	
	1.k.iv.	Level 3 findings for detailed inspections - Transmission lines																		# findings	
	1.l.iv.	Level 3 findings for other inspections (list types of "other" inspections in comments) - Transmission lines																		# findings	
2. Vegetation clearance findings from inspection - total	2.a.i	Number of spans insepcted where at least some vegetation was found in non-compliant condition - total																		# of spans inspected with noncompliant clearance based on applicable rules and regulations at the time of inspection	
	2.a.ii	Number of spans insepcted for vegetation compliance - total																		# of spans inspected for vegetation compliance	
2. Vegetation clearance findings from inspection - in HFTD	2.b.i	Number of spans insepcted where at least some vegetation was found in non-compliant condition in HFTD																		# of spans inspected with noncompliant clearance based on applicable rules and regulations at the time of inspection	
	2.b.ii	Number of spans insepcted for vegetation compliance in HFTD																		# of spans inspected for vegetation compliance	
3. Community outreach metrics	3.a.	# Customers in an evacuation zone for utility-ignited wildfire																		# customers (if customer was in an evacuation zone for multiple wildfires, count the customer for each relevant wildfire)	
	3.b.	# Customers notified of evacuation orders																		# customers (count customer multiple times for each unique wildfire of which they were notified)	
	3.c.	% of customers notified of evacuation in evacuation zone of a utility-ignited wildfire																		Percentage of customers notified of evacuation	

Utility	X
Table No.	2
Date Modified	

Notes:
Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV.

Note: These columns are placeholders for future QR submissions.

Table 2: Recent performance on outcome metrics

Metric type	#	Outcome metric name	2015	2016	2017	2018	2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Unit(s)	Comments
1. Risk events	1.a.	Number of all events with probability of ignition, including wires down, contacts with objects, line slap, events with evidence of heat generation, and other events that cause sparking or have the potential to cause ignition																		Number per year	
	1.b.	Number of wires down (total)																		Number of wires down per year	
	1.c.	Number of outage events not caused by contact with vegetation (total)																		Number of outage events per year	
	1.d.	Number of outage events caused by contact with vegetation (total)																		Number of outage events per year	
2. Utility inspection findings - Distribution	2.a.	Number of Level 1 findings (distribution - total)																		# findings	
	2.b.	Number of Level 2 findings (distribution - total)																		# findings	
	2.c.	Number of Level 3 findings (distribution - total)																		# findings	
	2.d.	Number of distribution circuit miles inspected																		# circuit miles	
2. Utility inspection findings - Transmission	2.a.ii	Number of Level 1 findings (transmission - total)																		# findings	
	2.b.ii	Number of Level 2 findings (transmission - total)																		# findings	
	2.c.ii	Number of Level 3 findings (transmission - total)																		# findings	
	2.d.ii	Number of transmission circuit miles inspected																		# circuit miles	
3. Utility ignited wildfire fatalities	3.a.	Fatalities due to utility-ignited wildfire (total)																		Number of fatalities per year	
	3.b.	Injuries due to utility-ignited wildfire (total)																		Number of injuries per year	
4. Value of assets destroyed by utility-ignited wildfire, listed by asset type	4.a.	Value of assets destroyed by utility-ignited wildfire (total)																		Dollars of damage or destruction per year	
5. Structures damaged or destroyed by utility-ignited wildfire	5.a.	Number of structures destroyed by utility-ignited wildfire (total)																		Number of structures destroyed per year	
	5.b.	Critical infrastructure damaged/destroyed by utility-ignited wildfire (total)																		Number of critical infrastructure damaged/destroyed per year	
6. Acreage burned by utility-ignited wildfire	6.a.	Acreage burned by utility-ignited wildfire (total)																		Acres burned per year	
7. Number of utility wildfire ignitons	7.a.	Number of ignitions (total) according to existing ignition data reporting requirement																		Number per year	
	7.b.	Number of ignitions in HFTD (subtotal)																		Number in HFTD per year	
	7.c.	Number of ignitions in HFTD Zone 1																		Number in HFTD Zone 1 per year	
	7.c.ii.	Number of ignitions in HFTD Tier 2																		Number in HFTD Tier 2 per year	
	7.c.iii.	Number of ignitions in HFTD Tier 3																		Number in HFTD Tier 3 per year	
	7.d.	Number of ignitions in non-HFTD (subtotal)																		Number in non-HFTD per year	
8. Fatalities resulting from utility wildfire mitigation initiatives	8.a.	Fatalities due to utility wildfire mitigation activities (total) - "activities" defined as all activities accounted for in the 2020 WMP proposed WMP spend																		Number of fatalities per year	
9. OSHA-reportable injuries from utility wildfire mitigation initiatives	9.a.	OSHA-reportable injuries due to utility wildfire mitigation activities (total) - "activities" defined as all activities accounted for in the 2020 WMP proposed WMP spend																		Number of OSHA-reportable injuries per year	

Utility	X
Table No.	3
Date Modified	

Note: These columns are placeholders for future QR submissions.

Table 3: List and description of additional metrics

Metric	Definition	Purpose	Assumptions made to connect metric to purpose	Third-party validation (if any)	2015	2016	2017	2018	2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Unit(s)	Comments

Utility	X
Table No.	4
Date Modified	

Note: These columns are placeholders for future QR submissions.

Table 4: Fatalities due to utility wildfire mitigation initiatives

Metric type	**#**	**Outcome metric name**	**2015**	**2016**	**2017**	**2018**	**2019**	Q1 **2020**	Q2 **2020**	Q3 **2020**	Q4 **2020**	Q1 **2021**	Q2 **2021**	Q3 **2021**	Q4 **2021**	Q1 **2022**	Q2 **2022**	Q3 **2022**	Q4 **2022**	**Unit(s)**	**Comments**
1. Fatalities - Full-time Employee	1.a.	Fatalities due to utility inspection - Full-time employee																		# fatalities	
	1.b.	Fatalities due to vegetation management - Full-time employee																		# fatalities	
	1.c.	Fatalities due to utility fuel management - Full-time employee																		# fatalities	
	1.d.	Fatalities due to grid hardening - Full-time employee																		# fatalities	
	1.e.	Fatalities due to other - Full-time employee																		# fatalities	
2. Fatalities - Contractor	2.a.	Fatalities due to utility inspection - Contractor																		# fatalities	
	2.b.	Fatalities due to vegetation management - Contractor																		# fatalities	
	2.c.	Fatalities due to utility fuel management - Contractor																		# fatalities	
	2.d.	Fatalities due to grid hardening - Contractor																		# fatalities	
	2.e.	Fatalities due to other - Contractor																		# fatalities	
3. Fatalities - Member of public	3.a.	Fatalities due to utility inspection - Public																		# fatalities	
	3.b.	Fatalities due to vegetation management - Public																		# fatalities	
	3.c.	Fatalities due to utility fuel management - Public																		# fatalities	
	3.d.	Fatalities due to grid hardening - Public																		# fatalities	
	3.e.	Fatalities due to other - Public																		# fatalities	

Utility	X
Table No.	5
Date Modified	

Note: These columns are placeholders for future QR submissions.

Table 5: OSHA-reportable injuries due to utility wildfire mitigation initiatives

Metric type	**#**	**Outcome metric name**	**2015**	**2016**	**2017**	**2018**	**2019**	Q1 **2020**	Q2 **2020**	Q3 **2020**	Q4 **2020**	Q1 **2021**	Q2 **2021**	Q3 **2021**	Q4 **2021**	Q1 **2022**	Q2 **2022**	Q3 **2022**	Q4 **2022**	**Unit(s)**	**Comments**
1. OSHA injuries - Full-time Employee	1.a.	OSHA injuries due to utility inspection - Full-time employee																		# OSHA-reportable injuries	
	1.b.	OSHA injuries due to vegetation management - Full-time employee																		# OSHA-reportable injuries	
	1.c.	OSHA injuries due to utility fuel management - Full-time employee																		# OSHA-reportable injuries	
	1.d.	OSHA injuries due to grid hardening - Full-time employee																		# OSHA-reportable injuries	
	1.e.	OSHA injuries due to other - Full-time employee																		# OSHA-reportable injuries	
2. OSHA injuries - Contractor	2.a.	OSHA injuries due to utility inspection - Contractor																		# OSHA-reportable injuries	
	2.b.	OSHA injuries due to vegetation management - Contractor																		# OSHA-reportable injuries	
	2.c.	OSHA injuries due to utility fuel management - Contractor																		# OSHA-reportable injuries	
	2.d.	OSHA injuries due to grid hardening - Contractor																		# OSHA-reportable injuries	
	2.e.	OSHA injuries due to other - Contractor																		# OSHA-reportable injuries	
3. OSHA injuries - Member of public	3.a.	OSHA injuries due to utility inspection - Public																		# OSHA-reportable injuries	
	3.b.	OSHA injuries due to vegetation management - Public																		# OSHA-reportable injuries	
	3.c.	OSHA injuries due to utility fuel management - Public																		# OSHA-reportable injuries	
	3.d.	OSHA injuries due to grid hardening - Public																		# OSHA-reportable injuries	
	3.e.	OSHA injuries due to other - Public																		# OSHA-reportable injuries	

Utility	X
Table No.	6
Date Modified	

Note: These columns are placeholders for future QR submissions.

Table 6: Weather patterns								Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
Metric type	**#**	**Outcome metric name**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2020**	**2020**	**2020**	**2021**	**2021**	**2021**	**2021**	**2022**	**2022**	**2022**	**2022**	**Unit(s)**	**Comments**
1. Red Flag Warning Overhead circuit mile Days	1.a.	Red Flag Warning Overhead circuit mile days - entire utility territory																		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. For example, if 100 overhead circuit miles were under an RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW OH circuit mile days would be 110.	
	1.b.	Red Flag Warning Overhead circuit mile days - HFTD Zone 1																		Red Flag Warning Overhead circuit mile days, see above for definition	
	1.c.	Red Flag Warning Overhead circuit mile days - HFTD Tier 2																		Red Flag Warning Overhead circuit mile days, see above for definition	
	1.d.	Red Flag Warning Overhead circuit mile days - HFTD Tier 3																		Red Flag Warning Overhead circuit mile days, see above for definition	
	1.e.	Red Flag Warning Overhead circuit mile days - Non-HFTD																		Red Flag Warning Overhead circuit mile days, see above for definition	
2. Wind conditions	2.a.	High wind warning overhead circuit mile days																		Sum of overhead circuit miles of utility grid subject to High Wind Warnings (HWW, as defined by the National Weather Service) each day within a given time period, calculated as the number of overhead circuit miles that were under an HWW multiplied by the number of days those miles were under said HWW. For example, if 100 overhead circuit miles were under an HWW for 1 day, and 10 of those miles were under HWW for an additional day, then the total HWW OH circuit mile days would be 110.	
3. Other	3.a.	Other relevant weather pattern metrics tracked (add additional rows as needed)																			

Utility	X
Table No.	7.1
Date Modified	

Notes:
Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV.
Data from 2015 - 2020 Q2 should be actual numbers. 2020 Q3 - 2023 should be projected. In future submissions update projected numbers with actuals

Table 7.1: Key recent and projected drivers of risk events

						Number of risk events									Projected risk events										
											Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
	Risk Event category	**Cause category**	**#**	**Sub-cause category**	**Are risk events tracked for ignition driver? (yes / no)**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2020**	**2020**	**2020**	**2021**	**2021**	**2021**	**2021**	**2022**	**2022**	**2022**	**2022**	**Unit(s)**	**Comments**
x	Wire down event - Distribution	1. Contact from object - Distribution	1.a.	Veg. contact- Distribution																			# risk events (excluding ignitions)	
			1.b.	Animal contact- Distribution																			# risk events (excluding ignitions)	
			1.c.	Balloon contact- Distribution																			# risk events (excluding ignitions)	
			1.d.	Vehicle contact- Distribution																			# risk events (excluding ignitions)	
			1.e.	Other contact from object - Distribution																			# risk events (excluding ignitions)	
		2. Equipment / facility failure - Distribution	2.a.	Connector damage or failure- Distribution																			# risk events (excluding ignitions)	
			2.b.	Splice damage or failure — Distribution																			# risk events (excluding ignitions)	
			2.c.	Crossarm damage or failure - Distribution																			# risk events (excluding ignitions)	
			2.d.	Insulator damage or failure- Distribution																			# risk events (excluding ignitions)	
			2.e.	Lightning arrestor damage or failure- Distribution																			# risk events (excluding ignitions)	
			2.f.	Tap damage or failure - Distribution																			# risk events (excluding ignitions)	
			2.g.	Tie wire damage or failure - Distribution																			# risk events (excluding ignitions)	
			2.h.	Other - Distribution																			# risk events (excluding ignitions)	
		3. Wire-to-wire contact - Distribution	3.a.	Wire-to-wire contact / contamination- Distribution																			# risk events (excluding ignitions)	
		4. Contamination - Distribution	4.a.	Contamination - Distribution																			# risk events (excluding ignitions)	
		5. Utility work / Operation	5.a.	Utility work / Operation																			# risk events (excluding ignitions)	
		6. Vandalism / Theft - Distribution	6.a.	Vandalism / Theft - Distribution																			# risk events (excluding ignitions)	
		7. Other- Distribution	7.a.	All Other- Distribution																			# risk events (excluding ignitions)	
		8. Unknown- Distribution	8.a.	Unknown - Distribution																			# risk events (excluding ignitions)	
x	Wire down event - Transmission	9. Contact from object - Transmission	9.a.	Veg. contact- Transmission																			# risk events (excluding ignitions)	
			9.b.	Animal contact- Transmission																			# risk events (excluding ignitions)	
			9.c.	Balloon contact- Transmission																			# risk events (excluding ignitions)	
			9.d.	Vehicle contact- Transmission																			# risk events (excluding ignitions)	
			9.e.	Other contact from object - Transmission																			# risk events (excluding ignitions)	
		10. Equipment / facility failure - Transmission	10.a.	Connector damage or failure- Transmission																			# risk events (excluding ignitions)	
			10.b.	Splice damage or failure — Transmission																			# risk events (excluding ignitions)	
			10.c.	Crossarm damage or failure - Transmission																			# risk events (excluding ignitions)	
			10.d.	Insulator damage or failure- Transmission																			# risk events (excluding ignitions)	
			10.e.	Lightning arrestor damage or failure- Transmission																			# risk events (excluding ignitions)	
			10.f.	Tap damage or failure - Transmission																			# risk events (excluding ignitions)	
			10.g.	Tie wire damage or failure - Transmission																			# risk events (excluding ignitions)	
			10.h.	Other - Transmission																			# risk events (excluding ignitions)	
		11. Wire-to-wire contact - Transmission	11.a.	Wire-to-wire contact / contamination- Transmission																			# risk events (excluding ignitions)	
		12. Contamination - Transmission	12.a.	Contamination - Transmission																			# risk events (excluding ignitions)	
		13. Utility work / Operation	13.a.	Utility work / Operation																			# risk events (excluding ignitions)	
		14. Vandalism / Theft - Transmission	14.a.	Vandalism / Theft - Transmission																			# risk events (excluding ignitions)	
		15. Other- Transmission	15.a.	All Other- Transmission																			# risk events (excluding ignitions)	
		16. Unknown- Transmission	16.a.	Unknown - Transmission																			# risk events (excluding ignitions)	
x	Outage - Distribution	17. Contact from object - Distribution	17.a.	Veg. contact- Distribution																			# risk events (excluding ignitions)	
			17.b.	Animal contact- Distribution																			# risk events (excluding ignitions)	
			17.c.	Balloon contact- Distribution																			# risk events (excluding ignitions)	
			17.d.	Vehicle contact- Distribution																			# risk events (excluding ignitions)	
			17.e.	Other contact from object - Distribution																			# risk events (excluding ignitions)	
		18. Equipment / facility failure - Distribution	18.a.	Capacitor bank damage or failure- Distribution																			# risk events (excluding ignitions)	
			18.b.	Conductor damage or failure — Distribution																			# risk events (excluding ignitions)	
			18.c.	Fuse damage or failure - Distribution																			# risk events (excluding ignitions)	
			18.d.	Lightning arrestor damage or failure- Distribution																			# risk events (excluding ignitions)	
			18.e.	Switch damage or failure- Distribution																			# risk events (excluding ignitions)	
			18.f.	Pole damage or failure - Distribution																			# risk events (excluding ignitions)	
			18.g.	Insulator and brushing damage or failure - Distribution																			# risk events (excluding ignitions)	
			18.h.	Crossarm damage or failure - Distribution																			# risk events (excluding ignitions)	
			18.i.	Voltage regulator / booster damage or failure - Distribution																			# risk events (excluding ignitions)	
			18.j.	Recloser damage or failure - Distribution																			# risk events (excluding ignitions)	
			18.k.	Anchor / guy damage or failure - Distribution																			# risk events (excluding ignitions)	
			18.l.	Sectionalizer damage or failure - Distribution																			# risk events (excluding ignitions)	
			18.m.	Connection device damage or failure - Distribution																			# risk events (excluding ignitions)	
			18.n.	Transformer damage or failure - Distribution																			# risk events (excluding ignitions)	
			18.o.	Other - Distribution																			# risk events (excluding ignitions)	
		19. Wire-to-wire contact - Distribution	19.a.	Wire-to-wire contact / contamination- Distribution																			# risk events (excluding ignitions)	
		20. Contamination - Distribution	20.a.	Contamination - Distribution																			# risk events (excluding ignitions)	
		21. Utility work / Operation	21.a.	Utility work / Operation																			# risk events (excluding ignitions)	
		22. Vandalism / Theft - Distribution	22.a.	Vandalism / Theft - Distribution																			# risk events (excluding ignitions)	
		23. Other- Distribution	23.a.	All Other- Distribution																			# risk events (excluding ignitions)	
		24. Unknown- Distribution	24.a.	Unknown - Distribution																			# risk events (excluding ignitions)	
x	Outage - Transmission	25. Contact from object - Transmission	25.a.	Veg. contact- Transmission																			# risk events (excluding ignitions)	
			25.b.	Animal contact- Transmission																			# risk events (excluding ignitions)	
			25.c.	Balloon contact- Transmission																			# risk events (excluding ignitions)	
			25.d.	Vehicle contact- Transmission																			# risk events (excluding ignitions)	
			25.e.	Other contact from object - Transmission																			# risk events (excluding ignitions)	
		26. Equipment / facility failure - Transmission	26.a.	Capacitor bank damage or failure- Transmission																			# risk events (excluding ignitions)	
			26.b.	Conductor damage or failure — Transmission																			# risk events (excluding ignitions)	
			26.c.	Fuse damage or failure - Transmission																			# risk events (excluding ignitions)	
			26.d.	Lightning arrestor damage or failure- Transmission																			# risk events (excluding ignitions)	
			26.e.	Switch damage or failure- Transmission																			# risk events (excluding ignitions)	
			26.f.	Pole damage or failure - Transmission																			# risk events (excluding ignitions)	
			26.g.	Insulator and brushing damage or failure - Transmission																			# risk events (excluding ignitions)	
			26.h.	Crossarm damage or failure - Transmission																			# risk events (excluding ignitions)	
			26.i.	Voltage regulator / booster damage or failure - Transmission																			# risk events (excluding ignitions)	
			26.j.	Recloser damage or failure - Transmission																			# risk events (excluding ignitions)	
			26.k.	Anchor / guy damage or failure - Transmission																			# risk events (excluding ignitions)	
			26.l.	Sectionalizer damage or failure - Transmission																			# risk events (excluding ignitions)	
			26.m.	Connection device damage or failure - Transmission																			# risk events (excluding ignitions)	
			26.n.	Transformer damage or failure - Transmission																			# risk events (excluding ignitions)	
			26.o.	Other - Transmission																			# risk events (excluding ignitions)	
		27. Wire-to-wire contact - Transmission	27.a.	Wire-to-wire contact / contamination- Transmission																			# risk events (excluding ignitions)	
		28. Contamination - Transmission	28.a.	Contamination - Transmission																			# risk events (excluding ignitions)	
		29. Utility work / Operation	29.a.	Utility work / Operation																			# risk events (excluding ignitions)	
		30. Vandalism / Theft - Transmission	30.a.	Vandalism / Theft - Transmission																			# risk events (excluding ignitions)	
		31. Other- Transmission	31.a.	All Other- Transmission																			# risk events (excluding ignitions)	
		32. Unknown- Transmission	32.a.	Unknown - Transmission																			# risk events (excluding ignitions)	
x	Ignition - Distribution	33. Contact from object - Distribution	33.a.	Veg. contact- Distribution																			# ignitions	
			33.b.	Animal contact- Distribution																			# ignitions	
			33.c.	Balloon contact- Distribution																			# ignitions	
			33.d.	Vehicle contact- Distribution																			# ignitions	
			33.e.	Other contact from object - Distribution																			# ignitions	
		34. Equipment / facility failure - Distribution	34.a.	Capacitor bank damage or failure- Distribution																			# ignitions	
			34.b.	Conductor damage or failure — Distribution																			# ignitions	
			34.c.	Fuse damage or failure - Distribution																			# ignitions	
			34.d.	Lightning arrestor damage or failure- Distribution																			# ignitions	
			34.e.	Switch damage or failure- Distribution																			# ignitions	
			34.f.	Pole damage or failure - Distribution																			# ignitions	
			34.g.	Insulator and brushing damage or failure - Distribution																			# ignitions	
			34.h.	Crossarm damage or failure - Distribution																			# ignitions	

			34.i.	Voltage regulator / booster damage or failure - Distribution		# ignitions	
			34.j.	Recloser damage or failure - Distribution		# ignitions	
			34.k.	Anchor / guy damage or failure - Distribution		# ignitions	
			34.l.	Sectionalizer damage or failure - Distribution		# ignitions	
			34.m.	Connection device damage or failure - Distribution		# ignitions	
			34.n.	Transformer damage or failure - Distribution		# ignitions	
			34.o.	Other - Distribution		# ignitions	
		35. Wire-to-wire contact - Distribution	35.a.	Wire-to-wire contact / contamination- Distribution		# ignitions	
		36. Contamination - Distribution	36.a.	Contamination - Distribution		# ignitions	
		37. Utility work / Operation	37.a.	Utility work / Operation		# ignitions	
		38. Vandalism / Theft - Distribution	38.a.	Vandalism / Theft - Distribution		# ignitions	
		39. Other- Distribution	39.a.	All Other- Distribution		# ignitions	
		40. Unknown- Distribution	40.a.	Unknown - Distribution		# ignitions	
x	Ignition - Transmission	41. Contact from object - Transmission	41.a.	Veg. contact- Transmission		# ignitions	
			41.b.	Animal contact- Transmission		# ignitions	
			41.c.	Balloon contact- Transmission		# ignitions	
			41.d.	Vehicle contact- Transmission		# ignitions	
			41.e.	Other contact from object - Transmission		# ignitions	
		42. Equipment / facility failure - Transmission	42.a.	Capacitor bank damage or failure- Transmission		# ignitions	
			42.b.	Conductor damage or failure — Transmission		# ignitions	
			42.c.	Fuse damage or failure - Transmission		# ignitions	
			42.d.	Lightning arrestor damage or failure- Transmission		# ignitions	
			42.e.	Switch damage or failure- Transmission		# ignitions	
			42.f.	Pole damage or failure - Transmission		# ignitions	
			42.g.	Insulator and brushing damage or failure - Transmission		# ignitions	
			42.h.	Crossarm damage or failure - Transmission		# ignitions	
			42.i.	Voltage regulator / booster damage or failure - Transmission		# ignitions	
			42.j.	Recloser damage or failure - Transmission		# ignitions	
			42.k.	Anchor / guy damage or failure - Transmission		# ignitions	
			42.l.	Sectionalizer damage or failure - Transmission		# ignitions	
			42.m.	Connection device damage or failure - Transmission		# ignitions	
			42.n.	Transformer damage or failure - Transmission		# ignitions	
			42.o.	Other - Transmission		# ignitions	
		43. Wire-to-wire contact - Transmission	43.a.	Wire-to-wire contact / contamination- Transmission		# ignitions	
		44. Contamination - Transmission	44.a.	Contamination - Transmission		# ignitions	
		45. Utility work / Operation	45.a.	Utility work / Operation		# ignitions	
		46. Vandalism / Theft - Transmission	46.a.	Vandalism / Theft - Transmission		# ignitions	
		47. Other- Transmission	47.a.	All Other- Transmission		# ignitions	
		48. Unknown- Transmission	48.a.	Unknown - Transmission		# ignitions	

Utility	X
Table No.	7.2
Date Modified	

Notes:
Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV.
Data from 2015 - 2019 should be actual numbers. 2020 - 2023 should be projected. In future submissions update projected numbers with actuals

Table 7.2: Key recent and projected drivers of ignitions by HFTD region

		Metric type	**#**	**Ignition driver**	**Are ignitions tracked for ignition driver? (yes / no)**	Number of ignitions by HFTD tier																				Projected ignitions by HFTD tier									
						Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	**Unit(s)**	**Comments**
						2015	2015	2015	2015	2016	2016	2016	2016	2017	2017	2017	2017	2018	2018	2018	2018	2019	2019	2019	2019	2020	2020	2020	2020	2021	2021	2021	2021	2022	2022	2022	2022		
x	Ignition - Distribution	1. Contact from object - Distribution	1.a.	Vee, contact- Distribution																															# ignitions	
			1.b.	Animal contact- Distribution																															# ignitions	
			1.c.	Balloon contact- Distribution																															# ignitions	
			1.d.	Vehicle contact- Distribution																															# ignitions	
			1.e.	Other contact from object - Distribution																															# ignitions	
		2. Equipment / facility failure - Distribution	2.a.	Capacitor bank damage or failure- Distribution																															# ignitions	
			2.b.	Conductor damage or failure — Distribution																															# ignitions	
			2.c.	Fuse damage or failure - Distribution																															# ignitions	
			2.d.	Lightning arrestor damage or failure- Distribution																															# ignitions	
			2.e.	Switch damage or failure- Distribution																															# ignitions	
			2.f.	Pole damage or failure - Distribution																															# ignitions	
			2.g.	Insulator and brushing damage or failure - Distribution																															# ignitions	
			2.h.	Crossarm damage or failure - Distribution																															# ignitions	
			2.i.	Voltage regulator / booster damage or failure - Distribution																															# ignitions	
			2.j.	Recloser damaee or failure - Distribution																															# ignitions	
			2.k.	Anchor / euy damaee or failure - Distribution																															# ignitions	
			2.l.	Sectionalizer damaee or failure - Distribution																															# ignitions	
			2.m.	Connection device damaee or failure - Distribution																															# ignitions	
			2.n.	Transformer damaee or failure - Distribution																															# ignitions	
			2.o.	Other - Distribution																															# ignitions	
		3. Wire-to-wire contact - Distribution	3.a.	Wire-to-wire contact / contamination- Distribution																															# ignitions	
		4. Contamination - Distribution	4.a.	Contamination - Distribution																															# ignitions	
		5. Utility work / Operation	5.a.	Utility work / Operation																															# ignitions	
		6. Vandalism / Theft - Distribution	6.a.	Vandalism / Theft - Distribution																															# ignitions	
		7. Other- Distribution	7.a.	All Other- Distribution																															# ignitions	
		8. Unknown- Distribution	8.a.	Unknown - Distribution																															# ignitions	
x	Ignition - Transmission	9. Contact from object - Transmission	9.a.	Vee, contact- Transmission																															# ignitions	
			9.b.	Animal contact- Transmission																															# ignitions	
			9.c.	Balloon contact- Transmission																															# ignitions	
			9.d.	Vehicle contact- Transmission																															# ignitions	
			9.e.	Other contact from object - Transmission																															# ignitions	
		10. Equipment / facility failure - Transmission	10.a.	Capacitor bank damage or failure- Transmission																															# ignitions	
			10.b.	Conductor damage or failure — Transmission																															# ignitions	
			10.c.	Fuse damage or failure - Transmission																															# ignitions	
			10.d.	Lightning arrestor damage or failure- Transmission																															# ignitions	
			10.e.	Switch damage or failure- Transmission																															# ignitions	
			10.f.	Pole damage or failure - Transmission																															# ignitions	
			10.g.	Insulator and brushing damage or failure - Transmission																															# ignitions	
			10.h.	Crossarm damaee or failure - Transmission																															# ignitions	
			10.i.	Voltaee reeulator / booster damaee or failure - Transmission																															# ignitions	
			10.j.	Recloser damaee or failure - Transmission																															# ignitions	
			10.k.	Anchor / euy damaee or failure - Transmission																															# ignitions	
			10.l.	Sectionalizer damaee or failure - Transmission																															# ignitions	
			10.m.	Connection device damaee or failure - Transmission																															# ignitions	
			10.n.	Transformer damaee or failure - Transmission																															# ignitions	
			10.o.	Other - Transmission																															# ignitions	
		11. Wire-to-wire contact - Transmission	11.a.	Wire-to-wire contact / contamination- Transmission																															# ignitions	
		12. Contamination - Transmission	12.a.	Contamination - Transmission																															# ignitions	
		13. Utility work / Operation	13.a.	Utility work / Operation																															# ignitions	
		14. Vandalism / Theft - Transmission	14.a.	Vandalism / Theft - Transmission																															# ignitions	
		15. Other- Transmission	15.a.	All Other- Transmission																															# ignitions	
		16. Unknown- Transmission	16.a.	Unknown - Transmission																															# ignitions	

Utility	x
Table No.	8
Date Modified	

Note: These columns are placeholders for future OR submissions.

	Table 8: State of service territory and utility equipment			Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3		
	Metric type	#	Outcome metric name	2015	2015	2015	2015	2016	2016	2016	2016	2017	2017	2017	2017	2018	2018	2018	2018	2019	2019	2019	2019	2020	2020	2020	2020	2021	2021	2021	2021	2022	2022	2022	2022	Unit(s)	Comments
x	1. State of service territory and equipment in urban areas	1.a.	Circuit miles (including WUI and non-WUI)																																Circuit miles	
		1.b.	Circuit miles in WUI																																Circuit miles in WUI	
		1.c.	Number of critical facilities (including WUI and non-WUI)																																Number of critical facilities	
		1.d.	Number of critical facilities in WUI																																Number of critical facilities in WUI	
		1.e.	Number of customers (including WUI and non-WUI)																																Number of customers	
		1.f.	Number of customers in WUI																																Number of customers in WUI	
		1.g.	Number of customers belonging to access and functional needs populations (including WUI and non-WUI)																																Number of customers belonging to access and functional needs populations	
		1.h.	Number of customers belonging to access and functional needs populations in WUI																																Number of customers belonging to access and functional needs populations in WUI	
		1.i.	Circuit miles of overhead transmission lines (including WUI and non-WUI)																																Circuit miles of overhead transmission lines	
		1.j.	Circuit miles of overhead transmission lines in WUI																																Circuit miles of overhead transmission lines in WUI	
		1.k.	Circuit miles of overhead distribution lines (including WUI and non-WUI)																																Circuit miles of overhead distribution lines	
		1.l.	Circuit miles of overhead distribution lines in WUI																																Circuit miles of overhead distribution lines in WUI	
		1.m.	Number of substations (including WUI and non-WUI)																																Number of substations	
		1.n	Number of substations in WUI																																Number of substations in WUI	
		1.o.	Number of weather stations (including WUI and non-WUI)																																Number of weather stations	
		1.p.	Number of weather stations in WUI																																Number of weather stations in WUI	
x	2. State of service territory and equipment in rural areas	2.a.	Circuit miles (including WUI and non-WUI)																																Circuit miles	
		2.b.	Circuit miles in WUI																																Circuit miles in WUI	
		2.c.	Number of critical facilities (including WUI and non-WUI)																																Number of critical facilities	
		2.d.	Number of critical facilities in WUI																																Number of critical facilities in WUI	
		2.e.	Number of customers (including WUI and non-WUI)																																Number of customers	
		2.f.	Number of customers in WUI																																Number of customers in WUI	
		2.g.	Number of customers belonging to access and functional needs populations (including WUI and non-WUI)																																Number of customers belonging to access and functional needs populations	
		2.h.	Number of customers belonging to access and functional needs populations in WUI																																Number of customers belonging to access and functional needs populations in WUI	
		2.i.	Circuit miles of overhead transmission lines (including WUI and non-WUI)																																Circuit miles of overhead transmission lines	
		2.j.	Circuit miles of overhead transmission lines in WUI																																Circuit miles of overhead transmission lines in WUI	
		2.k.	Circuit miles of overhead distribution lines (including WUI and non-WUI)																																Circuit miles of overhead distribution lines	
		2.l.	Circuit miles of overhead distribution lines in WUI																																Circuit miles of overhead distribution lines in WUI	
		2.m.	Number of substations (including WUI and non-WUI)																																Number of substations	
		2.n	Number of substations in WUI																																Number of substations in WUI	
		2.o.	Number of weather stations (including WUI and non-WUI)																																Number of weather stations	
		2.p.	Number of weather stations in WUI																																Number of weather stations in WUI	
x	3. State of service territory and equipment in highly rural areas	3.a.	Circuit miles (including WUI and non-WUI)																																Circuit miles	
		3.b.	Circuit miles in WUI																																Circuit miles in WUI	
		3.c.	Number of critical facilities (including WUI and non-WUI)																																Number of critical facilities	
		3.d.	Number of critical facilities in WUI																																Number of critical facilities in WUI	
		3.e.	Number of customers (including WUI and non-WUI)																																Number of customers	
		3.f.	Number of customers in WUI																																Number of customers in WUI	
		3.g.	Number of customers belonging to access and functional needs populations (including WUI and non-WUI)																																Number of customers belonging to access and functional needs populations	
		3.h.	Number of customers belonging to access and functional needs populations in WUI																																Number of customers belonging to access and functional needs populations in WUI	
		3.i.	Circuit miles of overhead transmission lines (including WUI and non-WUI)																																Circuit miles of overhead transmission lines	
		3.j.	Circuit miles of overhead transmission lines in WUI																																Circuit miles of overhead transmission lines in WUI	
		3.k.	Circuit miles of overhead distribution lines (including WUI and non-WUI)																																Circuit miles of overhead distribution lines	
		3.l.	Circuit miles of overhead distribution lines in WUI																																Circuit miles of overhead distribution lines in WUI	
		3.m.	Number of substations (including WUI and non-WUI)																																Number of substations	
		3.n	Number of substations in WUI																																Number of substations in WUI	
		3.o.	Number of weather stations (including WUI and non-WUI)																																Number of weather stations	
		3.p.	Number of weather stations in WUI																																Number of weather stations in WUI	

Utility	X
Table No.	9
Date Modified	

Notes:
Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV. Report net additions using positive numbers and net removals and undergrounding using negative numbers for circuit miles and numbers of substations. Only report changes expected within the target year.
For example, if 20 net overhead circuit miles are planned for addition by 2023, with 15 being added by 2022 and 5 more added by 2023, then report "15" for 2022 and "5" for 2023. Do not report cumulative change across years. In this case, do not report "20" for 2023, but instead the number planned to be added for just that year, which is "5".

Table 9: Location of actual and planned utility equipment additions or removal year over year

	Metric type	#	Outcome metric name	Actual				Projected								Unit(s)	Comments
				Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3		
				2020	2020	2020	2020	2021	2021	2021	2021	2022	2022	2022	2022		
x	1. Planned utility equipment net addition (or removal) year over year - in urban areas	1.a.	Circuit miles of overhead transmission lines (including WUI and non-WUI)													Circuit miles	
		1.b.	Circuit miles of overhead distribution lines (including WUI and non-WUI)													Circuit miles	
		1.c.	Circuit miles of overhead transmission lines in WUI													Circuit miles in WUI	
		1.d.	Circuit miles of overhead distribution lines in WUI													Circuit miles in WUI	
		1.e.	Number of substations (including WUI and non-WUI)													Number of substations	
		1.f.	Number of substations in WUI													Number of substations in WUI	
		1.g.	Number of weather stations (including WUI and non-WUI)													Number of weather stations	
		1.h.	Number of weather stations in WUI													Number of weather stations in WUI	
x	2. Planned utility equipment net addition (or removal) year over year - in rural areas	2.a.	Circuit miles of overhead transmission lines (including WUI and non-WUI)													Circuit miles	
		2.b.	Circuit miles of overhead distribution lines (including WUI and non-WUI)													Circuit miles	
		2.c.	Circuit miles of overhead transmission lines in WUI													Circuit miles in WUI	
		2.d.	Circuit miles of overhead distribution lines in WUI													Circuit miles in WUI	
		2.e.	Number of substations (including WUI and non-WUI)													Number of substations	
		2.f.	Number of substations in WUI													Number of substations in WUI	
		2.g.	Number of weather stations (including WUI and non-WUI)													Number of weather stations	
		2.h.	Number of weather stations in WUI													Number of weather stations in WUI	
x	3. Planned utility equipment net addition (or removal) year over year - in highly rural areas	3.a.	Circuit miles of overhead transmission lines (including WUI and non-WUI)													Circuit miles	
		3.b.	Circuit miles of overhead distribution lines (including WUI and non-WUI)													Circuit miles	
		3.c.	Circuit miles of overhead transmission lines in WUI													Circuit miles in WUI	
		3.d.	Circuit miles of overhead distribution lines in WUI													Circuit miles in WUI	
		3.e.	Number of substations (including WUI and non-WUI)													Number of substations	
		3.f.	Number of substations in WUI													Number of substations in WUI	
		3.g.	Number of weather stations (including WUI and non-WUI)													Number of weather stations	
		3.h.	Number of weather stations in WUI													Number of weather stations in WUI	

Utility	X	Notes:
Table No.	10	Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV.
Date Modified		In future submissions update planned upgrade numbers with actuals
		In the comments column on the far-right, enter the relevant program target(s) associated

Table 10: Location of actual and planned utility infrastructure upgrades year over year

	Metric type	**#**	**Outcome metric name**	Actual				Projected								**Unit(s)**	**Comments**
				Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3	Non-HFTD	HFTD Zone 1	HFTD Tier 2	HFTD Tier 3		
				2020	**2020**	**2020**	**2020**	**2021**	**2021**	**2021**	**2021**	**2022**	**2022**	**2022**	**2022**		
x	1. Planned utility infrastructure upgrades year over year - in urban areas	1.a.	Circuit miles of overhead transmission lines planned for upgrades (including WUI and non-WUI)													Circuit miles	
		1.b.	Circuit miles of overhead distribution lines planned for upgrades (including WUI and non-WUI)													Circuit miles	
		1.c.	Circuit miles of overhead transmission lines planned for upgrades in WUI													Circuit miles in WUI	
		1.d.	Circuit miles of overhead distribution lines planned for upgrades in WUI													Circuit miles in WUI	
		1.e.	Number of substations planned for upgrades (including WUI and non-WUI)													Number of substations	
		1.f.	Number of substations planned for upgrades in WUI													Number of substations in WUI	
		1.g.	Number of weather stations planned for upgrades (including WUI and non-WUI)													Number of weather stations	
		1.h.	Number of weather stations planned for upgrades in WUI													Number of weather stations in WUI	
x	2. Planned utility infrastructure upgrades year over year - in rural areas	2.a.	Circuit miles of overhead transmission lines planned for upgrades (including WUI and non-WUI)													Circuit miles	
		2.b.	Circuit miles of overhead distribution lines planned for upgrades (including WUI and non-WUI)													Circuit miles	
		2.c.	Circuit miles of overhead transmission lines planned for upgrades in WUI													Circuit miles in WUI	
		2.d.	Circuit miles of overhead distribution lines planned for upgrades in WUI													Circuit miles in WUI	
		2.e.	Number of substations planned for upgrades (including WUI and non-WUI)													Number of substations	
		2.f.	Number of substations planned for upgrades in WUI													Number of substations in WUI	
		2.g.	Number of weather stations planned for upgrades (including WUI and non-WUI)													Number of weather stations	
		2.h.	Number of weather stations planned for upgrades in WUI													Number of weather stations in WUI	
x	3. Planned utility infrastructure upgrades year over year - in highly rural areas	3.a.	Circuit miles of overhead transmission lines planned for upgrades (including WUI and non-WUI)													Circuit miles	
		3.b.	Circuit miles of overhead distribution lines planned for upgrades (including WUI and non-WUI)													Circuit miles	
		3.c.	Circuit miles of overhead transmission lines planned for upgrades in WUI													Circuit miles in WUI	
		3.d.	Circuit miles of overhead distribution lines planned for upgrades in WUI													Circuit miles in WUI	
		3.e.	Number of substations planned for upgrades (including WUI and non-WUI)													Number of substations	
		3.f.	Number of substations planned for upgrades in WUI													Number of substations in WUI	
		3.g.	Number of weather stations planned for upgrades (including WUI and non-WUI)													Number of weather stations	
		3.h.	Number of weather stations planned for upgrades in WUI													Number of weather stations in WUI	

Utility	X
Table No.	11
Date Modified	

Notes:
"PSPS" = Public Safety Power Shutoff
In future submissions update planned upgrade numbers with actuals

Table 11: Recent use of PSPS and other PSPS metrics

			Actual									Projected									
								Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
Metric type	**#**	**Outcome metric name**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2020**	**2020**	**2020**	**2021**	**2021**	**2021**	**2021**	**2022**	**2022**	**2022**	**2022**	**Unit(s)**	**Comments**
1. Recent use of PSPS	1.a.	Frequency of PSPS events (total)																		Number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability, per year	
	1.b.	Scope of PSPS events (total)																		Circuit-events, measured in number of events multiplied by number of circuits de-energized per year	
	1.c.	Duration of PSPS events (total)																		Customer hours per year	
2. Customer hours of PSPS and other outages	2.a.	Customer hours of planned outages including PSPS (total)																		Total customer hours of planned outages per year	
	2.b.	Customer hours of unplanned outages, not including PSPS (total)																		Total customer hours of unplanned outages per year	
	2.c.	System Average Interruption Duration Index (SAIDI) (including PSPS)																		SAIDI index value = sum of all interruptions in time period where each interruption is defined as sum(duration of interruption * # of customer interruptions) / Total number of customers served	
	2.d.	System Average Interruption Duration Index (SAIDI) (excluding PSPS)																		SAIDI index value = sum of all interruptions in time period where each interruption is defined as sum(duration of interruption * # of customer interruptions) / Total number of customers served	
	2.e.	System Average Interruption Frequency Index (SAIFI) (including PSPS)																		SAIFI index value = sum of all interruptions in time period where each interruption is defined as (total # of customer interruptions) / (total # of customers served)	
	2.f.	System Average Interruption Frequency Index (SAIFI) (excluding PSPS)																		SAIFI index value = sum of all interruptions in time period where each interruption is defined as (total # of customer interruptions) / (total # of customers served)	
3. Critical infrastructure impacted by PSPS	3.a.	Critical infrastructure impacted by PSPS																		Number of critical infrastructure (in accordance with D.19-05-042) locations impacted per hour multiplied by hours offline per year	
4. Community outreach of PSPS metrics	4.a.	# of customers impacted by PSPS																		# of customers impacted by PSPS (if multiple PSPS events impact the same customer, count each event as a separate customer)	
	4.b.	# of medical baseline customers impacted by PSPS																		# of customers impacted by PSPS (if multiple PSPS events impact the same customer, count each event as a separate customer)	
	4.c.	# of customers notified prior to initiation of PSPS event																		# of customers notified of PSPS event prior to initiation (if multiple PSPS events impact the same customer, count each event in which customer was notified as a separate customer)	
	4.d.	# of medical baseline customers notified prior to initiation of PSPS event																		# of customers notified of PSPS event prior to initiation (if multiple PSPS events impact the same customer, count each event in which customer was notified as a separate customer)	
	4.e.	% of customers notified prior to a PSPS event impacting them																		=4.a. / 4.c.	
	4.f.	% of medical baseline customers notified prior to a PSPS event impacting them																		=4.a. / 4.c.	
5. Other PSPS metrics	5.a.	Number of PSPS de-energizations																		Number of de-energizations	
	5.b.	Number of customers located on de-energized circuit																		Number of customers	
	5.c.	Customer hours of PSPS per RFW OH circuit mile day																		=1.c. / RFW OH circuit mile days in time period	
	5.d.	Frequency of PSPS events (total) - High Wind Warning wind conditions																		Events over time period that overlapped with a High Wind Warning as defined by the National Weather Service	
	5.e.	Scope of PSPS events (total) - High Wind Warning wind conditions																		Estimated customers impacted over time period that overlapped with a High Wind Warning as defined by the National Weather Service	
	5.f.	Duration of PSPS events (total) - High Wind Warning wind conditions																		Customer hours over time period that overlapped with a High Wind Warning as defined by the National Weather Service	

Utility	X
Table No.	12
Date Modified	

Notes:
Risk-Spend-Efficiency (RSE) is defined as "An estimate of the cost-effectiveness of initiative, calculated by dividing the mitigation risk reduction benefit by the mitigation cost estimate based on the full set of risk reduction benefits estimated from the incurred costs."
CAPEX = Capital expenditure; OPEX = Operating expenditure.
In future submissions update planned spend, line miles treated, RSE, etc. with updated projections and actuals. Additional instructions can be found in QR information.

Table 12: Mitigation initiative financials

																Actual	Actual	Actual	Actual	Projected	Projected	Projected	Projected	Projected	Projected	Projected	Projected		
																CAPEX ($ thousands)	OPEX ($ thousands)	Line miles to be treated	Alternative units (if used	CAPEX ($ thousands)	OPEX ($ thousands)	Line miles to be treated	Alternative units (if used	CAPEX ($ thousands)	OPEX ($ thousands)	Line miles to be treated	Alternative units (if used		
Metric type	**WMP Table # / Category**	**WMP initiative #**	**Initiative activity**	**Primary driver targeted**	**Secondary driver targeted**	**Year initiated**	**Estimated RSE in non-HFTD ratings**	**Estimated RSE in HFTD Zone 1**	**Estimated RSE in HFTD Tier 2**	**Estimated RSE in HFTD Tier 3**	**If existing: most recent proceeding that has reviewed program**	**If new: memorandum account**	**Current compliance status - in / exceeding compliance with regulations**	**Associated rule(s) - if multiple, separate by semi-colon ";"**	**If spend not disaggregated by category, note spend category or mark several questions**	**Alternative units in which initiative is reported (if not line miles); still required to report line miles**	**Comments**	**2020**	**2020**	**2020**	**2020**	**2021**	**2021**	**2021**	**2021**	**2022**	**2022**	**2022**	**2022**		
Other	Risk Assessment & Mapping	5.3.1.1.	A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment																										
Other	Risk Assessment & Mapping	5.3.1.2.	Climate-driven risk map and modelling based on various relevant weather scenarios																										
Other	Risk Assessment & Mapping	5.3.1.3.	Ignition probability mapping showing the probability of ignition along the electric lines and equipment																										
Other	Risk Assessment & Mapping	5.3.1.4.	Initiative massive and estimation of wildfire and PSPS risk-reduction impact																										
Other	Risk Assessment & Mapping	5.3.1.5.	Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment																										
Other	Situational Awareness & Forecastine	5.3.2.1.	Pan-and-tilt weather monitorine and weather stations																										
Other	Situational Awareness & Forecastine	5.3.2.2.	Continuous monitorine sensors																										
Other	Situational Awareness & Forecastine	5.3.2.3.	Fault indicators for detectine faults on electric lines and equipment																										
Other	Situational Awareness & Forecastine	5.3.2.4.	Forecast of a fire risk index, fire potential index, or similar																										
Other	Situational Awareness & Forecastine	5.3.2.5.	Personnel monitorine areas of electric lines and equipment in elevated fire risk conditions																										
Other	Situational Awareness & Forecastine	5.3.2.6.	Weather forecastine and estimatine impacts on electric lines and equipment																										
Grid hardening	Grid Design & System Hardening	5.3.3.1.	Capacity maintenance and replacement program																										
Grid hardening	Grid Design & System Hardening	5.3.3.2.	Circuit breaker maintenance and installation to de-energize lines upon detectine a fault																										
Grid hardening	Grid Design & System Hardening	5.3.3.3.	Covered conductor installation																										
Grid hardening	Grid Design & System Hardening	5.3.3.4.	Covered conductor maintenance																										
Grid hardening	Grid Design & System Hardening	5.3.3.5.	Crossarm maintenance, repair, and replacement																										
Grid hardening	Grid Design & System Hardening	5.3.3.6.	Distribution pole replacement and reinforcement, includine with composite poles																										
Grid hardening	Grid Design & System Hardening	5.3.3.7.	Expulsion fuse replacement																										
Grid hardening	Grid Design & System Hardening	5.3.3.8.	Grid topology improvements to mitigate or reduce PSPS events																										
Grid hardening	Grid Design & System Hardening	5.3.3.9.	Installation of system protection equipment																										
Grid hardening	Grid Design & System Hardening	5.3.3.10.	Maintenance, repair, and replacement of connectors, includine hotline clamps																										
Grid hardening	Grid Design & System Hardening	5.3.3.11.	Mitigation of impact on customers and other residents affected durine PSPS event																										
Grid hardening	Grid Design & System Hardening	5.3.3.12.	Other corrective action																										
Grid hardening	Grid Design & System Hardening	5.3.3.13.	Pole loadine infrastructure hardenine and replacement program based on pole loadine assessment program																										
Grid hardening	Grid Design & System Hardening	5.3.3.14.	Transformers maintenance and replacement																										
Grid hardening	Grid Design & System Hardening	5.3.3.15.	Transmission tower maintenance and replacement																										
Grid hardening	Grid Design & System Hardening	5.3.3.16.	Undergrounding of electric lines and/or equipment																										
Grid hardening	Grid Design & System Hardening	5.3.3.17.	Updates to grid topology to minimize risk of ignition in HFTDs																										
Asset inspection	Asset Management & Inspections	5.3.4.1.	Detailed inspections of distribution electric lines and equipment																										
Asset inspection	Asset Management & Inspections	5.3.4.2.	Detailed inspections of transmission electric lines and equipment																										
Asset inspection	Asset Management & Inspections	5.3.4.3.	Improvement of inspections																										
Asset inspection	Asset Management & Inspections	5.3.4.4.	Infrared inspections of distribution electric lines and equipment																										
Asset inspection	Asset Management & Inspections	5.3.4.5.	Infrared inspections of transmission electric lines and equipment																										
Asset inspection	Asset Management & Inspections	5.3.4.6.	Intrusive pole inspections																										
Asset inspection	Asset Management & Inspections	5.3.4.7.	LiDAR inspections of distribution electric lines and equipment																										
Asset inspection	Asset Management & Inspections	5.3.4.8.	LiDAR inspections of transmission electric lines and equipment																										
Asset inspection	Asset Management & Inspections	5.3.4.9.	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations																										
Asset inspection	Asset Management & Inspections	5.3.4.10.	Other discretionary inspection of transmission electric lines and																										
Asset inspection	Asset Management & Inspections	5.3.4.11.	Patrol inspections of distribution electric lines and equipment																										
Asset inspection	Asset Management & Inspections	5.3.4.12.	Patrol inspections of transmission electric lines and equipment																										
Asset inspection	Asset Management & Inspections	5.3.4.13.	Pole loadine assessment program to determine safety factor																										
Asset inspection	Asset Management & Inspections	5.3.4.14.	Quality assurance / quality control of inspections																										
Asset inspection	Asset Management & Inspections	5.3.4.15.	Substation inspections																										
Vegetation management project	Vegetation Management & Inspections	5.3.5.1.	Additional efforts to manage community and environmental impacts																										
Vegetation inspection	Vegetation Management & Inspections	5.3.5.2.	Detailed inspections of vegetation around distribution electric lines and equipment																										
Vegetation inspection	Vegetation Management & Inspections	5.3.5.3.	Detailed inspections of vegetation around transmission electric lines and equipment																										
Vegetation management project	Vegetation Management & Inspections	5.3.5.4.	Emergency response vegetation management due to red flag warning or other urgent conditions																										
Vegetation management project	Vegetation Management & Inspections	5.3.5.5.	Fuel management and reduction of "slash" from vegetation management activities																										
Vegetation inspection	Vegetation Management & Inspections	5.3.5.6.	Improvement of inspections																										
Vegetation inspection	Vegetation Management & Inspections	5.3.5.7.	LiDAR inspections of vegetation around distribution electric lines and equipment																										
Vegetation inspection	Vegetation Management & Inspections	5.3.5.8.	LiDAR inspections of vegetation around transmission electric lines and equipment																										
Vegetation inspection	Vegetation Management & Inspections	5.3.5.9.	Other discretionary inspections of vegetation around distribution electric lines and equipment																										
Vegetation inspection	Vegetation Management & Inspections	5.3.5.10.	Other discretionary inspections of vegetation around transmission electric lines and equipment																										
Vegetation inspection	Vegetation Management & Inspections	5.3.5.11.	Patrol inspections of vegetation around distribution electric lines and equipment																										
Vegetation inspection	Vegetation Management & Inspections	5.3.5.12.	Patrol inspections of vegetation around transmission electric lines and equipment																										
Vegetation inspection	Vegetation Management & Inspections	5.3.5.13.	Quality assurance / quality control of vegetation inspections																										
Vegetation management project	Vegetation Management & Inspections	5.3.5.14.	Recruitine and trainine of vegetation management personnel																										
Vegetation management project	Vegetation Management & Inspections	5.3.5.15.	Remediation of at-risk species																										
Vegetation management project	Vegetation Management & Inspections	5.3.5.16.	Removal and remediation of trees with strike potential to electric lines and equipment																										
Vegetation inspection	Vegetation Management & Inspections	5.3.5.17.	Substation inspections																										
Vegetation management project	Vegetation Management & Inspections	5.3.5.18.	Substation vegetation management																										
Vegetation management project	Vegetation Management & Inspections	5.3.5.19.	Vegetation inventory system																										
Vegetation management project	Vegetation Management & Inspections	5.3.5.20.	Vegetation management to achieve clearance around electric lines and equipment																										
Other	Grid Operations & Operating Protocols	5.3.6.1.	Automatic recloser operations																										
Other	Grid Operations & Operating Protocols	5.3.6.2.	Crew-accompanying ignition prevention and suppression resources and services																										
Other	Grid Operations & Operating Protocols	5.3.6.3.	Personnel work procedures and trainine in conditions of elevated fire risk																										
Other	Grid Operations & Operating Protocols	5.3.6.4.	Protocols for PSPS re-energization																										
Other	Grid Operations & Operating Protocols	5.3.6.5.	PSPS events and mitigation of PSPS impacts																										
Other	Grid Operations & Operating Protocols	5.3.6.6.	Sectioned and on-call ignition prevention and suppression resources and services																										
Other	Data Governance	5.3.7.1.	Centralized repository for data																										
Other	Data Governance	5.3.7.2.	Collaborative research on utility ignition and/or wildfire																										
Other	Data Governance	5.3.7.3.	Documentation and disclosure of wildfire-related data and algorithms																										
Other	Data Governance	5.3.7.4.	Tracking and analysis of near miss data																										
Other	Resource Allocation Methodology	5.3.8.1.	Allocation methodology development and application																										
Other	Resource Allocation Methodology	5.3.8.2.	Risk reduction scenario development and analysis																										
Other	Resource Allocation Methodology	5.3.8.3.	Risk spend efficiency (RSE)																										
Other	Emergency Planning & Preparedness	5.3.9.1.	Adequate, well-located workforce for service restoration																										
Other	Emergency Planning & Preparedness	5.3.9.2.	Community outreach, public awareness, and communications efforts																										
Other	Emergency Planning & Preparedness	5.3.9.3.	Customer support in emergencies																										
Other	Emergency Planning & Preparedness	5.3.9.4.	Disaster and emergency preparedness plan																										
Other	Emergency Planning & Preparedness	5.3.9.5.	Preparedness and planning for service restoration																										
Other	Emergency Planning & Preparedness	5.3.9.6.	Protocols in place to learn from wildfire events																										
Other	Stakeholder Cooperation & Community Engagement	5.3.10.1.	Community engagement																										
Other	Stakeholder Cooperation & Community Engagement	5.3.10.2.	Cooperation and best practice sharing with agencies outside CA																										
Other	Stakeholder Cooperation & Community Engagement	5.3.10.3.	Cooperation with suppression agencies																										
Other	Stakeholder Cooperation & Community Engagement	5.3.10.4.	Forest service and fuel reduction cooperation and joint roadmap																										

ATTACHMENT 2.4

Wildfire Safety Division

Attachment 2.4: 2021 Maturity Model

November 2020

Resolution WSD-011 - Attachment 2.4

Executive Summary - Utility Wildfire Mitigation Maturity Model

Approach to Utility Wildfire Mitigation Maturity Assessment

The Utility Wildfire Mitigation Maturity Model is a method to assess utility wildfire risk reduction capabilities and examine the relative maturity of the wildfire mitigation programs. When leveraged with requirements to increase maturity over time, the maturity assessment can be used to drive continuous improvement in utility wildfire mitigation. Implementation of the maturity assessment will help to identify and share best practices amongst the utilities and to establish a continually improving suite of best practices and lessons learned to combat the growing risk of utility-caused wildfires.

This assessment evaluates maturity, or the capacity to address wildfire risk displayed by a utility. The maturity assessment is not designed to assess performance or regulatory compliance, which should be conducted separately. The Wildfire Safety Division (WSD) intends to apply the maturity assessment to track each utility's maturity using the following process:

1. **In the 2021 WMP review, the WSD intends to assess progress on maturity** by comparing the utility's progress from 2020 maturity using self-reported data—subject to verification—from the utility's maturity survey, wildfire mitigation plan, and other relevant data sources. On an annual basis, WSD requires each utility to complete the maturity survey that asks utilities to report their current activities, capabilities and plans, a copy of which is outlined below.
2. **The WSD intends to score the utility's projected maturity** over the plan cycle, assuming full implementation of each of the elements of the utility's WMP. WSD intends to evaluate each utility's maturity based on three data sources: its response to the survey, additional data requests, and the utility's other filings, including their WMP.
3. **After WMP approvals, the WSD intends to annually re-evaluate each utility's maturity** to track progress against WMP-projected maturity. The WSD requires each utility to report their current activities, capabilities, and plans using the maturity survey, a copy of which is outlined below.
4. **Finally, every three years, the maturity model rubric** is expected to be updated, in order to drive continued improvement over the longer term. The WSD may periodically adjust the scale and re-define the maturity scoring such that there is room for utilities to continuously improve. By way of example, a utility that improves on the scale from a 1 (meets minimum expectations) to a 4 (improvement over current best practices) should continue to improve over time. In contrast, a utility that scores a 3 should not expect the same score in the future without further improvements.

The maturity assessment scores each utility against a total of 52 capabilities, organized in 10 categories. Each capability is scored into one of five possible levels of maturity. Table 1 below summarizes the capabilities being assessed.

	Category	I. Capability	II. Capability	III. Capability	IV. Capability	V. Capability	VI. Capability
	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	
	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	
	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	
	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	
	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
	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. Personnel qualifications and practices
	G. Data governance	33. Data collection and curation	34. Data transparency and analytics	35. Risk event tracking	36. Data sharing with research community		
	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
	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	
	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 AFN populations	51. Collaboration with emergency response agencies	52. Collaboration on wildfire mitigation planning with stakeholders	

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Summary descriptions of capabilities

Below are summary descriptions of each maturity model capability, organized by category. In the sections following, each category is listed with its underlying capabilities and their descriptions.

Table 1: Description of capabilities

Category	Capability	Capability description
A. Risk mapping and simulation	1. Climate scenario modeling and sensitivities	For planning purposes, the ability of the utility to reliably model various climate scenarios. The ability to understand how changing weather patterns impact wildfire and PSPS risk across their grid. Higher scores are achieved for incorporating a wider range of inputs and having more granularity.
	2. Ignition risk estimation	Having tools and capabilities to assess ignition risk across the utility's grid based on the combination of electric lines and equipment, vegetation, and weather/climate. Higher scores are achieved for having greater automation, with tools that take utilize a wide range of variables to more accurately estimate ignition risk.
	3. Estimation of wildfire consequences for communities	Having tools and capabilities to assess how communities would be affected, given an ignition. Higher scores are achieved for having more highly-automated tools that take into account more variables and more granular data to accurately estimate the consequence of wildfire.
	4. Estimation of wildfire and PSPS risk-reduction impact	The ability of the utility to estimate the consequence of various initiatives in reducing wildfire and PSPS risk to communities. Higher scores are achieved for being able to estimate risk reduction at a more granular level and for taking into account the specific existing lines and equipment, vegetation, weather/climate, and other factors specific to the location in which the initiative is being undertaken.
	5. Risk maps and simulation algorithms	Having established processes to update risk maps and wildfire simulation algorithms based on differences between modeled estimates and measured results. Higher scores are achieved by having more robust mechanisms for detecting differences and for more frequent updates.
B. Situational awareness and forecasting	6. Weather variables collected	The completeness of weather data variables collected. Higher scores are achieved by collecting a greater scope of reliable and relevant weather data and have more processes to validate the readings on each of these variables.
	7. Weather data resolution	The spatial and temporal resolution with which relevant weather data is collected, with higher scores achieved

Category	Capability	Capability description
		for collecting more data at a resolution that helps them understand the specific conditions at a finer resolution across the grid and in time.
	8. Weather forecasting ability	The ability of the utility to accurately predict weather across its grid. Higher scores are awarded for utilities that are able to forecast more accurately, at higher spatial and temporal resolution, and at a longer range.
	9. External sources used in weather forecasting	The external sources and validation processes the utility uses to obtain and validate its weather data. Higher scores are awarded for utilities that use external weather data to error check utility collected data.
	10. Wildfire detection processes and capabilities	The ability of utilities to detect ignitions and wildfire within their territory, particularly along the utility's lines and equipment. Higher scores are awarded for greater automation in its detection and having more means of detection.
C. Grid design and system hardening	11. Approach to prioritizing initiatives across territory	The effectiveness of the utility's approach to prioritizing initiatives to the areas along their grid that would most benefit from wildfire and PSPS risk reduction initiatives. Higher scores are awarded for utilities that can prioritize geographically at a higher granularity and take into account evolving impact on communities and surrounding environment.
	12. Grid design for minimizing ignition risk	The parameters of the utility's grid that minimize ignition risk. Higher scores are awarded for strategic grid design and localization (e.g., including solutions such as microgrids and minigrids, as well as geographically-targeted hardening initiatives and locating lines away from highest risk areas of landscape).
	13. Grid design for resiliency and minimizing PSPS	The level of redundancy and resilience in the utility's grid to avoid leaving customers without any electricity supply, should a line be de-energized, and to confine any PSPS to a limited number of customers. Higher scores are awarded for more redundant grid topologies and for greater sectionalization.
	14. Risk-based grid hardening and cost efficiency	The degree to which the utility's grid is built using ignition prevention equipment. Higher scores are awarded to utilities that use more risk spend efficient ignition prevention equipment.
	15. Grid design and asset innovation	The program in place by the utility to evaluate and develop new design and hardening initiatives. Higher scores are awarded to utilities that have more robust processes for evaluating new technologies and evaluating their risk spend efficiency.
D. Asset	16. Asset inventory and	Having an accurate inventory database of utility lines

Category	Capability	Capability description
management and inspections	condition assessments	and equipment by asset type across the grid, as well as the condition of each component. Higher scores are achieved by recording more wildfire-related attributes of each piece of equipment, with greater frequency.
	17. Asset inspection cycle	How the utility determines the cycle with which inspections of the utility's grid are conducted. Higher scores are achieved by understanding equipment failure probability and timing inspections accordingly to maximize risk mitigation efficacy.
	18. Asset inspection effectiveness	The depth and detail to which inspections are performed and recorded. Higher scores are achieved by having greater ability to identify higher risk areas and assets and conducting more in-depth inspections to maximize risk mitigation efficacy.
	19. Asset maintenance and repair	The approach taken by the utility to maintain and repair equipment in higher risk areas. Higher scores are awarded to utilities that maintain equipment in better condition in areas with the highest wildfire risk.
	20. QA/QC for asset management	Having established processes for monitoring the quality of inspection and maintenance work across the grid. Higher scores are achieved for having robust processes, trainings, and leveraging technologies to monitor and validate work performed.
E. Vegetation management and inspection	21. Vegetation inventory and condition assessments	Having an accurate inventory database of vegetation along rights of way, and vegetation with strike potential, including the condition of each vegetation. Higher scores are achieved by more granular information and having a more up-to-date database.
	22. Vegetation inspection cycle	How the utility determines the cycle with which inspections of the vegetation are conducted. Higher scores are achieved by understanding vegetation growth, characteristics, and failure probability and timing inspections accordingly to maximize risk mitigation efficacy.
	23. Vegetation inspection effectiveness	The depth and detail to which inspections are performed and recorded. Higher scores are achieved by having greater ability to identify higher risk areas and vegetation and conducting more in-depth inspections to maximize risk mitigation efficacy.
	24. Vegetation grow-in mitigation	The utility's standards and actions for treating vegetation that has grow-in potential around lines and equipment. Higher scores are awarded for utilities that use ignition risk modeling and vegetation growth rates to determine appropriate vegetation clearances and trim cycles.

Category	Capability	Capability description
	25. Vegetation fall-in mitigation	The utility's processes for treating vegetation that has strike potential on its grid. Higher scores are awarded to utilities that treat vegetation based on a granular understanding of individual vegetation strike potential.
	26. QA/QC for vegetation management	Having established processes for monitoring the quality of inspection and treatment work across the grid. Higher scores are achieved for having robust processes, trainings, and leveraging technologies to monitor and validate work performed.
F. Grid operations and protocols	27. Protective equipment and device settings	The utilities' procedures for adjusting the sensitivity of grid elements that can reduce wildfire risk. For example, this includes the utility's approach to adjusting reclosers by limiting or disabling reclosers in high fire threat districts. Higher scores are awarded for more automated processes.
	28. Incorporating ignition risk factors in grid control	The utility's process for determining when to operate electric lines and equipment above rated nameplate capacity. Higher scores are awarded for utilities that have clearly defined and explained protocols for operating equipment above nameplate capacity and incorporate understanding of incremental wildfire risk associated with operating conditions.
	29. PSPS operating model and consequence mitigation	The utility's ability to implement PSPS events including accurate predictions, customer communication, and mitigation activities. Higher scores are awarded to utilities that better predict, communicate, and mitigate consequences of PSPS.
	30. Protocols for PSPS initiation	The utility's approach to determining the thresholds for activating PSPS events. Higher scores are awarded to utilities that have well-defined PSPS protocols supported by risk assessing algorithms and position PSPS as a tool of last resort. Initiation should also account for cost associated with de-energizing the impact communities and critical facilities.
	31. Protocols for PSPS re-energization	The utility's approach to inspecting circuits after they have been de-energized and prior to a re-energization. Higher scores are awarded to utilities that have faster inspection processes and use technologies to complete these inspections cost-effectively.
	32. Personnel qualifications and practices	The utility personnel's qualifications to reduce ignition and PSPS risk. Higher scores are awarded for utilities that require higher worker qualifications for inspections, maintenance and other activities, and provide personnel with more robust training, tools and explicit policies about what activities that they should be undertaking.
G. Data	33. Data collection and	The ability of the utility to track and retrieve a variety of

Category	Capability	Capability description
governance	curation	situational, operational, and risk data to drive decisions. Higher scores are awarded for utilities that have the capabilities needed to handle large amounts of data, conduct sophisticated analytics, & share real time data.
	34. Data transparency and analytics	The utility's organization and openness toward sharing data listed in a centralized catalogue. Higher scores are awarded for utilities with a comprehensive catalogue of data, analyses, and algorithms and that can share data across multiple permissions levels.
	35. Risk event tracking	The utility's approach to tracking events that had the potential to result in ignition. Higher scores are awarded to utilities that track risk events and accurately estimate their potential to cause ignition.
	36. Data sharing with research community	The level of involvement and support that utilities provide those in the research community. Higher scores are provided for utilities that participate in research that addresses utility-ignited wildfire.
H. Resource allocation methodology	37. Scenario analysis across different risk levels	The ability of the utility to understand and explain the incremental risk reduction potential that incremental funding would enable. Higher scores are provided to utilities that are able to show the incremental risk reduction potential at a more granular level.
	38. Presentation of relative risk spend efficiency for portfolio of initiatives	The utility's ability to estimate the degree of wildfire risk reduction achieved by specific wildfire risk management initiatives and weigh these reductions against the cost of those initiatives, across the utility's grid. Higher scores are provided for increased granularity by location and the frequency with which these estimates are updated.
	39. Process for determining risk spend efficiency of vegetation management initiatives	The utility's ability to estimate the degree of wildfire risk reduction achieved by specific vegetation management initiatives and weigh these reductions against the cost of those initiatives, across the utility's grid. Higher scores are provided for increased granularity by location and the frequency with which these estimates are updated.
	40. Process for determining risk spend efficiency of system hardening initiatives	The utility's ability to estimate the degree of wildfire risk reduction achieved by specific system hardening initiatives and weigh these reductions against the cost of those initiatives, across the utility's grid. Higher scores are provided for increased granularity by location and the frequency with which these estimates are updated.
	41. Portfolio-wide initiative allocation methodology	The utility's ability to efficiently and effectively decide which initiatives should be applied and to which part of its grid. Higher scores are provided for increased granularity and use of risk spend efficiency calculations.
	42. Portfolio-wide innovation in new	The program in place by the utility to evaluate and develop new initiatives across the entire portfolio,

Category	Capability	Capability description
	wildfire initiatives	including inspection, grid operations, simulation, etc. Higher scores are awarded to utilities that have more robust processes for evaluating new technologies and evaluating their risk spend efficiency.
I. Emergency planning and preparedness	43. Wildfire plan integrated with overall disaster / emergency plan	The extent of coordination and synchronization between the utility's wildfire mitigation plan and emergency operations plans of the State and local jurisdictions. Higher scores are awarded for additional stakeholder engagement and for the use of simulations to stress-test plans.
	44. Plan to restore service after wildfire related outage	The extent and sophistication of utility's plans to restore electric service after a wildfire-related outage. Higher scores are awarded for a greater granularity at which plans are customized.
	45. Emergency community engagement during and immediately after wildfire	The utility's ability to clearly and effectively communicate information to affected communities. Higher scores are awarded for the utility's ability to reach vulnerable populations, the use of multiple channels, and the relevance and usefulness of the information communicated.
	46. Protocols in place to learn from wildfire events	The processes used by a utility to undertake after-action reviews following wildfire events. Higher scores are awarded for more extensive documentation and the extent to which the lessons learned are used to update capital and operational plans.
	47. Processes for continuous improvement after wildfire and PSPS events	The utility's application of continuous improvement processes, and incorporation of performance benchmarks and stakeholder feedback, to update capital and operational plans. Higher scores are awarded for more formalized review procedures, more extensive benchmarking, and more sophisticated stakeholder engagement.
J. Stakeholder cooperation and community engagement	48. Cooperation and best practice sharing with other utilities	The extent and sophistication of the utility's incorporation of lessons learned by peers, including those outside the State. Higher points are awarded for greater formalization of learning processes.
	49. Engagement with communities on utility wildfire mitigation initiatives	The extent and sophistication of the utility's engagement with the communities that it serves (and in which its assets are located), including key stakeholder groups. Higher scores are awarded for more successful engagement of landowners, other potential partners.
	50. Engagement AFN populations	The extent of the utility's relationship with stakeholders representing Access and Functional Needs (AFN) populations, and the utility's ability to reach these populations, both proactively and during emergencies. Higher scores are awarded for the ability of the utility to

Category	Capability	Capability description
		utilize these relationships to minimize the consequence of PSPS and other wildfire mitigation measures on these populations.
	51. Collaboration with emergency response agencies	The extent and sophistication of the utility's engagement with suppression and other emergency planning agencies and stakeholder groups involved in wildfire response. Higher scores are awarded for broader engagement and deeper planning processes.
	52. Collaboration on wildfire mitigation planning with stakeholders	The extent and sophistication of the utility's engagement with non-emergency planning agencies and stakeholder groups involved in wildfire risk reduction initiatives. Higher scores awarded for broader engagement, a more comprehensive planning process (e.g., including environmental values as well as wildfire risk), and greater financial involvement in plan implementation.

The utility's maturity is then graded across each of these categories from a score of 0 at the low end to a score of 4 at the high end. Scores are generally awarded according to the following philosophy:

0. Below expectations
1. Meets minimum expectations
2. Beyond minimum expectations but not consistent with best practice
3. Consistent with best practice
4. Improvement over best practice

Additional descriptions that may represent typical scores are provided in the table below.

Table 2: Illustrative descriptions that may represent typical maturity levels

		Maturity				
		0	**1**	**2**	**3**	**4**
	Scoring philosophy	**Below minimum expectations** or expected standards (e.g., GO-95, FERC)	**Meets minimum expectations** or expected standards (e.g., GO-95, FERC)	**Beyond minimum expectations** but not consistent with best practices	**Consistent with best practice**	**Improvement over best practice**
	Typical characteristics	• Fails to establish consistent procedures or policies that meet minimum expectations	• Basic collaboration with other agencies	• Utility coordinates closely with other agencies	• Utility leads efforts with other agencies in all areas where appropriate	• Utility leads efforts with other agencies and develops new protocols to reduce wildfire and PSPS risk
	Typical data validation and granularity	• Sporadic or inconsistent data validation • Generally, little granularity across grid	• Ad-hoc data validation by experts • Regional granularity across grid	• Systematic data validation using historical measurements and expert input • Circuit-level granularity	• Systematic validation using historical measurements and expert input • Span-level granularity	• Systematic validation using historical measurements and expert input • Real-time machine learning • Asset-level granularity

Level of systematization and automation	• Little systematization • No automation	• Basic systems in place for workflow management • Some automated processes to support decision makers	• Detailed and tested workflow systems • Semi-automated processes exist to support decision makers in key decisions	• Detailed and tested workflow systems • Automated and vetted processes exist for to support decision makers in nearly all circumstances	• Detailed and tested workflow systems • Automated processes competently handle most decisions and actions without manual intervention
Typical approach to learning and updates	• Insufficient structures to incorporate learnings in updated processes	• Basic systems and methods in place to manually incorporate learnings into new processes • Subject matter experts review decision-making and manually incorporate learnings into new decision-making	• Detailed systems and methods in place to manually incorporate learnings into processes • Subject matter experts review decision-making and incorporate learnings into future decisions using defined processes	• Well-defined systems and methods in place to frequently incorporate most learnings into processes • Subject matter experts review decision-making and incorporate learnings into automated processes to support decision makers	• Tested systems and methods to automatically and continuously update processes and tools in real time • Subject matter experts review decision-making and incorporate learnings into fully automated decision-making processes and algorithms

Category A: Risk assessment and mapping

Illustrative descriptions that may represent typical grades—not comprehensive

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
1. Climate scenario modeling	No clear ability to understand incremental risk under various weather scenarios	Ability to reliably determine wildfire risk i) across each region of the grid ii) based on weather and estimates of how the weather affects failure modes and fire propagation	i) Partially automated tools and process to reliably categorize weather scenarios by level of risk ii) across each circuit of the grid, iii) based on existing hardware, and weather and estimates of how the weather affects failure modes and fire propagation, and iv) independently assessed by experts	i) Mostly automated tools and process to reliably estimate risk of various weather scenarios ii) for each span of the grid, iii) based on level of vegetation, weather as measured at circuit level, existing hardware, and estimates of how the weather affects failure modes and fire propagation, and iv) independently assessed by experts and supported by historical data of incidents and risk events	i) Fully automated tools and processes to accurately and quantitatively estimate incremental risk of foreseeable weather scenarios ii) for each asset of the grid, iii) based on level of vegetation, weather measured at the circuit level, and existing hardware, and estimates of how the weather affects failure modes and fire propagation, iv) independently assessed by experts and verified by historical evidence of risk events and incidents, and v) updated based on real-time learning during weather event
2. Ignition risk estimation	No reliable tool or process to estimate risk across sections of the	i) Partially automated tools and processes to reliably categorize	i) Mostly automated tools and processes to reliably categorize ii)	i) Fully automated tools and processes to ii) quantitatively and	i) Fully automated tools and processes to ii) accurately and

Capability	Maturity level 0	1	2	3	4
	grid based on characteristics and condition of lines and equipment and vegetation	regions of the grid as ii) high or low risk based on iii) at least characteristics and condition of lines and equipment and surrounding vegetation, with iv) subjective assessment of areas by experts	individual circuits into iii) high or low risk based on iv) at least characteristics and condition of lines and equipment, surrounding vegetation, and area weather patterns, with v) assessment risk confirmed based on historical data	accurately assess the risk of ignition at iii) span level across entire grid based on characteristics including surrounding vegetation, weather patterns at individual span, and other factors, with iv) assessment risk confirmed based on historical data	quantitatively assess the risk of ignition iii) across entire grid iv) at asset level resolution within individual circuits, v) based on characteristics including surrounding vegetation, weather patterns at individual circuit, flying debris probability, and other factors, vi) with probability estimated based on understanding of specific failure modes and top contributors to those failure modes with vii) assessment risk confirmed based on historical data
3. Estimation of wildfire consequences on communities	No translation of ignition risk estimates to potential consequences for communities	i) Partially automated tools to reliably categorize ignition events as high or low risk to communities ii) as a function of at least one of structures burned, potential fatalities, area burned, or damages for each region of the grid,	i) Mostly automated tools to reliably categorize ignition events in 5 or more levels of risk to communities ii) as a function of at least potential fatalities, and one of structures burned or area burned or damages, for each circuit	i) Fully automated tools and processes to accurately and quantitatively estimate consequence ii) as a function of at least potential fatalities and structures burned or area burned or damages, iii) the damage to communities for ignition	i) Fully automated tools and processes to ii) accurately and quantitatively estimate consequence from ignition iii) as a function of at least potential fatalities, structures burned or monetary damages, area burned, and impact on GHG

Capability	Maturity level 0	1	2	3	4
		iii) independently assessed by experts	of the grid, iii) based on level and conditions of vegetation and weather, and iv) independently assessed by experts	events at each individual span across the grid iv) across all seasons of the year, v) based on vegetation species and weather, vi) independently assessed by experts & confirmed by historical data	reduction goals, across entire grid iv) at asset level resolution within individual circuits, v) based on characteristics including surrounding vegetation species and up-to-date moisture content, weather patterns at individual circuit, across all seasons, vi) independently assessed by experts & confirmed updated based on real time learning
 **4. Estimation of wildfire and PSPS risk-reduction impact of initiatives**	No clear estimation of risk reduction potential across most initiatives	Mostly manual approach to i) accurately estimate risk reduction potential of initiatives averaged across the territory where such initiatives could be installed for each region, ii) with evidence and logical reasoning to support estimates	i) Automated tools and process to support subject matter experts in ii) accurately categorizing initiatives by risk reduction potential iii) for each circuit of the grid, iv) based on existing hardware, and v) independently assessed by third-party experts	i) Mostly automated tools and process to ii) reliably and accurately estimate risk reduction potential of initiatives iii) for each span of the grid, iv) based on level and condition of vegetation, weather, and existing hardware type and condition including operating history, and v) independently assessed by third-party experts	i) Fully automated tools and processes to ii) accurately and quantitatively estimate risk reduction potential of initiatives iii) for each asset on the grid, iv) based on level and condition of vegetation, weather, and existing hardware, v) and considering the combination of initiatives already deployed, and vi)

Capability	Maturity level 0	1	2	3	4
					independently assessed by experts and verified by historical evidence
5. Risk maps and simulation algorithms	No defined process for updating risk mapping algorithms	Risk mapping algorithms i) updated at least bi-annually based on ii) manually detected differences between modeled ignitions and actual ignitions and wildfire propagation	i) Partially automated tools and process to reliably determine whether risk map and simulations should be updated ii) based on semi-automated detection of differences between modeled ignitions and iii) actual ignition and propagation data, and iv) independently assessed by experts	i) Mostly automated tools and process to reliably determine whether risk map and simulations should be updated ii) based on semi-automated detection of differences between modeled risk events (including ignitions) and iii) risk event and actual ignition and propagation data, and iv) independently assessed by experts and historical data	i) Fully automated tools and process to accurately and quantitatively update risk map and simulations substantially continuously in real-time ii) based on automated detection of differences between modeled risk events (including ignitions) and measured data using iii) both risk event and actual ignition and propagation data, iv) including data derived from other utilities or other sources, and v) independently assessed by experts and historical data

Category B: Situational awareness and forecasting

Illustrative descriptions that may represent typical grades—not comprehensive

Capability	Maturity level 0	1	2	3	4
6. Weather variables collected	Weather data being collected insufficient to properly understand risks along grid	Wind, temperature, and relative humidity being accurately measured along grid	i) Range of accurate weather variables collected including at least wind, temperature, and relative humidity, that ii) affect risk of ignition and propagation from utility assets; iii) manual field calibration measurements taken to validate measurement hardware	i) Range of accurate weather variables collected including at least wind, temperature, and relative humidity, that ii) impact risk of ignition from utility assets and propagation; iii) manual field calibration measurements taken to validate measurement hardware; iv) accurate predictions made of the status of elements that cannot reliably be measured in real time (e.g., fuel moisture content); v) further data collected to measure physical impact of weather on grid (e.g., sway in lines, sway in vegetation, etc.)	i) Range of accurate weather variables collected, including at least wind, temperature, and relative humidity, that ii) impact risk of ignition from utility assets and propagation; iii) automatic field calibration measurements taken to validate measurement hardware; iv) accurate predictions made of the status of elements that cannot reliably be measured in real time (e.g., fuel moisture content), v) further data collected to measure physical impact of weather on grid (e.g., sway in lines, sway in vegetation, etc.), vi) with each collected from multiple sources
7. Weather data resolution	Weather data collected does not accurately	Gather weather data with i) sufficient	Gather weather data with i) sufficient	Gather weather data with i) sufficient	Gather weather data with i) sufficient

Capability	Maturity level 0	1	2	3	4
	reflect local weather conditions across grid infrastructure	granularity to reliably measure weather conditions ii) independently for each area of the grid iii) at least on an hourly basis	granularity to reliably measure weather conditions using a partially automated process ii) independently for each circuit mile of the grid iii) at least 4 times per hour	granularity to reliably measure weather conditions using a mostly automated process ii) independently and sufficient to reliably estimate conditions at each span of the grid iii) at least 6 times per hour; iv) along the entire grid and in all areas needed to predict weather on the grid	granularity to reliably measure weather conditions using a completely automated process ii) independently and sufficient to estimate conditions around each span and each asset that may cause wildfire iii) at least 60 times per hour; iv) along the entire grid and in all areas needed to predict weather on the grid; v) including wind estimations at various atmospheric altitudes relevant to risk of wildfire ignition and consequence
8. Weather forecasting ability	No reliable independent weather forecasting ability	Weather forecasting ability sufficiently accurate to fulfill PSPS requirements at circuit level	Utility i) uses a combination of accurate weather stations and ii) external weather data to make partially automated and accurate forecasts iii) at least 1 week in advance iv) at circuit level; v) which are error-checked against historical weather patterns	Utility i) uses a combination of accurate weather stations and ii) external weather data to make mostly automated and accurate forecasts iii) at least 1 week in advance iv) at individual span level; v) which are error-checked against historical weather	Utility i) uses a combination of accurate weather stations and ii) external weather data to make mostly automated and accurate forecasts iii) at least 2 weeks in advance iv) at individual span level and around each asset with potential to cause ignition; v) which are

Capability	Maturity level 0	1	2	3	4
				patterns and subject matter expert input	error checked against historical weather patterns and subject matter expert input; and vi) adjusted in real-time based on a learning algorithm and updated weather inputs
9. External sources used in weather forecasting	Utility does not use external weather data	Utility i) uses external data ii) where direct measurements from the utility's own weather stations are not available	Utility i) uses a combination of accurate weather stations and ii) external weather data to make decisions, and iii) has reliable, defined, and mostly manual processes for error checking weather stations with external data sources	Utility i) uses a combination of accurate weather stations and ii) external weather data to iii) automatically produce a combined weather map, and iv) has reliable, defined, and mostly automated processes for combining and error checking weather stations with external data sources, v) and electing to use the data set that, as a whole or in composite is most accurate	Utility i) uses a combination of accurate weather stations and ii) external weather data to iii) automatically produce a combined weather map, and iv) has reliable, defined, and completely automated processes for combining and error checking weather stations with external data sources into a single visual and configurable live map, v) and where the utility builds new weather stations or verifies the accuracy of existing stations and calibrates stations where possible based on these error checking processes

Capability	Maturity level 0	1	2	3	4
10. Wildfire detection processes and capabilities	No reliable equipment or procedures for detecting ignitions along grid	i) Well-defined procedures and equipment for detecting ignitions along grid, including ii) remote detection equipment, including cameras	i) Well-defined procedures and equipment for detecting ignitions along grid, including ii) remote detection equipment, including cameras iii) augmented by ignition detection algorithms or software, and iv) including a procedure for notifying suppression forces	i) Well-defined procedures and equipment for detecting ignitions along grid, including ii) remote detection equipment, including cameras that are iii) augmented with automated ignition detection algorithms or software, in which iv) satellite monitoring of utility territory to detect utility ignitions automatically, in which v) detection is reported to key stakeholders including suppression forces vi) automatically, accurately, and in real time	i) Well-defined procedures and equipment for detecting ignitions along grid, including ii) remote detection equipment, including cameras that are iii) fully operated using automated ignition detection algorithms or software, and iv) satellite monitoring of utility territory to detect utility ignitions automatically, in which v) detection is reported to key stakeholders including suppression forces automatically, and vi) propagation paths are tracked and reported to suppression forces accurately and in real time

Category C: Grid design and system hardening

Illustrative descriptions that may represent typical grades—not comprehensive

Capability	Maturity level 0	1	2	3	4
11. Approach to prioritizing initiatives across territory	Plan does not clearly prioritize initiatives geographically to focus on highest risk areas	Plan prioritizes wildfire and PSPS risk reduction initiatives to within only HFTD areas	Plan prioritizes wildfire and PSPS risk reduction initiatives at the circuit level based on local geography and climate/weather conditions within HFTD areas	Plan prioritizes wildfire and PSPS risk reduction initiatives at the span level based on i) risk modeling driven by local geography and climate/weather conditions, fuel loads and moisture content and topography ii) detailed wildfire and PSPS risk simulations across individual circuits,	Plan prioritizes wildfire and PSPS risk reduction initiatives at the asset level based on i) risk modeling driven by local geography and climate/weather conditions, fuel loads and moisture content and topography ii) risk estimates across individual circuits, including estimates of actual consequence, and iii) taking power delivery uptime into account (e.g. reliability, PSPS, etc.)
12. Grid design for minimizing ignition risk	Grid topology does not meet minimal design standards in areas with high wildfire risk	Grid topology meets minimal design standards in areas with high wildfire risk, and routing of new portions of grid takes wildfire risk into account	Grid topology i) demonstrates an understanding of the drivers of utility ignition risk, and ii) is designed in a way to substantially address it, exceeding design requirements, with routing of new	Grid topology designed in a manner that incorporates the latest principles of asset management, utilizes new technologies, and reflects an aggressive commitment to minimizing utility ignition by providing the utility	Grid topology sets planned using wildfire risk as a key driver for minimizing ignition risk through its use of innovative technologies and asset management strategies, and routing of new portions of grid takes wildfire risk into

Capability	Maturity level 0	1	2	3	4
			portions of grid taking wildfire risk into account	control over its assets during periods of high fire risk, with routing of new portions of grid taking wildfire risk into account	account, including by providing microgrids or islanding in situations where traditional grid infrastructure is impracticable and at high wildfire risk
13. Grid design for resiliency and minimizing PSPS	Grid design and architecture has many single points of failure	Grid architecture i) includes n-1 redundancy for transmission circuits subject to PSPS ii) and switches in HFTD areas to individually isolate circuits	Grid architecture i) includes n-1 redundancy for transmission circuits subject to PSPS and n-1 redundancy for distribution subject to PSPS covering at least 50% of customers in HFTD ii) and switches in HFTD areas to isolate individual circuits such that no more than 2000 customers sit within one switch iii) with egress points used as an input for grid topology design	Grid architecture i) includes n-1 redundancy for transmission circuits subject to PSPS and n-1 redundancy for distribution subject to PSPS covering at least 70% of customers in HFTD ii) and switches in HFTD areas to isolate individual circuits such that no more than 1000 customers sit within one switch iii) with egress points available and mapped for each customer, with potential traffic mapped based on traffic simulation and taken into consideration for grid topology design	Grid architecture i) includes n-1 redundancy for transmission circuits subject to PSPS and n-1 redundancy for distribution subject to PSPS covering at least 85% of customers in HFTD ii) and switches in HFTD areas to isolate individual circuits such that no more than 200 customers sit on one switch iii) with egress points available and mapped for each customer, with potential traffic simulated and taken into consideration for grid topology design, and iv) microgrids or other means to reduce consequence for

Capability	Maturity level 0	1	2	3	4
					customers at frequent risk of PSPS
14. Risk-based grid hardening and cost efficiency	Utility has no clear understanding of the relative risk spend efficiency of hardening initiatives	Utility has i) accurate relative understanding of the ii) cost, and iii) feasibility of producing a iv) reliable risk spend efficiency estimate of v) commonly-deployed and commercially available grid hardening initiatives vi) in each area of the utility's grid	Utility has i) accurate relative understanding of the ii) cost, and iii) feasibility of producing a iv) reliable risk spend efficiency estimate of v) commonly-deployed and commercially available grid hardening initiatives vi) for each circuit of the utility's grid vii) updated on an annual basis	Utility has i) accurate quantitative understanding of the ii) cost, including sensitivities, and iii) feasibility of producing a iv) reliable risk spend efficiency estimate of v) all commercially available grid hardening initiatives vi) for each span along the utility's grid vii) updated on an annual basis	Utility has i) accurate quantitative understanding of the ii) cost, including sensitivities, and iii) feasibility of producing a iv) reliable risk spend efficiency estimate of v) all commercially available grid hardening initiatives, vi) and those initiatives that are lab-tested, vii) for each asset along the utility's grid viii) updated on an annual basis, ix) including risk reduction effect from the combination of various initiatives to reduce risk to communities
15. Grid design and asset innovation	No established program for evaluating the wildfire risk, PSPS risk and risk spend efficiency of new hardening initiatives	New initiatives developed and evaluated based on i) installation of hardening initiatives into grid and ii) measuring direct reduction in ignition events	New initiatives developed and evaluated based on i) installation of hardening initiatives into grid and ii) measuring direct reduction in ignition events and iii) measuring reduction	New initiatives i) developed and independently evaluated using lab facilities by a trained team of grid innovation specialists, followed by ii) field testing based on	New initiatives i) developed and independently evaluated using lab facilities by a trained team of grid innovation specialists, ii) field testing done by installation into grid and

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
			impact on risk event metrics; iv) including an evaluation of the total cost of the initiative	installation into grid and iii) measuring direct reduction in ignition events at a span level and iv) measuring reduction impact on risk event metrics; v) including an evaluation of the total cost of the initiative	iii) measuring direct reduction in ignition events and iv) measuring reduction impact on risk event metrics v) independent auditing of performance in grid; vi) extensive data sharing with industry, academia, and other utilities utilizing the same initiatives to share results; vii) including an evaluation of the total cost of initiative

Category D: Asset management and inspections

Illustrative descriptions that may represent typical grades—not comprehensive

Capability	Maturity level 0	1	2	3	4
16. Asset inventory and condition assessments	Lack of inventory of all electric lines and equipment and their state of wear or disrepair across the service territory	Accurate i) inventory database that is updated within 90 days of equipment inventory or conditions being collected of ii) equipment that may contribute to wildfire and PSPS risk, iii) including age, state of wear, and expected lifecycle	Accurate i) inventory database that is updated within 30 days of equipment inventory or conditions being collected of ii) equipment that may contribute to wildfire and PSPS risk, iii) including age, state of wear, and expected lifecycle, iv) and records of all inspections and repairs conducted	Accurate i) at least monthly-updated inventory database that is updated within 7 days of equipment inventory or conditions being collected of ii) all components that may contribute to wildfire and PSPS risk, iii) including age, state of wear, operating history, expected lifecycle, and probability of failure, iv) and records of all inspections and repairs conducted, v) up to date work plans on expected future repairs and replacements, vi) wherein repairs are independently audited, vii) and a system and approach are in place to reliably detect incipient malfunctions likely to cause ignition	Accurate and i) substantially real-time inventory database that is updated within 1 day of equipment inventory or conditions being collected of ii) all components that may contribute to wildfire and PSPS risk, iii) including age, state of wear, operating history, expected lifecycle, and probability of failure, iv) and records of all inspections and repairs conducted, v) inputs from sensorized equipment that substantially continuously monitors the state of electric lines and equipment, vi) up to date work plans on expected future repairs and replacements, vii) wherein repairs and

Capability	Maturity level 0	1	2	3	4
					sensor outputs are independently audited, viii) and a system and approach are in place to reliably detect incipient malfunctions likely to cause ignition, including in real time and with the ability to de-activate electric lines and equipment exhibiting incipient failure
17. Asset inspection cycle	Inspections less frequent than minimum expectations	Detailed inspection and patrol inspection frequency consistent with minimum expectations	Detailed inspections and patrol inspections of electric lines and equipment scheduled based on: i) an up-to-date static map of equipment type and environment, ii) with more frequent inspections for highest risk equipment in areas with fire potential, and all equipment in HFTD areas	Detailed inspections and patrol inspections i) scheduled based on risk, and ii) demonstrated to be determined by accurate predictive modeling of equipment failure probability and risk of failure causing ignition; iii) where failure probability is assessed via analysis of early indicators and actual failures; additional inspection types (i.e., beyond routine patrols and detailed) implemented as needed	Detailed inspections and patrol inspections i) scheduled based on risk, with ii) each inspection type (e.g., ground-based, aerial, subsurface, etc.) iii) demonstrated to be determined independently by accurate predictive modeling of equipment failure probability and risk of failure causing ignition, iv) where failure probability is assessed via analysis of early indicators and actual failures, and v) continuous monitoring

Capability	Maturity level 0	1	2	3	4
					by sensors to monitor the condition of electric lines and equipment areas with fire risk
18. Asset inspection effectiveness	Patrol, detailed, enhanced, and other inspection procedures and checklists do not include all items expected at a minimum	Patrol, detailed, enhanced, and other inspection procedures and checklists include all items expected at a minimum	Procedures and checklists for patrol, detailed, enhanced, and other inspections each determined according to: i) wildfire risk estimated via accurate predictive modeling, ii) for each circuit of the service territory, iii) based on equipment type and age, iv) which includes inspections for electric lines and equipment responsible for wildfire ignitions and risk events	Procedures and checklists for patrol, detailed, enhanced, and other inspections i) determined according to wildfire risk estimated via accurate predictive modeling ii) for each span iii) based on equipment type, age, and condition iv) which includes inspections for electric lines and equipment responsible for wildfire ignitions and risk events, v) validated by independent experts, and vi) providing basic training and conducting spot inspections to identify vegetation-based risk drivers	Inspection procedures and checklists for patrol, detailed, enhanced, and other inspections determined i) according to wildfire risk estimated via accurate predictive modeling, and ii) adjusted dynamically and in real time based on number and severity of deficiencies found during inspection iii) for each asset iv) based on equipment type, age, condition, and operating history v) which includes inspections for electric lines and equipment responsible for wildfire ignitions and risk events, and vi) based on predictive modeling based on equipment type, age, and condition and validated by independent experts,

Capability	Maturity level 0	1	2	3	4
					with dynamic adjustments in real time based on deficiencies found during inspection, and vi) asset inspection personnel being trained to conduct vegetation patrol inspections to identify vegetation-based risk drivers, including logging relevant risk drivers and in a vegetation management system
19. Asset maintenance and repair	Electric lines and equipment not consistently maintained at expected condition over multiple circuits	Electric lines and equipment maintained as expected under applicable rules	Electric lines and equipment maintained as expected, and additional maintenance done in circuits at highest wildfire risk based on detailed risk mapping	Electric lines and equipment maintained as expected under applicable rules, and additional maintenance done in spans at highest wildfire risk based on detailed risk mapping, with service intervals of equipment being set based on wildfire risk in the relevant area, with maintenance and repair procedures taking into account wildfire risk	Electric lines and equipment maintained as expected under applicable rules, and additional maintenance done on assets at highest wildfire risk based on detailed risk mapping, with service intervals of equipment being set based on wildfire risk in the relevant circuit, as well as real-time monitoring from sensors, with maintenance and repair procedures taking into account wildfire risk,

Capability	Maturity level 0	1	2	3	4
					performance history and past operating conditions
20. QA/QC for asset management	Lack of any one of i) established controls for ii) maintenance or inspection work, iii) post construction inspections of employee and contractor work, iv) follow-up and correction process and documentation, and v) auditing work completed including deep-dive spot inspections, whether conducted by employees or sub-contractors	Established and demonstrably functioning i) maintenance and inspection work, ii) post construction inspections of employee and contractor work, iii) follow-up and correction process and documentation, and audit process to manage and confirm work completed by employees or subcontractors, and iv) QA/QC information is used periodically to identify deficiencies in quality of work and inspections	Established and demonstrably functioning i) maintenance and inspection work, ii) post construction inspections of employee and contractor work, iii) follow-up and correction process and documentation, and audit process to manage and confirm work completed by subcontractors, iv) where subcontractors follow same processes and standards as utility's own employees, and v) QA/QC information is regularly used to identify systematic deficiencies in quality of work and inspections	Established and demonstrably functioning i) maintenance and inspection work, ii) post construction inspections of employee and contractor work, iii) follow-up and correction process and documentation, and audit process to manage and confirm work completed by subcontractors, and where subcontractors follow same processes and standards as utility's own employees iv) where contractor activity is subject to semi-automated audits (e.g., using photographic evidence, LiDAR scans, etc.), and v) a defined procedure is in place to use QA/QC information to identify systematic deficiencies in quality of work and inspections, and recommend training based on weaknesses	Established and demonstrably functioning i) maintenance and inspection work, ii) post construction inspections of employee and contractor work, iii) follow-up and correction process and documentation, and audit process to manage and confirm work completed by employees and subcontractors, iv) where subcontractors follow same processes and standards as utility's own employees, v) use integrated workforce management processes and tools vi) where contractor activity is subject to automated audits (e.g., using photographic evidence, LiDAR scans, etc.), and vii) real-time QA/QC information is used to identify systematic deficiencies, grade individuals, and recommend specific pre-made and tested training based on weaknesses

Category E: Vegetation management and inspections

Illustrative descriptions that may represent typical grades—not comprehensive

Capability	Maturity level 0	1	2	3	4
21. Vegetation inventory and condition assessments	Lack of vegetation inventory sufficient to determine vegetation clearances across grid at time of last inspection	i) Centralized and accurate ii) inventory database of vegetation clearances that is updated within 90 days of vegetation inventory or conditions being collected ii) across each region based on most recent inspection	i) Centralized and accurate inventory database of vegetation clearances that is updated within 30 days of vegetation inventory or conditions being collected ii) across each circuit based on most recent inspection, including iii) inventory of predominant vegetation species at each circuit, and iv) individual high-risk trees (e.g., those within striking distance) across grid	i) Centralized and accurate inventory of vegetation clearances that is updated within 7 days of vegetation inventory or conditions being collected ii) across each span based on most recent inspection, iii) inventory of individual vegetation species around each span, and iv) including expected growth rates and v) individual high-risk trees (e.g., those within striking distance) across grid vi) wherein inspections are independently audited, vii) and including capturing tree health and other vegetation risk factors	i) Accurate centralized inventory database of ii) real-time vegetation clearances that is updated within 1 day of vegetation inventory or conditions being collected ii) across each asset based on most recent inspection, with iii) inventory of vegetation types and species around each asset, iv) individual high-risk trees (e.g., those with strike potential) across entire grid, and v) up-to-date tree health and moisture content at the time of last inspection to determine risk of ignition and propagation; vi) wherein inspections are independently audited vi) and including capturing tree health and other vegetation risk factors

Capability	Maturity level 0	1	2	3	4
22. Vegetation inspection cycle	Inspections less frequent than expected under applicable rules	All inspection frequency consistent with minimum expectations	All inspections scheduled based on i) a static vegetation map of predominant vegetation species and environments across the utility territory, with ii) more frequent inspections for areas with fastest growing vegetation based on typical growth rates	All inspections i) scheduled based on risk, ii) demonstrated to be determined by predictive modeling of vegetation growth iii) assessed via vegetation species and iv) growing conditions (e.g., precipitation, temperature, etc.), v) and considering tree health and other vegetation risk factors for more frequent inspections in less healthy areas	All inspections i) scheduled based on risk, with ii) each inspection type (e.g., ground-based, aerial, subsurface, etc.) iii) demonstrated to be determined independently by predictive modeling of vegetation growth iv) assessed via vegetation species, growing conditions (e.g., precipitation, temperature, etc.), and failure characteristics, v) continuous sampling of sensor data, vi) and considering tree health and other vegetation risk factors for more frequent inspections in less healthy areas

23. Vegetation inspection effectiveness	Patrol, detailed, enhanced, and other inspection procedures and checklists do not include all items expected under applicable rules	Patrol, detailed, enhanced, and other inspection procedures and checklists include all items expected under applicable rules	Procedures and checklists for patrol, detailed, enhanced, and other inspections each determined according to: i) wildfire risk estimated via accurate predictive modeling, ii) for each circuit of the service territory, iii) based on vegetation density and equipment type and age, iv) which includes inspections for electric lines and equipment responsible for wildfire ignitions and risk events	Procedures and checklists for patrol, detailed, enhanced, and other inspections i) determined according to wildfire risk estimated via accurate predictive modeling ii) for each span iii) based on vegetation and equipment type, age, and condition iv) which includes inspections for electric lines and equipment responsible for wildfire ignitions and risk events, and v) validated by independent experts; vi) vegetation inspection personnel being trained to conduct simple equipment patrol inspections and logging faults into the utility's asset management tool	Inspection procedures and checklists for patrol, detailed, enhanced, and other inspections determined i) according to wildfire risk estimated via accurate predictive modeling, and ii) adjusted dynamically and in real time based on number and severity of deficiencies found during inspection iii) for each asset iv) based on vegetation species, condition, environment and equipment type, age, condition, and operating history v) which includes inspections for electric lines and equipment responsible for wildfire ignitions and risk events, and vi) based on predictive modeling based on vegetation and equipment type, age, and condition and validated by independent experts, with dynamic adjustments in real time

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
					based on deficiencies found during inspection; vii) vegetation inspection personnel being trained to conduct equipment patrol inspections, particularly in areas of highest risk to identify and prioritize faults for the utility's asset management tool
 **24. Vegetation grow-in mitigation**	Utility often fails to maintain minimum expected clearances around lines and equipment. Utility does not remove vegetation waste/residue along right of ways.	Utility maintains vegetation around lines and equipment according to minimum expected clearances. Utility i) removes vegetation waste/residue along right of ways ii) within 1 week of cutting vegetation across entire grid	Utility meets or exceeds minimum expected clearances during all seasons around electric lines and equipment in the HFTD at circuit level. Utility i) removes vegetation waste/residue along right of ways ii) within 3 days of cutting vegetation across entire grid, and iii) works with landowners to ensure wood removed from potential ignition areas	Utility meets or exceeds minimum expected clearances where relevant based on input from ignition risk modeling during all seasons around electric lines and equipment in the HFTD, with clearances also determined by species growth rates and species limb failure estimates at the span level and engages with communities on clearances protocols. Utility i) removes vegetation waste/residue along	Utility meets or exceeds minimum expected clearances, with clearances being determined based on species growth rates, species limb failure rates cross-referenced with local climatological conditions and an accurate ignition and propagation risk modeling and works with community organizations to cooperatively set local clearances and protocols. Utility i) removes vegetation waste/residue along right of ways on ii) same

Capability	Maturity level 0	1	2	3	4
				right of ways ii) on same day as cutting vegetation	day as cutting vegetation; iii) utility collaborates with local landowners to provide a use for cutting vegetation across entire grid; iv) utility works with partners to identify new cost-effective uses for vegetation waste/residue and v) takes into consideration environmental consequences and emissions of vegetation waste/residue
25. Vegetation fall-in mitigation	Utility does not remove vegetation outside of right of way. Utility does not remove vegetation waste/residue along right of ways.	Utility i) removes some vegetation outside of right of ways but ii) does not have a specific process in place to systematically identify trees likely to pose a risk Utility iii) removes vegetation waste/residue outside right of ways ii) within 1 week of cutting vegetation across entire grid	Utility i) systematically removes vegetation outside of right of ways ii) based on the height of trees with potential to make contact with electric lines and equipment and iii) informs communities about vegetation removal. Utility iv) removes vegetation waste/residue outside of right of ways v) within 3 days of cutting	Utility i) systematically removes vegetation outside of right of ways ii) based on the probability and consequence for electric lines and equipment iii) based on risk modeling and iv) engages with communities on vegetation removal. Utility v) removes vegetation waste/residue outside of	Utility i) conducts regular and ii) accurate systematic inspections for individual trees outside the right of way to identify high risk trees and considers iii) environmental or climatological conditions contributing to increased risk and removes this vegetation, the with cooperation from community. Utility iv) removes vegetation

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
			vegetation across entire grid, and vi) works with landowners to ensure wood removed from potential ignition areas.	right of ways vi) on same day as cutting vegetation	waste/residue along right of ways on ii) same day as cutting vegetation; v) utility collaborates with local landowners to provide a use for cutting vegetation across entire grid; vi) utility works with partners to identify new cost-effective uses for vegetation waste/residue and vi) takes into consideration environmental consequences and emissions of vegetation waste/residue
26. QA/QC for vegetation management	Lack of any one of i) established controls for ii) vegetation management or vegetation inspection work, iii) post vegetation management inspections of employee and contractor work, iv) follow-up and correction process and documentation, and v)	Established and demonstrably functioning i) vegetation management and inspection work, ii) post vegetation management inspections of employee and contractor work, iii) follow-up and correction process and documentation, and audit process to manage	Established and demonstrably functioning i) vegetation management and inspection work, ii) post vegetation management inspections of employee and contractor work, iii) follow-up and correction process and documentation, and audit process to manage	Established and demonstrably functioning i) vegetation management and inspection work, ii) post vegetation management inspections of employee and contractor work, iii) follow-up and correction process and documentation, and audit process to manage	Established and demonstrably functioning i) vegetation management and inspection work, ii) post vegetation management inspections of employee and contractor work, iii) follow-up and correction process and documentation, and audit process to manage

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
	auditing work completed including deep-dive spot inspections, whether conducted by employees or sub-contractors	and confirm work completed by employees or subcontractors, and iv) QA/QC information is used periodically to identify deficiencies in quality of work and inspections	and confirm work completed by subcontractors, iv) where subcontractors follow same processes and standards as utility's own employees, and v) QA/QC information is regularly used to identify systematic deficiencies in quality of work and inspections	and confirm work completed by subcontractors, and where subcontractors follow same processes and standards as utility's own employees iv) where contractor activity is subject to semi-automated audits (e.g., using photographic evidence and analytics, , LiDAR scans, etc.), and v) a defined procedure is in place to use QA/QC information to identify systematic deficiencies in quality of work and inspections, and recommend training based on weaknesses	and confirm work completed by employees and subcontractors, iv) where subcontractors follow same processes and standards as utility's own employees, v) use integrated workforce management processes and tools vi) where contractor activity is subject to automated audits (e.g., using photographic evidence and analytics, LiDAR scans, satellite and aerial imagery, etc.), and vii) real-time QA/QC information is used to identify systematic deficiencies, grade individuals, and recommend specific pre-made and tested training based on weaknesses

Category F: Grid operations and protocols

Illustrative descriptions that may represent typical grades—not comprehensive

Capability	Maturity level 0	1	2	3	4
27. Protective equipment and device settings	Utility does not make changes to adjustable equipment in response to high wildfire threat conditions	Utility i) increases sensitivity of risk reduction elements ii) during high threat weather conditions	Utility i) increases sensitivity of risk reduction elements ii) during high threat weather conditions and iii) monitors risk events in a iv) partially automated process to set sensitivity of grid elements	Utility i) increases sensitivity of risk reduction elements ii) during high threat weather conditions based on risk mapping and iii) monitors risk events in a iv) partially automated process to set sensitivity of grid elements and via v) mostly predetermined protocol driven by fire risk conditions	Utility i) automatically increases sensitivity of risk reduction elements ii) during high threat weather conditions based on risk mapping and iii) monitors risk events in a iv) fully automated process to set sensitivity of grid elements via v) predetermined protocol driven by fire risk conditions
28. Incorporating risk factors in grid control	Utility has no clearly defined and explained process for incorporating wildfire risk when determining electric control limits of the grid beyond equipment nameplate capacities (e.g., exceeding rated current or voltage design) or does not track detailed electric	Utility has i) clearly defined and explained process for incorporating wildfire risk when determining electric control limits of the grid beyond equipment nameplate capacities (e.g., exceeding rated current or voltage design) and ii) has systems in place to	Utility has i) clearly defined and explained process for incorporating wildfire risk when determining electric control limits of the grid beyond equipment nameplate capacities (e.g., exceeding rated current or voltage design) and ii) has	Utility has i) clearly defined and explained process for incorporating wildfire risk when determining electric control limits of the grid beyond equipment nameplate capacities (e.g., exceeding rated current or voltage design) and ii) has systems in place to automatically track and record detailed	Utility has i) clearly defined and explained process for incorporating wildfire risk when determining electric control limits of the grid beyond equipment nameplate capacities (e.g., exceeding rated current or voltage design) and ii) has systems in place to

		operational history when operating equipment above nameplate capacities	automatically track and record detailed electric operational history when operating equipment above nameplate capacities at the circuit level.	systems in place to automatically track and record detailed electric operational history when operating equipment above nameplate capacities at the circuit level. iii) Utility uses predictive modeling to shorten the expected life of equipment based on grid operating history	electric operational history when operating equipment above nameplate capacities at the circuit level. iii) Utility uses predictive modeling to shorten the expected life of equipment based on grid operating history, iv) and the utility has the predictive model reviewed by external experts and verified using historical data	automatically track and record detailed electric operational history when operating equipment above nameplate capacities at the circuit level. iii) Utility uses predictive modeling to shorten the expected life of equipment based on grid operating history, iv) and the utility has the predictive model reviewed by external experts and verified using historical data, v) and never operates grid above rated capacities in HFTD areas
	29. PSPS operating model and consequence mitigation	PSPS event frequently forecasted incorrectly and poorly communicated to affected customers	PSPS event i) generally forecasted accurately with fewer than 50% of predictions being false positives where ignition would not have been likely to occur, ii) and communicated to >95% of affected customers iii) and >99% of medical baseline customers in advance of PSPS action, iv) no website	PSPS event i) generally forecasted accurately with fewer than 33% of predictions being false positives where ignition would not have been likely to occur, ii) and communicated to >98% of affected customers iii) and >99.5% of medical	PSPS event i) generally forecasted accurately with fewer than 33% of predictions being false positives where ignition would not have been likely to occur, ii) and communicated to >99% of affected customers iii) and >99.9% of medical baseline customers in advance of PSPS action, iv) with fewer than 0.5%	PSPS event i) generally forecasted accurately with fewer than 25% of predictions being false positives where ignition would not have been likely to occur, ii) and communicated to >99.9% of affected customers iii) and 100% of medical baseline customers in advance of PSPS action,

			downtime, v) and fewer than 1 hrs. of average PSPS time per customer per year, vi) utility has developed resources to mitigate PSPS consequence, including providing water, phone charging, other resources to all affected by PSPS	baseline customers in advance of PSPS action, iv) with fewer than 0.5% of customers complaining, and v) no website downtime, vi) and fewer than 0.5 hrs. of average PSPS per customer per year, vii) utility has developed resources to mitigate PSPS consequence, including providing water, phone charging, and other resources to all affected by PSPS	of total customers complaining, and v) no website downtime, and vi) specific resources provided to customers to alleviate the consequence of the power shutoff (e.g., providing backup generators, supplies, batteries, etc.), and vii) fewer than 0.25 hrs. of PSPS per customer per year, viii) utility has developed resources to mitigate PSPS consequence, including providing water, phone charging, and other resources to all affected by PSPS	iv) with fewer than 0.5% of total customers complaining, and v) no website downtime, and vi) specific resources provided to customers to alleviate the consequence of the power shutoff (e.g., providing backup generators, supplies, batteries, etc.), and vii) and fewer than 0.1 hrs. of PSPS per customer per year
!	**30. Protocols for PSPS initiation**	Utility has no well-defined and clearly explained threshold for PSPS activation	Utility has i) explicit policies and explanation for the thresholds above which PSPS is activated as a measure of last resort, ii) SME opinion is used as an input into PSPS decisions.	Utility has i) explicit, objective policies and explanation for the thresholds above which PSPS is activated as a measure of last resort, ii) PSPS decisions are supported by a partially automated system that	Utility i) de-energizes circuits only upon detection of damaged condition of electric lines and equipment or contact with foreign objects or when the circuit presents a safety risk to suppression and other personnel.	Utility i) maintains grid in sufficiently low risk condition to not require any PSPS events and ii) the only circuits de-energized are those with sufficient redundancy to create no disruption in energy supply to customers or as a measure of last resort,

			recommends circuits for which PSPS should be activated, which is validated by SMEs.		iii) utility may de-energize specific circuits upon detection of damaged condition of electric lines and equipment or contact with foreign objects.
31. Protocols for PSPS re-energization	Inadequate process for inspecting de-energized sections of the grid prior to re-energization	i) Manual process to accurately inspect de-energized sections of the grid prior to re-energization, ii) ensure grid is returned to service within 24 hours after weather has returned to below utility's PSPS threshold.	i) Partially automated process (e.g., using drones, LiDAR, etc.) to accurately inspect de-energized sections of the grid prior to re-energization, ii) ensure grid is returned to service within 18 hours after de-energization weather has returned to below utility's PSPS threshold iii) and causing 0 after-event ignitions.	i) Mostly automated process (e.g., using drones, LiDAR, etc.) augmented ii) with sensors and aerial tools to accurately inspect de-energized sections of the grid prior to re-energization to iii) ensure grid is returned to service within 12 hours after de-energization weather has returned to below utility's PSPS threshold, iv) and causing 0 after-event ignitions	i) Primarily automated process (e.g., using drones, LiDAR, etc.) augmented ii) with sensors and aerial tools to accurately inspect de-energized sections of the grid prior to re-energization to iii) ensure grid is returned to service within 8 hours after de-energization weather has returned to below utility's PSPS threshold, iv) and causing 0 after-event ignitions
32. Personnel qualifications and practices	Utility has no policies governing what personnel roles are in reducing risk events, and personnel are untrained	Utilities have i) explicit policies about the role of personnel at the site of risk events, ii) including providing training and communication tools to immediately report ignitions caused by	Utilities have i) explicit policies about the role of personnel, including contractors and subcontractors at the site of risk event, ii) including providing training, suppression tools, and	Utilities have i) explicit policies about the role of personnel, including contractors and subcontractors at the site of risk event, ii) including providing training provided by suppression professionals, a variety of	Utilities have i) explicit policies about the role of personnel, including contractors and subcontractors at the site of risk event, ii) including providing training provided by suppression

		workers or in immediate vicinity of workers, iii) with no major injuries or fatalities to workers	communication tools, iii) to reduce risk events caused by workers or in immediate vicinity of workers, iv) with no OSHA reportable injuries or fatalities to workers	suppression tools, and robust communication tools that function without cell reception, iii) to suppress ignitions caused by workers or in immediate vicinity of workers, iv) with no major injuries or fatalities to workers	professionals, a variety of suppression tools, and robust communication tools that function without cell reception, and requiring contractors to provide the same, iii) to suppress small ignitions caused by workers or in immediate vicinity of workers, iv) with no major injuries or fatalities to workers; v) and share risk reduction and suppression training materials and techniques with other utilities

Category G: Data collection and reporting

Illustrative descriptions that may represent typical grades—not comprehensive

Capability	Maturity level 0	1	2	3	4
33. Data collection and curation	Situational, operational, and risk data not collected in a centralized database	Utility has i) centralized repository of accurate situational, operational, and risk data, ii) but does not use them to make short-term/operational and long-term/ investment decisions	Utility has centralized repository of i) accurate situational, operational, and other data relevant to wildfire risk and PSPS, ii) collects data from all sensored portions of electric lines and equipment, weather stations, etc., and iii) is able to utilize advanced analytics to drive decision-making in short term	Utility has centralized repository of i) accurate situational, operational, and risk data, ii) collects data from all sensored portions of electric lines and equipment, weather stations, etc., iii) is able to utilize advanced analytics to drive decision-making in short and long-term, iv) is able to ingest and share data using real-time API protocols with a wide variety of stakeholders	Utility has centralized repository of i) accurate situational, operational, and risk data, and ii) collects data from all sensored portions of electric lines and equipment, weather stations, etc. iii) is able to utilize advanced analytics to drive decision-making in short and long-term, iv) identify new sources of data needed for decision making, v) and to share best practices with other utilities in California and beyond, vi) is able to ingest and share data using real-time API protocols with a wide variety of stakeholders
34. Data transparency and analytics	No central catalogue of all wildfire-related data and algorithms, analyses, and data processes	All wildfire-related data and algorithms used by utilities i) catalogued in a single document, ii)	All wildfire-related data and algorithms used by utilities i) catalogued in a single document, ii)	All wildfire-related data and algorithms used by utilities i) catalogued in a single document, ii)	All wildfire-related data and algorithms used by utilities i) catalogued in a single document, ii)

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
		including an explanation of the sources, and assumptions made; and iii) all analysis and algorithms documented	including an explanation of the sources and assumptions made; iii) all wildfire-related analyses, algorithms, and data processing explained and documented; and iv) an IT system for sharing data in real time across at least two levels of permissions, including a. utility-regulator permissions, b. first responder permissions.	including an explanation of the sources and assumptions made, cleaning processes, and assumptions made in the data; iii) all analyses, algorithms, and data processing explained and documented, iv) most relevant wildfire related data and algorithms disclosed to regulators and other relevant stakeholders, v) an IT system for sharing data in real time across at least three levels of permissions, including a. utility-regulator permissions, b. first responder permissions, and c. public data sharing.	including an explanation of the sources and assumptions made, cleaning processes, and assumptions made in the data; iii) all analyses, algorithms, and data processing explained and documented, with iv) sensitivities disclosed for each type of analysis and data to at least the regulator; v) most relevant wildfire related data and algorithms disclosed publicly in WMP; and vi) an IT system for sharing data in real time across at least three levels of permissions, including a. utility-regulator permissions, b. first responder permissions, and c. public data sharing.
	35. Risk event tracking	No tracking of risk event data	Tracking of risk event data for all risk events with wildfire ignition potential and associated event characteristics,	Tracking of i) risk event data for all risk events with wildfire ignition potential, ii) event characteristics and fuel	Tracking of i) risk event data for all risk events with wildfire ignition potential, ii) event characteristics to enable	Tracking of i) risk event data for all risk events with wildfire ignition potential, ii) event characteristics to enable

Capability	Maturity level 0	1	2	3	4
		including capturing data related to the specific mode of failure	loads and moisture to enable simulation of wildfire potential given an ignition, iii) including capturing data related to the specific mode of failure	simulation of wildfire potential given an ignition, iii) and predicting the probability of such a risk event in causing an ignition, iv) including capturing data related to the specific mode of failure	simulation of wildfire potential given an ignition, iii) and predicting the probability of such a risk event in causing an ignition, iv) using data from risk events to change grid operation protocols in real time, v) including capturing data related to the specific mode of failure
36. Data sharing with research community	Utility fails to share data or participate in research	Utility does not share data beyond disclosures expected under applicable rules, nor does it participate in collaborative research	Utility participates in i) collaborative research that ii) addresses utility-ignited wildfires	Utility i) funds and ii) participates in both independent and collaborative research that iii) addresses utility-ignited wildfires, and risk reduction initiatives	Utility i) funds and ii) participates in both independent and collaborative research that iii) addresses utility-ignited wildfires, and risk reduction initiatives, iv) and promotes best practices, based on the latest independent scientific and operational research, and v) ensures that research, where possible, is abstracted to apply to other utilities

Category H: Resource allocation methodology, business case, and sensitivities

Illustrative descriptions that may represent typical grades—not comprehensive

Capability	Maturity level 0	1	2	3	4
37. Scenario analysis across different risk levels	Utility does not project proposed initiatives or costs across different levels of risk scenarios	Utility i) provides at least an accurate high-risk reduction and a low risk reduction scenario and ii) projected cost and total risk reduction potential for each region	Utility i) provides at least an accurate high-risk reduction and a low risk reduction scenario in addition to ii) their proposed scenario and iii) shows the projected cost and total risk reduction iv) potential for each circuit	Utility i) provides at least an accurate high-risk reduction and a low risk reduction scenario in addition to ii) their proposed scenario and iii) shows the projected cost and total risk reduction iv) potential for each scenario within each span	Utility i) provides at least an accurate high risk reduction and a low risk reduction scenario in addition to ii) their proposed scenario and iii) shows the projected cost and total risk reduction iv) potential for each scenario at each asset, v) and includes 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, and vi) utility includes estimate of impact on reliability factors
38. Presentation of relative risk spend efficiency for portfolio of initiatives	Utility does not present relative risk spend efficiency figures across initiatives	Utility provides i) accurate qualitative ranking of ii) common commercial initiatives by risk spend efficiency, and iii) includes figures for estimated cost and projected risk reduction	Utility provides i) accurate qualitative ranking of ii) all commercial initiatives by risk spend efficiency, and iii) includes figures for estimated cost and	Utility provides i) accurate qualitative ranking of ii) all commercial initiatives by risk spend efficiency, and iii) includes figures for estimated PV cost and projected risk reduction	Utility provides i) accurate qualitative ranking of ii) all commercial initiatives and emerging initiatives by risk spend efficiency, and iii) includes figures for estimated cost and

		Maturity level			
Capability	**0**	**1**	**2**	**3**	**4**
		impact of each initiative, iv) for each region, and v) explanation of their investment in each initiative	projected risk reduction impact of each initiative, iv) in each circuit of their grid, and v) explanation of their investment in each particular initiative	impact of each initiative, iv) in each span, and v) explanation of their investment in each particular initiative, and vi) the expected overall reduction in risk	projected risk reduction impact of each initiative, iv) for each asset, and v) explanation of their investment in each particular initiative and vi) the expected overall reduction in risk from each asset and the grid overall and vii) utility includes estimate of impact on SAIDI factors
39. Process for determining risk spend efficiency of vegetation management initiatives	Utility has no clear understanding of the relative risk spend efficiency of various clearances and types of vegetation management initiatives	Utility has i) accurate relative understanding of the ii) cost, and iii) effectiveness to produce a iv) reliable risk spend efficiency estimate of v) commonly-deployed vegetation management initiatives vi) in each area of the utility's grid	Utility has i) accurate relative understanding of the ii) cost, and iii) effectiveness to produce a iv) reliable risk spend efficiency estimate of v) all vegetation management initiatives deployed in California vi) for each circuit of the utility's grid vii) updated on an annual basis	Utility has i) accurate quantitative understanding of the ii) cost, including sensitivities, and iii) effectiveness to produce a iv) accurate risk spend efficiency estimate of v) all feasible vegetation management initiatives vi) for each span along the utility's grid vii) updated on an annual basis	Utility has i) accurate quantitative understanding of the ii) cost, including sensitivities, and iii) effectiveness to produce a iv) accurate risk spend efficiency estimate of v) all feasible vegetation management initiatives, vi) supported by independent testing, vii) around each asset along the utility's grid viii) updated on an annual basis, ix) including risk reduction effect from the combination of various initiatives

Capability	Maturity level 0	1	2	3	4
40. Process for determining risk spend efficiency of system hardening initiatives	Utility has no clear understanding of the relative risk spend efficiency of hardening initiatives	Utility has i) accurate relative understanding of the ii) cost, and iii) effectiveness to produce a iv) reliable risk spend efficiency estimate of v) commonly-deployed and commercially available grid hardening initiatives vi) in each area of the utility's grid	Utility has i) accurate relative understanding of the ii) cost, and iii) effectiveness to produce a iv) reliable risk spend efficiency estimate of v) commonly-deployed and commercially available grid hardening initiatives vi) for each **circuit** of the utility's grid vii) updated on an annual basis	Utility has i) accurate quantitative understanding of the ii) cost, including sensitivities, and iii) effectiveness to produce a iv) reliable risk spend efficiency estimate of v) all commercially available grid hardening initiatives vi) for each **span** along the utility's grid vii) updated on an annual basis	Utility has i) accurate quantitative understanding of the ii) cost, including sensitivities, and iii) effectiveness to produce a iv) reliable risk spend efficiency estimate of v) all commercially available grid hardening initiatives, vi) and those initiatives that are lab-tested, vii) for each **asset** along the utility's grid viii) updated on an annual basis, ix) including risk reduction effect from the combination of various initiatives
41. Portfolio-wide initiative allocation methodology	Utility does not allocate capital to wildfire risk reduction initiatives based on wildfire risk spend efficiency	Utility i) allocates spend within each category of wildfire risk reduction initiative ii) by accurate risk spend efficiency estimates iii) but does not allocate spend across categories of initiatives (e.g. prioritizing between vegetation management and grid hardening)	Utility i) allocates spend across all categories of wildfire risk reduction initiatives ii) by accurate risk spend efficiency estimates iii) across various categories using an average estimate of risk spend efficiency for each initiative across the entire grid	Utility i) allocates spend across all categories of wildfire risk reduction initiatives ii) by accurate risk spend efficiency estimates iii) based on the current state of the utility’s equipment and the specific location or area of grid where the initiative is to be	Utility i) allocates spend across all categories of wildfire risk reduction initiatives ii) by accurate risk spend efficiency estimates iii) based on the current state of the utility’s equipment at the asset level where the initiative is to be implemented and iv)

Capability	Maturity level 0	1	2	3	4
				implemented; iv) which is verified by experimental data confirmed by experts and other utilities in CA	utility includes estimate of impact on reliability factors; v) which is verified by experimental data confirmed by experts and by other utilities in California or abroad
42. Portfolio-wide innovation in new wildfire initiatives	No established program for evaluating the wildfire risk and risk spend efficiency of new wildfire initiatives	New initiatives developed and evaluated based on i) piloting and ii) measuring direct reduction in ignition events	New initiatives developed and evaluated based on i) piloting initiatives and ii) measuring direct reduction in ignition events and iii) measuring reduction impact on risk event metrics; iv) including an evaluation of the total cost of the initiative	New initiatives i) developed and independently evaluated using lab facilities by a trained team of innovation specialists, followed by ii) in-field testing based on piloting and iii) measuring direct reduction in ignition events at a span level and iv) measuring reduction in impact on risk event metrics; v) including an evaluation of the total cost of the initiative	New initiatives i) developed and independently evaluated using lab facilities by a trained team of innovation specialists, ii) field testing done by piloting, and iii) measuring direct reduction in ignition events and iv) measuring reduction impact on risk event metrics v) independent auditing of performance; vi) extensive data sharing with industry, academia, and other utilities utilizing the same initiatives to share results; vii) including an evaluation of the total cost of initiative

Category I: Emergency planning and preparedness

Illustrative descriptions that may represent typical grades—not comprehensive

Capability	Maturity level 0	1	2	3	4
43. Wildfire plan integrated with overall disaster / emergency plan	Wildfire plan not integrated with overall disaster and emergency preparedness plan	Wildfire plan i) a component of overall disaster and emergency preparedness plan; ii) running in drills to audit the viability and execution of plans	Wildfire plan i) an integrated component of overall disaster and emergency preparedness plan, with ii) consequence of confounding events or multiple simultaneous disasters considered in planning process, iii) running in drills to audit the viability and execution of plans across incident types	Wildfire plan i) an integrated component of overall disaster and emergency preparedness plan, with ii) consequence of confounding events or multiple simultaneous disasters considered in planning process, and iii) plan integrated with disaster and emergency preparedness plan of other relevant stakeholders (e.g. Cal Fire, Fire Safe Councils, etc.) iv) coordinating planning and integrating plans across stakeholders; and v) participating in drills to audit the viability and execution of plans across stakeholders	Wildfire plan i) an integrated component of overall disaster and emergency preparedness plan, with ii) consequence of confounding events or multiple simultaneous disasters considered in planning process, and iii) plan integrated with disaster and emergency preparedness plan of other relevant stakeholders (e.g. Cal Fire, Fire Safe Councils, etc.), iv) with utility taking a leading role in planning, coordinating, and integrating plans across stakeholders, and leading efforts to run drills to audit the viability and execution of plans across stakeholders

Capability	Maturity level 0	1	2	3	4
44. Plan to restore service after wildfire related outage	Wildfire plan not integrated with overall disaster and emergency preparedness plan	Wildfire plan i) a component of overall disaster and emergency preparedness plan; ii) running in drills to audit the viability and execution of plans	Wildfire plan i) an integrated component of overall disaster and emergency preparedness plan, with ii) consequence of confounding events or multiple simultaneous disasters considered in planning process, iii) running in drills to audit the viability and execution of plans across incident types	Wildfire plan i) an integrated component of overall disaster and emergency preparedness plan, with ii) consequence of confounding events or multiple simultaneous disasters considered in planning process, and iii) plan integrated with disaster and emergency preparedness plan of other relevant stakeholders (e.g. Cal Fire, Fire Safe Councils, etc.) iv) coordinating planning and integrating plans across stakeholders; and v) participating in drills to audit the viability and execution of plans across stakeholders	Wildfire plan i) an integrated component of overall disaster and emergency preparedness plan, with ii) consequence of confounding events or multiple simultaneous disasters considered in planning process, and iii) plan integrated with disaster and emergency preparedness plan of other relevant stakeholders (e.g. Cal Fire, Fire Safe Councils, etc.), iv) with utility taking a leading role in planning, coordinating, and integrating plans across stakeholders, and leading efforts to run drills to audit the viability and execution of plans across stakeholders
45. Emergency community engagement during and after wildfire	Little community engagement or poor communication during and after wildfire	i) Clear and substantially complete communication of available utility-related information ii) to >95%	i) Clear and substantially complete communication of available utility-related information ii) to >98%	Clear and substantially complete communication of utility-related information to >99% of	Utility i) communicates to >99.9% of affected customers ii) and 100% of affected medical baseline customers, iii)

Capability	Maturity level 0	1	2	3	4
		of affected customers, and iii) >99% of affected medical baseline customers, as well as referral to other agencies, iv) links to relevant evacuation information prominently on website and via toll-free phone number	of affected customers, and iii) >99.5% of affected medical baseline customers, as well as referral to other agencies, iv) availability of relevant evacuation information and links prominently on website and via toll-free phone number	affected customers ii) and >99.9% of affected medical baseline customers iii) has detailed and actionable established protocols for cooperation with emergency management organizations iv) availability of relevant evacuation information and links prominently on website and via toll-free phone number, v) and assists where helpful with communication of information related to power outages to customers, as well as partnering with other agencies to refer those affected to relevant assistance and resources	has detailed and actionable established protocols for cooperation with emergency management organizations iv) availability of relevant evacuation information and links prominently on website and via toll-free phone number and v) assists where helpful with communication of information related to power outages to customers, and vi) communicates and coordinates resources to communities during emergencies (e.g., shelters, supplies, transportation etc.)
46. Protocols in place to learn from wildfire events	No defined protocols established to learn from wildfire events	Protocols in place to i) record outcome of emergency events and to ii) clearly and actionably document learnings and potential process improvements, iii) including a defined	Protocols in place to i) record outcome of emergency events and to ii) clearly and actionably document learnings and potential process improvements, iii) including a defined	Protocols in place to i) record outcome of emergency events and to ii) clearly and actionably document learnings and potential process improvements, iii) including a defined	Protocols in place to i) record outcome of emergency events and to ii) clearly and actionably document learnings and potential process improvements, iii) including a defined

Capability	Maturity level 0	1	2	3	4
		process and staff responsible for incorporating learnings into emergency plan	process and staff responsible for incorporating learnings into emergency plan, and iv) having subject matter experts assess the effectiveness of the updated plan	process and staff responsible for incorporating learnings into emergency plan, and iv) testing updated plan using "dry runs" and subject matter experts to confirm effectiveness of updated plan	process and staff responsible for incorporating learnings into emergency plan, and iv) testing updated plan using "dry runs" and subject matter experts to confirm effectiveness of updated plan; v) including a defined process to solicit input from variety of other stakeholders and defined process to incorporate learnings from other stakeholders into emergency plan
47. Processes for continuous improve-ment after wildfire and PSPS	Utility does not conduct an evaluation or debrief process after a wildfire event.	Utility i) conducts a customer survey and utilized partners to disseminate ii) utility also debriefs with partners about what can be improved, iii) feedback and recommendations on potential improvements are made public.	Utility i) conducts a customer survey and utilized partners to disseminate ii) conducts proactive outreach to local agencies and organizations to solicit additional feedback on what can be improved iii) feedback and recommendations on potential improvements are made public.	Utility has i) a clear plan for post-event listening and incorporating lessons learned from all stakeholders, ii) activities include debriefs, public listening sessions, surveys, and additional measures available to the public, iii) feedback is compiled, written, and recommended actions are made public. Implementation of	Utility has i) a clear plan for post-event listening and incorporating lessons learned from all stakeholders, ii) activities include debriefs, public listening sessions, surveys, and additional measures available to the public, iii) feedback is compiled, written, and recommended actions are made public, implementation of

	Maturity level				
Capability	**0**	**1**	**2**	**3**	**4**
				recommendations is tracked and reported on	recommendations is reported on and tracked, iv) utility further has an established process to conduct reviews after wildfires in other the territory of other utilities and states to identify and address areas of improvement

Category J: Stakeholder cooperation and community engagement

Illustrative descriptions that may represent typical grades—not comprehensive

Capability	Maturity level 0	1	2	3	4
48. Cooperation and best practice sharing with other utilities	Utility does not adopt lessons learned from other utilities	Utility has a i) clearly defined operational process in place to ii) exchange best practices with other California utilities iii) tests lessons learned from other utilities to ensure local applicability	Utility i) actively seeks best practices from utilities, ii) successfully implements relevant best practices, and iii) seeks to share best practices and lessons learned in a consistent format iv) tests lessons learned from other utilities to ensure local applicability	Utility i) actively seeks best practices from utilities, ii) successfully implements relevant best practices, and iii) seeks to share best practices and lessons learned in a consistent format, and iv) via a consistent and predictable set of venues/media, v) and participates in annual benchmarking exercises with other utilities to find areas for improvement vi) implement a process for testing lessons learned from other utilities to ensure local applicability	Utility i) actively seeks best practices from utilities, ii) successfully implements relevant best practices, and iii) seeks to share best practices and lessons learned in a consistent format, and iv) via a consistent and predictable set of venues/media, v) and participates in annual benchmarking exercises with other utilities to find areas for improvement and vi) implement a defined process for testing and adapting lessons learned from other utilities to ensure local applicability
49. Engagement with communities on utility	Utility has poor relationship with local communities, impairing ability to implement initiatives	Utility has i) clear and actionable plan to develop or maintain a collaborative relationship with local	Utility has i) clear and actionable plan to develop or maintain a collaborative relationship with local	Utility has i) clear and actionable plan to develop or maintain a collaborative relationship with local	Utility has demonstrably cooperative relationship with local communities, and i) clear and actionable plan to

Capability	Maturity level 0	1	2	3	4
wildfire mitigation initiatives		communities, ii) enables utility to implement initiatives (e.g., conduct vegetation management) iii) with fewer than 10% of land owners in utility territory preventing or significantly hindering the utility's performance of reasonable vegetation work, and iv) complaints from fewer than 5% of landowners	communities, ii) enables utility to implement initiatives (e.g., conduct vegetation management) iii) with fewer than 3% of land owners in utility territory preventing or significantly hindering the utility's performance of reasonable vegetation work, and iv) complaints from fewer than 2% of landowners	communities, ii) enables utility to implement initiatives (e.g., conduct vegetation management) iii) with fewer than 2% of land owners in utility territory preventing or significantly hindering the utility's performance of reasonable vegetation work, and iv) complaints from fewer than 1% of landowners	develop or maintain a collaborative relationship with local communities, ii) enables utility to implement initiatives (e.g., conduct vegetation management) iii) with fewer than 1% of land owners in utility territory preventing or significantly hindering the utility's performance of reasonable vegetation work, and iv) complaints from fewer than 1% of landowners; and v) landowners periodically reach out to utility to notify of risks, dangers, or issues
50. Engagement with AFN populations	Utility has poor relationships with key organizations representing AFN communities, impairing ability to implement initiatives.	Utility has i) a plan for partnering with organizations representing AFN communities, and ii) is able to provide information about the nature of these partnerships	Utility has i) a clear and actionable plan to develop and maintain collaborative relationships with organizations representing AFN communities, with ii) pathways for implementing suggested	Utility has i) a clear and actionable plan to develop and maintain ii) demonstrably cooperative and codified relationships with organizations representing AFN communities, and iii) can point to clear examples of how those	Utility has i) a clear and actionable plan to develop and maintain ii) demonstrably cooperative and codified relationships with organizations representing AFN communities, and iii) can point to clear examples of how those

Capability	Maturity level 0	1	2	3	4
			activities to address population needs	relationships have driven the utility's ability to interact with and prepare these populations for wildfire mitigation activities.	relationships have driven the utility's ability to interact with and prepare these populations for wildfire mitigation activities, and has a specific annually-updated action plan further reduce wildfire and PSPS risk to these communities
51. Collaboration with emergency response agencies	Utility does not sufficiently cooperate with suppression agencies	Utility cooperates with suppression agencies by i) calling in ignitions detected along length of grid for ii) high risk areas	Utility cooperates with suppression agencies by i) calling in ignitions detected along length of grid ii) for all areas under utility control	i) Utility works cooperatively with suppression agencies to detect wildfires in the utility's service area, ii) alerts suppression resources, and iii) accurately predict and communicates the forecasted fire propagation path using available analytics resources and weather data	i) Utility works cooperatively with suppression agencies to detect wildfires in the utility's service area, ii) alerts suppression resources, and iii) accurately predict and communicates the forecasted fire propagation path using available analytics resources and weather data, iv) communicates fire path to community if requested, and v) utility works to assist suppression personnel logistically where possible

Capability	Maturity level 0	1	2	3	4
52. Collaboration on wildfire planning with stakeholders	Utility does not collaborate with other agencies conducting non-emergency wildfire planning and initiatives to reduce wildfire risk.	Utility i) coordinates on a regular basis with other agencies including all Fire Safe Councils within its territory and ii) conduct fuel management along right of ways but iii) is not coordinating with broader fuel management efforts by other stakeholders	Utility i) coordinates on a regular basis with other agencies including all Fire Safe Councils within its territory and ii) conducts substantial fuel management along right of ways and iii) shares fuel management plans with other stakeholders, iv) works with other stakeholders conducting fuel management concurrently	Utility i) coordinates on a regular basis with other agencies including all Fire Safe Councils within its territory and ii) conducts substantial fuel management along right of ways, iii) shares fuel management plans and iv) 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, v) cultivates a native vegetative ecosystem along right of ways that is consistent with lower fire risk, and work with stakeholders across its territory to cultivate a native vegetative ecosystem	Utility i) coordinates on a regular basis with other agencies including all Fire Safe Councils within its territory and ii) conducts substantial fuel management in service area, iii) shares fuel management plans and iv) pro-actively coordinates fuel management initiatives with other stakeholders to encourage state-wide to collaborate to focus on areas that would have the biggest impact in reducing wildfire risk, v) utility funds local groups (e.g. fire safe councils) to support fuel management, vi) cultivates a native vegetative ecosystem along right of ways that is consistent with lower fire risk and work with stakeholders across its territory to cultivate a native vegetative ecosystem

ATTACHMENT 3

Wildfire Safety Division

Attachment 3: Changes to Wildfire Mitigation Plan (WMP) Process

November 2020

Resolution WSD-011 – Attachment 3

Contents

EXECUTIVE SUMMARY

To streamline the 2021 Wildfire Mitigation Plan (WMP) process, the Wildfire Safety Division (WSD) presents targeted changes.

This document presents changes to the 2021 WMP evaluation schedule, timeline and project plan to build upon the improvements made in 2020. All changes presented in this document target outstanding areas to improve the WMP schedule, preparation and evaluation processes. These changes further streamline the WMP process while following all existing legislative requirements.

Below are the two areas of focus in this document - the WMP timeline, schedule and project plan, and preserving procedural provisions for 2021.

2021 WMP timeline, schedule and project plan changes

A. WMP evaluation to be based on initial submissions
B. Phased approach to WMP submissions and review
C. Quarterly Report data submission supplants annual requirements
D. Quarterly Report data requirements standardized to align with annual WMP requirements

Preserving WSD-001 provisions into 2021

To continue effective operation of the review process, the procedural mechanisms and other provisions of Resolution WSD-001[1] will remain in effect for the 2021 WMP season.

[1] Resolution WSD-001 can be found on the WSD home page - http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M324/K966/324966978.PDF

WMP TIMELINE, SCHEDULE AND PROJECT PLAN CHANGES

The 2020 WMP introduced additional requirements that improved the WSD's ability to effectively evaluate utility wildfire mitigation performance. Through the 2020 review process, WSD learned that the WMP timeline needs to be refined to give utilities additional time to properly prepare all narrative and data, as well as to provide the WSD and interested stakeholders additional time to review and evaluate WMPs. The data request process also highlighted several areas for improvement to ensure that utilities are submitting complete WMPs on the submission date. For the 2021 WMP cycle, it is important to implement key changes to further improve the end-to-end WMP process for all stakeholders.

A. WMP evaluation to be based on initial submissions

Issue:
Initial 2020 WMP submissions did not fully satisfy completeness requirements, which led to additional data requests being issued following the 2020 WMP submissions.

Solution:
Moving forward, utilities will be evaluated for WMP completeness based on the requirements and specific components of the initial submissions. WMP approval is contingent upon complete and adequate filings along with data from Quarterly Reports and other relevant filings.

B. Phased approach to WMP submissions and review

Issue:
The 2020 WMP cycle was on a constrained timeline as the WSD was a new division and utilities were required to all submit their 2020 WMPs no later than February 7, 2020 per Resolution WSD-001.[2] The WSD has the legislative authority to stagger WMP submissions, per Public Utilities Code § 8386(b), and staggering would provide greater time for comprehensive submissions and review.

Solution:
The 2021 WMP timeline intends to follow a modified approach in which large utilities submit WMPs first, followed by the Small and multi-jurisdictional (SMJUs) and independent transmission owners (ITOs) one month after. This phased approach provides the WSD more time to review each WMP and complies with the statutory authority given to the WSD in Public Utilities Code § 8386(b).

The deadline for San Diego Gas & Electric Company (SDG&E), Southern California Edison Company (SCE) and Pacific Gas and Electric Company (PG&E) to submit their 2021 WMP updates is February 5, 2021. For Bear Valley Electric Service, Inc (Bear Valley), Liberty Utilities (Liberty), PacifiCorp, Horizon West Transmission, LLC (Horizon West) and TransBay Cable, the deadline to submit 2021 WMP updates is March 5, 2021. The WSD will issue a draft resolution for SDG&E, SCE and PG&E in May 2021 and the SMJUs/ITOs in June 2021, unless the WSD makes a written determination that the 90-day deadline cannot be met, pursuant to Public Utilities Code § 8386.3(a). This change is intended to mitigate the compressed WMP review timeline experienced in previous years and allow WSD enough time to evaluate each WMP, while maintaining compliance with the 90-day statutory review deadline. In future

[2] https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M324/K966/324966978.PDF

years, the WSD will consider whether each investor-owned utility will submit annual updates or a 3-year plan on a case-by-case basis.

The 2021 WMP cycle timeline is outlined for PG&E, SCE and SDG&E in Table 1 and outlined for SMJUs and ITOs in Table 2.

Table 1: 2021 WMP Cycle Timeline for PG&E, SCE and SDG&E

Date[3]	Action
December 9, 2020	Second Quarterly Report filings due (Covers Q3: Jul 1 – Sept 30)
December 11, 2020	Second WMP Change Order filings due
January 6, 2021[4]	Public comments due for Dec. Quarterly Reports
January 13, 2021[5]	Reply comments due for Dec. Quarterly Reports
February 5, 2021	WMP update submission deadline for PG&E, SCE and SDG&E[5,6]
Feb 23 & 24, 2021	WMP workshops for PG&E, SCE and SDG&E
March 17, 2021	Public comment (on WMP and workshop) due for PG&E, SCE and SDG&E WMPs
March 24, 2021	Reply comments (on WMP and workshop) due for PG&E, SCE and SDG&E WMPs[7]
May 1, 2021	Quarterly Reports due for utilities (covers Q1: Jan 1 – Mar 31)
May 15, 2022	Public comments due for May Quarterly Reports
May 22, 2022	Reply comments due for May Quarterly Reports
May 2021	WSD publishes draft resolution and action statement for PG&E, SCE and SDG&E[8]
June 2021	Earliest timeframe in which Commission ratifies WMP resolution for PG&E, SCE and SDG&E

[3] If any deadline falls on a weekend or holiday, the deadline shall be moved to the following business day.

[4] Public comment and reply comment adjusted from Dec 23rd and 30th respectively given holidays

[5] WSD plans to hold working calls with utilities in December 2020 and January 2021 to clarify WMP guidelines and metrics, as needed.

[6] Quarterly Report cadence now begins in February for PG&E, SCE and SDG&E to align with WMP submissions.

[7] Any stakeholder may submit reply comments.

[8] The WSD plans to issue a draft resolution for SDG&E, SCE and PG&E in May 2021, unless the WSD makes a written determination that the three-month deadline cannot be met, pursuant to Public Utilities Code § 8386.3(a).

Table 2: 2021 WMP Cycle Timeline for SMJUs and ITOs

Date[9]	Action
December 9, 2020	Second Quarterly Report filings due (covers Q3: Jul 1 – Sept 30)
December 11, 2020	Second WMP Change Order filings due
January 6, 2021[10]	Public comments due for Dec. Quarterly Reports
January 13, 2021[10]	Reply comments due for Dec. Quarterly Reports
March 5, 2021	WMP update submission deadline for SMJUs/ITOs[11,12]
March 23, 2021	WMP workshops for SMJUs/ITOs
April 14, 2021	Public comment (on WMP and workshop) due for SMJU/ITO WMPs
April 21, 2021	Reply comments (on WMP and workshop) due for SMJU/ITO WMPs[13]
May 1, 2021	Quarterly Reports due for utilities (covers Q1: Jan 1 – Mar 31)
May 15, 2022	Public comments due for May Quarterly Reports
May 22, 2022	Reply comments due for May Quarterly Reports
June 2021	WSD publishes draft resolution and action statement for SMJUs/ITOs[14]
July 2021	Earliest timeframe in which Commission ratifies WMP resolution for SMJUs/ITOs

[9] If any deadline falls on a weekend or holiday, the deadline shall be moved to the following business day.

[10] Public comment and reply comment adjusted from Dec 23rd and 30th respectively given holidays

[11] WSD plans to hold working calls with utilities in December 2020 and January 2021 to clarify WMP guidelines and metrics, as needed.

[12] Quarterly Report cadence now begins in March for SMJUs to align with WMP submissions

[13] Any stakeholder may submit reply comments.

[14] The WSD plans to issue a draft resolution for the SMJUs/ITOs in June 2021, unless the WSD makes a written determination that the three-month deadline cannot be met, pursuant to Public Utilities Code § 8386.3(a).

C. Quarterly Report (QR) data submission supplants annual data requirements

Issue:
The 2020 WMP data submission provided a wealth of data that could be more useful if provided quarterly rather than annually. Furthermore, submitting data quarterly would allow the WSD and stakeholders to iterate on the data requirements as needed at a faster pace than they would at an annual reporting cadence.

Currently, all WMP data flows in at one time in the year, which makes a thorough 90-day WMP review process difficult. Furthermore, some of the data collected becomes outdated for current trends in less than a year, requiring a more frequent data upload schedule.

Solution:
WSD can address these issues by replacing the data submissions present in the annual WMP with data submissions in the Quarterly Reports. Quarterly Reports enable the WSD to monitor utility data at an enhanced frequency and shifts much of data evaluation from WMP review to the off-season months. Furthermore, insights generated from the Quarterly Reports may reduce analysis time during annual WMP review, leading to a faster review process.

The data required in each Quarterly Report going forward plans to be a combination of spatial and non-spatial data:

- Spatial data plans to follow the schema of WSD's Draft GIS Data Reporting Requirements and Schema for California Electrical Corporations, which the WSD may update as it learns from ongoing quarterly submissions.
- Non-spatial plans to follow the schema of Attachment 2.3: 2021 Performance Metrics Data Templates

The WSD may organize data analysis working groups on an ongoing basis to analyze and discuss the WMP update and data submission processes.

Utilities will be required to submit Quarterly Reports according to the following schedule. Each Quarterly Report will align with the calendar quarters (Jan 1 – Mar 31, April 1 – June 30, July 1 – September 30, October 1 – December 31) and are reported 30 days following the close of the quarter;[15] with the exception of the first two Quarterly Reports, which will be submitted slightly later than 30 days following close of the quarter . The timeline below shows when Quarterly Reports will be submitted going forward, and which calendar quarters they cover:

- December 9, 2020 – Covers calendar Q3: July 1, 2020 – September 30, 2020
- February/March 2021 (with WMP submission) – Covers calendar Q4: October 1, 2020 – December 31, 2020
- May 1, 2021 – Covers calendar Q1: January 1, 2021 – March 31, 2021
- August 1, 2021 – Covers calendar Q2: April 1, 2021 – June 30, 2021
- November 1, 2021 – Covers calendar Q3: July 1, 2021 – September 30, 2021
- February/March 2022 (with WMP submission) – Covers calendar Q4: October 1, 2021 – December 31, 2021

[15] If Quarterly Report submission deadline falls on a weekend or holiday, the reports shall be submitted on the following business day.

- May 1, 2022 – Covers calendar Q1: January 1, 2022 – March 31, 2022
- August 1, 2022 – Covers calendar Q2: April 1, 2022 – June 30, 2022
- November 1, 2022 – Covers calendar Q3: July 1, 2022 – September 30, 2022
- February/March 2023 (with WMP submission) – Covers calendar Q4: October 1, 2022 – December 31, 2022

If Quarterly Report submission deadlines fall on weekends or holidays, the reports shall be submitted on the following business day. This data reporting schedule replaces the ongoing quarterly data reporting schedule adopted in Resolution WSD-002.[16] 2020 Class B deficiencies and conditions[17] requiring ongoing reporting are still required and will be submitted alongside the new quarterly data submissions, rather than according to the schedule adopted in WSD-002. The WSD may modify this schedule and reporting cadence, if deemed necessary, via written public notice.

D. Quarterly Report data requirements standardized to align with data requirements in annual WMP

Issue:
To transition data requirements from annual to quarterly reporting, the Quarterly Reports need to fulfill all data requirements in the annual WMP. If all relevant data is collected on a quarterly basis, then analyses and additional data requests could be addressed prior to the 90-day WMP review period. This would enable annual reviewers to focus more on understanding how the data fits in with the utilities' narratives rather than ensuring the completeness and validity of their data.

Solution:
In 2021, WSD plans to merge all annual data requirements into the Quarterly Report (spatial and non-spatial), and to remove data requirements from the annual WMP submissions. The WSD may modify the organization of data requirements for 2021, if deemed necessary, via written public notice.

The data required in each Quarterly Report should be a combination of spatial and non-spatial data:

- Spatial data to follow the WSD's Draft GIS Data Reporting Requirements and Schema for California Electrical Corporations, to be released outside the resolution process. A draft can be found here.[18]
- Non-spatial data to follow the schema of Attachment 2.3: 2021 Performance Metrics Data Templates. WSD may change these templates over time to address evolving requirements.

PRESERVING WSD-001 PROVISIONS INTO 2021

[16] See resolution WSD-002 here: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M340/K859/340859823.PDF

[17] Per WSD-002: Class B deficiencies 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. Such information shall be submitted either one time in the [next] quarterly report or on an ongoing basis as specified by each condition. The quarterly reports shall be named "[Name]'s Quarterly Report on [WMP cycle year (e.g., 2020)] Wildfire Mitigation Plan for [period covered]." (WSD-002)

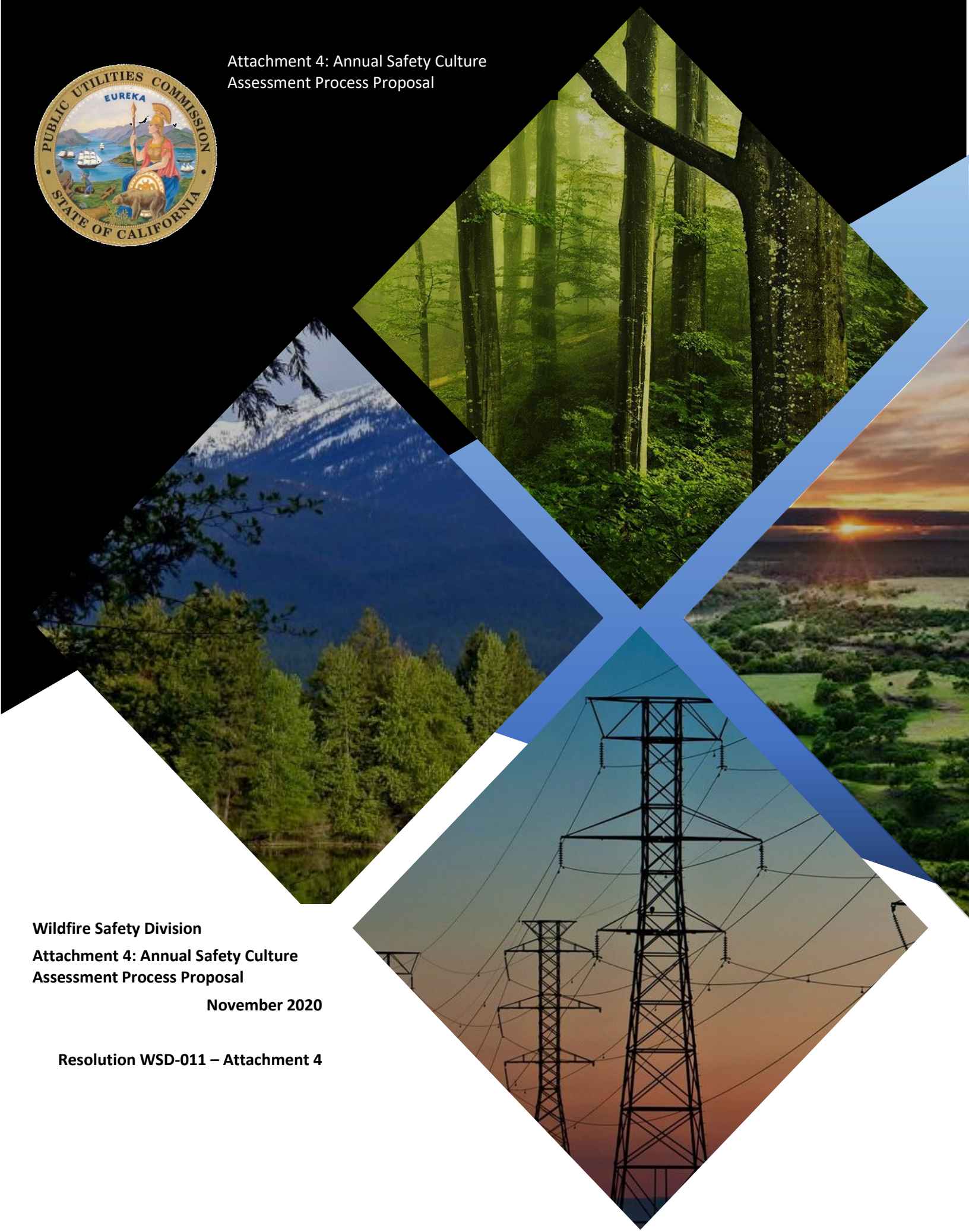
[18] https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/WSD/WSD%20GIS%20Data%20Reporting%20Standards_DRAFT_20200805.pdf

To continue effective operation of the review process, specific procedural mechanisms and other provisions from Resolution WSD-001[19] will remain in effect for the 2021 WMP season. These include, but are not limited to:

1. The e-mail address wildfiresafetydivision@cpuc.ca.gov and the service list in Rulemaking (R.) 18-10-007 for correspondence with utilities and other stakeholders. The method for utilities to submit and share their WMP submissions may change given written notice by WSD
2. Wildfire Safety Division website to publish WMP resolutions, and schedule workshops for presentation of and feedback on the WMPs. Publishing method may change given written notice by WSD

[19] WSD-001 can be found on the WSD home page - http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M324/K966/324966978.PDF

ATTACHMENT 4



Wildfire Safety Division

Attachment 4: Annual Safety Culture Assessment Process Proposal

November 2020

Resolution WSD-011 – Attachment 4

Contents

Executive Summary

Pursuant to Public Utilities Code §8389, by December 1, 2020, and annually thereafter, the Commission, after consultation with the Wildfire Safety Division (WSD), must adopt and approve a process for the WSD to conduct annual safety culture assessments for each electrical corporation subject to the Commission's jurisdiction.[1] The WSD here introduces an overview of how it plans to conduct annual safety culture assessments.

Upon Commission approval of the process for conducting safety culture assessments described herein, in early 2021, the WSD will release safety culture assessment submission requirements for electrical corporations for 2021. The WSD will expect electrical corporations to prepare their submissions by late spring of 2021 and plans to conduct its first safety culture assessment in the summer of 2021. Specific dates will be released together with the submission requirements in early 2021, and dates are subject to change with written notice by the WSD.

The WSD expects its safety culture assessment process to evolve year over year, and accordingly may phase in implementation of the full process described in this proposal, conducting select elements in 2021 and building on those elements in subsequent years, ultimately ramping up to a comprehensive steady-state process. Throughout this document, the WSD describes the process it aspires to conduct in 2021, while identifying some elements of the process which may be phased in as the process for conducting safety culture assessments evolves. The WSD plans to incorporate lessons learned each year to further improve and refine the proposed processes for safety culture assessments, for consideration by the Commission on an annual basis hereafter pursuant to Public Utilities Code §8389(d)(4).

The WSD provides the following information regarding its safety culture assessment process:

- **Starting point and vision** for the WSD's proposed safety culture assessment
- **Framework and scope** for the WSD's proposed safety culture assessment
- **Proposed process** for the WSD's safety culture assessment
    - This safety culture assessment process will also include an assessment of whether electrical corporations have met the Board structure and reporting requirements outlined in Public Utilities Code §8389(e)(5) and Public Utilities Code §8389(e)(3).
- **Next steps**

Safety Culture Assessment Vision

The WSD has an ambitious vision for its safety culture assessment, rooted in conviction that the safety culture of each electrical corporation (encompassing shared values, assumptions, and standards governing behavior, as well as the behavior that ensues) influences safety performance in the context of wildfire hazard mitigation. Accordingly, the WSD aspires to (1) assess a baseline for culture against which improvement can be measured over time, (2) ground its safety culture assessment in data-driven insight, and connect the results to known outcome metrics, (3) ground its assessment in cultural drivers of wildfire risk, (4) focus its assessment on wildfire safety but consider cultural elements that are relevant to broader safety outcomes, and (5) foster continuous and collaborative improvement.

[1] For 2021, these electrical corporations are Pacific Gas and Electric Company, San Diego Gas & Electric, Southern California Edison, Liberty Utilities (CalPeco), PacifiCorp, Bear Valley Electric Service, Inc., Horizon West Transmission, and Trans Bay Cable.

Framework and scope

To achieve the vision for its safety culture assessment set out in this proposal, the WSD will assess select elements of culture, including leadership influence and workforce perceptions and behavior, as well as the organizational foundation that drives culture, which encompasses sustaining systems, structure and governance, and select safety enabling systems.

The WSD's annual safety culture assessment is distinct from and intended to be complementary to the broader safety culture assessment required of the Commission by Public Utilities Code §8386.2. While the Commission's safety culture assessment will cover safety culture broadly, the WSD's safety culture assessment will focus on safety culture in the settings most relevant to wildfire risk. The WSD will focus its assessment on wildfire safety by customizing assessment tools to identify whether overall culture for safety has reached the settings that most influence the public's exposure to wildfire risk and safety risks to employees doing wildfire mitigation work.

Each electrical corporation may conduct its own internal safety culture assessment in addition to the WSD's assessment. This safety culture assessment might measure additional elements most relevant to that electrical corporation's context and might not be focused exclusively on wildfire. The WSD's assessment of safety culture is intended to be complementary to, and not a replacement for, ongoing work to improve safety culture at each electrical corporation.

Proposed process

Verification of requirements, including Board structure and safety governance

From 2021 onwards, the WSD will leverage the process, described herein, subject to Commission approval per Public Utilities Code §8389(d)(4), to conduct annual safety culture assessments to assess whether electrical corporations meet minimum safety governance requirements as well as Board structure and reporting requirements pursuant to Public Utilities Code §8389(e)(5) and Public Utilities Code §8389(e)(3).

Safety culture assessment

After conducting its safety culture assessment, the WSD proposes to release an assessment each year, setting a baseline (or updated baseline) for culture and organizational foundation, and evaluating how organizational foundation may be influencing culture and how culture may be influencing outcomes. The WSD will base this assessment on four forms of data collected from the electrical corporations:

1. Targeted workforce survey, intended to assess culture across dimensions and settings particularly relevant to wildfire, including communication regarding safety between workforce and leadership
2. Organizational self-assessment and plan, intended to assess elements of organizational foundation[2] that heavily influence culture, including wildfire safety related communication across the organization, as well as each electrical corporation's targets and plans to improve
3. Supporting documentation requirement, which provides narrative information regarding objectives and lessons learned, supporting evidence for the organizational self-assessment, and detail regarding plan to improve
4. Interviews and observational visits, which will add nuance and context to the data types outlined above

[2] Organizational foundation includes organizational sustaining systems (set of organizational antecedents and consequences that support effective safety management, leadership, and wildfire safety performance), certain governance elements (how systems or objectives relevant to wildfire safety are monitored), and certain safety enabling systems (systems and processes intended as specific mechanisms to improve safety). This is explained in detail in section 2.3.1.

The WSD will also consider key safety outcome metrics as submitted in each electrical corporation's latest Wildfire Mitigation Plan or related data submission.[3] These outcome metrics are separate from the WSD's evaluation of safety culture but will allow the WSD to further develop its understanding over time of how safety culture influences wildfire-related outcomes.

1 Starting point and vision

1.1 Statutory mandate

The WSD's safety culture assessment will evaluate safety culture at all electrical corporations subject to the Commission's jurisdiction. In addition, for those electrical corporations that request a Safety Certification, the WSD's annual safety culture assessment will serve as one of the inputs that the WSD will consider as it evaluates each electrical corporation's request.

Pursuant to Public Utilities Code §8389(d)(4), the WSD proposes a process to conduct annual safety culture assessments such that the following criterion outlined in §8389(e)(2) can be considered in the evaluation of future Safety Certification requests:

- Each electrical corporation's agreement to implement the findings of its most recent safety culture assessment, if applicable

Because safety culture is heavily influenced by overall governance, the WSD proposes to also evaluate the following within the same safety culture assessment process proposed in this document:

- Board-of-director-level reporting to the Commission on safety issues and a Safety Committee on the Board of Directors composed of members with relevant safety experience, pursuant to Public Utilities Code§8389(e)(5) and Public Utilities Code§8389(e)(3)

Pursuant to Public Utilities Code §8389(e), other categories of elements not addressed in this document must also be satisfied for the WSD to issue a Safety Certification to an electrical corporation. Elements covered by other processes within the WSD include the following:

- Wildfire Mitigation Plan approval status, per §8389(e)(1), covered by the WSD's Wildfire Mitigation Plan review, and Wildfire Mitigation Plan implementation, per §8389(e)(7), covered by the WSD's Wildfire Mitigation Plan compliance process
- Executive compensation structure, per §8389(e)(4) and (6), covered by the WSD's executive compensation assessment process

1.2 Vision for WSD annual safety culture assessment

The vision for the WSD's safety culture assessment is intended to further the WSD's overall vision:

[3] Related data submissions may include Quarterly Reports, as required in Class B conditions, or other data submissions required as part of the WMP process

A sustainable California, with no catastrophic utility-related wildfires, that has access to safe, affordable, and reliable electricity.[4]

An organization's culture (encompassing shared values, assumptions, and standards governing behavior, as well as the behavior that ensues) is central to executing any strategy and a key driver of organizational performance.

Therefore, WSD views culture for safety at each electrical corporation as a critical enabler for safely designing and executing Wildfire Mitigation Plans and for achieving the WSD's broader vision.

Accordingly, the WSD will conduct a robust annual safety culture assessment. WSD's design of the safety culture assessment aspires to achieve the following:

1. **Assess baseline for culture against which improvement can be measured over time**
   The WSD's safety culture assessment will act as a longitudinal measure of safety culture across electrical corporations. This enables tracking of improvement in a consistent fashion year over year, as well as identification and sharing of best practices for improving culture based on what proves to be effective with time.

2. **Ground its safety culture assessment in data-driven insight, and connect the results to known outcome metrics**
   The WSD recognizes risk informed, data supported decision making as critical to success and a key principle for wildfire hazard mitigation activities.[5] This principle holds for the WSD's safety culture assessment as well, in that the WSD will inform much of its assessment from the data collected (both qualitative and quantitative) and drive towards increased understanding of how the cultural data collected relates to outcome metrics year over year (see section 2.3.2.2 for more detail). As the WSD evolves its proposed safety culture assessment process and method, it may refine the types of data collected in pursuit of more valid, reliable, and informative data which reflects the true culture for safety throughout each organization.[6]

3. **Ground assessment in cultural drivers of wildfire risk**
   The WSD recognizes that its annual safety culture assessment will need to be focused and plans to focus on elements of culture that influence the public's exposure to wildfire risk and risk to employees or contractors conducting wildfire hazard mitigation activities. The WSD expects to evolve its assessment to incorporate lessons learned and best practices over time.

4. **Focus on wildfire safety, but consider cultural elements which are relevant to broader safety outcomes**
   The WSD recognizes that an organization's culture for wildfire hazard mitigation is a subset of its overall safety culture. However, for the purposes of the WSD's annual safety culture assessment, it is important to identify whether this broader culture for safety has reached the settings that most influence the public's exposure to wildfire risk and the safety risks posed to supervisors and employees doing wildfire hazard mitigation work as defined by initiatives in each electrical corporation's most recent Wildfire Mitigation Plan. The WSD will focus its assessment accordingly (see section 2.3.2.1). The WSD and the Commission will

[4] WSD Strategic Roadmap Appendix 2, available here
[5] WSD Strategic Roadmap, available here
[6] "Organization" here implies the employees within an electrical corporation and contractors to the electrical corporation who do work which influences wildfire mitigation outcomes. The exact scope will be defined in early 2021 as part of the method for executing this proposed process.

strive for coordination between the WSD's safety culture assessment and the Commission's broader safety culture assessment required by Public Utilities Code §8386.2 such that the assessments of safety culture in a wildfire context and safety culture overall may be complementary and mutually informative.

5. **Foster continuous and collaborative improvement and learning, ultimately driving towards a culture of practicing safety**
   The WSD recognizes that changing culture throughout large organizations requires a clear vision and focused attention over time. The WSD aspires to support accountability for improving culture and promote continuous learning across electrical corporations such that a culture for safety becomes woven into the fabric of each organization.

1.3 Framework and scope

1.3.1 Framework for the WSD's safety culture assessment

In two separate investigations into utility safety culture, for Pacific Gas & Electric[7] and for Southern California Gas Company[8] the Commission enunciated certain minimal expectations for utility safety culture:

> "A public utility whose organizational culture and governance prioritize safety, makes safety the primary objective of the entire organization, encourages employees to report safety concerns with non-punitive outcomes, and that achieves a positive record of safe operation, can be described as possessing a high-functioning safety culture."

The WSD's proposed safety culture assessment process is rooted in the belief that culture for safety affects wildfire outcomes and accordingly is an important driver for all six WSD objectives: Public Safety, Property, Natural Resources, Reliability, Affordability and Climate Action.[9]

In particular, the WSD's safety culture assessment process will cover the following elements:

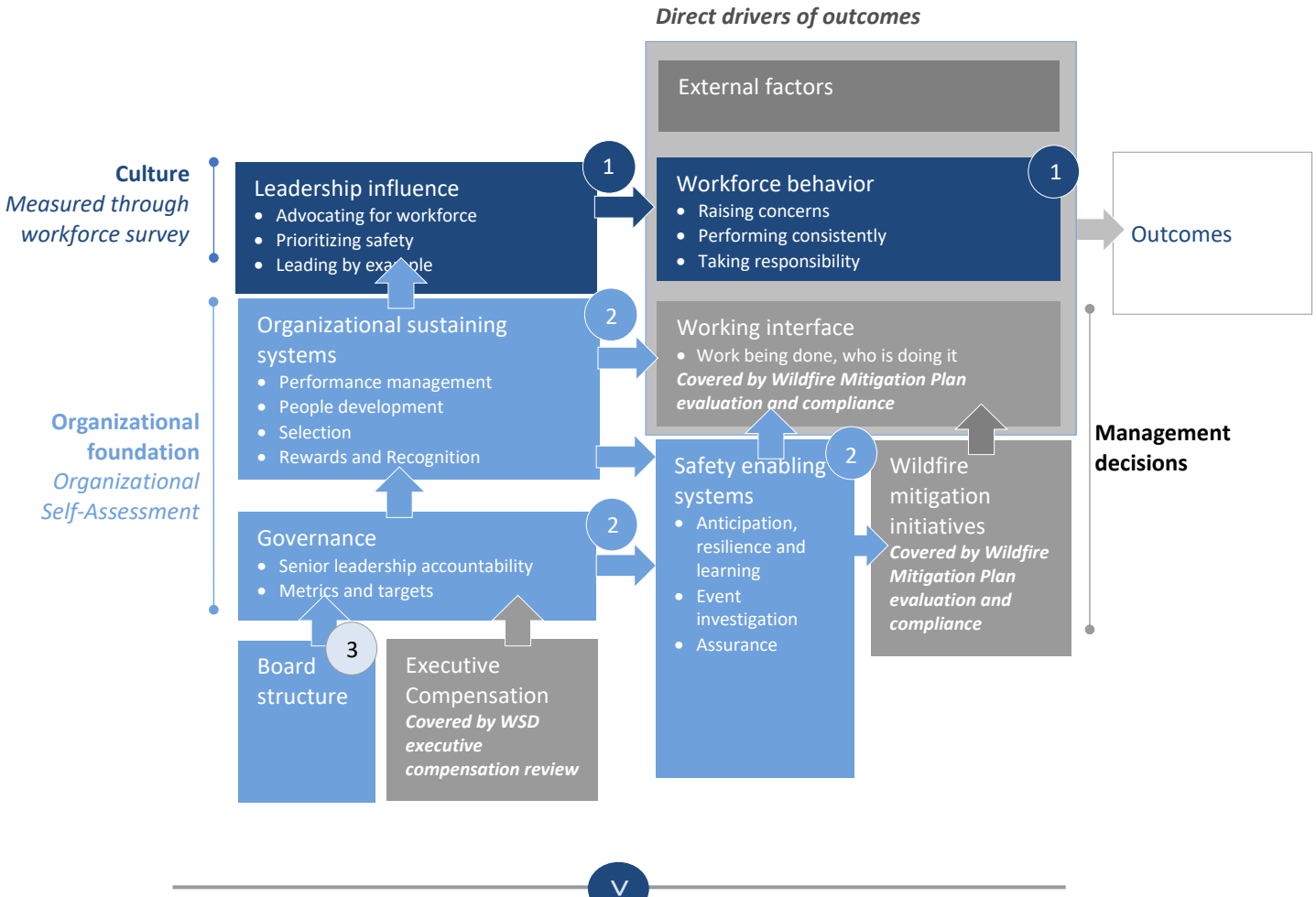
1. Verification of Board structure and reporting requirements pursuant to Public Utilities Code §8389(e)(5) and Public Utilities Code §8389(e)(3)
2. Safety culture assessment:
   - Culture, including
     - Leadership influence: How leadership is perceived by the workforce to prioritize safety, and extent to which leadership encourages and practices key behaviors relevant to wildfire safety
     - Workforce behavior: Extent to which workforce practices key behaviors relevant to wildfire safety
   - Organizational Foundation, including
     - Organizational sustaining systems: Set of organizational antecedents and consequences that support effective safety management, leadership, and wildfire safety performance

[7] I.15-08-019, Order Instituting Investigation on the Commission's Own Motion to Determine Whether Pacific Gas and Electric Company and PG&E Corporation's Organizational Culture and Governance Prioritize Safety
[8] I.19-06-014, Order Instituting Investigation on the Commission's Own Motion to Determine Whether Southern California Gas Company's and Sempra Energy's Organizational Culture and Governance Prioritize Safety
[9] WSD Strategic Roadmap Appendix 2, available here

- Certain governance elements: How systems or objectives relevant to wildfire safety are monitored, and
- Certain safety enabling systems: Systems and processes are intended as specific mechanisms to improve safety

A detailed description of how each of these elements affects outcomes, including their relationship to other elements of the Safety Certificate is provided in Figure 2 below.

Figure 2: Framework for safety culture assessment



Culture: Assess <u>throughout</u> the organization via targeted, wildfire focused workforce survey

1 **Foundation:** Assess through <u>organizational self-assessment,</u> supporting evidence, and interviews / observational visits

2 **Board structure:** Assess whether electrical corporations meet minimum <u>safety governance requirements as well as Board structure and reporting requirements</u> pursuant to Public Utilities Code §8389(e)(5) and Public Utilities Code §8389(e)(3).

1.3.2 Scope for the WSD's safety culture assessment

1.3.2.1 Focus of the WSD's safety culture assessment

As discussed in section 2.2, the WSD recognizes that culture for safety permeates an organization beyond the wildfire context. The WSD's annual safety culture assessment will focus on whether this broader culture for safety has reached the settings that most influence the public's exposure to wildfire risk and the safety risks for employees and contractors doing wildfire mitigation work.

Accordingly, the WSD will focus its annual safety culture assessment on wildfire context in two ways:

1. Assessment tools (see section 3.2) will measure some broader foundational elements of safety culture but in some instances be customized to focus specifically on wildfire context
2. The WSD's workforce survey (see section 3.2.2) will be constrained to focus on employees and contractors who conduct activities which touch wildfire mitigation initiatives as defined in the Wildfire Mitigation Plans both directly and indirectly. The WSD will work with electrical corporations to identify the appropriate criteria by which to identify this target population.

The WSD and the Commission will strive to share learnings and coordinate processes between the WSD's safety culture assessment and the Commission's broader safety culture assessment.

Each electrical corporation can conduct internal safety culture assessments in addition to the WSD's assessment which measure additional elements most relevant to that electrical corporation's context. The WSD's assessment of safety culture is intended to be complementary to, and not a replacement for, ongoing work to improve safety culture at each electrical corporation.

1.3.2.2 Role of Wildfire Mitigation Plan outcome metrics

The WSD's safety culture assessment requires consideration of outcome metrics, which tie closely to the WSD's Utility Wildfire Mitigation Objectives outlined in the WSD's Strategic Roadmap[10] of Public Safety, Property, Natural Resources, Reliability, Affordability, and Climate Action. This is because the WSD's safety culture assessment is intended to measure improvements in safety culture, which together with other factors will in turn influence those outcome metrics which reflect the WSD's six objectives listed above.

The WSD will select a subset of relevant metrics submitted as part of the Wildfire Mitigation Plan requirements to consider in the context of a safety culture assessment. The WSD's Utility Wildfire Mitigation Objectives are meant to guide the determination of these relevant outcome metrics. Outcome metrics may be adjusted or modified as the WSD further develops its safety culture assessment method.

The WSD's safety culture assessment seeks to understand which elements of culture could be influencing those outcome metrics, both positively and adversely. The WSD recognizes that this knowledge will be built over time as the safety culture assessment and Wildfire Mitigation Plan processes evolve, and the WSD will strive for close coordination between its safety culture assessment and Wildfire Mitigation Plan processes such that conclusions regarding outcome metrics can be complementary.

[10] WSD Strategic Roadmap Appendix 2, available here

The WSD recognizes that outcome metrics are distinct from indicators of culture, and they will be assessed accordingly. Specifically, the WSD will seek to understand over time whether improvements in culture and organizational foundation, shown through the workforce survey and organizational self-assessment, are accompanied by improvements in safety outcomes, as reflected by the data submitted annually in each electrical corporation's Wildfire Mitigation Plan. Similarly, if poor safety outcomes do occur, the WSD will seek to understand how each electrical corporation plans to address the cultural and organizational issues which contributed to those poor safety outcomes.

2 Proposed process for safety culture assessment

2.1 Annual assessment

Each year, the WSD proposes to release an annual assessment of electrical corporations, subject to change as the safety culture assessment process evolves. Specifically, the WSD proposes to cover the following in its assessment:

1. **Executive Summary**
    a. Overall assessment results: How organizational foundation may be influencing culture, and how this relates to wildfire safety performance
    b. Baseline for wildfire safety culture and organizational foundation against which improvement can be tracked
    c. Findings that electrical corporations seeking a Safety Certification must agree to implement, if applicable (see section 3.3)
2. **Verification of requirements, including Board structure and safety governance**
    a. Finding of whether electrical corporations have satisfied the board structure and reporting requirements in Public Utilities Code §8389(e)(5) and Public Utilities Code §8389(e)(3)
3. **Wildfire safety performance**
    a. Brief summary of wildfire safety performance over the past year, based on data from each electrical corporation's latest wildfire mitigation plan or related data submission[11]
4. **Wildfire safety culture**, informed by workforce survey (see section 3.3), as well as interview results and supporting documentation, if applicable
    a. Areas where culture is stronger or less strong (including overall baseline for wildfire safety culture); in future years, this could include progress from the last safety culture assessment
    b. How safety culture may be influencing safety performance in a wildfire setting, including public safety and safety of employees and contractors doing wildfire hazard mitigation work
    c. If applicable, potential interdependencies with Wildfire Mitigation Plans and other WSD processes
5. **Organizational foundation and plan**, informed by organizational self-assessment and plan, as well as interview results and supporting documentation, if applicable
    a. Areas where organizational foundation is stronger or less strong (including overall baseline for organizational foundation); in future years, this may include progress from the last safety culture assessment
    b. How organizational foundation may be influencing culture

[11] Related data submissions may include Quarterly Reports, as required in Class B conditions, or other data submissions required as part of the WMP process

c. Potential interdependencies with Wildfire Mitigation Plans and other WSD processes
d. Commentary on plan to improve organizational foundation, if applicable

The WSD or Commission may modify the elements covered for 2021 above based on initial data collected in 2021.

2.2 Inputs for the WSD's assessment

To centralize learnings across electrical corporations and conduct an objective, data-driven assessment, the WSD will assess safety culture in a standardized way. The WSD's safety culture assessment will rely on five key forms of data or inputs collected. Here, a brief overview of each is presented.

These five forms of data, or inputs to the WSD's assessment, are described at a high level below. The exact requirements of utilities, specifically those described in sections 3.2.1-3.2.5, will be released separately in early 2021, as described in section 4.

The WSD might not collect every form of data described below for all electrical corporations in 2021 and may phase in select elements over subsequent years or modify the data collection process for smaller or multijurisdictional electrical corporations as well as independent transmission owners. The WSD will communicate the specific requirements for 2021 for each electrical corporation when it releases the detailed requirements for 2021, as described in section 4.

2.2.1 Verification of safety governance and Board-related requirements

From 2021 onwards, the WSD will leverage the process used to conduct annual safety culture assessments described in this proposal to also verify whether electrical corporations meet minimum safety governance requirements as well as Board structure and reporting requirements pursuant to Public Utilities Code §8389(e)(5) and Public Utilities Code §8389(e)(3).

In addition, in conducting the electrical corporation's safety culture assessment, the WSD will also consider and may recommend (to the extent not already occurring) that:

- Each electrical corporation should establish a Safety Committee at the Board of Directors (by whatever name), responsible for the Wildfire Mitigation Plans, Public Safety Power Shutoffs (PSPS), among other responsibilities, and reporting to the overall Board and to the Commission about safety matters.
- Qualifications for candidates for the Board of Directors should include safety expertise and risk management experience.
- The utilities should employ a Chief Safety Officer (or equivalent).

Documentation of some of these recommendations are already embodied in quarterly Tier 1 advice letters submitted in compliance with Section 8389 (e)(7), which must include

- a statement of the recommendations of the Board of Directors Safety Committee meetings that occurred during the quarter
- a summary of the implementation of the Safety Committee recommendations from the electrical corporation's previous advice letter filing

The WSD may also require additional information for the safety culture assessment such as

- a Safety Committee mission statement or charter
- a safety policy statement for the electrical corporation that clearly defines how safety expectations are communicated to employees

2.2.2 Workforce survey

Workforce surveys are a common practice for assessing the extent to which safety culture is perceived and practiced throughout an organization and are employed for the purposes of assessing safety culture broadly at many electrical corporations, including Pacific Gas and Electric, San Diego Gas & Electric, and Southern California Edison.

The WSD proposes to conduct a targeted survey to assess the extent to which key elements of safety culture related to wildfire hazard mitigation work are perceived and practiced by the employees and contractors of each electrical corporation doing wildfire hazard mitigation work. Note that the proposed workforce survey might not be administered to all electrical corporations.

Scope of the workforce survey: The workforce survey proposed here may be administered to employees and contractors at each electrical corporation who conduct wildfire hazard mitigation work as defined by the initiatives in each electrical corporation's Wildfire Mitigation Plan. The WSD will hold planning sessions with each electrical corporation to be surveyed in early 2021 to determine a consistent methodology for identifying and targeting this population. Some of the survey questions cover topics specifically related to wildfire safety, while others cover topics related more generally to safety culture, but with a view towards determining whether these elements of safety culture more generally are perceived and practiced specifically by employees doing wildfire hazard mitigation work. See section 2.3.2.1 for a more detailed explanation of how targeted workforce survey fits into the overall scope of the WSD's safety culture assessment and how it relates to other efforts related to safety culture more broadly, including the safety culture surveys conducted by electrical corporations and any which may be conducted as part of the Commission's safety culture assessment.

Content of the workforce survey: The proposed workforce survey will cover approximately 30 questions in six categories, as outlined below. Note that, as discussed in section 4 of this document, the actual survey will be released separately in early 2021 and is still under development. The below descriptions are intended to provide a directional overview of the proposed survey with select illustrative examples.

1. Leadership influence: How leadership is perceived by workforce, and extent to which leadership encourages and practices key behaviors relevant to wildfire safety
    a. Advocating for workforce: For example, extent to which employees feel encouraged by leaders to ask questions, raise suggestions regarding wildfire safety, and pause work for safety concerns
    b. Prioritizing safety: For example, extent to which employees feel that leaders seek out signs of wildfire safety hazards, have prepared employees to intervene in the event of a hazard or emergency, and communicate safety as a value
    c. Leading by example: For example, extent to which employees feel leaders demonstrate expectations by using mistakes or incidents as learning opportunities and hear out employee concerns before making decisions
2. Workforce behavior: Extent to which workforce practices key behaviors relevant to wildfire safety
    a. Raising concerns: For example, extent to which employees look for new wildfire hazards as work progresses and report concerns or mistakes

b. Performing consistently: For example, extent to which employees feel that they can correct errors early and have the skills and tools they need to do wildfire mitigation related work well
c. Taking responsibility: For example, extent to which employees feel their workgroups follow the procedures put in place related to personal and wildfire safety, and feel personally responsible for safety outcomes

Data collection: A critical element of any workforce survey is to administer it in a fair and unbiased manner so that the data received is a true representation of each employee's perceptions of the work environment and that these perceptions are not unduly influenced by the organization. To ensure unbiased data collection, the survey will most likely be administered by a third party selected by the WSD. Regardless of administration method, administration of the survey will need to comply with specific guidelines provided by the WSD to ensure the data received is accurate. These guidelines will cover the communication, administration, and collection of the survey.

2.2.3 Self-assessment and plan

Process for completion of the self-assessment and plan: The WSD may ask some electrical corporations to complete a single self-assessment for the organization and submit that self-assessment for evaluation by the WSD. In 2021, for each element of the self-assessment, the electrical corporation will indicate its perceived state in 2021 and its target state for the following year. Each electrical corporation will also provide its proposed actions to realize any planned improvement. To support the WSD's review, each electrical corporation assessed will provide a summary of its plan to improve against each element of the self-assessment as part of the self-assessment requirement, and a detailed description of its plan within the supporting documentation requirement (see section 3.2.4).

Content of the self-assessment: The WSD proposes a self-assessment for electrical corporations to evaluate elements of organizational foundation, specifically around organizational sustaining systems, governance, and safety enabling systems, further described below. Each element is intended to be directly under the influence of leadership at each electrical corporation, therefore creating accountability for improvement. Note that, as discussed in section 4 of this document, the actual self-assessment will be released separately in early 2021, is still under development, and may not be administered to all electrical corporations. The below descriptions are intended to provide a directional overview of the proposed self-assessment with select illustrative examples. The WSD may modify the elements below as development of the self-assessment progresses.

1. **Organizational sustaining systems:** Set of organizational antecedents and consequences that support effective safety management, leadership, and performance. Illustrative examples include:
    a. Performance management: Extent to which safety performance and wildfire safety responsibilities are integrated into annual performance reviews and promotion decisions
    b. People development: Extent to which training and support resources are available to frontline leaders and workers
    c. Selection: Extent to which safety focus is incorporated into position descriptions and expectations for new hires
    d. Contractor management: Extent to which contractors are trained in identifying and addressing potential wildfire risks
    e. Rewards and recognition: Extent to which rewards and incentive systems support wildfire safety objectives
2. **Governance:** Formal accountability mechanisms and targets. Illustrative examples include:

   a. Senior leadership accountability: Extent to which accountability is clear for wildfire safety outcomes and wildfire safety objectives exist at appropriate levels of the organization
   b. Metrics and targets: Extent to which wildfire safety measures and targets used internally are effective in providing actionable insight, and communicated throughout the organization
3. **Safety enabling systems:** Specific and direct mechanisms to manage and improve safety. Illustrative examples include:
   a. Event investigation: Extent to which near misses and other weak signals are investigated, and how effectively the information from these investigations is used
   b. Hazard recognition: Quality of the process used by the workforce to report potential wildfire hazards
   c. Anticipation, resilience and learning: Systems and processes to encourage sensitivity to weak signals of wildfire risks, as well as processes and structures to create a learning organization
   d. Assurance: Types of audits conducted, and how those findings are tracked and leveraged

For each element, each assessed electrical corporation will rate itself along a four-point scale which reflects how safety is viewed. The scale is broad, meaning that there are different ways to reach each level of the scale. The exact specifications of best practice are not prescribed, only general characteristics of high performance.

Each assessed electrical corporation may also submit specific supporting documentation for select elements and questions, enabling the WSD to verify responses with minimal data requests. This documentation would be collected as part of the supporting documentation requirement outlined in section 3.2.4.

Content of the plan: Each assessed electrical corporation will be expected to develop a plan to improve its organizational foundation that is tailored to the unique context of that electrical corporation and submit that plan together with the self-assessment for evaluation by the WSD. For 2021, each assessed electrical corporation will describe specific actions that it will take to drive improvement across each element of the self-assessment, if applicable. The WSD may require each electrical corporation seeking a Safety Certification to agree to make updates or revisions to its plan, if applicable (see section 3.3). Each assessed electrical corporation will submit a summary of its plan as part of the self-assessment, and a detailed plan as part of the supporting documentation requirement outlined in section 3.2.4.

2.2.4 Supporting documentation

The supporting documentation requirement will provide narrative information to support the WSD's safety culture assessment. Illustrative types of information which may be included are:

1. Narrative information, including a description of lessons learned from prior year and overarching objectives for the coming year, to provide the WSD with a better understanding of each electrical corporation's priorities and context
2. Evidence to support select elements of the self-assessment (see section 3.2.3), so that the WSD can verify how electrical corporations have assessed themselves
3. Detailed plan against each element of the self-assessment (see section 3.2.3), so that the WSD can better assess how each electrical corporation intends to drive improvement

The WSD plans to leverage this information to add nuance to its holistic assessment and gather supporting evidence upfront where applicable, enabling a more robust review.

2.2.5 Interviews and observational visits

The WSD may supplement the information collected in electrical corporation submissions described above with interviews and/or observational visits. These would add nuance and depth to the WSD's understanding of each electrical corporation's context and goals, helping the WSD to conduct a more holistic and accurate evaluation.

The WSD aspires to conduct interviews and observational visits in a targeted way in 2021 but may adjust this plan as it reviews the initial data received in response to the requirements outlined in sections 3.2.1-3.2.4 and evaluates adjustments necessary considering the status of the COVID-19 health crisis. The WSD may adjust scale and scope in future years as the safety culture assessment process evolves.

2.3 Evaluation of good standing

Pursuant to Public Utilities Code §8389(e)(2), a Safety Certification shall be issued to an electrical corporation if

> "the electrical corporation provides documentation of … good standing, which can be satisfied by the electrical corporation having agreed to implement the findings of its most recent safety culture assessment, if applicable."

Accordingly, the WSD may require those electrical corporations seeking a Safety Certification to agree to implement findings of the WSD's safety culture assessment in order to be considered in good standing for the purposes of a Safety Certification. In 2021, the WSD plans to focus on ensuring that each electrical corporation has provided all the information required for the WSD to assess a baseline for safety culture and, if applicable, has presented how they plan to drive improvements to its safety culture. The WSD may require those electrical corporations seeking a Safety Certification to make changes or updates to that plan as one requirement for electrical corporations to be considered in good standing. The WSD will communicate the process by which each electrical corporation must do this together with the results of its first safety culture assessment in 2021. In future years, the WSD intends to assess improvement over the baseline for safety culture set in 2021 and may evaluate the adequacy of each electrical corporation's plan to improve safety culture in more detail.

3 Next steps

Consistent with the process for conducting safety culture assessments approved in WSD-011, the WSD will release submission requirements for electrical corporations for 2021 in early 2021. The WSD plans to proceed according to the following schedule, which is subject to change with written notice from the WSD.

- Late 2020: The WSD will request comments from the public on a draft version of the specific requirements for each electrical corporation
- Early 2021: The WSD will release final requirements for each electrical corporation, along with specific deadline for submission
- Late spring 2021: Deadline for electrical corporations to submit their responses to the requirements described above
- Summer of 2021: WSD will conduct its first safety culture assessment

The WSD expects its safety culture assessment process to evolve year over year, and accordingly may phase in implementation of the full process described in this resolution, conducting select elements in 2021 and building on those in subsequent years, ramping up to a robust steady-state process. The WSD will incorporate lessons learned each year to continuously improve the proposed processes and method for safety culture assessments.