State of California – A Natural Resources Agency
Gavin Newsom, Governor
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Caroline Thomas Jacobs, Director

September 19, 2022

To: Wildfire Mitigation Plans Service List

Subject: 2023-2025 Draft Wildfire Mitigation Plan Guidelines

Dear Wildfire Mitigation Plan Stakeholders:

Pursuant to Government Code section 15475.6, the Office of Energy Infrastructure Safety (Energy Safety) releases the following draft guidelines associated with the electrical corporations' 2023-2025 Wildfire Mitigation Plan (WMP) submittals for public comment. The following documents will be known as Package 1; other packages will be forthcoming as set forth at the end of this cover letter.

Package 1:

- Attachment 1 - Draft 2023-2025 WMP Technical Guidelines (WMP Technical Guidelines), including:
  - Appendix A – Definitions
  - Appendix B – Supporting Documentation
  - Appendix C – 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (Maturity Model)
- Attachment 2 - Draft 2023-2025 WMP Process and Evaluation Guidelines

The WMP Technical Guidelines set forth the technical requirements of the WMP submission. The Maturity Model is a tool Energy Safety uses to assess the current and projected maturity of electrical corporations' wildfire risk mitigation capabilities. Energy Safety evaluates maturity based on responses to the Maturity Survey that each electrical corporation is required to complete.[1] The Process and Evaluation Guidelines set forth the procedural guidelines and requirements for the WMP submission and evaluation process.

Public Comment

On September 19, 2022, the Draft 2023-2025 WMP Technical Guidelines and Draft 2023 Process and Evaluation Guidelines are hereby published for public review and comment.

[1] The Maturity Survey will be issued under separate cover.

Comments will be accepted through October 26, 2022, 5:00 p.m. Pacific Time. Reply comments will not be considered.

Comments must be submitted to the 2023-2025 Wildfire Mitigation Plans docket (#2023-2025-WMPs)[2] and titled "[Commenter Name] Comments on the Draft 2023-2025 Wildfire Mitigation Plan Guidelines - Package 1."

To receive notifications of the comments on these documents, subscribe to Energy Safety's WMPs service list by following the instructions at: https://energysafety.ca.gov/events-and-meetings/how-to-participate-in-public-events/.

Public Workshop

Energy Safety will present the Draft 2023-2025 WMP Guidelines at a public workshop in October. Public and Stakeholder comment and questions will be accepted verbally during the meeting. The workshop can be attended remotely. Energy Safety will release information on how to participate in the public workshop, along with an agenda, at a later date.

Forthcoming Documents

Energy Safety will publish the following additional documents and guidelines in the coming month in addition to the Draft 2023-2025 WMP Guidelines included herein:

- Draft 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Survey
- Draft WMP Data Guidelines
- Draft Independent Transmission Operator Supplement to the 2023-2025 WMP Technical Guidelines
- Draft WMP Submission Template
- Draft WMP Schedule

Separate written public comment periods will be established for these draft documents at the time of their publication.

[2] https://efiling.energysafety.ca.gov/EFiling/DocketInformation.aspx?docketnumber=2023-2025-WMPs (accessed September 19, 2022)

Adoption Meeting

Pursuant to Government Code section 15475.6, Energy Safety will hold a public meeting to receive public and stakeholder on all 2023-2025 Guidelines, including the WMP Data Guidelines, prior to their adoption. Energy Safety will hold this public meeting in November and will notice the meeting with at least 10-days’ notice.

Sincerely,

Melissa Semcer
Deputy Director, Electrical Infrastructure Directorate
Office of Energy Infrastructure Safety

Attachment 1 - Draft 2023-2025 WMP Technical Guidelines

Appendix A – Definitions

Appendix B – Supporting Documentation

Appendix C – 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model

OFFICE OF ENERGY INFRASTRUCTURE SAFETY

2023-2025 WILDFIRE MITIGATION PLAN TECHNICAL GUIDELINES

DRAFT

SEPTEMBER 19, 2022

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Introduction to Guidelines

This document is the Office of Energy Infrastructure Safety's Wildfire Mitigation Plan (WMP) Technical Guidelines for the 2023-2025 Base WMP.

Authority

Energy Safety has authority under Government Code section 15475.6 to "adopt guidelines setting forth the requirements, format, timing, and any other matters required to exercise its powers, perform its duties, and meet its responsibilities described in Sections 326, 326.1, and 326.2 and Chapter 6 (commencing with Section 8385) of Division 4.1 of the Public Utilities Code…."

Pursuant to Public Utilities Code section 8386(b), electrical corporations must annually prepare and submit a WMP to the Office of Energy Infrastructure Safety (Energy Safety) for review and approval. The plans must cover at least a three-year period and must satisfy requirements set forth by Energy Safety. In its discretion, Energy Safety may allow the annual submissions to be updates to the last approved comprehensive, hereinafter referred to as the "Base WMP," provided that each electrical corporation submits a Base WMP at least once every three years.

Purpose & Scope

Energy Safety's WMP Technical Guidelines (Guidelines) set forth substantive and procedural requirements for electrical corporations to prepare and submit their 2023–2025 Base WMPs (Base WMPs), including the Electrical Corporation Wildfire Mitigation Maturity Survey (Maturity Survey). The Guidelines address wildfire risk analysis; risk-informed decision making; risk evaluation; grid design, operations and maintenance; vegetation management; situational awareness; emergency preparedness; community outreach and engagement; and Public Safety Power Shutoff (PSPS).

The Guidelines apply to electrical corporations in the State of California. There are nine electrical corporations – Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), PacifiCorp (PC), Liberty Utilities (CalPeco Electric) LLC (LU), Bear Valley Electrical Service, Inc. (BVES), Trans Bay Cable (TBC), Horizon West Transmission (HWT), and LS Power Grid California, LLC (LSPGC).

Improvements in the WMP Guidelines

Building on the improvements from 2019 and learning from the 2020, 2021, and 2022 WMP submissions and subsequent evaluations, Energy Safety has further improved the Guidelines for the 2023-2025 Base WMP in the following key areas.

- Restructuring of chapters (i.e., implementation of a “problem solving” framework for flow of sections and consolidation of key technical areas into dedicated sections)
- Addition of a new section for an overview of electrical corporation service territory overview (Section 5)
- Addition of a risk-informed WMP development framework (Section 6)
- Substantial changes to the risk modeling and assessment reporting framework and requirements (Section 6)
- Addition of a section on WMP risk-informed decision making and high-level wildfire risk mitigation strategy (Section 7)
- Addition of new mitigation activities in the Situational Awareness and Forecasting section (Section 8.3)
- Reorganization of the Emergency Preparedness section (Section 8.4) to focus on government agencies coordination, with Community Outreach and Engagement (Section 8.5) to focus on collaboration with non-governmental organizations and the public
- Overhaul of the Maturity Survey (i.e., addition/modification/consolidation of categories and capabilities, new scoring philosophies)
- Integration of compliance division features into Guidelines
- Integration and coordination of Maturity Survey categories and capabilities into Guidelines

General Instructions

The following sections provide general instructions for electrical corporations to prepare their WMPs. Specific instructions are provided in the body of the Guidelines, staring at Section 1, Executive Summary.

Electrical corporations must reference the 2023-2025 WMP Process and Evaluation Guidelines for procedural requirements, such as submission information, document maintenance, and file naming conventions.

Electrical corporations must reference the Energy Safety Data Guidelines for requirements related to both spatial and non-spatial data submissions.

Narratives

Each section of an electrical corporation's WMP must include narrative responses. The narrative responses must provide qualitative descriptions and explanations of the requested information, supported with a variety of visual aids (e.g., maps, summary tables, informatics, diagrams, flow charts, photographs, sample calculations/equations) and other supporting documentation to communicate and substantiate concepts and strategies. Each narrative must be clear and concise and must include a high-level bulleted summary of key takeaways for each section (where appropriate). Electrical corporations should not duplicate narratives across different WMP sections.

Non-Existant Plans for Mitigation Initiatives

An electrical corporation does not need to have plans for every mitigation initiative. For any mitigation initiative for which an electrical corporation does not have plans, the electrical corporation must provide a brief narrative in the relevant section explaining why the electrical corporation does not have plans for that mitigation initiative.

Cross-Referencing

An electrical corporation's WMP must include cross-referencing and hyperlinks to minimize duplication of narratives and provide quick referencing of other relevant sections. All figures and tables must include captions with hyperlink references in the text. PDFs must incorporate electronic bookmarks for all sections, main headings, and subheadings.

Utility Initiative Tracking IDs

The electrical corporations must use “Utility Initiative Tracking IDs” (Tracking ID) through the WMP. In previous years, Energy Safety and the electrical corporations tracked mitigation initiatives using the section numbers of the WMP. For example, in the 2022 WMP Updates, “Covered Conduction Installation” was covered in Section 7.3.3.3 and tracked through that number, 7.3.3.3. In the 2023-2025 Base WMP, electrical corporations must implement their own tracking system using Tracking IDs to tie objectives, targets, narratives, and initiatives together throughout the WMP. These IDs are specified in the Energy Safety Data Guidelines. Consistent IDs are to be used in WMP and QDR submissions.

There are various reminders throughout these Guidelines to use the Tracking IDs.

Quantitative and Tabulated Responses

The electrical corporations must provide quantitative information to support narratives and qualitative descriptions. Electrical corporations must use the template tables for reporting requested information according to the instructions provided in the respective sections. Where applicable, quantitative and tabulated responses must match information provided in Quarterly Data Reports (QDR).

Inaccessable Data/Information

If any portion of the Guidelines requires information that the electrical corporation cannot collect and/or is not obtainable from peer electrical corporations, the electrical corporation is required to work with federal-, state-, and local- agencies, stakeholders, or partners to obtain the necessary information. When requested information is not collected by any stakeholder, then the electrical corporation must identify these circumstances and provide a description of an alternative source of information or proxy that most closely fits the original requirement. The electrical corporation’s WMP shall clearly cite the source(s) of the data used in lieu of the required data.

Energy Safety may direct the electrical corporation to provide a plan for its data/information collection and/or cooperation with partners for collecting the required information, including a timeline for implementation.

Relevant Regulations, Codes, and Standards

The electrical corporation must cite relevant regulations, codes, and standards (both external and internal standards/processes/protocols) throughout its WMP. The electrical corporation must provide the title or tracking number of the regulation/code/standard in parentheses next to the relevant text, or in the appropriate column if noted in a table. The electrical corporation must provide citations as footnotes.

In accordance with the WMP Process & Evaluation Guidelines, each electrical corporation must post all documents referenced in its WMP on a WMP-specific website in an easy-to-follow format.

Foundational Documents

The electrical corporation must cite documents that are foundational to its WMP throughout the WMP (e.g., an Emergency Preparedness Plan).

In accordance with the WMP Process & Evaluation Guidelines, each electrical corporation must post all documents referenced in its WMP on a WMP-specific website in an easy-to-follow format.

1. Executive Summary

In the opening section of the WMP, the electrical corporation must provide an executive summary that is no longer than 10 pages. The executive summary must provide brief narratives on each of the following topics.

1.1 Summary of 2020–2022 WMP Cycle

The electrical corporation must provide a brief overview of its progress in achieving the goals, objectives, and targets specified in the previous WMP submissions. The overview must discuss areas of success, areas for improvement, and any major lessons learned.

1.2 Summary of 2023–2025 Base WMP

1.2.1 Overview

The electrical corporation must summarize the primary goal, objectives, and framework for the development of the WMP for the three-year cycle. The electrical corporation may use a combination of brief narratives and bulleted lists.

1.2.2 Mitigation Initiative Plans

The electrical corporation must provide a high-level overview of its proposed objectives by mitigation initiative for 3-year and 10-year outlooks.

Table 1-1 provides an exemplar of the minimum acceptable level of information for an electrical corporation's proposed mitigation initiative objectives.

Table 1-1. Exemplar List and Description of Electrical Corporation-Specific WMP Mitigation Initiatives for 3-Year and 10-Year Outlooks

WMP Category	Within 3 Years	Within 10 Years	Location in WMP
Risk methodology and assessment	• Expand and integrate academic partnerships • Integrate and align models with climate vulnerability assessment • Migrate existing models to cloud	• Increase granularity and accuracy in risk assessments • Incorporate broader range of inputs in risk assessments • Increase automation of risk modeling • Provide more real-time updates of risk models • Enhance capabilities through expanded academic partnerships	Section 6
Wildfire mitigation strategy	• Establish new organization dedicated to overseeing portfolio of wildfire mitigations	• Enhance methodology and process for portfolio-wide assessment of wildfire mitigations • Establish process for evaluating and developing new technologies	Section 5
Grid design, operations, and maintenance	• Continue overhead fire-hardening infrastructure programs • Increase scope of strategic undergrounding • Install advanced protection capabilities • Continue to use special work procedures during high-risk conditions • Refresh, replace, and update software for all mobile devices	• Increase granularity in prioritizing initiatives across grid • Incorporate strategic grid design and localization that includes microgrid solutions and location of lines away from highest-risk areas • Increase redundancy for grid topology and increase sectionalizing capabilities • Enhance protocols for grid operations and better understanding of associated wildfire risk • Enhance training, tools, and policies to prevent and suppress ignitions related to grid activities	Section 8.1
Vegetation management and inspections	• Continue development of inventory tree database • Continue to implement vegetation management work plan with enhanced clearances in high-risk areas (going above regulatory requirements) • Continue fuels management program	• Increase granularity in vegetation database • Enhance modeling capabilities to better predict vegetation growth patterns and probability of failure • Optimize vegetation inspection cycles based on risk mitigation efficacy • Develop more robust processes, training, and technologies to monitor and validate work performed	Section 8.2
Situational awareness and forecasting	• Integrate weather data into National Meteorological Service for more automated, real-time operational decision making • Modernize and expand weather station network	• Increase scope of reliable weather data and improve processes for validating readings • Create 1-km resolution of weather data across grid • Develop new artificial intelligence models for weather forecasts	Section 8.3

WMP Category	Within 3 Years	Within 10 Years	Location in WMP
		• Increase use of external weather data	
Emergency preparedness	• Modernize and enhance workforce training in storm response, process, and documentation • Enhance community outreach by incorporating effectiveness outreach survey feedback, expanding tribal and access and functional needs (AFN) campaigns, and enhancing partnerships with Indian Councils, community-based organizations, and local school districts • Participate in and support mutual assistance programs	• Increase granularity and customization of response plans • Enhance customer communication and ability to reach vulnerable populations during emergencies • Establish more formalized review of procedures, benchmarking, and stakeholder engagement	Section 8.4
Community Outreach and Engagement	• Continue community outreach and public awareness efforts with year-round wildfire safety education and communication campaign • Assess and resolve any customer support and communications gaps identified through AFN stakeholders • Enhance communication channels and use technology to improve accessibility	• Establish more formalized process of learning from peers in and outside state • Establish more successful engagement with communities • Establish broader engagement and deeper planning with emergency and non-emergency planning agencies	Section 8.5
PSPS	• Expand generator grant program to mitigate PSPS impacts • Install PSPS sectionalizing enhancements	• Eliminate use of PSPS as a primary wildfire mitigation initiative for localized wind events • Enhance prediction, communication, and mitigation of PSPS consequences • Leverage academic partnerships to analyze risk factors and incorporate into PSPS protocols	Section 9

1.2.3 Proposed Expenditures

Each electrical corporation must summarize its projected expenditures (in thousands of U.S. dollars) per year for the next 3-year WMP cycle, as well as the planned and actual expenditures in the previous 3-year WMP cycle (e.g., 2020–2022), in both tabular and graph form.

Table 1-2 provides an exemplar of the minimum acceptable level of information summarizing an electrical corporation's WMP expenditures. The financials represented in the summary table equal the aggregate spending listed in the financial tables of the QDR (See the Energy Safety Data Guidelines). Energy Safety's WMP evaluation, including approval or denial, shall not be construed as approval of, or agreement with, costs listed in the WMP.

Table 1-2. Summary of WMP Expenditures

Year	Spend (thousands $USD)
2020	Planned (as reported in the 2020 WMP) = Actual = ±△ =
2021	Planned (as reported in the 2021 WMP Update) = Actual = ±△ =
2022	Planned (as reported in the 2022 WMP Update) = Actual = ±△ =
2023	Planned =
2024	Planned =
2025	Planned =

2. Responsible Persons

The electrical corporation must list those responsible for executing the WMP, including:

- Executive-level owner with overall responsibility
- Program owners with responsibility for each of the main components of the plan
- As applicable, general ownership for questions related to or activities described in the WMP

Titles, credentials, and components of responsible person(s) must be released publicly. Electrical corporations can reference the WMP Process Guidelines and section 29200 of Title 14 of the California Code of Regulations for the submission process of any confidential information.

3. Statutory Requirement Checklist

This section provides a "checklist" of the statutory requirements for a WMP as detailed in Public Utilities Code section 8386(c). By completing the checklist, the electrical corporation affirms that its WMP addresses each requirement.

For each statutory requirement, the checklist must include a reference and hyperlink to the relevant section and page number in the WMP. Where multiple WMP sections provide the information for a specific requirement, the electrical corporation must provide references and hyperlinks to all relevant sections. Unique references must be separated by semicolons, and each must include a brief summary of the contents of the referenced section (e.g., Section 5, pp. 30–32 [workforce]; Section 7, p. 43 [mutual assistance]).

Table 3-1 provides a partial exemplar of the minimum acceptable level of information and citation for the statutory requirements checklist.

Table 3-1. Statutory Requirements Checklist - Partial Exemplar

PUC section 8386	Description	WMP Section/Page
(c)(2)	The objectives of the WMP	Section 4.1, p. 13
(c)(10)	Protocols for the PSPS of the electrical corporation's transmission infrastructure, etc.	Section 5 overview, pp. 30–31
(c)(19)	A description of how the WMP is consistent with the electrical corporation's disaster and emergency preparedness plan prepared pursuant to Public Utilities Code section 768.6, including plans to restore service and community outreach	Sections 7.3.9.2 to 7.3.9.3, pp. 790–801 (community outreach and customer support before, during, and after wildfires and customer support during emergencies)

PUC section 8386	Description	WMP Section/Page
		Section 7.3.9.4, pp. 802–804 (emergency plan) Section 7.3.9.5, pp. 805–808 (preparedness and planning for service restoration after emergency) Section 7.3.10.1, pp. 812–842 (community engagement to prepare for wildfire, PSPS, and protective devices and sensitivity settings)

4. Overview of WMP

4.1 Primary Goal

Each electrical corporation must state the primary goal of its WMP, using, as a minimum, the following language:

In accordance with California Public Utilities Code section 8386(a), an electrical corporation must satisfy the following primary goal:

> *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.*

4.2 Risk Reduction Objectives

Each electrical corporation must report on its specific risk reduction objectives to meet the intent of the primary goal and for the next three-year cycle. The electrical corporation must provide a brief narrative describing the basis for selection of performance indicators, followed by a table identifying the performance indicators and associated risk reduction objectives or targets that are specific, measurable, achievable, and reasonably within the control of the electrical corporation.[1] Table 4-1 provides an exemplar of the minimum acceptable performance indicators and level of information for an electrical corporation's key outcome-based objectives for the next three-year WMP cycle.

Table 4-1. Exemplar of Key Outcome-Based Objectives for 2023–2025 WMP Cycle

Performance Indicators	**Risk Reduction Objectives**
No. of utility-related ignitions	Reduce by x%

[1] Annual information included in this section should align with Tables 2 and 10 from the Quarterly Data Reports (QDRs).

Performance Indicators	**Risk Reduction Objectives**
No. of utility-related ignitions resulting in fires over 5,000 acres	Reduce by x%
Total no. of utility-related ignitions in HFTD	Reduce by x%
Total no. of ignitions by key drivers in HFTD	Reduce contact-with-foreign-object (CFO) ignitions by x% Reduce wire-to-wire contact ignitions by x% Reduce tree-caused circuit interruption (TCCI) ignitions by x% Reduce equipment and facility failure (EFF) ignitions by x%
Total no. of faults in HFTD	Reduce by x%
Total no. of faults by key drivers in HFTD	Reduce CFO faults by x% Reduce wire-to-wire contact faults by x% Reduce TCCI faults by x% Reduce EEF faults by x%
Total no. of wire-down incidents in HFTD	Reduce by x%
No. of outages caused by protective equipment and device settings	Reduce by x%
No. of PSPS events	Reduce by x%

Performance Indicators	Risk Reduction Objectives
Average hours of an outage caused by protective equipment and device settings	Reduce to less than x hours
Average outage hours during a PSPS event	Reduce to less than x hours
Average no. of customers affected per outage caused by protective equipment and device settings	Reduce to less than x customers
Average no. of customers affected per PSPS	Reduce to less than x customers

4.3 Risk-Informed Framework

The electrical corporation must adopt a risk-informed approach to developing its WMP. The purposes of adopting this approach are as follows:

- To develop a WMP that achieves an optimal level of life safety, property protection, and environmental protection, while also being in balance with other performance objectives (e.g., reliability and affordability)
- To integrate risk modeling outcomes with a range of other performance objectives, methods, and subject matter expertise to inform decision-making processes and the spatiotemporal prioritization of mitigations
- To target mitigation efforts that prioritize the highest-risk equipment, wildfire environmental settings, and assets-at-risk (e.g., people, communities, critical infrastructure), while still satisfying other performance objectives defined by the California Public Utilities Commission (CPUC)(e.g., reliability and affordability)
- To provide a decision-making process that is clear and transparent to internal and external stakeholders, including clear evaluation criteria and visual aids (such as flow charts or decision trees)

The risk-informed approach adopted by the electrical corporation must, at a minimum, incorporate several key components, described below. In addition, the evaluation and management of risk must include consideration of a broad range of performance objectives (e.g., life safety, property protection, reduction of social vulnerability, reliability, resiliency, affordability, health, environmental protection, public perception, etc.), integrate cross-disciplinary expertise, and engage various stakeholder groups as part of the decision-making process.

The risk-informed approach must have seven minimum components, as shown in Figure 4-1 and described in Table 4-2.

Figure 4-1. Risk-Informed Approach to Developing a WMP

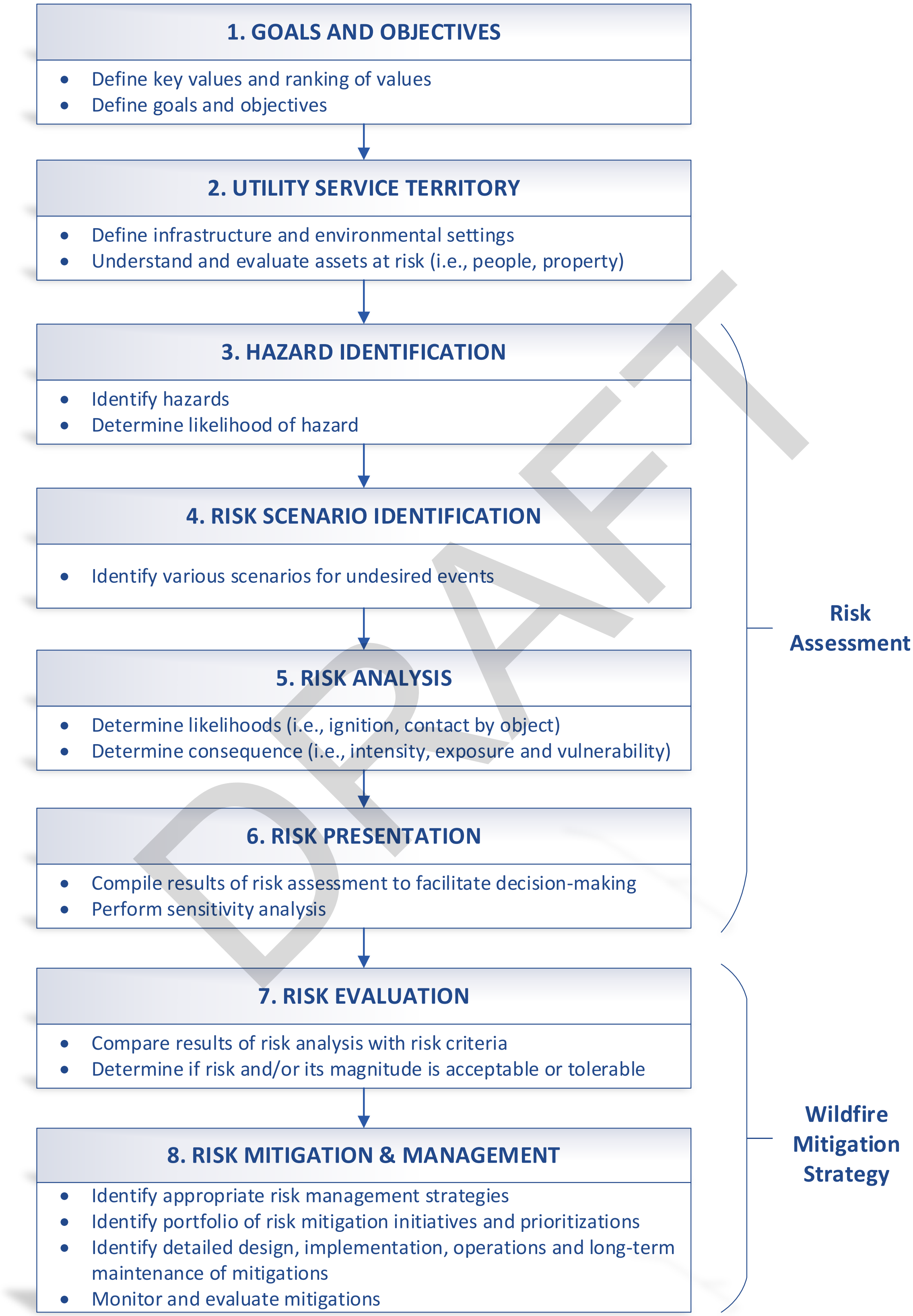


Table 4-2. Exemplar Risk-Informed Approach Components

Risk-Informed Approach Component	Brief Description
1. Goals and objectives	The first step in the risk-informed approach is to identify the primary goal and objectives of the electrical corporation's WMP. As indicated in Section 4.1, Energy Safety predefines the primary goal and sub-goals of all WMPs. The overall risk reduction objectives of an electrical corporation's WMP are electrical corporation-specific and must be defined in Section 4.2.
2. Scope of application (i.e., electrical corporation service territory)	The second step is to define the physical characteristics of the system in terms of its major elements: utility service area characteristics, electrical infrastructure, wildfire environmental settings, and various assets-at-risk (e.g., communities and people, property, critical infrastructure, cultural/historical resources, environmental services). Knowledge and understanding of how individual system elements interface are essential to this step. Sections 5–5.4 provide instructions on what electrical corporations must present regarding physical traits, environmental characteristics, and potential assets at risk in their service territory.
3. Hazard identification	The third step is to identify hazards and determine their likelihoods. Section 6.2.1 provides instructions on hazard identification.
4. Risk scenario identification	The fourth step, based on the context and desired values, is to develop risk scenarios that could lead to an undesirable event. Risk scenario techniques that may be employed include event tree analysis, fault tree analysis, preliminary hazard analysis,

Risk-Informed Approach Component	Brief Description
	and failure modes and effects analysis. Section 6.3 provides instructions on risk scenario identification.
5. Risk analysis (i.e., likelihood and consequences)	The fifth step is to evaluate the likelihood and consequences of the identified risk scenarios to understand the potential impact on the desired goals and objectives. The consequences are based on an array of risk components that are fundamental to overall utility risk, wildfire risk, and PSPS risk given the electrical corporation's scope of application and portfolio of wildfire mitigation initiatives. Section 6.2.2 provides instructions on risk analysis.
6. Risk presentation	The sixth step is to consider how the risk analysis is presented to the various stakeholders involved. Section 0 provides instructions on risk presentation.
7. Risk evaluation	After the risk analysis is complete, hazards can be resolved by either assuming the risk associated with the hazards or eliminating or controlling the hazards. Risk evaluation includes identification of criteria, processes, and procedures for identifying critical risk both spatially and temporally. Risk evaluation must also include, as a minimum, evaluating the seriousness, manageability, urgency, and growth potential of the wildfire hazard/risk. Risk evaluation should be used to determine whether the individual hazard/risk should be prevented or mitigated. Risk evaluation and risk-informed decision-making should be done using a consensus approach involving a range of key stakeholder groups. Section 7 provides instructions for risk evaluation or risk-informed decision making.

Risk-Informed Approach Component	Brief Description
8. Risk mitigation and management	In the final step, the electrical corporation must identify which risk management strategies are appropriate given practical constraints such as limited resources, costs, and time. The electrical corporation must indicate the high-level risk management approach, such as preventing the risk or mitigating the risk (i.e., reducing its likelihood and/or consequences) as determined in Step 7. The electrical corporation must identify risk mitigation initiatives (or a portfolio of initiatives) and prioritize their spatial and temporal implementation. This step includes consideration of what risk mitigation strategies are appropriate and most effectively meet the intent of the WMP goals and objectives, while still in balance with other performance objectives. It also includes the processes, procedures, and monitoring strategies to develop, review, and execute schedules for implementation of mitigation initiatives and activities (as well as interim strategies). Section 8provides instructions for reporting on initiatives to mitigate identified risks.

5. Overview of the Service Territory

In this section of the WMP, the electrical corporation must provide a high-level overview of its service territory and key characteristics of its electrical infrastructure. This information is intended to provide the reader with an understanding of the physical and technical scope of the electrical corporation's WMP. Sections 5.1 - 5.4 below provide detailed instructions.

5.1 Service Territory

The electrical corporation must provide a high-level description of its service territory, addressing the following components:[2]

- Area served (in square miles)
- Number of customers served
- Counties and cities served
- Overhead and underground circuit miles

The electrical corporation must provide a geospatial map that shows its service area (polygons), distribution of customers served (raster or polygons), and county and city administrative boundaries (polygons or polylines). This map should appear in the main body of the report. Additional maps needed to provide clarity and detail should appear in Appendix B.

Table 5-1 is an exemplar of the content and level of detail for communicating a electrical corporation's high-level service territory statistics.

[2] Annual information included in this section should align with Table 7 from the QDRs.

Table 5-1. Exemplar Service Territory High-Level Statistics

Characteristic	Description
Area served (sq. mi.)	XX,XXX
Number of customers served	X,XXX,XXX
Number of counties and cities served	X counties, XX cities
Overhead circuit miles	X,XXX
Underground circuit miles	X,XXX

5.2 Electrical Infrastructure

The electrical corporation must provide a high-level description of its infrastructure, including all power generation facilities, transmission lines and associated equipment, distribution lines and associated equipment, substations, and any other major equipment.[3]

Table 5-2 is an exemplar of the content and level of detail to be provided in the main body of the WMP.

Table 5-2. Exemplar of Overview of Key Electrical Equipment

Type of Equipment	HFTD	Non-HFTD	Total
Substations (#)	xx	xx	50
Power generation facilities (#)	xx	xx	14
Overhead transmission lines (circuit miles)	xxx	xxx	100,000

[3] Annual information included in this section should align with Table 7 from the QDRs.

Type of Equipment	HFTD	Non-HFTD	Total
Overhead distribution lines (circuit miles)	xxx	xxx	300,000
Hardened overhead distribution and transmission lines (circuit miles)	xxx	xxx	50,000
Underground transmission and distribution lines (circuit miles)	xxx	xxx	50,000
Distribution transformers (#)	xxx	xxx	35,000
Reclosers (#)	xxx	xxx	30,000
Poles (#)	xxx	xxx	3,000
Towers (#)	xxx	xxx	2,000
Microgrids (#)	xxx	xxx	10

5.3 Environmental Settings

The electrical corporation must provide a high-level overview of the wildfire environmental settings within its service territory.

5.3.1 Fire Ecology

The electrical corporation must provide a brief narrative describing the fire ecology or ecologies across its service territory. This includes a brief description of how ecological features, such as the following, influence the propensity of the electrical corporation's service territory to experience wildfires: generalized climate and weather conditions, ecological regions and associated vegetation types, and fire return intervals.

The electrical corporation must provide a map or set of maps and tabulated statistics of the vegetative coverage across its service territory. One overview map should appear in the main body of the WMP, with supplemental and more detailed maps provided in Appendix B, as needed. The vegetative coverage layer (raster or polygon) must span the electrical corporation's service territory.

The tabulated data must include a breakdown of the major vegetation types, total acres per type, and percentage of service territory per type. The electrical corporation must identify the vegetative database used to characterize the vegetation (e.g., CALVEG) and/or the alternative resource adopted Figure 5-1 and Table 5-3 provide exemplars of the minimum level of content and detail required.

Figure 5-1. Exemplar of Vegetation Across the electrical corporation's Service Territory (Source: CALVEG)

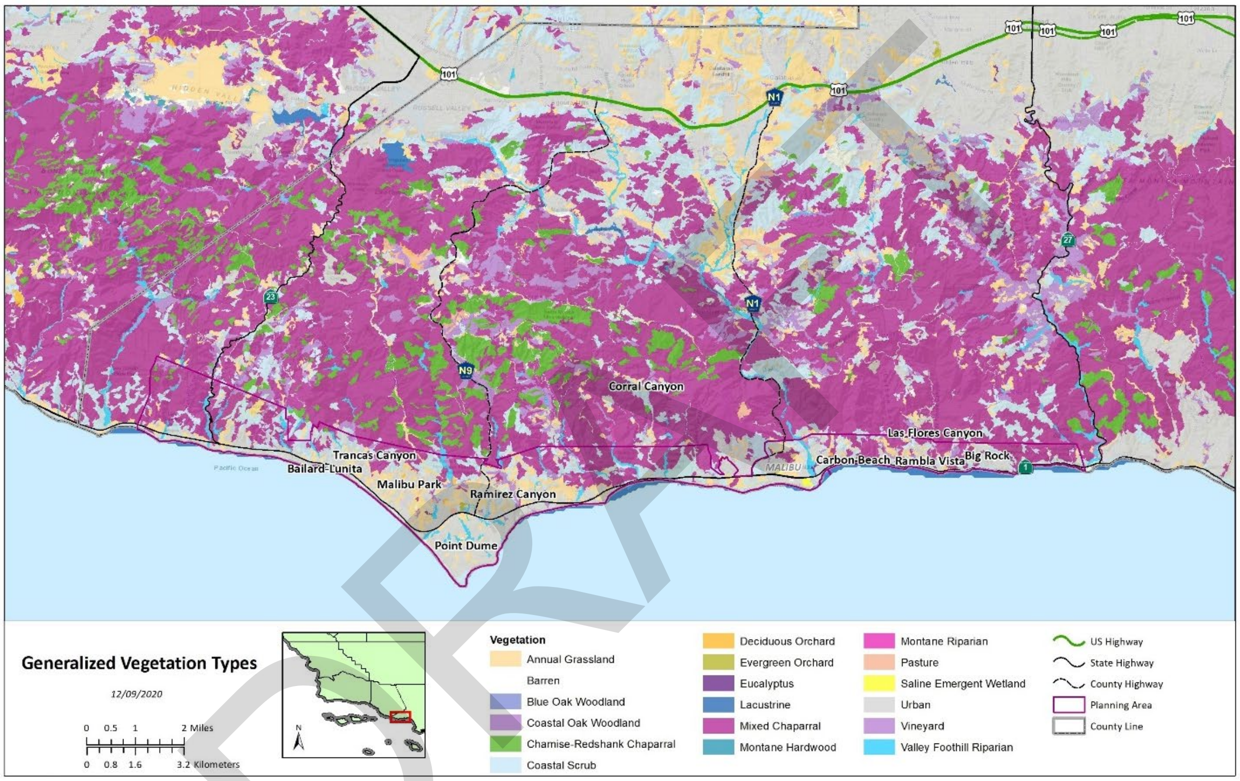


Table 5-3. Exemplar Existing Vegetation Types in the Service Territory

Vegetation Type	**Acres**	**Percentage of Service Territory**
Annual grassland	51,486.1	6.04%
Barren	12,486.0	1.46%
Blue oak woodland	12.6	0.00%

Vegetation Type	Acres	Percentage of Service Territory
Coastal oak woodland	21,837.4	2.56%
Coastal scrub	74,558.4	8.75%
Cropland	10,410.8	1.22%
Deciduous orchard	352.2	0.04%
Eucalyptus	92.1	0.01%
Evergreen orchard	461.1	0.05%
Lacustrine	6,199.1	0.73%
Mixed chaparral	138,596.5	16.26%
Montane hardwood	74.1	0.01%
Montane riparian	10.9	0.00%
Pasture	406.1	0.05%
Perennial grassland	61.6	0.01%
Saline emergent wetland	36.1	0.00%
Urban	530,986.1	62.29%
Valley foothill riparian	3,125.9	0.37%
Valley oak woodland	1,206.5	0.14%
Vineyard	92.0	0.01%

Vegetation Type	Acres	Percentage of Service Territory
Total =	852,492	100%

5.3.2 Fire History

The electrical corporation must provide a brief narrative summarizing the utility-related wildfire history across its service territory as recorded by the electrical corporation, CAL FIRE, or another authoritative sources. For this section, utility-related wildfire history must be limited to fires that either caused at least one death, damaged over 500 structures, or burned over 5,000 acres. In addition, the electrical corporation must provide historical utility-related wildfire statistics across its service territory in tabular form, including the following key metrics:

- Ignition date
- Fire name
- Size (acres)
- Number of fatalities
- Number of structures damaged
- Estimated financial loss (U.S. dollars)

Table 5-4 provides an exemplar of the content and level of detail required for the tabulated historical catastrophic utility-related wildfire statistics.[4] The electrical corporation must provide an authoritative government source (e.g., CAL FIRE, USFS, or local fire authority) for reporting of wildfire history data and loss/damage estimates, as available.

Table 5-4. Exemplar of Utility-Related Wildfires Within a Electrical Corporation's Service Territory

Ignition Date	Fire Name	Fire Size (acres)	# of Fatalities	# of Structures Destroyed and Damaged	Financial Loss (US$)

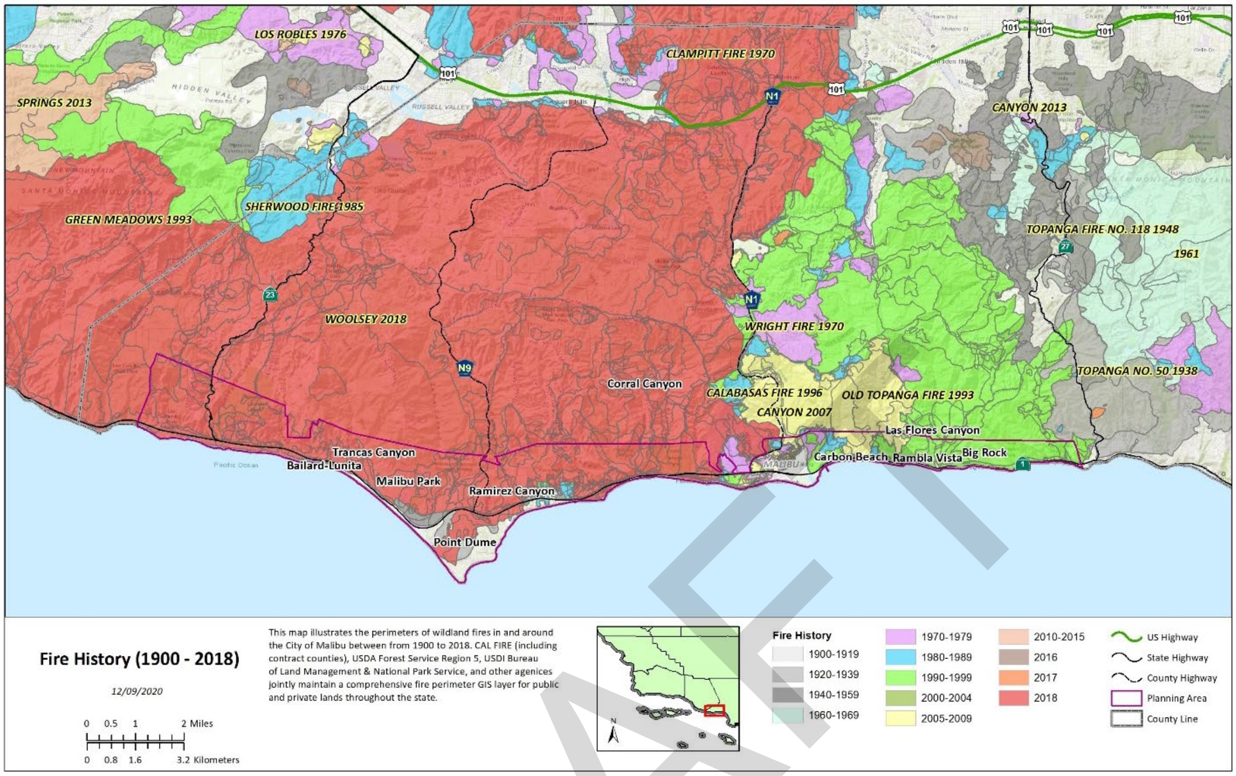
[4] Annual information included in this section should align with Table 2 from the QDRs.

The electrical corporation must also provide a map or set of maps illustrating the utility-related wildfires across its territory. One overview map must appear in the main body of the WMP, with supplemental or detailed maps provided in Appendix B, as needed. The maps must include the following:

- Contours showing the most recent fire to burn an area
- Legend and text labeling each fire contour
- County lines

Figure 5-2 provides an exemplar of the content and level of detail required for the map(s).

Figure 5-2. Exemplar of a Wildfire History Map, 1990–2018



5.3.3 CPUC High Fire Threat District and Electrical Corporation High Fire Risk Area

The electrical corporation must provide a brief narrative identifying the CPUC-defined HFTD across its territory and, if applicable, a brief narrative identifying the electrical corporation-defined High Fire Risk Area (HFRA) (i.e., areas that the electrical corporation has deemed high risk but are not designated HFTD). The electrical corporation must also provide a map of its service territory overlaid with the HFTD and HFRA. The map must be accompanied by tabulated statistics on the CPUC-defined HFTD and electrical corporation-defined HFRA across the electrical corporation's territory, including the following minimum information:

- Total area for each HFTD (sq. mi.)
- Percentage of total area for each HFTD (%)
- Total area of HFRA (not including HFTD) (sq. mi.)
- Percentage of total area of HFRA (%)

For the HFTD/HFRA map, the HFTD and HFRA layer(s) (raster or polygon) must cover the electrical corporation's service territory and the HFTD layer must match the latest boundaries as published by the CPUC. Table 5-5 provides an exemplar of the content and level of detail required.

Table 5-5. Exemplar of a Electrical Corporation's HFTD/HFRA Statistics

High Fire Threat District	Total Area of Individual District (sq. mi.)	% of Total Service Area
Non-HFTD	XX	85%
Tier 2	XX	5%
Tier 3	XX	8%
HFRA	XX	2%
Total =	XX	100%

5.3.4 Climate Change

It is critical for the electrical corporation to understand general climate conditions and how climate change impacts the frequency and the intensity of extreme weather events and the vegetation that fuels fires.

5.3.4.1 General Climate Conditions

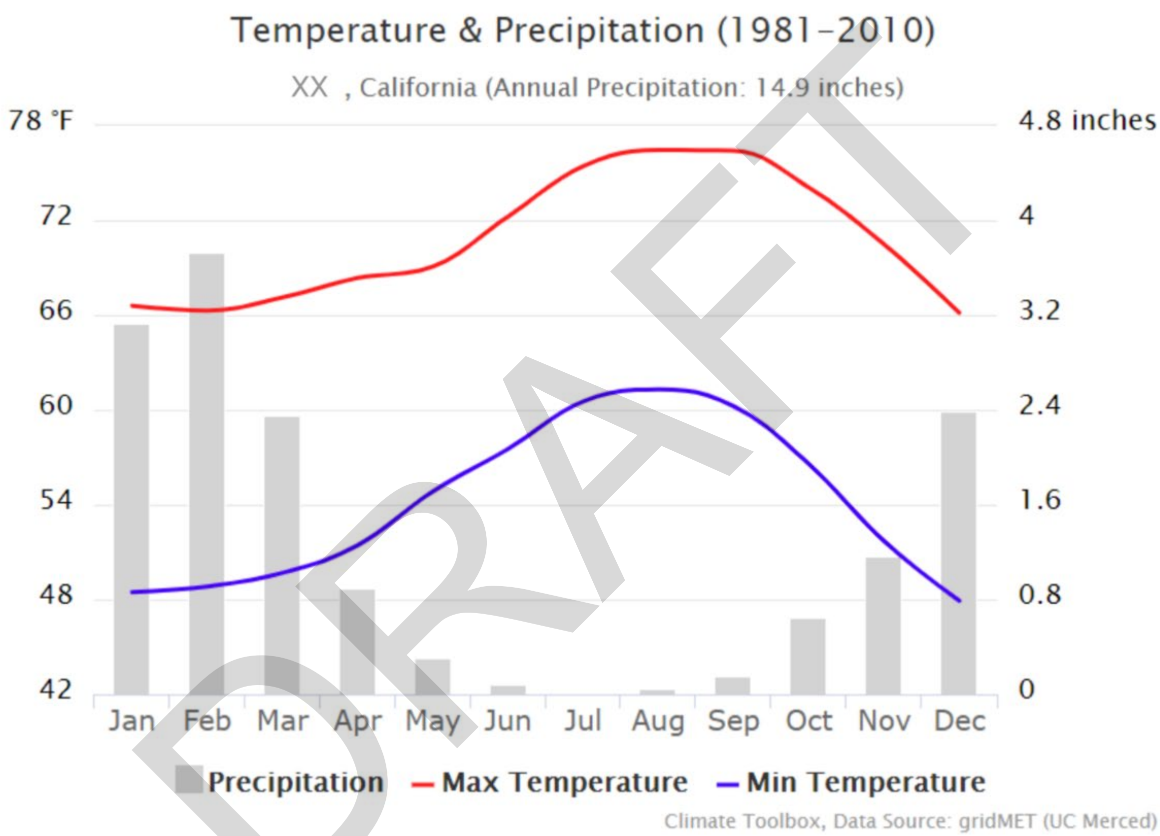
The electrical corporation must provide an overview of the general weather conditions and climate across its service territory in the past 30- to 40-year period.[5] The narrative must include, at a minimum, the following:

- Average temperatures throughout the year
- Extreme temperatures that may occur and when and where they may occur
- Precipitation throughout the year

[5] Annual information included in this section should align with Table 4 from the QDRs.

The electrical corporation must also provide a graph of the average precipitation and maximum and minimum temperatures for each distinct climatic region of its service territory. At a minimum, it must provide one graph in the main body of the report, with all supplemental graphs provided in Appendix B. Figure 5-3 provides an exemplar of the climate/weather graph.

Figure 5-3. Exemplar Annual Mean Climatology for the electrical corporation's Service Territory



5.3.4.2 Climate Change Phenomena and Trends

The electrical corporation must provide a brief discussion of the local impacts of anticipated climate change phenomena and trends across its service territory. In addition, the electrical corporation must provide graphs/charts illustrating:

- Mean annual temperature (Figure 5-4
- Mean annual precipitation (Figure 5-5)
- Projected changes in minimum and maximum daily temperatures (Figure 5-6)

The electrical corporation must also indicate the increase in extreme fire danger days (historic 95th-percentile conditions) due to climate change, considering (at a minimum) the combination of warmer temperatures, drier vegetation, and changes in high-wind events (e.g., Santa Ana winds, Diablo winds, Sundowners) for both winter/spring and summer/fall periods throughout the electrical corporation service territory. Figure 5-7 provides an exemplar of the required information on projections of extreme fire dangers.

The electrical corporation must cite all source(s) used to write and illustrate this section.

Figure 5-4. Exemplar Mean Annual Temperature for Service Territory, 1900s–2020s

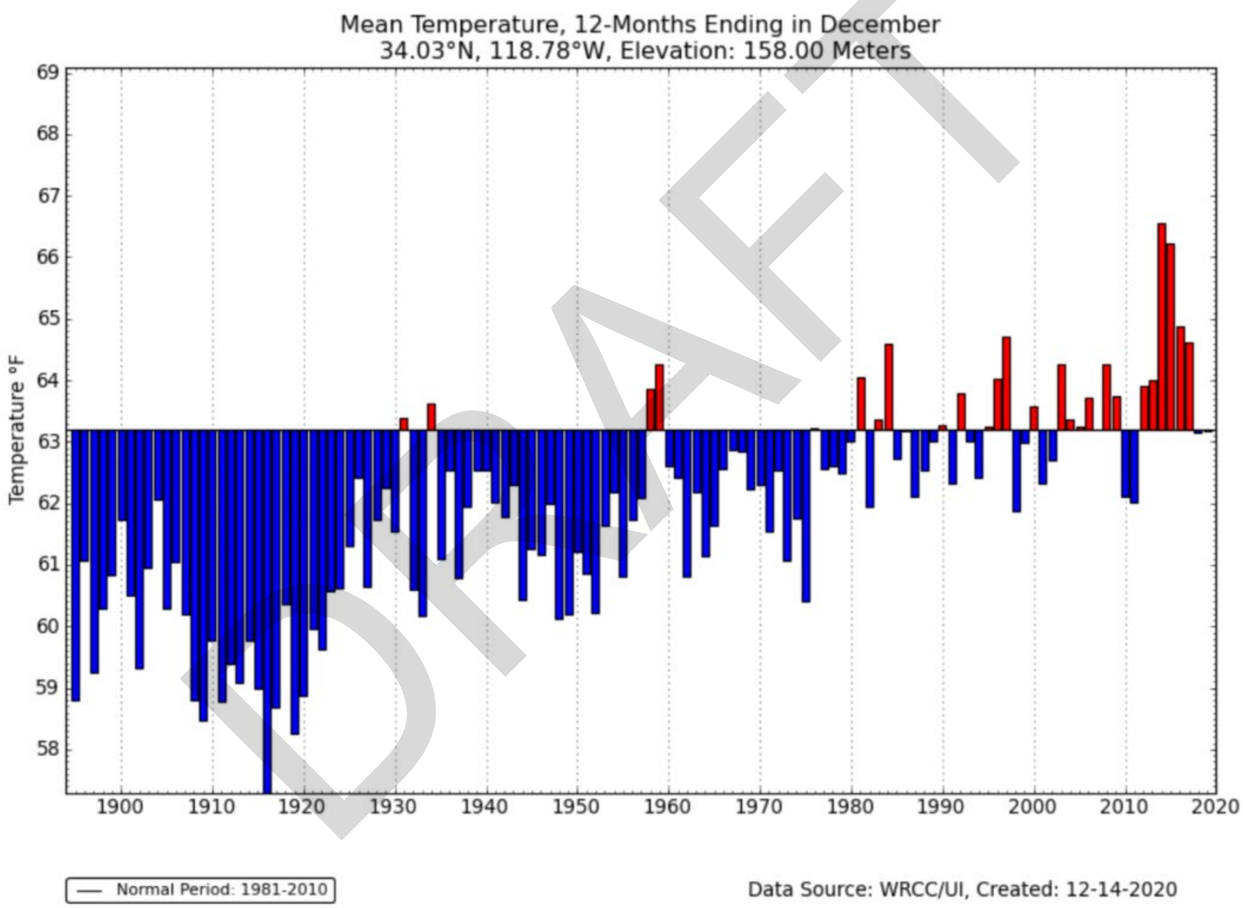


Figure 5-5. Exemplar Mean Annual Precipitation for Service Territory, 1900s–2020s

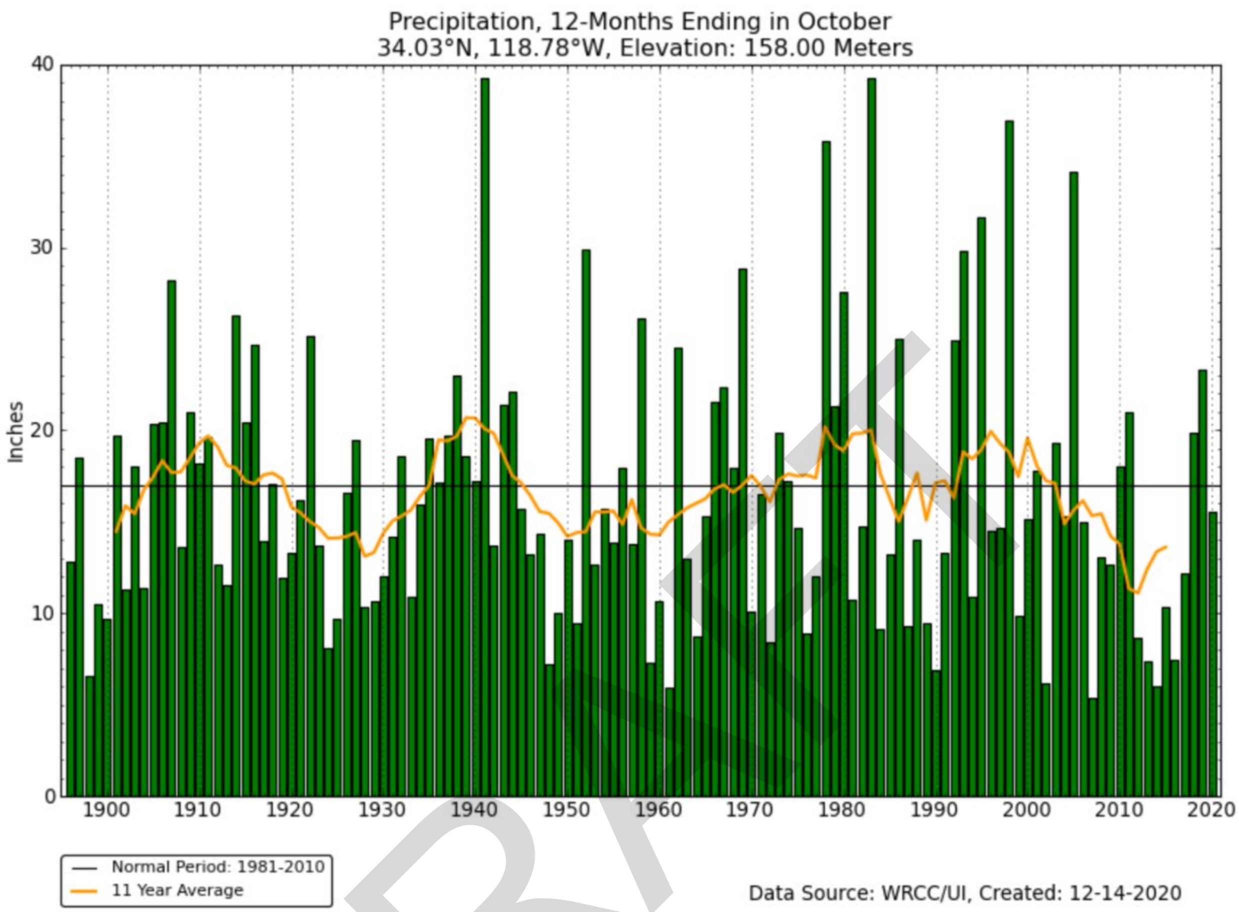


Figure 5-6. Exemplar Projected Change in Maximum Temperature (daytime highs) and Minimum Temperature (nighttime lows) Through 2100 for the Service Territory

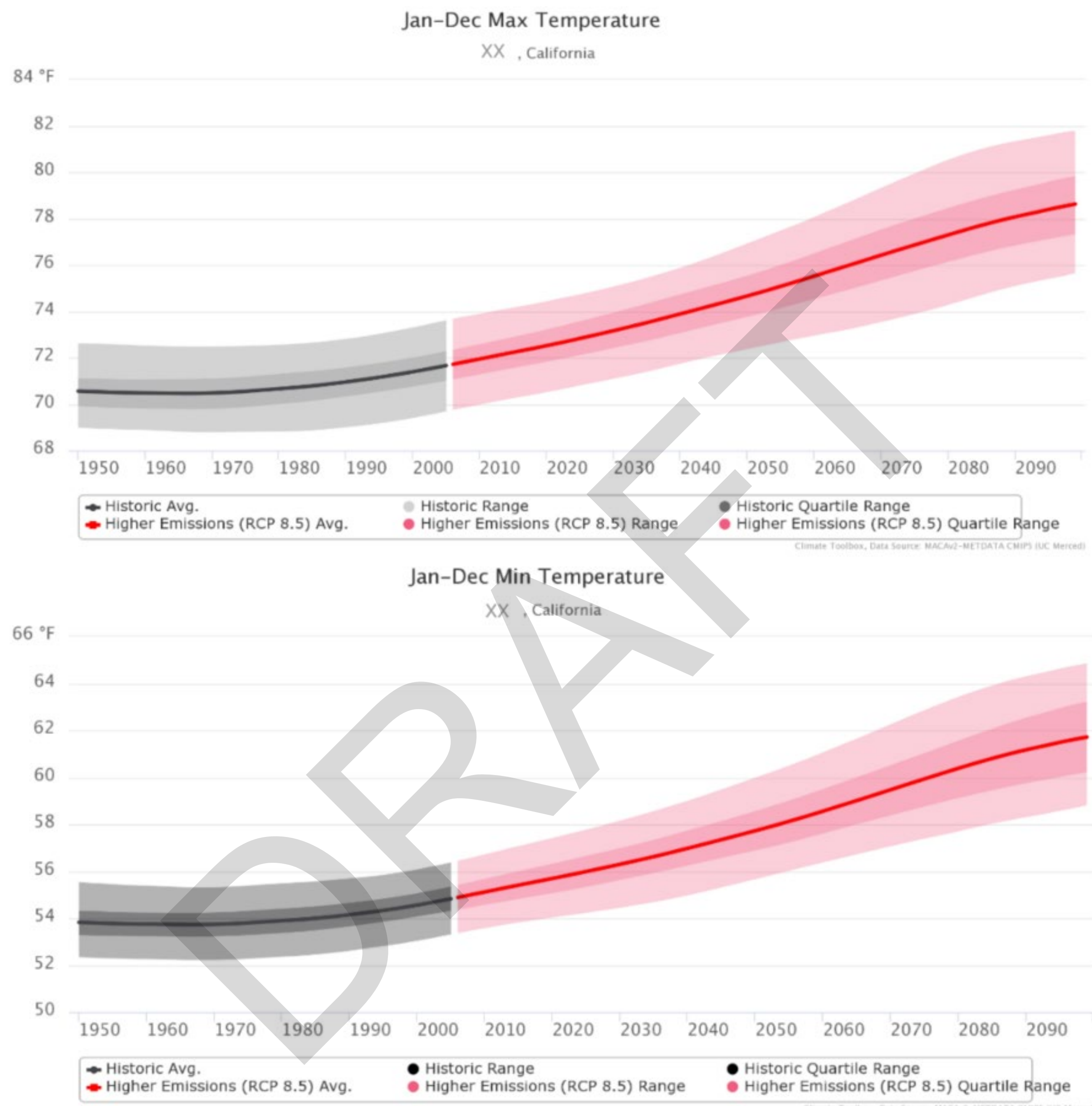
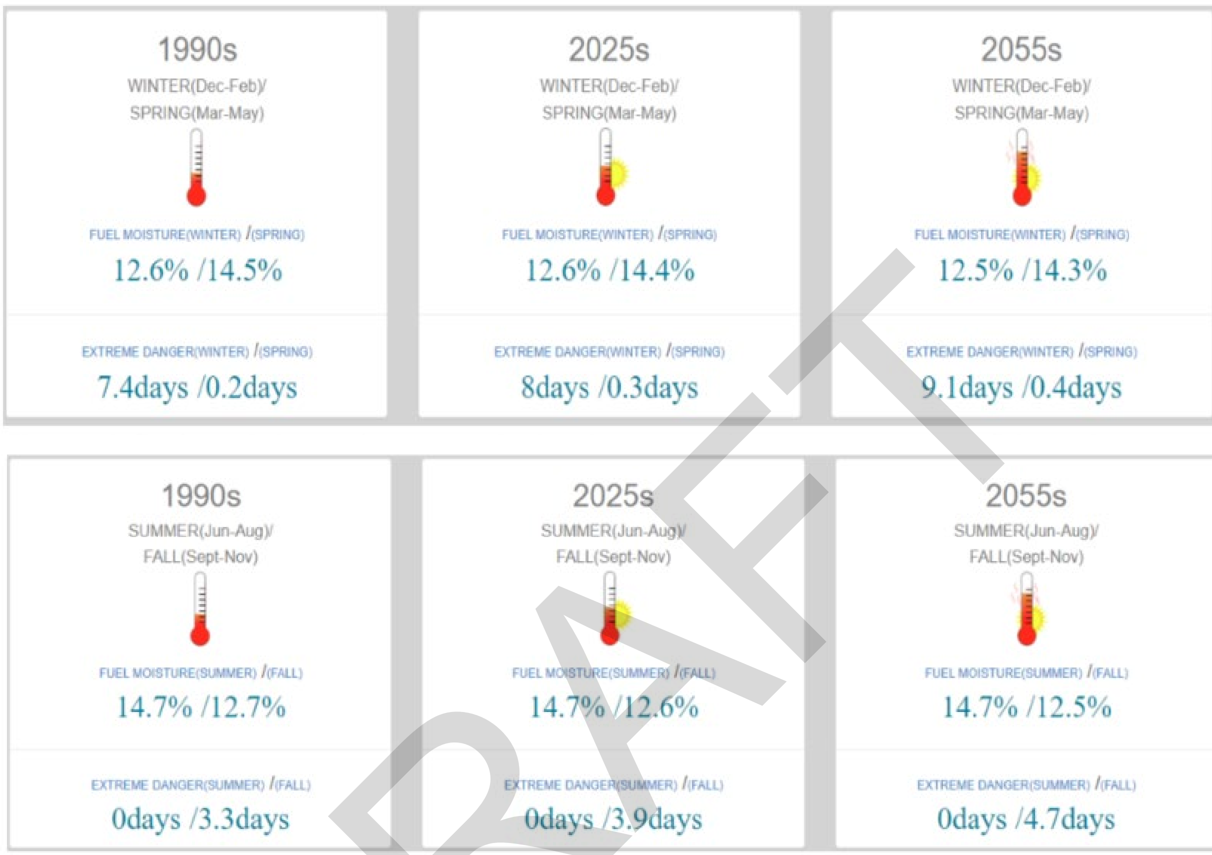


Figure 5-7. Exemplar Projected Changes in Average Fuel Moisture and Average Number of Days of Extreme Fire Danger for Winter/Spring and Summer/Fall Periods for the Service Territory Based on Global Climate Model Outputs



5.3.5 Topography

The electrical corporation must provide an overview and brief description of the various topographic conditions across its service territory. In addition, the electrical corporation must provide a map or set of maps illustrating the topography of its service territory and relevant source(s) for topographic information. One overview map should appear in the main body of the WMP.

5.4 Community Values at Risk

Community values at risk from wildfires are often defined in terms of life safety, buildings, and critical infrastructure. However, values can also include human health, natural resources, sensitive species, cultural and historical resources, and other intangibles (e.g., social capital, community culture, livelihood).

In this section of the WMP, the electrical corporation must identify the community values at risk across its service territory. At a minimum, the electrical corporation must provide a high-level overview of the distribution of customer types (urban, rural, and highly rural), customers in a wildland-urban interface (WUI), communities at risk per CAL FIRE, access and functional needs (AFN) customers, socially vulnerable communities, communities vulnerable because of single access/egress routes, and high-value assets at risk within the service territory. This information is intended to provide the reader with an understanding of the societal values at risk from a potential wildfire or PSPS event within the electrical corporation's territory. Sections 5.4.1–5.4.4 provide detailed instructions.[6]

5.4.1 Urban, Rural, and Highly Rural Customers

The electrical corporation must provide a brief narrative describing the distribution of urban, rural, and highly rural areas and customers across its service territory. Refer to Appendix A for definitions.

In addition, the electrical corporation must provide a geospatial map showing its service territory (polygon) overlaid with the urban, rural, and highly rural customer distributions (raster or polygon). This map should appear in the main body of the report, with additional maps, if needed to provide clarity and detail, in Appendix B.

The electrical corporation must also provide, in tabulated format, the number of customers and circuit miles in its territory that are in highly rural, rural, and urban regions. Detailed calculations must be provided in Appendix B.

5.4.2 Wildland-Urban Interface (WUI)

The electrical corporation must provide a brief narrative describing the WUIs across its service territory. Refer to Appendix A for definitions.

In addition, the electrical corporation must provide a geospatial map showing its service territory (polygon) overlaid with the distribution of WUIs (raster or polygon) and overhead transmission and distribution circuit miles. This map should be provided in the main body of the report, with additional maps, as needed to provide clarity and detail, in Appendix B.

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[6] Annual information included in these sections should align with Table 7 from the QDRs.

The electrical corporation must also provide, in tabulated format, the total area of the WUIs in its service territory and the numbers of customers and circuit miles in the WUIs. For calculation purposes, a WUI is defined as an area that has more than one housing unit per 40 acres and meets one of the following criteria:

- Wildland vegetation covers more than 50 percent of the land area (intermix WUI), *or*
- Wildland vegetation covers less than 50 percent of the land area, but the land area is adjacent to (defined as within 1.5 miles of) another large area (defined as larger than 1,235 acres) that has significant wildland vegetation (defined as more than 75 percent wildland vegetation) (interface WUI).[7]

5.4.3 Communities at Risk

In this section of the WMP, a utility must provide a high-level overview of individuals at risk, communities at risk, AFN customers, social vulnerability, and communities vulnerable because of single access/egress conditions within its service territory. Detailed instructions are provided below.

5.4.3.1 Individuals at Risk of Wildfire

The electrical corporation must provide a brief narrative (one to two paragraphs) describing the total number of people and distribution of people at risk across its service territory.

In addition, the electrical corporation must provide a single geospatial map showing its service territory (polygon) overlaid with population density (polygons). Additional maps needed to provide clarity and detail should be included in Appendix B.

5.4.3.2 Communities at Risk per CAL FIRE

The electrical corporation must provide a brief narrative (one to two paragraphs) describing the communities at risk per CAL FIRE data[8] across its service territory.

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[7] V. C. Radeloff, R. B. Hammer, S. I. Stewart, J. S. Fried, S. S. Holcomb, and J. F. McKeefry, 2005, "The wildland-urban interface in the United States," *Ecological Applications*.

[8] https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/fire-plan/communities-at-risk/

In addition, the electrical corporation must provide a single geospatial map showing its service territory (polygon) overlaid with the communities at risk (point data). Additional maps, if needed to provide clarity and detail, should be included in Appendix B.

5.4.3.3 Access and Functional Needs (AFN) Customers

The electrical corporation must provide a brief narrative describing the AFN customers, as defined by Government Code 8593.3(f)(1), across its service territory, including total number of AFN customers.

In addition, the electrical corporation must provide a single geospatial map showing its service territory (polygon) overlaid with the distribution of AFN customers and urban and major roadways. Any additional maps needed to provide clarity and detail should be included in Appendix B.

5.4.3.4 Social Vulnerability and Exposure to Electrical Corporation Wildfire Risk

The electrical corporation must provide a brief narrative describing the intersection of social vulnerability and community exposure to electrical corporation wildfire risk across its service territory. This intersection is defined as census tracts that 1) exceed the 70th percentile in Social Vulnerability Index (SVI) or have a median household income of less than 80 percent of the state median, and 2) exceed the 85th percentile in wildfire consequence risk according to the electrical corporation's risk assessment(s).[9]

For SVI, the electrical corporation must use the most up-to-date version of Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry's Social Vulnerability Index dataset (Year = 2018;[10] Geography = California; Geography Type = Census Tracts).[11]

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[9] These criteria are derived from Cal OES Recovery Division, Hazard Mitigation Assistance Branch's Multiple Hazards and Social Vulnerability Analysis, dated January 18, 2022: https://www.caloes.ca.gov/wp-content/uploads/Recovery/Documents/Socially-Vulnerable-and-High-Hazard-Risk-Community-Criteria.-Methodology.pdf & https://calema.maps.arcgis.com/apps/dashboards/3c78aea361be4ea8a21b22b30e613d6e

[10] As of the publishing of these Guidelines, 2018 was the most recent version of the dataset. Electrical corporations must use the most up-to-date version of the dataset.

[11] https://www.atsdr.cdc.gov/placeandhealth/svi/data_documentation_download.html

In addition, the electrical corporation must provide a single geospatial map showing its service territory (polygon) overlaid with the distribution of the SVI and exposure intersection and urban and major roadways. Any additional maps needed to provide clarity and detail should be included in Appendix B.

5.4.3.5 Sub-Divisions with Limited Egress or No Secondary Egress

The electrical corporation must provide a brief narrative (one to two paragraphs) describing the sub-divisions with limited egress or no secondary egress, per CAL FIRE data,[12] across the electrical corporation's service territory.

In addition, the electrical corporation must provide a single geospatial map showing its service territory (polygon) overlaid with the communities vulnerable because of access/egress constraints (polygon) and major roadways. Any additional maps needed to provide clarity and detail should be included in Appendix B.

5.4.4 Assets at Risk

In this section of the WMP, the electrical corporation must provide a high-level overview of high-value assets at risk across its service territory. High-value assets must include, at a minimum, buildings/structures, critical facilities and infrastructure, cultural and historical resources, and critical natural resources at risk of utility-related wildfire. Detailed instructions are provided below.

5.4.4.1 Residential, Commercial, and Industrial Buildings at Risk

The electrical corporation must provide a brief narrative describing the distribution of residential, commercial, and industrial buildings at risk across its service territory.

In addition, the electrical corporation must provide geospatial map(s) showing its service territory (polygon) overlaid with structure density (point data) and major roadways. A representative map must appear in the main body of the report. Any additional maps needed to provide clarity and detail should be included in Appendix B.

The electrical corporation must also provide, in tabulated format, the number of structures by occupancy type (i.e., residential, commercial, and industrial) in the HFTD/HFRA across its territory.

[12] https://bof.fire.ca.gov/projects-and-programs/subdivision-review-program/

5.4.4.2 Critical Facilities and Infrastructure

The electrical corporation must provide a brief narrative describing the distribution of critical facilities and infrastructure located in the HFTD/HFRA across its service territory. Critical facilities and infrastructure are defined in Appendix A. At a minimum, critical facilities and infrastructure statistics must include emergency services, government facilities, health care facilities, energy infrastructure, water and wastewater facilities, and communication and transportation infrastructure.

In addition, the electrical corporation must provide geospatial map(s) showing its service territory (polygon) overlaid with critical facilities (point data) and critical infrastructure (points and/or lines, as appropriate) to the extent this information is publicly available. A representative map must appear in the main body of the report. Any additional maps needed to provide clarity and detail should be included in Appendix B.

The electrical corporation must also provide, in tabulated format, the number of critical facilities and infrastructure by type (e.g., emergency services, health care facilities) in HFTDs across its territory.

6. Risk Methodology and Assessment

In this section of the WMP, the electrical corporation must provide an overview of its risk methodology, key input data and assumptions, risk analysis, and risk presentation (i.e., the results of its assessment). This information is intended to provide the reader with a technical understanding of the foundation for the electrical corporation's wildfire mitigation strategy for its Base WMP. Sections 6.1–6.7 below provide detailed instructions.

6.1 Methodology

In this section, the electrical corporation must present an overview of its risk calculation approach. This includes one or more graphics showing the calculation process, a concise narrative explaining key elements of the approach, and definitions of risks and risk components.

6.1.1 Overview

The electrical corporation must provide a brief narrative describing its methodology for quantifying its overall risk of wildfires and PSPS. This methodology will help inform the development of its wildfire mitigation strategy (see Section 7). The electrical corporation must describe the methodology and underlying intent of this risk assessment in no more than five pages, inclusive of all narratives, bullet point lists, and any graphics.

The following is an exemplar of this overview:

The risk assessment in this WMP is based on a quantified risk approach using a range of industry-recognized standards, best practices, and research to determine the electrical corporation's overall risk of wildfires and PSPS for its service territory. The intent of performing this risk analysis is to:

- *Understand the overall risk and associated risk components of wildfires and PSPS events spatially and temporally across the electrical corporation's service territory*
- *Use this understanding of risk to inform the development of a comprehensive wildfire mitigation strategy in Section 7 that achieves the goals and objectives stated in Section 4.1 and 4.2*

The risk analysis is shown schematically in Figure 6-1 below. The approach consists of the following:

- *Identifying key wildfire and PSPS hazards and risk components across the electrical corporation's service territory (refer to Section 6.2.1).*
- *Identifying key modeling tools, inputs, and assumptions to quantify the likelihood and consequence of the electrical corporation's overall risk (refer to Section 6.2.2 and 6.2.3).*
- *Identifying credible scenarios that would expose surrounding people, assets, and natural resources (PAR) to wildfire or PSPS risks (refer to Section 6.3).*
- *Summarizing the overall utility risk and key metrics (refer to Section 6.4).*
- *Presenting the quality assessment and quality control procedures for the electrical corporation's risk assessment (refer to Section 6.4).*
- *Improving the risk analysis approach based on lessons learned during the WMP cycle (refer to Section 6.7)*

Appendix B provides a detailed description of the technical basis for this approach.

Figure 6-1. Outline of Section 6 and Its Place in the Broader WMP

6.1.2 Summary of Risk Models

In this section, the electrical corporation must summarize the calculation approach for each risk and risk component identified in Section 6.2.1. This documentation is intended to provide a quick summary of the models used. The electrical corporation must provide the following information:

- **Identification (ID)** – Unique shorthand identifier for the risk or risk component.
- **Risk component** – Unique full identifier for the risk or risk component.
- **Design scenario(s)** – Reference to design scenarios evaluated with the model to calculate the risk or risk component. These must be defined in Section 6.3.
- **Key inputs** – List of key inputs used to evaluate the risk or risk component. These can be in summary form (e.g., the electrical corporation may list "equipment properties" rather than listing out equipment age, maintenance history, etc.).
- **Sources of inputs** – List of sources for each input parameter. These must include data sources (such as LANDFIRE) and modeling results (such as wind predictions) as relevant to the calculation of the risk or risk component. If the inputs come from multiple sources, each source should be on a new line.
- **Key outputs** – List of outputs calculated for the risk or risk component.
- **Units** – List of the units associated with the key outputs.
- **Reference** – Cross-link (i.e., hyperlink) to the section of the main body or appendix of the WMP where detail on the calculation is provided.

The exemplar table below is intended to provide general guidance. It is not a comprehensive list of information that the electrical corporation must furnish. The electrical corporation must provide additional detail on each model in the appendix, in accordance with the requirements documented in Appendix B.

Table 6-1. Summary of Risk Models

ID	Risk Component	Design Scenario(s)	Key Inputs	Source of Inputs (Data and/or Models)	Key Outputs	Units	Reference
R1	Overall utility risk	WL1, WL2, WL3 WV1, WV2, WV3	Ignition risk PSPS risk	See related models	Risk at a specific location, as granular as possible (i.e. circuit segment, pole)	(-)/year	Appendix B
R2	Ignition risk	WL1, WL2, WL3 WV1, WV2, WV3	Ignition likelihood Ignition consequence	See related models	Ignition risk at a specific location	(-)/year	Appendix B
R3	PSPS risk	WL1, WL2, WL3 WV1, WV2, WV3	PSPS likelihood PSPS consequence	See related models	PSPS risk at a specific location	(-)/year	Appendix B
IRC1	Ignition likelihood	WL1, WL2, WL3 WV1, WV2, WV3	Equipment likelihood of ignition Contact by vegetation likelihood of ignition Contact by object likelihood of ignition	See related models	Number of ignitions at a specific location	Ignitions/year	Appendix B
IRC2	Ignition consequence	WV1, WV2, WV3	Wildfire spread likelihood Wildfire consequence	See related models	Adverse effects at a specific location	(-)/ignition	Appendix B
IRC3	Wildfire consequence	WV1, WV2, WV3	Wildfire hazard intensity Wildfire exposure potential Wildfire vulnerability	See related models	Adverse effects at a specific location per wildfire	(-)/burned location	Appendix B
IRC4	PSPS consequence	WL1, WL2, WL3	PSPS exposure potential Vulnerability of community to PSPS	See related models	Adverse effects at a specific location per PSPS	(-)/de-energized location	Appendix B
FRC1	Equipment likelihood of ignition	WL1, WL2, WL3 WV1, WV2, WV3	Wind gust velocity Vegetation moisture	Weather model	Likelihood of equipment failure causing an ignition	ignitions/year	Appendix B
FRC1	Equipment likelihood of ignition	WL1, WL2, WL3 WV1, WV2, WV3	Equipment parameters Presence of mitigation	Asset database	Likelihood of equipment failure causing an ignition	ignitions/year	Appendix B
FRC1	Equipment likelihood of ignition	WL1, WL2, WL3 WV1, WV2, WV3	Current status Operating conditions	Data from inspections, work order history, and real-time monitoring systems	Likelihood of equipment failure causing an ignition	ignitions/year	Appendix B

ID	Risk Component	Design Scenario(s)	Key Inputs	Source of Inputs (Data and/or Models)	Key Outputs	Units	Reference
FRC2	Contact from vegetation likelihood of ignition	WL1, WL2, WL3 WV1, WV2, WV3	Wind gust velocity Vegetation moisture	Weather model	Likelihood of vegetation contact causing an ignition	ignitions/year	Appendix B
FRC2	Contact from vegetation likelihood of ignition	WL1, WL2, WL3 WV1, WV2, WV3	Vegetation parameters	Vegetation database	Likelihood of vegetation contact causing an ignition	ignitions/year	Appendix B
FRC2	Contact from vegetation likelihood of ignition	WL1, WL2, WL3 WV1, WV2, WV3	Current status	Data from inspections and vegetation treatment	Likelihood of vegetation contact causing an ignition	ignitions/year	Appendix B
FRC3	Contact from object likelihood of ignition	WL1, WL2, WL3 WV1, WV2, WV3	Wind gust velocity Vegetation moisture	Weather model	Likelihood of non-vegetation object contact causing an ignition	ignitions/year	Appendix B
FRC3	Contact from object likelihood of ignition	WL1, WL2, WL3 WV1, WV2, WV3	Historic risk events	Data from previous risk events	Likelihood of non-vegetation object contact causing an ignition	ignitions/year	Appendix B
FRC4	Wildfire spread likelihood	WV1, WV2, WV3	Topography	LANDFIRE	Likelihood of a fire reaching a location from a nearby but unknown ignition point	Occurrences/year	Appendix B
FRC4	Wildfire spread likelihood	WV1, WV2, WV3	Statistical profile of sustained wind speeds	Weather model	Likelihood of a fire reaching a location from a nearby but unknown ignition point	Occurrences/year	Appendix B
FRC4	Wildfire spread likelihood	WV1, WV2, WV3	Vegetation	LANDFIRE, adapted based on LiDAR (light detection and ranging) data	Likelihood of a fire reaching a location from a nearby but unknown ignition point	Occurrences/year	Appendix B
FRC5	Wildfire hazard intensity	WV1, WV2, WV3	Topography	LANDFIRE	Intensity of a fire at a specific location	HRR (heat release rate)/event Flame length/ event	Appendix B
FRC5	Wildfire hazard intensity	WV1, WV2, WV3	Sustained wind speeds	Weather model	Intensity of a fire at a specific location	HRR/event Flame length/ event	Appendix B

ID	Risk Component	Design Scenario(s)	Key Inputs	Source of Inputs (Data and/or Models)	Key Outputs	Units	Reference
FRC5	Wildfire hazard intensity	WV1, WV2, WV3	Vegetation	LANDFIRE, adapted based on LiDAR data	Intensity of a fire at a specific location	HRR/event Flame length/ event	Appendix B
FRC6	Wildfire exposure potential		Topography	LANDFIRE	Structures, people, and critical infrastructure at a specific location	Quantity/location	Appendix B
FRC6	Wildfire exposure potential		Land use	Remote sensing	Structures, people, and critical infrastructure at a specific location	Quantity/location	Appendix B
FRC6	Wildfire exposure potential		Population information	Census	Structures, people, and critical infrastructure at a specific location	Quantity/location	Appendix B
FRC7	Wildfire vulnerability		Vulnerable populations (AFN, limited English proficiency [LEP], elderly)	Census and surveys	Structures, people, and critical infrastructure at a specific location	Quantity/location	Appendix B
FRC7	Wildfire vulnerability		Land use	Remote sensing	Structures, people, and critical infrastructure at a specific location	Quantity/location	Appendix B
FRC7	Wildfire vulnerability		Critical infrastructure	Local municipalities	Structures, people, and critical infrastructure at a specific location	Quantity/location	Appendix B
FRC8	PSPS likelihood	WL1, WL2, WL3 WV1, WV2, WV3	Wind gust velocity Vegetation moisture	Weather model	Likelihood of PSPS at a specific location per year	Quantity/year	Appendix B
FRC8	PSPS likelihood	WL1, WL2, WL3 WV1, WV2, WV3	Equipment parameters Presence of mitigation	Asset database	Likelihood of PSPS at a specific location per year	Quantity/year	Appendix B
FRC8	PSPS likelihood	WL1, WL2, WL3 WV1, WV2, WV3	Current status Operating conditions	Data from inspections, work order history, and real-time monitoring systems	Likelihood of PSPS at a specific location per year	Quantity/year	Appendix B
FRC9	Vulnerability of community to PSPS		Vulnerable populations (AFN, LEP, elderly)	Census and surveys	Structures, people, and critical infrastructure at a specific location	Quantity/location	Appendix B
FRC9	Vulnerability of community to PSPS		Land use	Remote sensing	Structures, people, and critical infrastructure at a specific location	Quantity/location	Appendix B
FRC9	Vulnerability of community to PSPS		Critical infrastructure	Local municipalities	Structures, people, and critical infrastructure at a specific location	Quantity/location	Appendix B

6.2 Risk Analysis Framework

In this section of the WMP, the electrical corporation must provide a high-level overview of its risk analysis framework. This includes a summary of key modeling assumptions, input data, and modeling tools used.

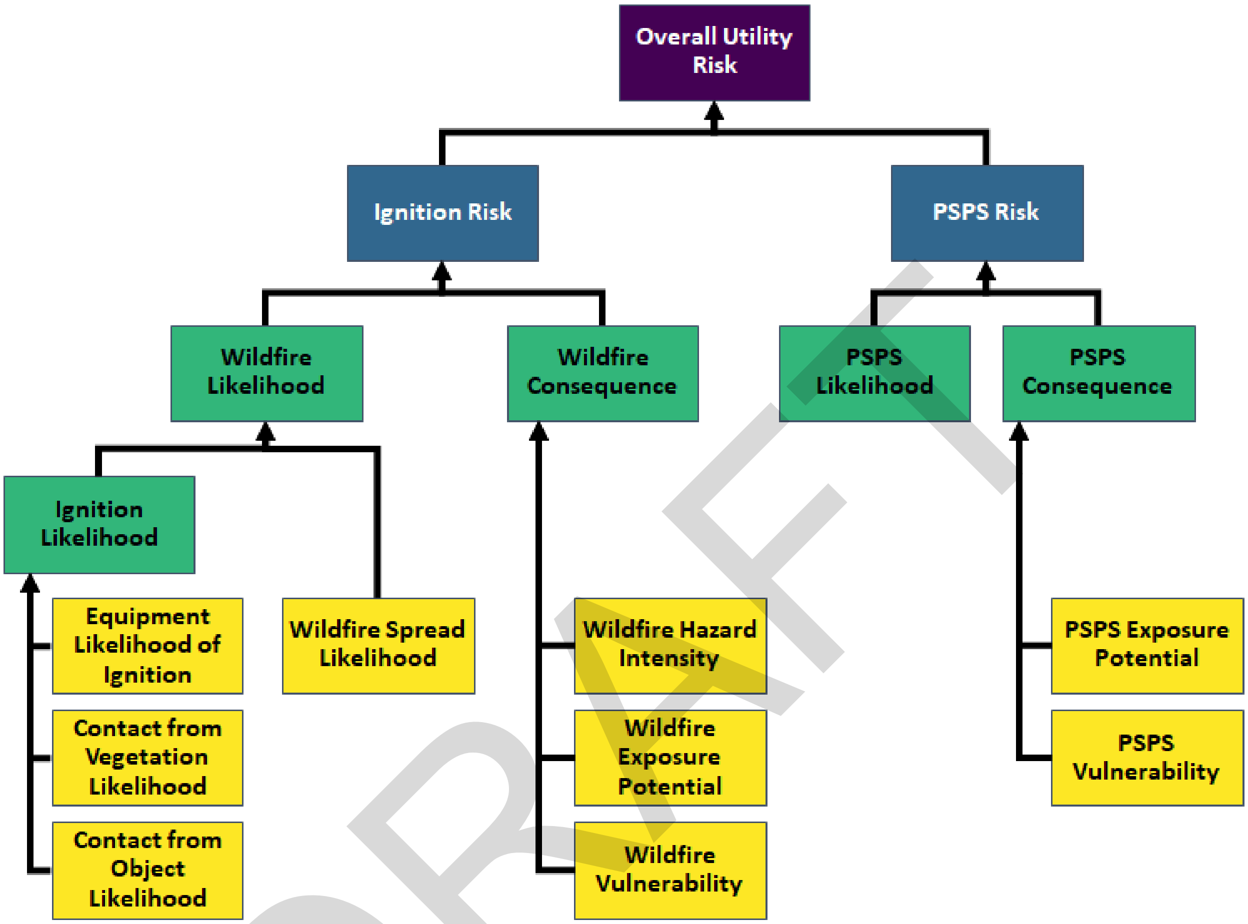
At a minimum, the electrical corporation must evaluate the impact of the following factors on the quantification of risk:

- **Equipment / Assets** (e.g., type, age, inspection, maintenance procedures, etc.)
- **Topography** (e.g., elevation, slope, aspect, etc.)
- **Weather –** at a minimum this must include statistically extreme conditions based on weather history and seasonal weather
- **Vegetation** (e.g., type/class/species/fuel model, canopy height/base height/cover, growth rates, moisture content, inspection, clearance procedures, etc.)
- **Climate change** (e.g., long-term changes in seasonal weather; statistical extreme weather; impact of change on vegetation species, growth, moisture, etc.) at a minimum, this must include adaptations of historical weather data to current and forecasting future climate
- **Social vulnerability** (e.g., AFN, socioeconomic factors, etc.)
- **Physical vulnerability** (e.g., people, structures, critical facilities/infrastructure, etc.)
- **Coping capacities** (e.g., limited access/egress, etc.)

6.2.1 Risk and Risk Component Identification

In this section, the electrical corporation must provide a brief narrative and one or more simple graphics describing the framework that defines its overall utility risk. At a minimum, the electrical corporation must define its overall risk as the comprehensive risk due to both wildfire and PSPS events across its service territory. This includes several likelihood and consequence risk components that are aggregated based on the framework shown in Figure 6-2 below. The following paragraphs define each risk component.

Figure 6-2. Composition of Overall Utility Risk (purple); Utility-related sources of risk including Ignition and PSPS Risks (blue); Intermediate Risk Components (green); and Fundamental Risk Components (yellow)



While the overall risk framework and associated risk components identified in Section 6.2 are the minimum requirements for determining overall risk, the electrical corporation may elect to include additional risk components, as needed, to better define risk for its service territory. Where the electrical corporation identifies additional terms as part of its risk framework, it must define those terms. The electrical corporation must include a schematic demonstrating its adopted risk framework (similar to Figure 6-2), including any components beyond minimum requirements.

As shown in Figure 6-2, overall utility risk is broken down into two individual hazard risks:

- **Ignition risk** – The total expected annualized impacts from ignitions at a specific location. This considers the likelihood that an ignition will occur, the likelihood the ignition will transition into a wildfire, and the potential consequences – considering hazard intensity, exposure potential, and vulnerability – the wildfire will have for each community it reaches

- **PSPS risk** – The total expected annualized impacts from PSPS at a specific location. This considers two factors: (1) the likelihood a PSPS will be required due to environmental conditions exceeding design conditions, and (2) the potential consequences of the PSPS for each affected community, considering exposure potential and vulnerability

The individual hazard risks are further broken down into 14 risk components. These risk components are split into two categories, intermediate and fundamental. Fundamental risk components are the smallest components of risk that the electrical corporation must determine as part of its risk analysis. Intermediate risk components are the likelihood and consequence related to each hazard. Each fundamental or intermediate risk component provides valuable insight in a electrical corporation's wildfire and PSPS risk calculations.

There are a minimum of five intermediate risk components:

- **Ignition likelihood –** The total anticipated annualized number of ignitions resulting from electrical corporation-owned assets at each location in the electrical corporation's service territory. This considers probabilistic weather conditions, type and age of equipment, and potential contact of vegetation and other objects with electrical corporation assets. This should include the use of any method used to reduce the likelihood of ignition. For example, the use of protective equipment and device settings to reduce the likelihood of an ignition upon an initiating event.
- **Wildfire likelihood** – The total anticipated annualized number of fires reaching each spatial location resulting from utility-related ignitions at each location in the electrical corporation service territory. This considers the ignition likelihood and the likelihood that an ignition will transition into a wildfire based on the probabilistic weather conditions in the area.
- **Wildfire consequence** – The total anticipated adverse effects from a wildfire on each community it reaches. This considers the wildfire hazard intensity, the wildfire exposure potential, and the inherent wildfire vulnerabilities of communities at risk (see definitions in the following list).
- **PSPS likelihood** – The likelihood of a electrical corporation requiring a PSPS given a probabilistic set of environmental conditions.

- **PSPS consequence** – The total anticipated adverse effects from a PSPS for a community. This considers the PSPS exposure potential and inherent PSPS vulnerabilities of communities at risk (see definitions in the following list).

There are a minimum of nine fundamental risk components:

- **Equipment ignition likelihood** – The likelihood that electrical corporation-owned equipment will cause an ignition either through normal operation (such as arcing) or through failure.
- **Contact from vegetation ignition likelihood** – The likelihood that vegetation will contact electrical corporation-owned equipment and result in an ignition.
- **Contact by object ignition likelihood** – The likelihood that a non-vegetative object (such as a balloon or vehicle) will contact electrical corporation-owned equipment and result in an ignition.
- **Wildfire spread likelihood** – The likelihood that a fire with a nearby but unknown ignition point will transition into a wildfire and will spread to a location in the service territory based on a probabilistic set of weather profiles, vegetation, and topography.
- **Wildfire hazard intensity** – The potential intensity of a wildfire at a specific location within the service territory given a probabilistic set of weather profiles, vegetation, and topography.
- **Wildfire exposure potential** – The potential physical, social, or economic impact of wildfire on people, property, critical infrastructure, livelihoods, health, environmental services, local economies, cultural/historical resources, and other high-value assets. These may include direct or indirect impacts, as well as short- and long-term impacts.
- **Wildfire vulnerability** – The susceptibility of people or a community to adverse effects of a wildfire, including all characteristics that influence their capacity to anticipate, cope with, resist, and recover from the adverse effects of a wildfire (e.g., AFN, SVI, age of structures, firefighting capacities).
- **PSPS exposure potential** – The potential physical, social, or economic impact of a PSPS event on people, property, critical infrastructure, livelihoods, health, local economies, and other high-value assets.
- **Vulnerability of community to PSPS (PSPS vulnerability)** – The susceptibility of people or a community to adverse effects of a PSPS event, including all characteristics that influence their capacity to anticipate, cope with, resist, and recover from the

adverse effects of a PSPS event (e.g., high AFN population, poor energy resiliency, low socioeconomics).

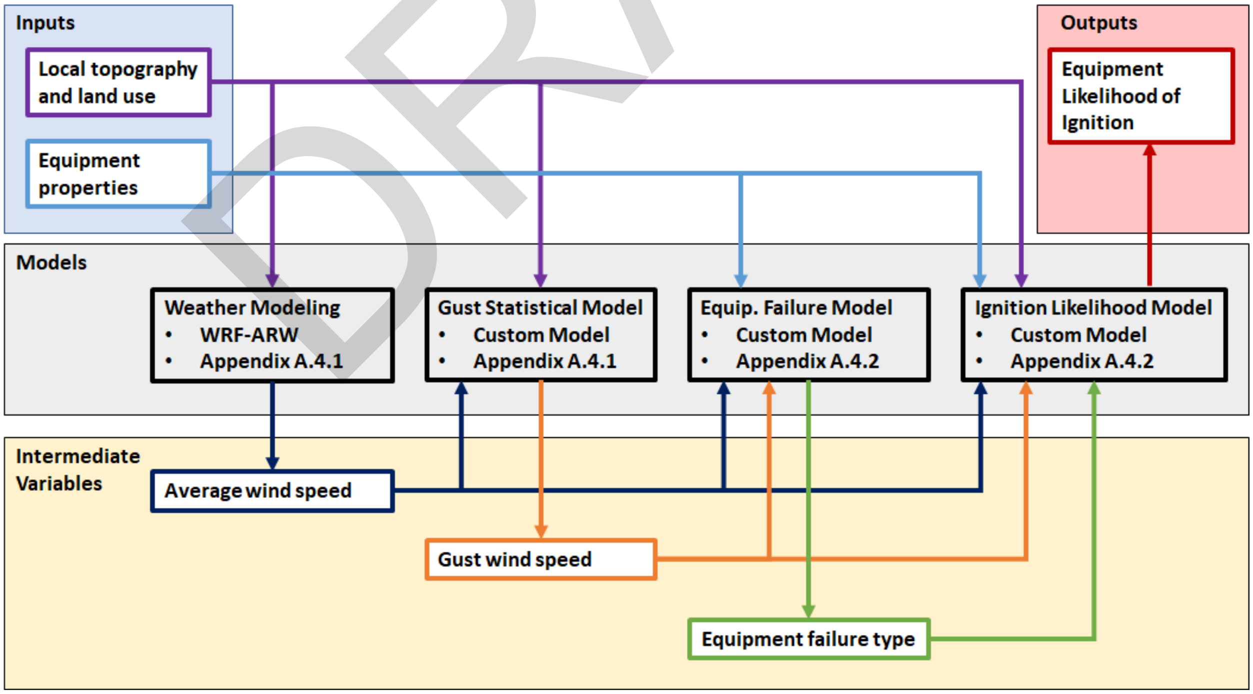
The electrical corporation must adopt these definitions in this section of the WMP. If the electrical corporation considers additional intermediate and fundamental risk components, it must define those components in this section as well.

6.2.2 Risk and Risk Components Calculation

The electrical corporation must calculate each risk and risk component defined in Section 6.2.1. Appendix B provides additional requirements on these calculations. These are the minimum requirements and are intended to establish the baseline evaluation and reporting of all electrical corporations. If the electrical corporation identifies other key factors as important, it must report them in the WMP in a similar format.

The electrical corporation must provide schematics illustrating the calculation of each risk and risk component as necessary to demonstrate the logical flow from input data to outputs, including separate items for any intermediate calculations. An example calculation schematic is provided for the equipment likelihood of ignition in Figure 6-3.

Figure 6-3. Example Calculation Schematic



The electrical corporation must summarize any differences between its calculation of these risk components and the requirements of these Guidelines. These differences may include any of the following:

- **Additional input parameters** beyond the minimum requirements for a specific risk component
- **Calculations of additional outputs** beyond the minimum requirements for a specific risk component
- **Calculations of additional risk components** defined by the electrical corporation in Section 6.2.1

The process used to combine risk components must be summarized for each relevant risk component. This process must align with applicable CPUC decisions regarding the inclusion of Risk Assessment and Mitigation Phase (RAMP) filings. If scaling factors (such as multi-attribute value functions [MAVFs] or representative cost) are used in this combination, the electrical corporation must present a table with all relevant information needed to understand this procedure. The electrical corporation must organize this discussion into the following two subsections focusing on likelihood and consequence.

6.2.2.1 Likelihood

The electrical corporation must calculate the likelihood that its equipment (through normal operations or failure) will result in a catastrophic wildfire and the resulting likelihood of issuing a PSPS. The risk components discussed in this section must include at least the following:

- Ignition likelihood
    - Equipment failure likelihood of ignition
    - Contact from vegetation likelihood of ignition
    - Contact from object likelihood of ignition
- Wildfire spread likelihood
- PSPS likelihood

6.2.2.2 Consequence

The electrical corporation must calculate the consequences of a fire originating from its equipment and the consequence of implementing a PSPS event to prevent a catastrophic wildfire in the community. The risk components discussed in this section must include at least the following:

- Wildfire consequence
- Wildfire hazard intensity
- Wildfire exposure potential
- Wildfire vulnerability
- PSPS consequence
- PSPS exposure potential
- PSPS vulnerability

6.2.2.3 Risk

The electrical corporation must calculate each risk and the resulting overall risk defined in Section 6.2.1. The discussion in this section must include at least the following:

- Ignition risk
- PSPS risk
- Overall utility risk

6.2.3 Key Assumptions and Limitations

Because the individual elements of risk assessment are interdependent, the interfaces between the various risk models and mitigation initiatives must be internally consistent. In this section of the WMP, the electrical corporation must discuss key assumptions, limitations, and data standards for the individual elements of its risk assessment. This must include the following:

- **Key modeling assumptions** made specific to each model to represent the physical world and to simplify calculations
- **Data standards,** which must be consistently defined (e.g., weather model predictions at a 30-ft [10-m] height must be converted to the correct height for fire behavior predictions, such as mid-flame wind speeds)
- **Consistency of assumptions and limitations** in each interconnected model, which must be traced from start to finish, with any discrepancies between models discussed
- **Stability of assumptions in the program**, including historical and projected changes

More mature programs regularly monitor and evaluate the scope and validity of modeling assumptions. Monitoring and evaluation categories may include:

- **Adaptation of weather history** to current and forecasted climate conditions
- **Availability of suppression resources** including type, number of resources, and ease of access to incident location
- **Height of wind driving fire spread** / wind adjustment factor calculation
- **General equipment failure rates** / wind speed functional dependence for unknown components
- **General vegetation contact rates** / wind speed functional dependence for unknown species
- Height of electrical equipment in the service territory
- **Stability of the atmosphere** and resulting calculation of near-surface winds
- **Vegetative fuels** and fuel models including adaptations based on fuel management activities by other Public Safety Partners
- **Combination of risk components / weighting of attributes** in alignment with most recent decision issued by the CPUC for inclusion in RAMP filings
- **Wind load capacity for electrical equipment** in the service territory
- **Number, extent, and type of community assets at risk** in the service territory
- **Proxies for estimating impact on customers and communities** in the service territory
- **Extent, distribution, and characteristics of vulnerable populations** in the service territory

The electrical corporation must document each assumption in Table 6-2, see the exemplar provided below. The electrical corporation must summarize detailed assumptions made within models in accordance with the model documentation requirements in Appendix B.

Table 6-2. Exemplar Risk Modeling Assumptions and Limitations

Assumption	Rationale/Justification	Limitation	Applicable Models
Height of conductors in rural and highly rural areas is assumed to be 28 feet	GO 95 requires 34’ or 30’ over railroads or thoroughfares for 35-kV lines. The sag in the lines in our service territory generally varies from 3 to 10 ft. The average height of conductors is thus: 34’ – 6’ = 28 ft.	Statute mandates minimum clearance, but the height could be higher. Since wind speed generally increases with height, this could lead to use of non-conservative wind speeds in design.	Each likelihood-of-ignition model

6.3 Risk Scenarios

In this section of the WMP, the electrical corporation must provide a high-level overview of the scenarios to be used in its risk analysis in Section 6.2. These must include at least the following:

- **Design basis scenarios** that will inform the electrical corporation's long-term wildfire mitigation initiatives and planning
- **Extreme-event scenarios** that may inform the electrical corporation's decisions to provide added safety margin and robustness

The risk scenarios described in Sections 6.3.1 and 6.3.2 below are the minimum scenarios the electrical corporation must assess in its wildfire and PSPS risk analysis. The electrical corporation must also describe and justify any additional scenarios it evaluates.

Each scenario must consider:

- **Local relevance** – Heterogeneous conditions (e.g., assets, equipment, topography, vegetation, weather) that vary over the landscape of the electrical corporation's service territory at a level sufficiently granular to permit understanding of the risk at a specific location or for a specific circuit segment. For example, statistical wind loads must be calculated based on wind gusts considering the impact of nearby topographic and environmental features, such as hills, canyons, and valleys
- **Statistical relevance** – Percentiles used in risk scenario selection must consider the statistical history of occurrence and must be designed to describe a reasonable return interval / probability of occurrence. For example, designing to a wind load with a 10,000-year return interval may not be desirable as most conductors in the service territory would be expected to fail (i.e., the scenario does not help discern which areas are at elevated risk)

6.3.1 Design Basis Scenarios

Fundamental to any risk assessment is the selection of one or more relevant design basis scenarios (design scenarios). These scenarios will inform long-term mitigation initiatives and planning. In this section, the electrical corporation must identify the design scenarios it has prioritized from a comprehensive set of possible scenarios. The scenarios identified must be based on the unique wildfire and PSPS risk characteristics of the electrical corporation's service territory and achieve the primary goal and stated objectives of its WMP. At a minimum, the following design scenarios representing statistically relevant weather and vegetative conditions must be considered throughout the service territory.

For wind loading on electrical equipment, the electrical corporation must consider at least four statistically relevant design conditions. It must calculate wind loading based on locally relevant 3-second wind gusts over a 30-year wind speed history during fire season in its service territory. The conditions are the following:

- **Wind Load Condition 1 – Baseline** – The baseline wind load condition the electrical corporation use in design, construction, and maintenance relative to GO 95, Rule 31.1.
- **Wind Load Condition 2 – Very High** – 95th-percentile wind gusts based on maximum daily values over the 30-year history. This corresponds to a probability of exceedance of 5 percent on an annual basis (i.e., 20-year return interval) and is intended to capture annual high winds observed in the region (e.g., Santa Ana winds).
- **Wind Load Condition 3 – Extreme** – Wind gusts with a probability of exceedance of 5 percent over the three-year WMP cycle (i.e., 60-year return interval).
- **Wind Load Condition 4 – Credible Worst Case** – Wind gusts with a probability of exceedance of 1 percent over the three-year WMP cycle (i.e., 300-year return interval).

The data and/or models the electrical corporation uses to establish locally relevant wind gusts for these design conditions must be documented in accordance with the weather analysis requirements described in Appendix B.

For weather conditions used in calculating fire behavior, the electrical corporation must use probabilistic scenarios based on a 30-year history of fire weather. This approach must consider a range of wind speeds, directions, and fuel moistures that are representative of historic conditions. In addition, the electrical corporation must discuss how this weather history is adapted to align with current and forecasted climate conditions. The electrical corporation must consider the following two conditions:

- **Weather Condition 1 – Anticipated Conditions** – The statistical weather analysis is limited to fire seasons expected to be the most relevant to the next three years of the WMP cycle.
- **Weather Condition 2 – Long-Term Conditions –** The statistical weather analysis is representative of fire seasons covering the full 30-year history.

The electrical corporation must state how it defines "fire weather" and "fire season" for the calculations of these probabilistic scenarios.

One possible approach to the statistical weather analysis for fire behavior is Monte- Carlo simulation of synthetic fire seasons in accordance with approaches presented by the United States Forest Service.[13] However, the electrical corporation must justify the selection of locally relevant data for use in this approach (i.e., Remote Automated Weather Systems data or historic weather reanalysis must be locally relevant). The data and/or models the electrical corporation uses to establish locally relevant weather data for these designs must be documented in accordance with the weather analysis requirements described in Appendix B.

For vegetative conditions not including short-term moisture content, the electrical corporation must evaluate design scenarios including the current and forecasted vegetative type and coverage. The conditions it must consider include the following:

- **Vegetation Condition 1 – Existing Fuel Load** – The wildfire hazard must be evaluated with the existing fuel load within the service territory, including existing burn scars and fuel treatments that reduce the near-term fire hazard.
- **Vegetation Condition 2 – Short-Term Forecasted Fuel Load** – The wildfire hazard must be evaluated considering the changes in expected fuel load over the three-year Base WMP cycle (2023-2025). At a minimum, this must include regrowth of previously burned and treated areas.
- **Vegetation Condition 3 – Long-Term Extreme Fuel Load** – The wildfire hazard must be evaluated considering the long-term potential changes in fuels throughout the service territory. This must include, at a minimum, regrowth of previously burned and treated areas and changes in predominant fuel types.

The data and/or models the electrical corporation uses to establish locally relevant fuel loads for these designs must be documented in accordance with the vegetation requirements described in Appendix B.

The electrical corporation must provide a brief narrative on the design basis scenarios used in its risk analysis. If the electrical corporation includes additional design scenarios, it must

[13] M. A. Finney, I. C. Grenfell, C. W. McHugh, R. C. Seli, D. Trethewey, R. D. Stratton, and S. Brittain, 2011, "A Method for Ensemble Wildland Fire Simulation," *Environmental Modeling & Assessment* 16, no. 2: 153–167.

M. A. Finney, C. W. McHugh, I. C. Grenfell, K. L. Riley, and K. C. Short, 2011, "A Simulation of Probabilistic Wildfire Risk Components for the Continental United States," *Stochastic Environmental Research and Risk Assessment* 25: 973–1000.

describe these scenarios and their purpose in the analysis. In addition, the electrical corporation must provide a table summarizing the following information:

- Identification of each design basis scenario (e.g., Scenario 1, Scenario 2)
- Components of each scenario (e.g., Weather Condition 1, Vegetation Condition 1)
- Purpose of each scenario
- Reference (including hyperlinked cross-reference) to location in Appendix B that provides key assumptions for the development of these scenarios

Table 6-3 provides an exemplar.

Table 6-3. Summary of Design Basis Scenarios

Scenario ID	Design Scenario	Purpose	Reference
WL1	Wind Load 1	Ignition likelihood calculation	Appendix B
WL2	Wind Load 2	Ignition likelihood calculation	Appendix B
WL3	Wind Load 3	Ignition likelihood calculation	Appendix B
WL4	Wind Load 4	Ignition likelihood calculation	Appendix B
WV4	Weather Condition 1 Vegetation Condition 1	Year 1 fire behavior calculation	Appendix B
WV5	Weather Condition 1 Vegetation Condition 2	Year 2–3 fire behavior calculation	Appendix B
WV6	Weather Condition 2 Vegetation Condition 3	Long-term fire behavior calculation	Appendix B

6.3.2 Extreme-Event Scenarios

In this section, the electrical corporation must identify extreme scenarios that it considers in its risk analysis. These generally include the following types of scenarios:

- Longer-term scenarios with higher uncertainty (e.g., climate change impacts, population migrations, extended drought)
- Multi-hazard scenarios (e.g., ignition from another source during a PSPS)
- High-consequence but low-likelihood ("Black Swan") events (e.g., acts of terrorism, 10,000-year weather)

While the primary risk analysis is intended to be based on the design scenarios discussed in Section 6.3.1, the potential for high consequences from extreme events may provide additional insight into the mitigation prioritization described in Section 7.

The electrical corporation must provide a brief narrative on the extreme-event scenarios used in its risk analysis. The electrical corporation must describe these scenarios and their purpose in the analysis. In addition, the electrical corporation must provide a table summarizing the following information:

- Identification of each extreme-event risk scenario (e.g., Scenario 1, Scenario 2)
- Components of each scenario (e.g., Weather Condition 1, Vegetation Condition 1)
- Purpose of the scenario
- Reference to the appendix providing key assumptions for the development of these scenarios

An exemplar of the minimum acceptable level of information is provided in Table 6-4.

Table 6-4. Exemplar Summary of Extreme-Event Scenarios

Scenario ID	Extreme-Event Scenario	Purpose	Reference
ES1	Climate Change 1 Weather Condition 2 Vegetation Condition 3	Impact of climate change on long-term fire behavior calculation	Appendix B

6.4 Risk Analysis Results and Presentation

In this section of the WMP, the electrical corporation must present a high-level overview of the risks calculated using the approaches discussed in Section 6.2 for the scenarios discussed in Section 6.3.

The risk presentation must include the following:

- Summary of electrical corporation-identified high fire threat areas in the service territory
- Geospatial map of electrical corporation-identified areas with heightened risk of fire in the service territory
- Narrative discussion of proposed updates to HFTD
- Tabular summary of top risk-contributing circuits across the service territory
- Tabular summary of key metrics across the service territory

The following subsections expand on the requirements for each of these. The electrical corporation must provide additional supporting maps, tables, and metrics in the appendix, in accordance with the requirements in Appendix B. Additional information on the calculation of key metrics is provided in Appendix B.

6.4.1 Electrical Corporation-Identified Areas with Heightened Risk of Fire

In this section, the electrical corporation must identify areas within its service territory that are at an elevated risk of wildfire, compare these areas to the existing HFTD areas approved by the CPUC, and discuss its planned process to submit proposed changes to the Commission for review.

6.4.1.1 Geospatial Maps of Areas with Heightened Risk of Fire

The electrical corporation must evaluate the outputs from its risk modeling to identify areas where its service territory has a heightened risk of fire (independent of HFTD status). The electrical corporation must provide geospatial maps of these areas.

The maps must fulfill the following requirements:

- **Contour levels** – Contour levels must be selected to show at least three distinct levels, with the values based on the following:

  - Top 5 percent
  - Top 20 percent
  - Bottom 80 percent
- **Colormap** – The colormap of the contour must meet accessibility requirements (recommended colormap is Viridis)
- **County lines** – The map must include county lines as a geospatial reference
- **HFTD tiers** – The map must show a comparison with existing HFTD tier 2 and tier 3 regions.

6.4.1.2 Proposed Updates to HFTD

In this section, the electrical corporation must discuss the differences between the electrical corporation-identified areas with heightened fire risk and the existing Commission-approved HFTD. The electrical corporation must identify areas that its risk analysis indicates are at a higher risk than indicated in the current HFTD. The electrical corporation must also describe its proposed process to submit proposed changes to the Commission to modify the HFTD. The electrical corporation need not conclude that the HFTD should be expanded and/or modified. Any proposed changes to the HFTD must be mapped in accordance with the requirement in the previous sub-section.

6.4.2 Top Risk-Contributing Circuits/Segments

The electrical corporation must provide a summary table showing the highest-risk circuits/segments[14] within its service territory. The table should include the following information about each circuit:

- Circuit or Segment ID – unique identifier for the circuit
- Risk scores – numerical value for each risk
- Top risk contributors –the risk components that lead to the high risk on the circuit

The electrical corporation must rank its circuits/segments by circuit mile weighted risk score and identify each significant risk-contributing circuit/segment. A circuit/segment is risk significant if it individually contributes more than 1 percent of the total cumulative risk of the electrical corporation or contributes to the top 95 percent of cumulative risk when ranked

[14] For the section, the electrical corporation may use either circuits or segments, whichever is more appropriate considering the granularity of its risk model(s).

from highest- to lowest-risk circuits/segments. The electrical corporation must include each significant risk-contributing circuit/segment in the table below.

Table 6-5. Summary of Top-Risk Circuits/Segments

Risk Ranking	Circuit/ Segment ID	Overall Risk Score	Ignition Risk Score	PSPS Risk Score	Top Risk Contributors
1	ID001				
2	ID002				

Note: Once populated, if this table is longer than two pages, the electrical corporation must append the table.

6.4.3 Other Key Metrics and Indicators

The electrical corporation must calculate, track, and present on several other key metrics and indicators of risk across its service territory (see Appendix B for additional information on the calculation of these metrics). These include, at a minimum:

- **Fire Potential Index (FPI)** – Landscape scale index used as a proxy for assessing real-time risk of a wildfire under current and forecasted weather conditions. The electrical corporation must specify whether it calculates its own FPI or uses an external source, such as the United States Geological Survey.[15]
- **Red Flag Warnings (RFW)** – Near-term proxy for the potential of high wildfire risk due to weather conditions, as declared by the National Weather Service (NWS)
- **High Wind Warnings (HWW)** – Near-term potential for high wind risk, as declared by the NWS

The electrical corporation must also provide a description and similar summary for each electrical corporation-identified metric discussed in Appendix B.

For each metric and indicator, the frequency of its occurrence within each HFTD tier and within the areas with a heightened risk of fire must be reported in the table below. The metric or indicator should be reported in number of overhead circuit mile (OCM) days of occurrence

[15] https://firedanger.cr.usgs.gov/viewer/index.html

normalized by circuit miles within that area type. For example, consider a electrical corporation with 1,000 OCM in HFTD tier 3. If 100 of these OCM are under RFW for one day, and 10 of those OCM are under RFW for an additional day, then the average RFW-OCM per OCM would be:

$$\frac{RFW\_OCM}{OCM} = \frac{(100 \times 1 + 10 \times 1)}{1000} = 0.1$$

This metric represents the average RFW-OCM experienced by an OCM within the electrical corporation's service territory within HFTD tier 3. If the metric is continuous (such as FPI), the report should include a note stating the threshold used to select high values, with a link to the appendix justifying the threshold.

Table 6-6. Summary of Key Metrics by Statistical Frequency Exemplar

Metric	**Non-HFTD**	**HFTD Tier 2**	**HFTD Tier 3**	**Areas Without a Heightened Risk of Fire**	**Areas with Heightened Risk of Fire**
FPI-OCM/ OCM	0.XX	0.XX	0.XX	0.XX	0.XX
RFW-OCM/ OCM	0.XX	0.XX	0.XX	0.XX	0.XX
HWW-OCM/ OCM	0.XX	0.XX	0.XX	0.XX	0.XX

6.5 Enterprise System for Risk Assessment

In this section, the electrical corporation must provide an overview of inputs, operation, and support for a centralized risk assessment enterprise system. This overview must include discussion of:

- The electrical corporation's database(s) utilized for storage of risk assessment data
- The utilities internal documentation of its database(s)
- Integration with systems in other lines of business
- The internal processes for updating enterprise system including database(s)
- Any changes to the initiative since the last WMP submission and a brief explanation as the why those changes were made. Include any planned improvements or updates to the initiative and timeline for implementation

6.6 Quality Assessment and Control

The electrical corporation must document the processes and procedures it uses to confirm that the data collected and processed for its risk assessment are accurate and comprehensive. This includes but is not limited to model, sensor, inspection, and risk event data used as part of the electrical corporation's WMP program. In this section of the WMP, the electrical corporation must describe the following:

- **Independent review** – Role of independent third-party review in the data and model quality assessment
- **Model controls, design, and review** – Overview of the quality controls in place on electrical corporation risk models and sub-models

6.6.1 Independent Review

The electrical corporation must report on its processes and procedures for independent review of data collected (e.g., through sensors or inspections) and generated (e.g., through risk models and software) to support decision making by qualified experts. In this section of the WMP, the electrical corporation must provide the following:

- **Independent review process** – The electrical corporation's processes and procedures for conducting independent reviews of data collection and risk models.

- **Processes triggering additional review** – The electrical corporation's internal processes and procedures to identify when a third-party review is required beyond the routinely scheduled reviews.
- **Results, recommendations, and disposition** – The results and recommendations from the electrical corporation's most recent independent review of its data collection and risk models. This includes the electrical corporation's disposition of each comment.
- **Routine review schedule** – The electrical corporation's routine review schedule.

Each accepted recommendation from independent review must be entered into the electrical corporation's action tracking system for resolution (assignment of responsibility, development of technical plan, schedule for development and deployment, etc.) in accordance with the requirements discussed in Section 11.

6.6.2 Model Controls, Design, and Review

An electrical corporation's risk modeling approaches are complex, with several layers of interaction between models and sub-models. If these models are designed as a single unit, it can be difficult to evaluate the propagation of small changes in assumptions or inputs through the models. The requirements in this section are designed to facilitate the review of models by the public, intervenors, and Energy Safety, and allow more comprehensive retrospective analysis of failures in the system.

The software used by the electrical corporation must meet the following requirements:

- **Modularization** – The electrical corporation must evaluate its software architecture to ensure the structure is sufficiently modular to track and control changes and enhancements over time. At a minimum, the electrical corporation risk model is expected to have separate modules to evaluate each of the following:
    - Weather analysis
    - Fire behavior analysis
    - Seasonal vegetation analysis
    - Equipment failure
    - Exposure and vulnerability analysis

- **Reanalysis** – The electrical corporation must maintain the capability to provide Energy Safety the results of its risk model based on the operational version of the software (including code and data) on a specific historic day.
- **Version control** – The electrical corporation must use industry standard practices in version controlling its risk model and sub-models. At a minimum, the electrical corporation is expected to meet the following requirements:
    - Models and software must use version controls aligned with industry standard programs, procedures, and protocols.
    - Model input data, including geospatial data layers, must be version controlled.
    - Technical, verification, and validation documentation must be periodically updated for new software versions.

More mature risk analysis frameworks are expected to use increased modularization and quality control, as discussed in the Maturity Survey.

6.7 Risk Assessment Improvement Plan

A key objective of the WMP process is to drive year-over-year continuous improvement. In this section, the electrical corporation must provide a high-level overview of its plan to improve both programmatic and technical aspects of its risk assessment in at least four key areas:

- **Risk assessment methodology** – Wildfire and PSPS risk assessment methodology and its documentation, including both quantitative and qualitative approaches
- **Design basis** – Justification of design basis scenarios used to evaluate the risk and its documentation
- **Risk presentation** – Presentation of risk to stakeholders, including dashboards and statistical assessments
- **Risk event tracking** – Tracking and reconstruction of risk events and integration of lessons learned

The overview must consist of the following information, in tabulated format:

- Key area – One of the four key areas identified above
- Title of proposed improvement – Brief heading or subject of the improvement
- Type of improvement – Technical or programmatic
- Expected value add – Summary of expected benefit and any other impacts of the proposed improvement

- Timeframe and key milestones – Total timeframe for undertaking the proposed improvement and any key milestones

An exemplar of the minimum acceptable level of information is provided in Table 6-7.

In addition, the electrical corporation must provide a more detailed description of its proposed improvement plan in Appendix B. This must consist of a concise narrative (maximum of five pages per improvement) summarizing:

- **Problem statement** – Description of the current state of the problem to be addressed
- **Planned improvement** – Discussion of the planned improvement, including any new/novel strategies to be developed and the timeline for their completion
- **Anticipated value** – Description of the anticipated benefit of the improvement to the electrical corporation's program and risk in its service territory
- **Region prioritization (where relevant)** – Reference to risk-informed analysis (e.g., local validation of weather forecasts in the HFTD) demonstrating that high-risk areas are being prioritized for continued improvement
- Supporting documentation (as necessary)

Table 6-7. Exemplar Utility Risk Assessment Improvement Plan

Key Risk Assessment Area	Proposed Improvement	Type of Improvement	Expected Value Add	Timeframe and Key Milestones
RA-1, risk assessment methodology	RA-1-A. Increase validation of local wind gusts in statistical weather modeling in the HFTD.		Improved likelihood-of-ignition calculations.	Pilot system, 2023–2024 Integrate system throughout HFTD, 2024–2026
RA-1, risk assessment methodology	RA-1-B. Develop verification and validation documentation for ignition models.		Improved quantitative understanding of the accuracy of the sub-models. This will help identify where our model has the highest areas of uncertainty that need to be addressed in future activities.	Conduct initial development, 2023 Expand validation basis, 2024–2026
RA-2, design basis				
RA-3, risk presentation				
RA-4, risk event tracking				

7. Wildfire Mitigation Strategy Development

In this section of the WMP, the electrical corporation must provide a high-level overview of its risk evaluation and process for deciding on a portfolio of mitigation initiatives to achieve maximum feasible[16] risk reduction and that meet the goals and objectives stated in Sections 4.1–4.2, and wildfire mitigation strategy for 2023-2025. Sections 7.1 and 7.2 below provide detailed instructions.

7.1 Risk Evaluation

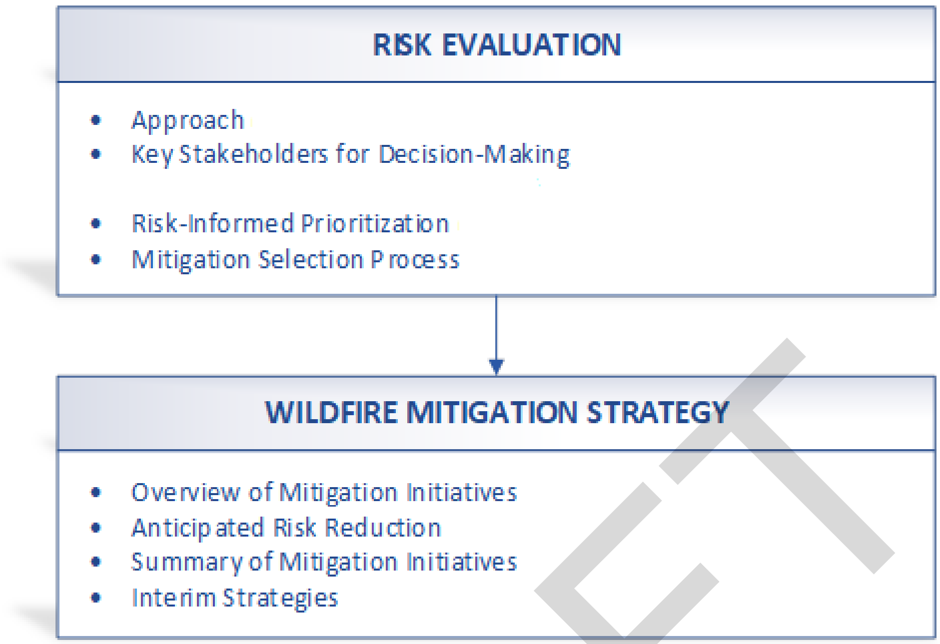
7.1.1 Approach

In this section of the WMP, the electrical corporation must provide a brief narrative of its risk evaluation approach, based on the risk analysis outcomes presented in Section 6, to help inform the development of a wildfire mitigation strategy that meets the goals and objectives stated in Sections 4.1–4.2.

The risk evaluation approach must have eight minimum components, as shown in Figure 7-1 and described below. The electrical corporation should describe the risk evaluation approach in a maximum of two pages, inclusive of all narratives, bullet point lists, and any graphics.

[16] "Maximum feasible" means, in accordance with Public Utilities Code section 326(a)(2), capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

Figure 7-1. Exemplar Risk Evaluation Approach to Developing a Wildfire Mitigation Strategy



The following is an exemplar of this description:

The risk evaluation approach in this WMP is designed to meet a range of industry-recognized standards (e.g., ISO 31000), best practices, and research[17] *to determine a wildfire and PSPS risk mitigation strategy. The intent is to use this approach to help inform [electrical corporations]'s development of a portfolio of wildfire mitigation initiatives and activities that meet the goals and objectives stated in Sections 4.1–4.2. Therefore, the general risk evaluation approach consists of the following:*

- *Identify key stakeholder groups, decision-making roles and responsibilities, and engagement process.*
- *Identify risk evaluation criteria based on the balance of various performance goals. Apply these criteria to monitor the effectiveness of the electrical corporation's WMP in achieving its identified goals and objectives.*
- *Evaluate wildfire and PSPS risks and risk components described in Section 4 against the risk evaluation criteria, considering both potential positive and potential negative*

[17] T. Aven, 2012, *Foundations of Risk Analysis*, 2nd ed. John Wiley and Sons, West Sussex, United Kingdom.

outcomes. Apply the results from the evaluation of wildfire and PSPS risks within [electrical corporation's] service territory within a risk-informed decision-making process to develop prioritized areas where mitigation initiatives are necessary.

- *Identify a portfolio of wildfire mitigation initiatives and activities, prioritized by risk. Identify and characterize potential mitigation approaches for each.*
- *Perform an integrated evaluation of the identified potential risk mitigation initiatives. The outcome is the specification of a portfolio of mitigation initiatives that will be implemented over the WMP cycle.*
- *Provide a summary of the approved risk mitigation strategies for inclusion in the WMP submission. This summary must include schedules for implementation of the strategies, procedures for management oversight of implementation of the mitigations, and methods of evaluation of their effectiveness once deployed.*
- *Discuss the expected improvements in maturity and describe monitoring activities to assess the degree of improvement in the targeted maturity.*

7.1.2 Key Stakeholders for Decision Making

In this section, the electrical corporation must identify all key stakeholder groups that are part of the decision-making process for developing and prioritizing mitigation initiatives. An exemplar of the required information is provided in Table 7-1. Exemplar Stakeholder Roles and Responsibilities in Decision-Making Process. At a minimum, the electrical corporation must do the following:

- Identify each key stakeholder group (e.g., electrical corporation executive leadership, public, state/county public safety partners)
- Identify decision-making role of each stakeholder group (e.g., decision maker, consulted, informed)
- Identify process or method of engagement (e.g., meeting, workshop, written comments)

The electrical corporation must also discuss its process for communicating decisions to the identified key stakeholders.

Table 7-1. Exemplar Stakeholder Roles and Responsibilities in Decision-Making Process

Stakeholder	Stakeholder Point of Contact	Electrical Corporation Point of Contact	Stakeholder Role	Engagement Protocols
County Cork	Director of Emergency Management	Director of Transmission / Distribution Northeast Region	• County provides electrical corporation with information on infrastructure improvements • Electrical corporation provides information on wildfire mitigations within county	• Monthly phone conversations • Quarterly public meetings

7.1.3 Risk-Informed Prioritization

In making decisions on wildfire risk mitigation, the electrical corporation must identify and evaluate where it can make investments and take actions to reduce its risk of catastrophic wildfire.

For each of the risk scenarios discussed in Section 6.2, the electrical corporation must develop an initial prioritization list based solely on quantitative risk. These prioritizations reflect a critical assessment of the risks associated with wildfire events. The electrical corporation must assess these initial prioritizations to identify any insights and considerations relevant to its decision-making process.

The electrical corporation must describe the process used to select parts of its service territory for potential mitigation, including, at a minimum, the following:

- Geographic scale used in prioritization (i.e., regional, circuit, circuit segment, span, asset)
- Statistical approach used to select candidates (e.g., areas in top 20 percent for risk, areas in top 20 percent for consequences)
- Feasibility constraints (e.g., limitations on data resolution, jurisdictional considerations, accessibility)

From this geospatial prioritization of quantitative risk, the electrical corporation must develop a prioritized list of risks for which it will investigate and develop potential mitigation initiatives. The electrical corporation must provide the results of the prioritization and the basis for the decisions on which potential mitigation initiatives will be developed for further consideration.

7.1.4 Mitigation Selection Process

After the electrical corporation creates a comprehensive prioritized list of risks (Section 7.1.3), the electrical corporation must then identify potential mitigation strategies. It must also evaluate the benefits and drawbacks of each strategy at different scales of application (e.g., circuit, circuit segment). In this section of the WMP, the electrical corporation must provide the basis for its decisions regarding which mitigation initiatives to pursue. It must also document its process to develop, evaluate, and select mitigation initiatives.

The electrical corporation should consider appropriate mitigation initiatives depending on the local conditions and setting and the risk components that create the high-risk conditions. There may be a wide variety of potential mitigation initiatives, such as:

- Engineering changes to grid design
- Discretionary inspection and/or maintenance of existing assets
- Vegetation clearances beyond minimum regulatory requirements
- Alternative operational policies, practices, and procedures
- Improved emergency planning and coordination

The electrical corporation may also mitigate risk by combining multiple mitigation initiatives.

The electrical corporation is expected to use its processes and procedures discussed in Section 8 to:

- Develop potential mitigation initiative approaches to address each risk

- Characterize the potential mitigation initiatives to provide decision makers with information required to support decision making (e.g., costs, material availability), including an assessment of uncertainties
- Document the results

The electrical corporation must develop a proposed schedule for implementing each mitigation initiative and proposed metrics to monitor implementation and effectiveness of the mitigation. The following subsections provide specific requirements.[18]

7.1.4.1 Mitigation Initiatives Development Process

The electrical corporation must describe its process and procedures to evaluate options for mitigating wildfire and PSPS risk at various analytical scales. The current decision governing this process is the 2018 Safety Model Assessment Proceeding (2018 S-MAP), adopted in D.18-12-014 (see S-MAP, step 3, rows 15–25). However, the CPUC is considering modifications to the approach in D.18-12-014 thorough R.20-07-013.[19] The electrical corporation's process to evaluate risk mitigation options must align with any changes resulting from R.20-07-013. Pending any such changes, the electrical corporation must describe the following:

- The processes and procedures to develop mitigation initiatives (see 2018 S-MAP row 26)
- To the extent possible, multiple potential locally relevant mitigation initiatives to address local wildfire risk drivers (see 2018 S-MAP, row 29)
- The approach the electrical corporation uses to characterize uncertainties and how the electrical corporation's evaluation and decision-making process incorporates these uncertainties (see 2018 S-MAP, rows 29 and 30)
- Two or more potential mitigation initiatives for each risk selected from the risk prioritization from Section 7.1.3, including the following information:
    - The initiatives and activities
    - Expected risk reduction and impact on individual risk components
    - Estimated implementation costs
    - Relevant uncertainties

[18] Annual information included in this section should align with Table 11 from the QDRs.

[19] See https://apps.cpuc.ca.gov/apex/f?p=401:56:0::NO:RP,57,RIR:P5_PROCEEDING_SELECT:R2007013

  - Implementation schedule
- How the electrical corporation uses multi-attribute value functions (MAVFs) and/or other specific risk factors (as identified in updates to S-MAP) in evaluating different mitigations

7.1.4.2 Potential Mitigation Initiative Evaluation and Selection

After identifying and characterizing the mitigation options, the electrical corporation must analyze the options to determine which will reduce risk the most, given identified limitations and constraints. To the greatest extent practicable, the electrical corporation must make these determinations using its existing framework of project prioritization and selection.

The overall objective is to define an optimal solution. This is an integrated portfolio of mitigations that provide the greatest benefits for a complex set of identified performance objectives. In addition to the quantified risk assessment results in Section 6, these can include additional performance objectives deemed of value by the electrical corporation and broader stakeholder groups (e.g., environmental protection, public perception, resilience, cost). At a minimum, the electrical corporation must do the following:

- Review the potential mitigation initiatives developed. This evaluation yields a prioritized (ranked) list of initiatives. The objective is for the electrical corporation to identify the preferable initiative for that specific area. (See 2018 S-MAP, rows 12, 26, and 29.)
- Select the mitigation initiatives across all risk areas identified for deployment. The outcome is a portfolio of projects expected to provide maximal benefits and meet the identified constraints (e.g., overall budget for mitigations across the electrical corporation). (See 2018 S-MAP, rows 12, 26, and 29.)

This process is expected to be iterative due to the complex interrelationships and the oftentimes competing nature of various performance objectives. For example, a combination of mitigation initiatives could result in a higher overall risk mitigation more quickly than a single slow-to-implement mitigation initiative.

The electrical corporation must describe its processes and procedures used to evaluate and select mitigation initiatives to reduce both wildfire and PSPS risk. This discussion must include the following:

- High-level schematic showing the process, procedures, and evaluation criteria used to review potential mitigation initiatives. At a minimum, the schematic must demonstrate the roles of quantitative risk assessment, resource allocation, evaluation of other performance objectives (e.g., cost, timing) identified by the electrical corporation, and subject matter expert (SME) judgement. Where specific local factors, which vary across the service territory, are considered in the decision-process (e.g., the primary risk driver in a region is legacy equipment), they must be indicated in the schematic. The detail must be sufficiently specific to understand why those local conditions are part of the decision process (i.e., there should not be simply one box in the schematic that is labeled "local conditions" which is then connected to the rest of the process).

- Summary description (no more than five pages) of the process, procedures, and evaluation criteria for reviewing and approving selected mitigation initiatives.

7.1.4.3 Mitigation Initiative Scheduling Process

The electrical corporation must report on its integrated schedule to implement the identified portfolio of mitigations. The electrical corporation must describe its preliminary schedules for each initiative and its iterative processes to modify the identified mitigation initiatives (Section 7.1.4.1).

All electrical corporations have programs, processes, and procedures to manage projects. These include development of applicable metrics to monitor progress and management controls to ensure effective execution and to take corrective actions if necessary. The electrical corporation must conduct mitigation initiatives using these approved mechanisms.

Mitigation initiatives may require several years to implement. For example, relocating transmission or distribution capabilities from overhead to underground may require substantial time and resources. Since mitigation initiatives are undertaken in high-risk regions, the electrical corporation may need interim strategies to mitigate risk while working to implement long-term strategies. Some example interim strategies include more frequent inspections, fire detection and monitoring activities, and PSPS usage. If the electrical corporation's selected mitigation requires substantial time to implement, the electrical corporation must identify and deploy interim mitigation initiatives as described in Section 7.2.4.

In its WMP submission, the electrical corporation must provide a summary description of the processes and procedures to develop and deploy mitigation initiatives. This discussion must include the following:

- Processes and procedures to schedule deployment of selected mitigations.

- Processes and procedures to evaluate the need for interim strategies and the development and deployment of these strategies (see Section 7.2.4) until permanent mitigations are implemented.
- Project management controls to verify the electrical corporation is on target to meet approved schedules and budgets. These should include strategies and metrics to monitor progress and detect/address any discrepancies.
- Project management controls to confirm the effectiveness of mitigation initiatives (e.g., tracking the number of protective equipment and device settings de-energizations that had the potential to ignite a wildfire due to observed damage/contact prior to re-energization). The mitigation sections of these Guidelines (Sections 6–11) include specific requirements for each mitigation initiative.

7.2 Wildfire Mitigation Strategy

Each electrical corporation must provide an overview of its proposed wildfire mitigation strategies based on the evaluation process identified in Section 7.1.

7.2.1 Overview of Mitigation Initiatives

The electrical corporation must provide a high-level summary of the portfolio of mitigation initiatives across its service territory.[20] The electrical corporation must present this overview geospatially in a map or series of maps including the following information:

- Geospatial area(s) where mitigation will be deployed
- Level(s) at which mitigation will be deployed
- Brief description of the scope of mitigation

In addition, the electrical corporation must describe the reasoning for the proposed portfolio of mitigation initiatives and why it did not select other potential mitigation initiatives.

7.2.2 Anticipated Risk Reduction

In this section, the electrical corporation must present the expected risk reduction for each mitigation and the schedule on which it plans to implement the mitigation initiatives.

[20] Annual information included in this section should align with Table 11 from the QDRs.

The electrical corporation must provide:

- Projected risk reduction over the three-year WMP cycle
- Timeline for implementation
- Projected risk reduction beyond three years

The following subsections expand on these requirements.

7.2.2.1 Projected Risk Reduction over Three-Year WMP Cycle

The objective of the service area risk reduction summary is to provide an integrated view of wildfire risk reduction across the electrical corporation service territory. The electrical corporation must provide the following information:

- Map of geospatial mitigation implementations over the three-year WMP cycle
- Tabular summary of numeric risk reduction for each high-risk circuit, showing risk levels before and after mitigation. This must include the same circuits presented in Section 6.4.2. The table must include the following information for each circuit:
    - Circuit ID – Unique identifier for the circuit
    - Annual risk score – Numerical value for the risk at the start of each year in the WMP cycle and at the end of the cycle
    - Annual mitigation initiatives – Mitigation initiatives the electrical corporation plans to apply to the circuit in each year of the WMP cycle. Initiatives must be summarized according to the planned date to be implemented in accordance with Table 7-2.

The map(s) must be provided in Appendix B. In addition, data layers related to the WMP strategy must be provided in accordance with the Energy Safety Data Guidelines.

An exemplar table showing the anticipated risk reduction is provided in Table 7-2. The electrical corporation must also calculate the "x% risk impact" for each mitigation initiative from 2023–2025. The x% risk impact is the percentage risk reduction identified in Table 7-2 for a specific mitigation initiative. For example:

For the protective devices and sensitivity setting initiative, the risk in Jan. 1, 2023 is:

$$(9.2 \times 10^{-2}) + (8.7 \times 10^{-2}) + (8.0 \times 10^{-2}) = 2.59 \times 10^{-1}$$

For the protective devices and sensitivity settings initiative, the risk after the first year of mitigations (i.e., in Jan. 1, 2024) is:

$$(4.6 \times 10^{-2}) + (4.3 \ \times 10^{-2}) + (4.0 \ \times 10^{-2}) = 1.29 \ \times 10^{-1}$$

The x% risk impact for the protective devices and sensitivity settings initiative is:

$$\frac{\text{risk before} - \text{risk after}}{\text{risk before}} \times 100$$

$$\frac{2.59 \ \times 10^{-1} - 1.29 \ \times 10^{-1}}{2.59 \ \times 10^{-1}} \times 100 = 50\%$$

The “x% risk impact” numbers must be reported for each mitigation initiative in the specific mitigation initiative sections of Section 8.

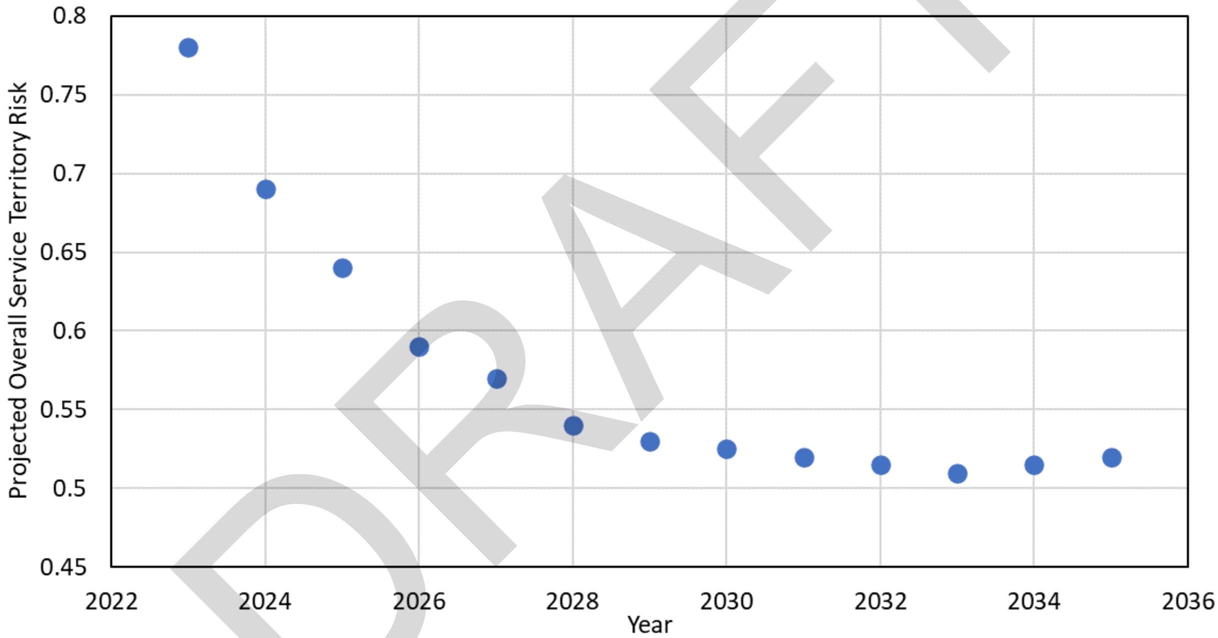
Table 7-2. Summary of Risk Reduction for Top-Risk Circuits

Circuit ID	Jan. 1, 2023 Overall Risk	Jan. 1, 2023 – Dec. 31, 2023 Mitigation Initiatives	Jan. 1, 2024 Overall Risk	Jan. 1, 2024 – Dec. 31, 2024 Mitigation Initiatives	Jan. 1, 2025 Overall Risk	Jan. 1, 2025 – Dec. 31, 2025 Mitigation Initiatives	Jan. 1, 2026 Overall Risk
ID001	1.1x10E-3	Undergrounding	0	-	0	-	0
ID002	9.5x10E-2	Undergrounding	0	-	0	-	0
ID003	9.2x10E-2	Protective devices and sensitivity settings	4.6x10E-2	-	4.7x10E-2	Undergrounding	0
ID004	8.7x10E-2	Protective devices and sensitivity settings	4.3x10E-2	-	4.7x10E-2	Undergrounding	0
ID005	8.0x10E-2	Protective devices and sensitivity settings	4.0x10E-2	Covered conductor installation	2.0x10E-2	-	2.0x10E-2
ID006	7.5x10E-2	Vegetation management	3.5x10E-2	-	3.5x10E-2	-	3.5x10E-2

7.2.2.2 Projected Risk Reduction Beyond Three Years

In this section, the electrical corporation must provide a figure showing the overall risk in its service territory as a function of time, assuming the electrical corporation meets the planned timeline for implementing the mitigations. This figure must show how the electrical corporation is meeting its risk reduction targets, defined in Section 7.1.3, within this timeline. The figure is expected to cover at least 10 years. If the electrical corporation proposes risk reduction strategies for a duration longer than ten years, this figure must show that corresponding time frame. An exemplar figure of the long-term changes in risk are shown in Figure 7-2.

Figure 7-2. Exemplar projected overall service territory risk.



7.2.3 Summary of Mitigation Initiatives and Activities

The electrical corporation must provide a detailed implementation strategy for each mitigation initiative selected in accordance with the risk-informed process discussed in Section 7.1 and included in the electrical corporation's wildfire mitigation strategy. The specific mitigations must be developed to reduce risk in the individual areas addressed in Sections 6–11 of these Guidelines. The primary purpose of this section is to provide enough detail on the implementation plan for the public, intervenors, and Energy Safety to evaluate its sufficiency in reducing wildfire and PSPS risk. This plan must include projects that the electrical corporation plans to complete over the three-year WMP cycle.

For each mitigation initiative, the electrical corporation must provide the following:

- High-level overview of the mitigation initiative
- Implementation plan, including schedule and monitoring of progress
- Documentation of the need for and selection of interim strategies (see Section 7.2.4)

Table 7-3 provides an exemplar summary list of mitigation initiatives.

Table 7-3. Exemplar List and Description of Electrical Corporation-Specific WMP Mitigation Initiatives for 3-year and 10-year Outlooks

WMP Category	Within 3 Years	Within 10 Years	Location in WMP
Grid design, operations, and maintenance	• Continue overhead fire-hardening infrastructure programs • Increase scope of strategic undergrounding • Install advanced protection capabilities • Continue to use special work procedures during high-risk conditions • Refresh, replace, and update software for all mobile devices	• Increase granularity in prioritizing initiatives across the grid • Incorporate strategic grid design and localization that includes microgrid solutions and location of lines away from highest-risk areas • Increase redundancy for grid topology and increase sectionalizing capabilities • Enhance protocols for grid operations and better understanding of associated wildfire risk • Enhance training, tools, and policies to prevent and suppress ignitions related to grid activities	Section 8.1
Vegetation management	• Continue development of the inventory tree database • Continue to implement the vegetation management work plan with enhanced clearances in high-risk areas (going beyond regulatory requirements) • Continue fuels management program	• Increase granularity in vegetation database • Enhance modeling capabilities to better predict vegetation growth patterns and probability of failure • Optimize vegetation inspection cycles based on risk mitigation efficacy • Develop more robust processes, training, and technologies to monitor and validate work performed	Section 8.2
Situational awareness and forecasting	• Integrate weather data into National Meteorological Service for more automated, real-time operational decision making • Enhance fault detection via wireless fault indicators • Modernize and expand the weather station network • Establish tuition reimbursement program for employees to prepare a workforce trained to deal with the evolving needs associated with wildland fire management and with climate change as it relates to power electrical corporations	• Increase scope of reliable weather data and improve processes for validating readings • Create 1-km resolution of weather data across the grid • Develop new artificial intelligence models for weather forecasts • Increase use of external weather data	Section 8.3
Emergency preparedness	• Modernize and enhance workforce training in storm response, process, and documentation • Enhance community outreach by incorporating effectiveness outreach survey feedback, expanding tribal and AFN	• Increase granularity and customization of response plans • Enhance customer communication and ability to reach vulnerable populations during emergencies	Section 8.4

WMP Category	Within 3 Years	Within 10 Years	Location in WMP
	campaigns, and enhancing partnerships with Indian Councils, community-based organizations, and local school districts • Participate in and support mutual assistance programs	• Establish more formalized review of procedures, benchmarking, and stakeholder engagement	
Community outreach and engagement	• Continue community outreach and public awareness efforts with year-round wildfire safety education and communication campaign • Assess and resolve any customer support and communications gaps identified through AFN stakeholders • Enhance communication channels and use technology to increase accessibility	• Establish more formalized process of learning from peers in and outside the state • Establish more successful engagement with communities • Establish broader engagement and deeper planning with emergency and non-emergency planning agencies	Section 8.5
PSPS	• Expand generator grant program to mitigate PSPS impacts • Install PSPS sectionalizing enhancements	• Eliminate use of PSPS • Enhance prediction, communication, and mitigation of PSPS consequences • Leverage academic partnerships to analyze risk factors and incorporate into PSPS protocols	Section 9

7.2.4 Interim Mitigation Strategies

As indicated in Section 7.1.4.3, for each mitigation that will require greater than one year to implement, the electrical corporation must assess the potential need for interim mitigation strategies to reduce risk until the primary/permanent mitigation is in place. If the electrical corporation determines that an interim strategy is necessary, it must also develop and implement that strategy, as appropriate.

The electrical corporation must provide a description of the following in this section of the WMP:

- The electrical corporation's processes and procedures for evaluating the need for interim risk reduction
- The electrical corporation's processes and procedures for determining which interim mitigation(s) to implement
- The electrical corporation's characterization of each interim risk management/reduction action and evaluation of its specific capabilities to reduce risks, including:
  - Potential consequences of risk event(s) addressed by the improvement/mitigation
  - Frequency of occurrence of the risk event(s) addressed by the improvement/mitigation

Each interim strategy planned by the electrical corporation for implementation on high-risk circuits must be listed as a mitigation initiative in Table 7-3. In addition, interim strategies must be discussed in the relevant mitigation initiative sections of the WMP and included in the related target tables.

8. Wildfire Mitigations

8.1 Grid Design, Operations, and Maintenance

8.1.1 Overview

In this section, the electrical corporation must identify objectives for the next 3- and 10-year periods, targets, and performance metrics related to the following grid design, operations, and maintenance programmatic areas:

- Grid design and system hardening
- Asset management and inspections
- Distribution inspection
- Transmission inspections
- Substation inspections
- Equipment inspections, maintenance, and repair
- Asset management and inspection enterprise system(s)
- Quality assurance / quality control
- Open work orders
- Grid operations and procedures
- Workforce planning

8.1.1.1 Objectives

Each electrical corporation must summarize the objectives for its 3-year and 10-year plans for implementing and improving its grid design, operations, and maintenance.[21] These summaries must include the following:

- Identification of which initiative(s) in the WMP the electrical corporation is implementing to achieve the stated objective, including Utility Initiative Tracking IDs

[21] Annual information included in this section must align with the QDR data

- Reference(s) to applicable codes, standards, and best practices/guidelines and an indication of whether the electrical corporation exceeds an applicable code, standard, or regulation
- Method of verifying achievement of each objective
- A completion date for when the electrical corporation will achieve the objective
- Reference(s) to the WMP section(s) or appendix, including page numbers, where the details of the objective(s) are documented and substantiated

This information must be provided in Table 8-1 for the 3-year plan and Table 8-2 for the 10-year plan. Exemplars of the minimum acceptable level of information are provided below.

Table 8-1. Exemplar Grid Design, Operations, and Maintenance Objectives (3-year plan)

Objectives for Three Years **(2023–2025)**	**Applicable Initiative(s), Tracking ID(s)**	**Applicable Regulations, Codes, Standards, and Best Practices (See Note)**	**Method of Verification (i.e., program)**	**Completion Date**	**Reference (section & page #)**
Update asset inspection protocols to include assessment of covered conductor condition	Distribution inspections - detailed, AI-1	GO 95, Detailed Distribution Inspection Protocol (Doc # XXXXX, version N)	Revised/ new version of protocol	February 2024	

Note: An asterisk indicates that the electrical corporation exceeds a particular code, regulation, standard, or best practice. The electrical corporation must provide a reference to the appendix section and page providing further documentation, justification, and substantiation.

Table 8-2. Exemplar Grid Design, Operations, and Maintenance Objectives (10-year plan)

Objectives for Ten Years **(2026–2032)**	**Applicable Initiative(s), Tracking ID(s)**	**Applicable Regulations, Codes, Standards, and Best Practices (See Note)**	**Method of Verification (i.e., program)**	**Completion Date**	**Reference (section & page #)**
Enable early fault detection capabilities for all circuits in HFTD areas	Grid operations- fault detection (GO-1)	IEEE 37.230	A listing of all circuits in HFTD areas, all early fault detection devices installed on each circuit, and installation dates	Conduct a pilot for completion by end of 2023; with buildout on all HFTD circuits by the end of 2028	

Note: An asterisk indicates that the electrical corporation exceeds a particular code, regulation, standard, or best practice. The electrical corporation must provide a reference to the appendix section and page providing further documentation, justification, and substantiation.

8.1.1.2 Targets

Initiative targets are quantifiable measurements of activities identified in the WMP. Electrical corporations will show progress towards completing targets in subsequent reports, including QDRs and WMP Updates.

The electrical corporation must list all targets it will use to track progress on its grid design, operations, and maintenance for the next three years (2023–2025). Energy Safety's Compliance Assurance Division and third parties must be able to track and audit each target.[22] For each initiative target, the electrical corporation must provide the following:

- Utility Initiative Tracking IDs
- Projected targets for the three years of the Base WMP and relevant units
- Quarterly, rolling targets for end of 2023 and 2024 (inspections only)
- For 2023–2025, the "x% risk impact." The x% risk impact is the percentage risk reduction identified in Table 7-2 for a specific mitigation initiative (see Section 7.2.2.1 for calculation instructions)
- Method of verifying target completion

Identified targets must be of enough detail and scope to effectively inform the performance of the electrical corporation's grid design, operations, and maintenance initiatives.

An exemplar of the minimum acceptable level of information is provided in Table 8-3 and Table 8-4 below.

[22] Annual information included in this section must align with Table 1 of the QDR.

Table 8-3. Exemplar Grid Design, Operations, and Maintenance Targets by Year

Initiative Activity	Tracking ID	2023 Target & Unit	x% Risk Impact 2023	2024 Target & Unit	x% Risk Impact 2024	2025 Target & Unit	x% Risk Impact 2025	Method of Verification
Expulsion fuse replacement	GH-1	500 Fuses Replaced	20%	600 Fuses Replaced	20%	700 Fuses Replaced	20%	Completed work orders/ GIS Data Submission(s)

Table 8-4. Exemplar Asset Inspections Targets by Year

Initiative Activity	Tracking ID	Target End of Q2 2023 & Unit	Target End of Q3 2023 & Unit	End of Year Target 2023 & Unit	x% Risk Impact 2023	Target End of Q2 2024 & Unit	Target End of Q3 2024 & Unit	End of Year Target 2024 & Unit	x% Risk Impact 2024	Target 2025 & Unit	x% Risk Impact 2025	Method of Verification
Discretionary patrols in HFTD	AI-02	300 circuit miles	500 circuit miles	700 circuit miles	3%	300 circuit miles inspected	500 circuit miles inspected	700 circuit miles inspected	3%	700 circuit miles inspected	3%	Work management system

8.1.1.3 Performance Metrics

Each electrical corporation must list and describe the performance metrics it uses to evaluate:

- The effectiveness of its grid design, operations, and maintenance in reducing wildfire and PSPS risk
- The electrical corporation's performance on those metrics since 2020 (if previously collected)
- Projected performance on metrics for 2023-2025
- How the metrics can be verified

Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of grid design, operations, and maintenance initiatives.[23]

The electrical corporation must:

- Graph the reported metric(s)
- Summarize reported metric(s) in tabular form
- Provide graphs necessary to show trends for the performance metrics and leading indicators (See exemplar in Section 8.2.1.3.)
- Provide a brief narrative that explains its trends

Table 8-5 provides an exemplar of the minimum acceptable level of information.

[23] If a utility-identified metric/leading indicator in this section aligns with required annualized metrics/indicators provided in the QDRs, the reporting between this section and the QDR must be consistent. Where utility-defined metrics/indicators identified in this section are not prescribed in the QDRs, the electrical corporation must report those metrics/indicators in Table 3 of the QDR.

Table 8-5. Exemplar Grid Design, Operations, and Maintenance Performance Metrics Results by Year

Performance Metrics	2020	2021	2022	2023 Projected	2024 Projected	2025 Projected	Method of Verification (e.g., third-party evaluation, QDR)
Equipment-caused ignitions							
Equipment-caused outages							
Grid inspection findings							
Open asset tags							

8.1.2 Grid Design and System Hardening

In this section the electrical corporation must discuss how it is designing its system to reduce ignition risk and what it is doing to strengthen its distribution, transmission, and substation infrastructure to prevent utility-related ignitions resulting in catastrophic wildfires.

The electrical corporation is required, at a minimum, to discuss grid design and system hardening for each of the following mitigation initiatives:

1. Covered conductor installation
2. Undergrounding of electric lines and/or equipment
3. Traditional overhead hardening
4. Line removal (in HFTD)
5. Distribution pole replacements and reinforcements
6. Transmission pole/tower replacements and reinforcements
7. Microgrids
8. Other grid topology improvements to minimize risk of ignitions
9. Other grid topology improvements to mitigate or reduce PSPS events
10. Installation of system automation equipment
11. Other grid hardening technology installations and pilot progress
12. Other technologies and systems not listed above

Through the process defined in Section 7.1, a set of mitigation initiatives is selected and documented in Section 7.2.3. For each mitigation initiative identified, the electrical corporation must provide a narrative of the following information in Sections 8.1.2.1 through 8.1.2.12:

- Utility Initiative Tracking ID
- Overview of initiative- Brief description of the initiative including the objective of and risk targeted by the initiative. Additionally, identify whether the initiative a program, project, or pilot/study.
- Impact of initiative on wildfire risk
- Impact of initiative on PSPS risk
- Updates to initiative- Changes to the initiative since the last WMP submission and a brief explanation as the why those change were made. Discuss any planned improvements or updates to the activity and timeline for implementation.

8.1.3 Asset Inspections

In this section, the electrical corporation must provide an overview of its processes and procedures for inspecting it assets.

Firstly, the electrical corporation must summarize details regarding the inspection process in Table 8-6. The table must include the following:

- **Type of inspection** – i.e., distribution, transmission, or substation
- **Inspection program name** – Identify various inspection programs within the electrical corporation
- **Frequency or trigger** – Identify the frequency or triggers, such as inputs from the risk model. Indicate differences in frequency or trigger by HTFD Tier, if applicable
- **Method of inspection** – Identify the methods used to perform the inspection (e.g., patrol, detailed, aerial, climbing, and LiDAR)
- **Governing standards and operating procedures** – Identify the regulatory requirements and the electrical corporation's procedures/processes

Table 8-6. Exemplar Vegetation Management Inspection Frequency, Method, and Criteria

Type	Inspection Program	Frequency or Trigger (Note 1)	Method of Inspection (Note 2)	Governing Standards & Operating Procedures
Transmission				
Distribution				
Substation				

Note 1: The electrical corporation must provide electrical corporation-specific risk-informed triggers used for vegetation management. If necessary, it should provide additional details in Appendix B.

Note 2: The electrical corporation must provide electrical corporation-specific definitions of the different methods of inspection. If necessary, it should provide additional details in Appendix B.

The electrical corporation must then provide a narrative overview of each asset inspection program identified in the above table in Sections 8.1.3.1 through 8.1.3.## (i.e., each asset inspection program is detailed in its own section) and include the following:

8.1.3.1 Asset Inspection

Process

In this section, the electrical corporation must provide an overview of the individual asset inspection and inspection criteria. Include the various methods of inspection conducted for each inspection program.

Include relevant visuals and graphics that depicts the workflow and decision process the electrical corporation uses for the inspection program (see example Figure 8-1).

Frequency or trigger

In this section, the electrical corporation must define and identify the frequency (including how frequency may differ by HFTD or other risk designation[s]) or triggers of the inspection program, such as inputs from the risk model.

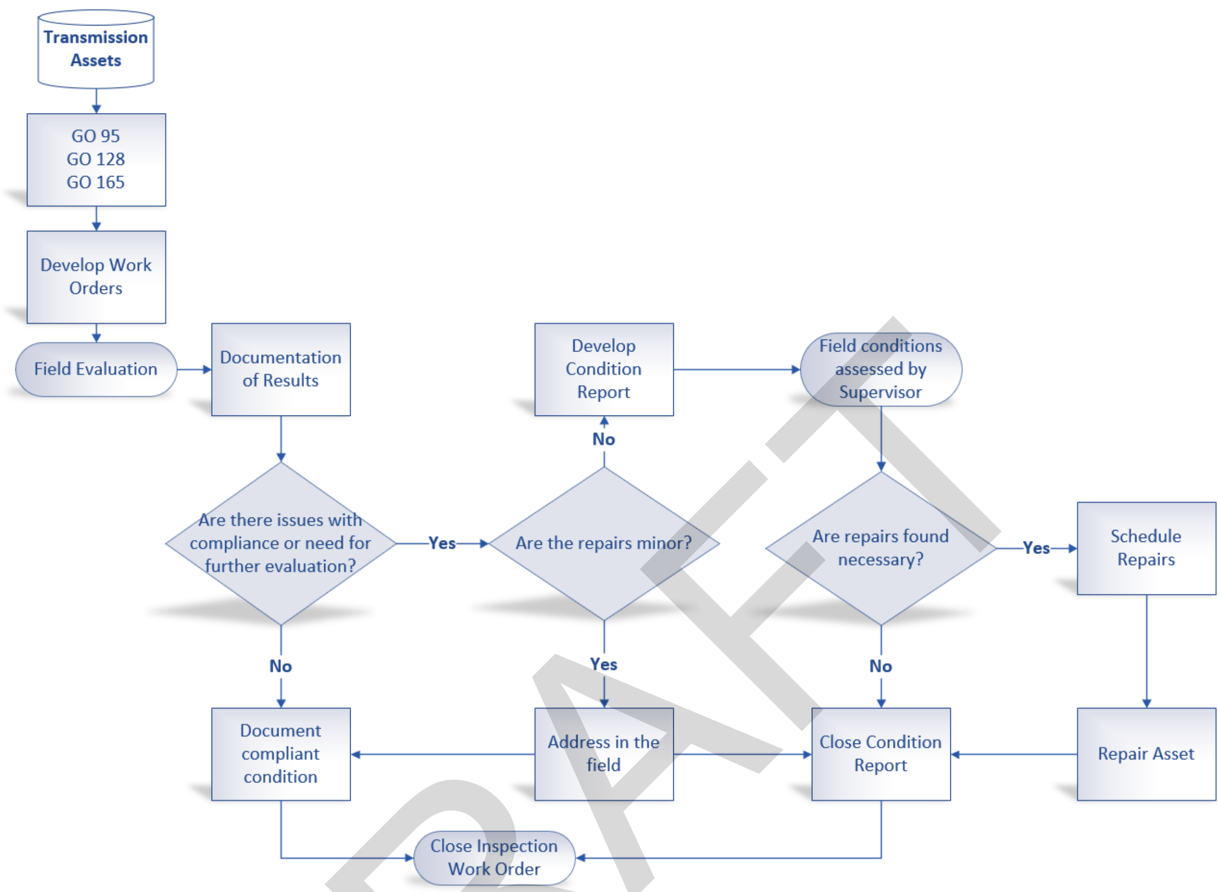
If the inspection program is schedule based, the electrical corporation must explain how it uses risk prioritization in the scheduling of the inspection program to target high-risk areas. If the electrical corporation does not use risk prioritization in the scheduling of the inspection program, it must explain why.

Accomplishments, roadblocks, and updates

In this section, the electrical corporation must discuss:

- Noteworthy accomplishments for the inspection program since the last WMP
- Roadblocks the electrical corporation has encountered while implementing the inspection program and how the electrical corporation has addressed the roadblock
- Changes/updates to inspection program since the last WMP Including known future plans (beyond the current year) and new/novel strategies the electrical corporation may implement in the next 5 years (e.g., references to and strategies from pilot projects and research)

Figure 8-1. Exemplar of Asset Management and Inspections Workflow



8.1.4 Equipment Maintenance and Repair

In this section, in addition to the information described above regarding distribution, transmission, and substation inspections, the electrical corporation must provide a brief narrative of maintenance programs. As a narrative, the electrical corporation must include its strategy for maintenance, such as whether the electrical corporation replaces or upgrades facilities/equipment proactively (for example, a electrical corporation may monitor dissolved gases in its transformers to detect potential transformer failures to alert engineering and maintenance personnel or component lifecycle management) or if it runs its facilities/equipment to failure. The narrative must include, at minimum, the following types of equipment:

- Capacitors
- Circuit breakers
- Connectors, including hotline clamps

- Conductor, including covered conductor
- Fuses, including expulsion fuses
- Distribution poles
- Lightning arrestors
- Reclosers
- Splices
- Transmission poles/towers
- Transformers
- Other equipment not listed

8.1.5 Asset Management and Inspection Enterprise System(s)

In this section, the electrical corporation must provide an overview of Inputs, operation, and support for centralized asset management and inspection enterprise system(s) updated based upon inspection results and activities such as hardening, maintenance, and remedial work. This overview must include discussion of:

- The electrical corporation's asset inventory and condition database
- Describe the utilities internal documentation of its database(s)
- Integration with systems in other lines of business
- Integration with the auditing system(s) (see QA/QC section below)
- Describe internal processes for updating enterprise system including database(s) and any planned updates
- Any changes to the initiative since the last WMP submission and a brief explanation as the why those changes were made. Include any planned improvements or updates to the initiative and timeline for implementation

8.1.6 Quality Assurance / Quality Control (QA/QC)

In this section, the electrical corporation must provide an overview of its QA/QC activities for asset management by inspection program. This overview must include:

- Reference to procedure/program documenting QA/QC activities. The electrical corporation must provide a summary of the procedures/processes in Appendix B or provide a copy in the supporting documents location

- How the sample sizes are determined and how the electrical corporation ensures the samples are representative
- Qualifications of the auditors
- Documentation of findings and process to incorporate the lessons learned from those findings into training and/or procedures
- Any changes to the initiative since the last WMP submission and a brief explanation as the why those changes were made. Include any planned improvements or updates to the initiative and timeline for implementation
- Tabular information (Table 8-7 is an exemplar of the appropriate level of detail) that includes:
  - Sample sizes
  - Type of QA/QC performed (e.g., desktop or field)
  - Resulting pass rates, starting in 2022
  - Yearly target pass rate for the 2023-2025 Base WMP cycle

Table 8-7. Grid Design and Maintenance QA/QC Program

Inspection Type	Sample Size	Type of Audit	Audit Results 2022	Yearly Target Pass Rate for 2023-2025
• Patrol – compliance driven	• 100% in HFTD Tier 2 and 3	Field	92%	95%

8.1.7 Open Work Orders

In this section, the electrical corporation must provide an overview of the process it uses to manage its open work orders. This overview must include a brief narrative that provides:

- Reference to procedures/programs documenting the work order process. The electrical corporation must provide a summary of these procedures/processes in Appendix B or provide a copy in the supporting documents location on its website.
- Process for prioritization of work orders based on risk

- Process for eliminating a backlog of work orders (i.e., open work orders that have passed remediation deadlines), if applicable
- A discussion of trends with respect to open work orders

In addition, each electrical corporation must graph open work orders over time as reported in the QDRs.

8.1.8 Grid Operations and Procedures

8.1.8.1 Equipment Settings to Reduce Wildfire Risk

In this section, the electrical corporation must discuss the ways in which operates its system to reduce wildfire risk. The equipment settings discussion must include the following:

- Protective equipment and device settings
- Automatic recloser settings
- Settings of other emerging technologies (e.g., Rapid Earth Fault Current Limiters)

For each of the above, the electrical corporation must provide a narrative on the following:

- Settings to reduce wildfire risk
- Analysis of reliability/safety impacts for settings the electrical corporation uses
- Criteria for when the electrical corporation enables the settings
- The number of circuit miles capable of these settings
- An estimate of the effectiveness of the settings
- The electrical corporation's operations procedures for response to off-normal events

8.1.8.2 Grid Response Procedures and Notifications

The electrical corporation must provide a narrative on operational procedures it uses to respond to faults, ignitions, or other issues detected on its grid that may result in a wildfire induing, at a minimum, how it:

- Locates the issues detected
- Prioritize issues detected
- Notifies relevant personnel and suppression resources to respond to issues detected
- Minimizes/optimizes response times to issues detected

8.1.8.3 Personnel Work Procedures and Training in Conditions of Elevated Fire Risk

The electrical corporation must provide a narrative on the following:

- The electrical corporation's procedures that designate what type of work the electrical corporation allows (or does not allow) personnel to perform during operating conditions of different levels of wildfire risk, including:
  - What the electrical corporation allows (or does not allow) during each level of risk
  - How the electrical corporation defines each level of wildfire risk
  - How the electrical corporation trains its personnel on those procedures
  - How it notifies personnel when conditions change, warranting implementation of those procedures
- The electrical corporation's procedures regarding deployment of firefighting staff and equipment (e.g., fire suppression engines, hoses, water tenders, etc.) to construction and/or electrical worksites for site-specific fire prevention and ignition mitigation during on-site work

8.1.9 Workforce Planning

In this section, the electrical corporation must report on qualifications and training practices regarding wildfire and PSPS mitigation for workers in the following target roles:

- Asset inspections
- Grid hardening
- Risk event inspection

For each of the target roles listed above, the electrical corporation must:

- List all worker titles relevant to the target role.
- 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:
  - Going beyond a basic knowledge of GO 95 requirements to perform relevant types of inspections or activities

    - Being a "Qualified Electrical Worker" (QEW); if so, define what certifications, qualifications, experience, etc. are required to be a QEW for the target role for the electrical corporation
- Report the percentage of electrical corporation and contractor full-time employees (FTEs) in the target role, with specific job titles
- Report plans to improve qualifications of workers relevant to wildfire and PSPS mitigation. The electrical corporation must explain how it is developing more robust training programs which would teach electrical workers to identify hazards that could ignite wildfires

Table 8-8, Table 8-9, and Table 8-10 are exemplars of the required information. The electrical corporation must provide details regarding training and qualifications in Appendix B as necessary.

Table 8-8. Workforce Planning, Asset Inspections

Worker Title	Minimum Qualifications for Target Role	Special Certification Requirements	Electrical Corporation % FTE Min Quals	Electrical Corporation % Special Certifications	Contractor % FTE Min Quals	Contractor % Special Certifications	Reference to Electrical Corporation Training/Qualification Programs
Transmission Lineman	• Journeyman Lineman having completed an accredited apprenticeship program • IBEW Journeyman Lineman status in good standing • Class A California driver's license	• QEW, Overhead and/or Underground Inspection Training	x%	x%	x%	x%	
Thermographer	• Part 107 drone license or must obtain within first year • Level I Infrared Certification or must obtain within first year	• QEW or Electrician	x%	x%	x%	x%	

Table 8-9. Workforce Planning, Grid Hardening

Worker Title	Minimum Qualifications for Target Role	Special Certification Requirements	Electrical Corporation % FTE Min Quals	Electrical Corporation % Special Certifications	Contractor % FTE Min Quals	Contractor % Special Certifications	Reference to Electrical Corporation Training/Qualification Programs
Apprentice Lineman	• Nine months' experience as Line Assistant • Valid California driver's license • Must have held previous position for at least nine months	• None	x%	NA	x%	NA	
Electric Troubleshooter	• Complete seven-week Relief Trouble Shooter (RETS) class and pass written and practical exams	• Journeyman Lineman	x%	x%	x%	x%	RETS Training

Table 8-10. Workforce Planning, Risk Event Inspection

Worker Title	Minimum Qualifications for Target Role	Special Certification Requirements	Electrical Corporation % FTE Min Quals	Electrical Corporation % Special Certifications	Contractor % FTE Min Quals	Contractor % Special Certifications	Reference to Electrical Corporation Training/Qualification Programs
Troubleshooter	• Journeyman Lineman who completed an accredited apprenticeship program • IBEW Journeyman Lineman status in good standing • Complete seven-week RETS class and pass the associated written and practical exams	• QEW	x%	x%	x%	x%	RETS Training

8.2 Vegetation Management and Inspection

8.2.1 Overview

In accordance with Public Utilities Code section 8386(c)(9), each electrical corporation's WMP must include plans for vegetation management.

In this section, the electrical corporation must identify objectives for the next 3- and 10-year periods, targets, and performance metrics related to the following vegetation management programmatic areas:

- Vegetation inspections
- Vegetation and fuels management
- Vegetation management enterprise system
- Environmental compliance and permitting
- Quality assurance / quality control
- Open work orders
- Workforce panning

8.2.1.1 Objectives

Each electrical corporation must summarize the objectives for its 3-year and 10-year plans for implementing and improving its vegetation management and inspections.[24] These summaries must include the following:

- Identification of which initiative(s) in the WMP the electrical corporation is implementing to achieve the stated objective, including Utility Initiative Tracking IDs
- Reference(s) to applicable codes, standards, and best practices/guidelines and an indication of whether the electrical corporation exceeds an applicable code, standard, or regulation
- Method of verifying achievement of each objective
- A completion date for when the electrical corporation will achieve the objective

[24] Annual information included in this section must align with the QDR data

- Reference(s) to the WMP section(s) or appendix, including page numbers, where the details of the objective(s) are documented and substantiated

This information must be provided in Table 8-11 for the 3-year plan and Table 8-12 for the 10-year plan. Exemplars of the minimum acceptable level of information are provided below.

Table 8-11. Exemplar Vegetation Management Implementation Objectives (3-year plan)

Objectives for Three Years (2023–2025)	**Applicable Initiative(s), Tracking ID(s)**	**Applicable Regulations, Codes, Standards, and Best Practices (See Note)**	**Method of Verification (i.e., program)**	**Completion Date**	**Reference (section & page #)**
Complete effectiveness of enhanced clearances study	Vegetation Clearances (VM-2)	GO 95, Rule 35, Tree Trimming Guidance	WMP reporting, report from 3rd party project manager	December 2025	

Note: An asterisk indicates that the electrical corporation exceeds a particular code, regulation, standard, or best practice. The electrical corporation must provide a reference to the appendix section and page providing further documentation, justification, and substantiation.

Table 8-12. Exemplar Vegetation Management Implementation Objectives (10-year plan)

Objectives for Ten Years (2026–2032)	**Applicable Initiative(s), Tracking ID(s)**	**Applicable Regulations, Codes, Standards, and Best Practices (See Note)**	**Method of Verification (i.e., program)**	**Completion Date**	**Reference (section & page #)**
Optimize vegetation inspection cycles based on risk mitigation efficacy	All VM inspections (VM-3, VM-4, VM-5)	GO 95, Rule 35, Inspection Protocols for Vegetation in HFTD (Doc # XXXXX, version N)	Revised/updated vegetation inspection protocol with revised inspection schedule to account for risk analysis	2028	

Note: An asterisk indicates that the electrical corporation exceeds a particular code, regulation, standard, or best practice. The electrical corporation must provide a reference to the appendix section and page providing further documentation, justification, and substantiation.

8.2.1.2 Targets

Initiative targets are quantifiable measurements of activities identified in the WMP. Electrical corporations will show progress towards completing targets in subsequent reports, including QDRs and WMP Updates.

The electrical corporation must list all targets it will use to track progress on its vegetation management and inspections for the next three years (2023–2025). Energy Safety's Compliance Assurance Division and third parties must be able to track and audit each target.[25] For each initiative target, the electrical corporation must provide the following:

- Utility Initiative Tracking IDs
- Projected targets for the three years of the Base WMP and relevant units
- Quarterly, rolling targets for end of 2023 and 2024 (inspections only)
- For 2023–2025, the "x% risk impact." The x% risk impact is the percentage risk reduction identified in Table 7-2 for a specific mitigation initiative (see Section 7.2.2.1 for calculation instructions)
- Method of verifying target completion

Identified targets must be of enough detail and scope to effectively inform the performance of the electrical corporation's vegetation management and inspections initiatives.

An exemplar of the minimum acceptable level of information is provided in Table 8-13 and Table 8-14 below.

[25] Annual information included in this section must align with Table 1 of the QDR.

Table 8-13. Exemplar Vegetation Management Initiative Targets by Year

Initiative Activity	Tracking ID	2023 Target & Unit	x% Risk Impact 2023	2024 Target & Unit	x% Risk Impact 2024	2025 Target & Unit	x% Risk Impact 2025	Method of Verification
Fuels management – Pole clearing beyond PRC 4292	VM-08	300 Poles brushed in non-SRA HFTD Tier 3 areas	1%	300 Poles brushed in non-SRA HFTD Tier 3 areas	1.2%	350 Poles brushed in non-SRA HFTD Tier 3 areas	1.2%	Work verification system, completed work orders, yearly internal audit, GIS Data Submission(s)

Table 8-14. Exemplar Vegetation Inspections Targets by Year

Initiative Activity	Tracking ID	Target End of Q2 2023 & Unit	Target End of Q3 2023 & Unit	End of Year Target 2023 & Unit	x% Risk Impact 2023	Target End of Q2 2024 & Unit	Target End of Q3 2024 & Unit	End of Year Target 2024 & Unit	x% Risk Impact 2024	Target 2025 & Unit	x% Risk Impact 2025	Method of Verification
Danger tree inspections	VM-04	100 circuit miles inspected	130 circuit miles inspected	200 circuit miles inspected	3%	90 circuit miles inspected	120 circuit miles inspected	180 circuit miles inspected	2.6%	400 circuit miles inspected	6%	Inspection records, billing receipts, GIS Data Submission(s)

8.2.1.3 Performance Metrics

Each electrical corporation must list and describe the performance metrics it uses to evaluate:

- The effectiveness of its vegetation management and inspections in reducing wildfire and PSPS risk
- The electrical corporation's performance on those metrics since 2020 (if previously collected)
- Projected performance on metrics for 2023-2025
- How the metrics can be verified

Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of vegetation management and inspections.[26]

The electrical corporation must:

- Graph the reported metric(s)
- Summarize reported metric(s) in tabular form
- Provide graphs necessary to show trends for the performance metrics and leading indicators (See exemplar in Section 8.2.1.3.)
- Provide a brief narrative that explains its trends

Figure 8-2 and Table 8-15 provide exemplars of the minimum acceptable level of information. The electrical corporation must provide a brief narrative that explains its trends.

[26] If a utility-identified metric/leading indicator in this section aligns with required annualized metrics/indicators provided in the QDRs, the reporting between this section and the QDR must be consistent. Where utility-defined metrics/indicators identified in this section are not prescribed in the QDRs, the electrical corporation must report those metrics/indicators in Table 3 of the QDR.

Figure 8-2. Vegetation-Caused Ignitions and Outages per 10,000 Overhead Circuit Miles (OH CM) – Large IOUs (2015–2021)

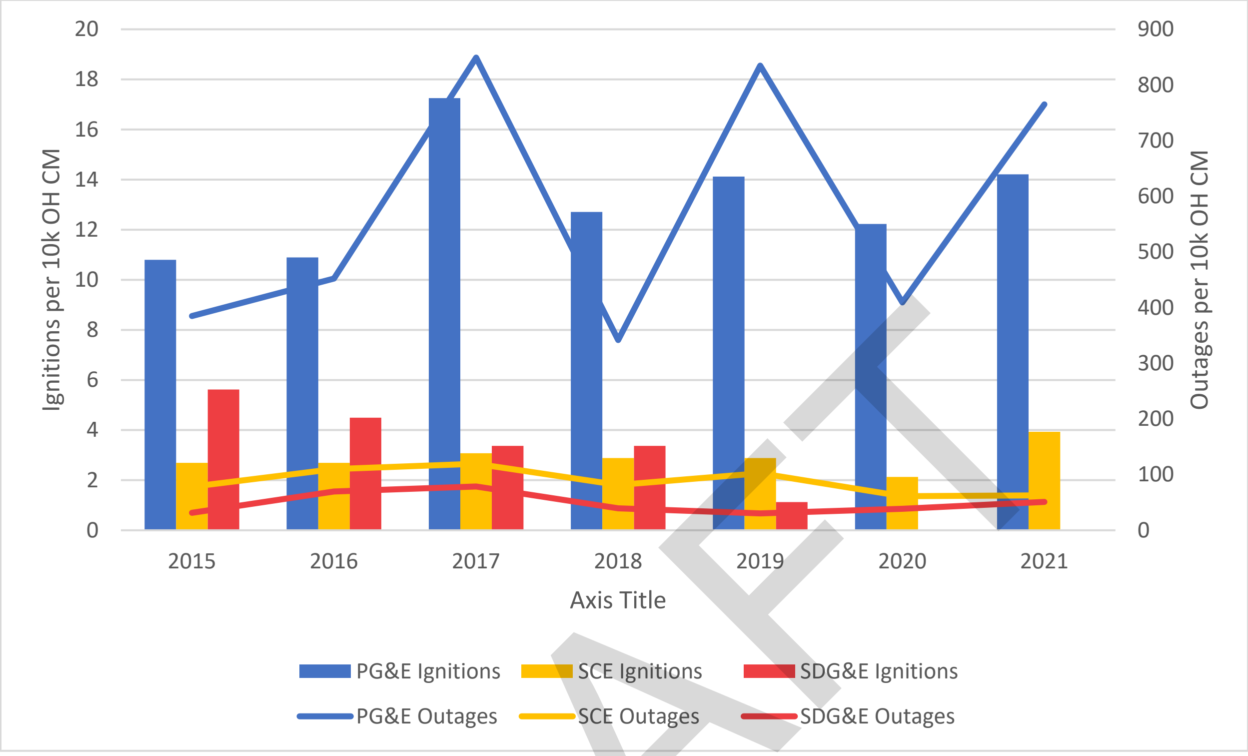


Table 8-15. Exemplar Vegetation Management and Inspection Performance Metrics Results by Year

Performance Metrics	2020	2021	2022	2023 Projected	2024 Projected	2025 Projected	Method of Verification (e.g., third-party evaluation, QDR)
Vegetation-caused ignitions							
Vegetation-caused outages							
Open vegetation work orders							

8.2.2 Vegetation Inspections

In this section, the electrical corporation must provide an overview of its processes and procedures for inspecting vegetation.

Firstly, the electrical corporation must summarize details regarding the inspection process in Table 8-16. The table must include the following:

- **Type of inspection** – i.e., distribution, transmission, or substation
- **Inspection program name** – Identify various inspection programs within the electrical corporation (e.g., routine, enhanced vegetation, high-risk species, and off-cycle)
- **Frequency or trigger** – Identify the frequency or triggers, such as inputs from the risk model. Indicate differences in frequency or trigger by HTFD Tier, if applicable
- **Method of inspection** – Identify the methods used to perform the inspection (e.g., patrol, detailed, sounding or root examination, aerial, and LiDAR)
- **Governing standards and operating procedures** – Identify the regulatory requirements and the electrical corporation's procedures/processes

Table 8-16. Exemplar Vegetation Management Inspection Frequency, Method, and Criteria

Type	Inspection Program	Frequency or Trigger (Note 1)	Method of Inspection (Note 2)	Governing Standards & Operating Procedures
Distribution				
Transmission				
Substation				

Note 1: The electrical corporation must provide electrical corporation-specific risk-informed triggers used for vegetation management. If necessary, it should provide additional details in Appendix B.

Note 2: The electrical corporation must provide electrical corporation-specific definitions of the different methods of inspection. If necessary, it should provide additional details in Appendix B.

The electrical corporation must then provide a narrative overview of each vegetation inspection program identified in the above table in Sections 8.2.2.1 through 8.1.2.## (i.e., each vegetation inspection program is detailed in its own section) and include the following:

8.2.2.1 Vegetation Inspection

Process

In this section, the electrical corporation must provide an overview of the individual vegetation inspection and inspection criteria. Include the various methods of inspection conducted for each inspection program.

Include relevant visuals and graphics that depicts the workflow and decision process the electrical corporation uses for the inspection program (see example Figure 8-3).

Frequency or trigger

In this section, the electrical corporation must define and identify the frequency (including how frequency may differ by HFTD or other risk designation[s]) or triggers of the inspection program, such as inputs from the risk model.

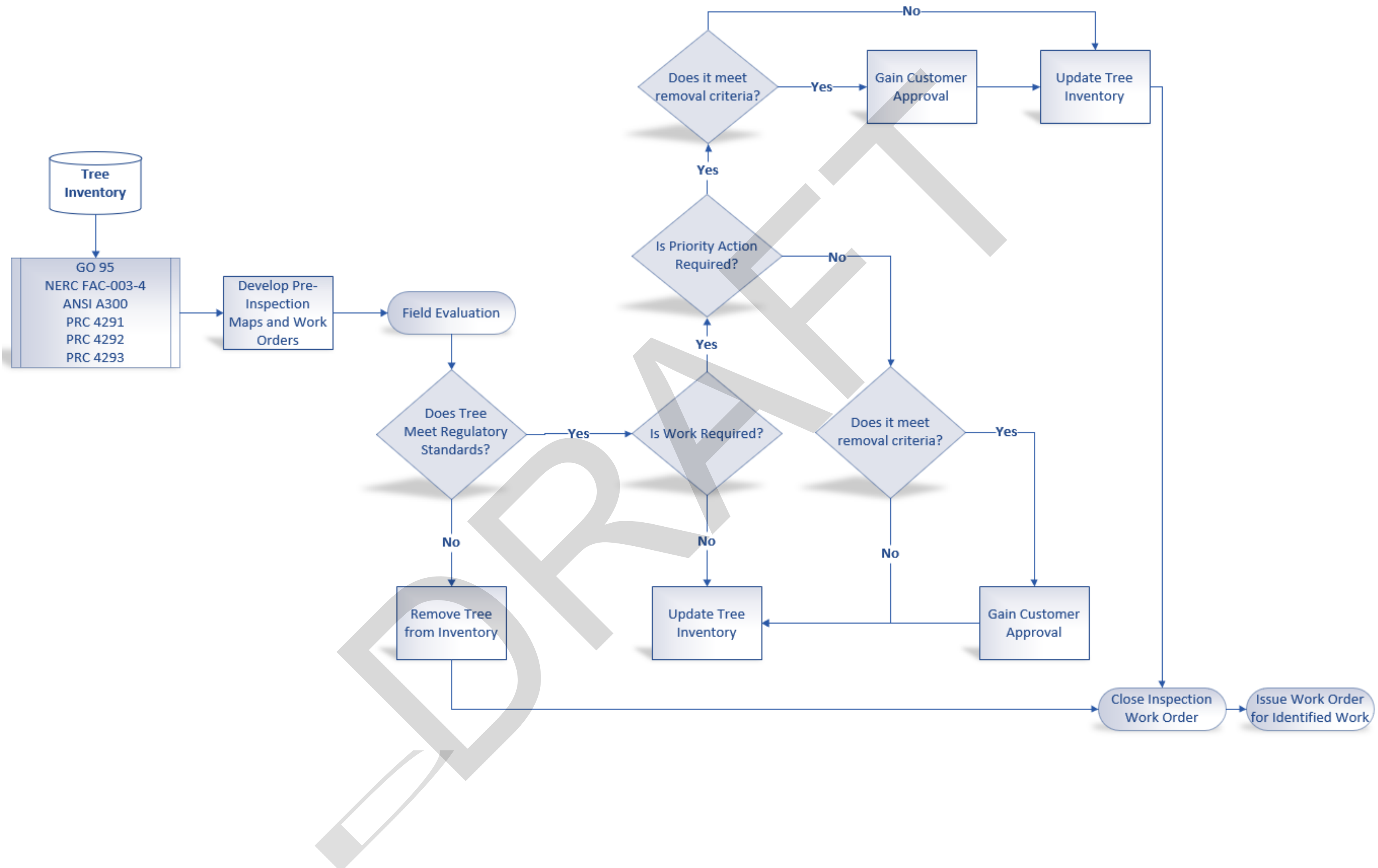
If the inspection program is schedule based, the electrical corporation must explain how it uses risk prioritization in the scheduling of the inspection program to target high-risk areas. If the electrical corporation does not use risk prioritization in the scheduling of the inspection program, it must explain why.

Accomplishments, roadblocks, and updates

In this section, the electrical corporation must discuss:

- Noteworthy accomplishments for the inspection program since the last WMP
- Roadblocks the electrical corporation has encountered while implementing the inspection program and how the electrical corporation has addressed the roadblock
- Changes/updates to inspection program since the last WMP Including known future plans (beyond the current year) and new/novel strategies the electrical corporation may implement in the next 5 years (e.g., references to and strategies from pilot projects and research)

Figure 8-3. Exemplar of Vegetation Management Inspection Overview



8.2.3 Vegetation and Fuels Management

In this section, the electrical corporation must discuss the following mitigation initiatives associated with vegetation and fuel management:

1. Fuels management
2. Clearance
3. Fall-in mitigation
4. Substation defensible space
5. High-risk species
6. Fire-wise right-of-way
7. Emergency response vegetation management

In the following subsections, the electrical corporation must provide an overview of its vegetation and fuel management initiatives. These overviews should include figure(s) that depict the workflow and decision process used for vegetation and fuel management. Figure 8-4 is an exemplar of the appropriate level of detail for tree trimming and removal.

In addition to figure(s), the electrical corporation must provide a narrative overview regarding vegetation and fuel management initiative. The discussion must include the following:

- **Utility Initiative Tracking ID**
- **Overview of initiative** – Brief description of the initiative including the objective and the risk targeted by the initiative.
- **Governing standards and electrical corporation standard operating procedures** – Reference to the appropriate code and electrical corporation program/process. If any standard exceeds regulatory requirements, this must include reference to the basis document for the electrical corporation-specific values.
- **Updates to initiative** - Changes to the initiative since the last WMP submission and a brief explanation as the why those change were made. Discuss any planned improvements or updates to the initiative and timeline for implementation.

As necessary, the electrical corporation must provide additional details in Appendix B.

8.2.3.1 Fuels Management

In this subsection, the electrical corporation must provide an overview of fuel management activities, including:

- Pole clearing per Public Resources Code section 4292

- Reduction or adjustment of live fuel (based on species or otherwise)
- Reduction or adjustment of dead fuel, including all downed wood and “slash” generated from vegetation management activities

8.2.3.2 Clearance

In this subsection, the electrical corporation must provide an overview of clearance activities, including:

- Clearances established in excess of the minimum clearances in Table 1 of GO 95
- The bases for the clearances established

8.2.3.3 Fall-in Mitigation

In this subsection, the electrical corporation must provide an overview of its actions taken to remove or otherwise remediate trees that pose a high risk of failure or fracture that could potentially strike electrical equipment.

8.2.3.4 Substation Defensible Space

In this subsection, the electrical corporation must provide an overview of its actions taken to reduce the ignition probability and wildfire consequence due to contact with substation equipment.

8.2.3.5 High-Risk Species

In this subsection, the electrical corporation must provide an overview of its actions, such as trimming, removal, and replacement, taken to reduce the ignition probability and wildfire consequence attributable to high-risk species.

8.2.3.6 Fire-Wise Right-of-Ways

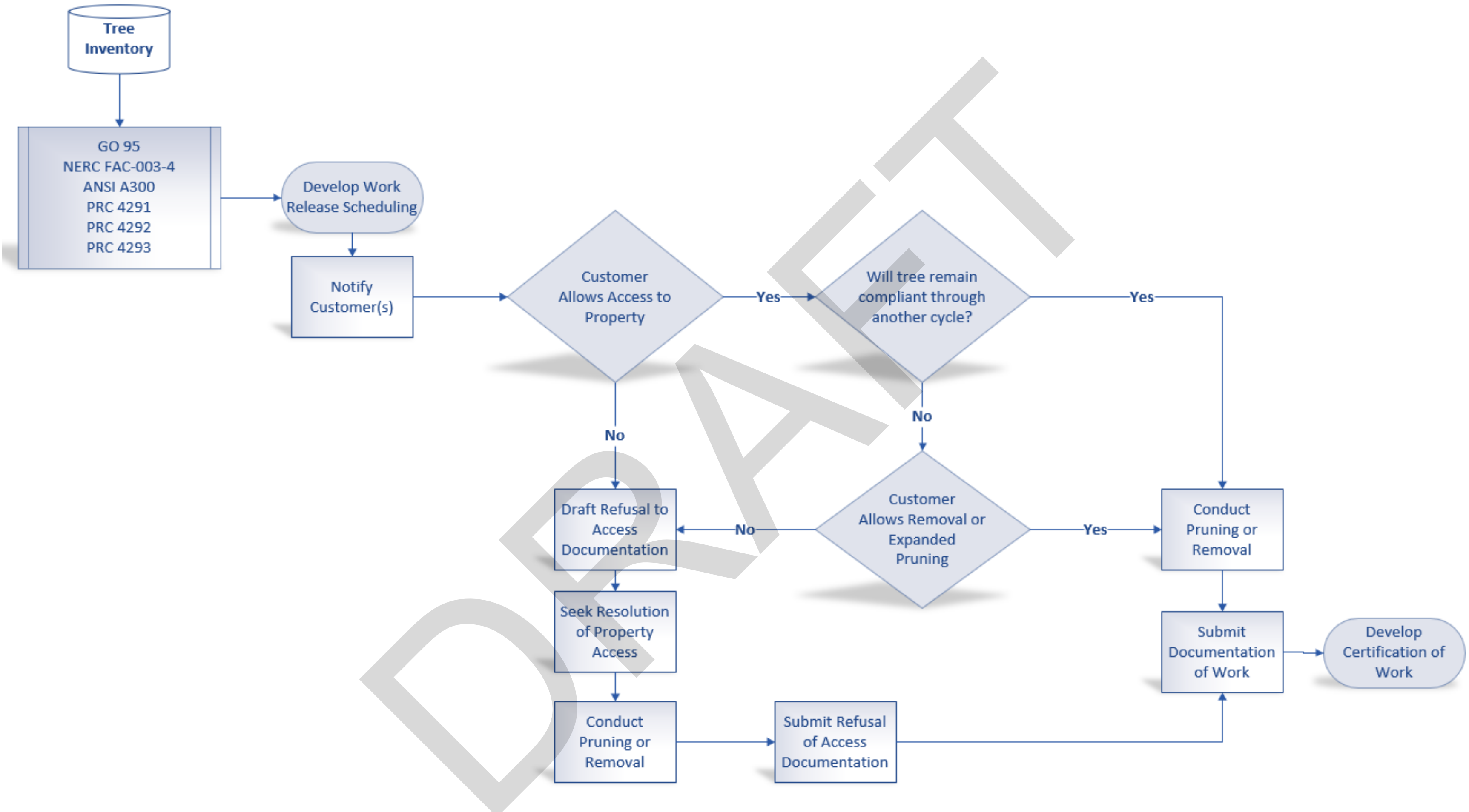
In this subsection, the electrical corporation must provide an overview of its actions (including strategic use of herbicides, growth regulators, or other chemical controls) taken to promote vegetation communities that are compatible with use of the land as a utility right-of-way, sustainable, and fire-wise, and actions to control incompatible vegetation, on the landscape where electrical equipment operates.

8.2.3.7 Emergency Response Vegetation Management

In this subsection, the electrical corporation must provide an overview of the following emergency response vegetation management activities:

- Activities based on weather conditions:
  - Planning and execution of vegetation management activities, such as trimming or removal, executed based upon and in advance of RFW or other weather condition forecasts that indicate elevated fire threat in terms of ignition probability and wildfire potential
- Post-fire service restoration:
  - Activities during post-fire service restoration, including, but not limited to, activities or protocols that differentiate post-fire vegetation management from programs described in other WMP initiatives; supporting documentation for the tool and/or standard the electrical corporation uses to assess the risk presented by vegetation post-fire; and how the electrical corporation includes fire-specific damage attributes in its assessment tool/standard

Figure 8-4. Exemplar Tree Trimming and Removal Workflow



8.2.4 Vegetation Management Enterprise System

In this section, the electrical corporation must provide an overview of Inputs, operation, and support for a centralized vegetation management enterprise system updated based upon inspection results and management activities such as trimming and removal of vegetation. This overview must include discussion of:

- The electrical corporation's vegetation inventory and condition database(s)
- Describe the utilities internal documentation of its database(s)
- Integration with systems in other lines of business
- Integration with the auditing system(s) (see QA/QC, Section 8.2.6, below)
- Describe internal processes for updating enterprise system including database(s) and any planned updates
- Any changes to the initiative since the last WMP submission and a brief explanation as the why those changes were made. Include any planned improvements or updates to the initiative and timeline for implementation

8.2.5 Environmental Compliance and Permitting

In this section, the electrical corporation must provide an overview of its compliance with applicable environmental laws, regulations, and permitting requirements related to vegetation management. This overview must include:

- References to procedure/processes for to ensure compliance with various environmental law, regulations, and permitting requirements
- Roadblocks the electrical corporation has encountered related to environmental laws, regulations, and permitting requirements related to vegetation management and how the electrical corporation has addressed the roadblock
- Any changes to the initiative since the last WMP submission and a brief explanation as to why those changes were made. Include any planned improvements or updates to the initiative and timeline for implementation

8.2.6 Quality Assurance / Quality Control (QA/QC)

In this section, the electrical corporation must provide an outline of its written QA/QC activities for vegetation management by inspection program. This overview must include:

- Reference to procedure/program documenting QA/QC activities. The electrical corporation must provide a summary of the procedures/processes in Appendix B or provide a copy in the supporting documents location
- How the sample sizes are determined and how the electrical corporation ensures the samples are representative
- Who performs QA/QC (internal or external; is there a dedicated team, etc.)
- Qualifications of the auditors
- Documentation of findings and process to incorporate the lessons learned from those findings into training and/or procedures
- Any changes to the process since the last WMP submission and a brief explanation as the why those changes were made. Include any planned improvements or updates to the initiative and timeline for implementation
- Tabular information (Table 8-17 is an exemplar of the appropriate level of detail):
    - Sample sizes
    - Type of QA/QC performed (e.g., desktop or field)
    - Resulting pass rates, starting in 2022
    - Yearly target pass rate for the 2023-2025 Base WMP cycle

Table 8-17. Vegetation Management QA/QC Program

Inspection Program	Sample Size	Type of Audit	Audit Results 2022	Yearly Target Pass Rate for 2023-2025
High-risk species	100% in HFTD Tier 2 and 3	Field	92%	95%

8.2.7 Open Work Orders

In this section, the electrical corporation must provide an overview of the process it uses to manage its open work orders. This overview must include a brief narrative that provides:

- Reference to procedures/programs documenting the work order process.
- Process for prioritization of work orders based on risk

- Process for eliminating a backlog of work orders (i.e., open work orders that have passed remediation deadlines), if applicable
- A discussion of trends with respect to open work orders

In addition, each electrical corporation must graph open work orders over time as reported in the QDRs.

8.2.8 Workforce Planning

In this section, the electrical corporation must provide a brief overview of its recruiting practices for vegetation management personnel and worker qualifications and training practices for workers in the following target roles:

- Vegetation inspections
- Vegetation management projects

For each of the target roles listed above, the electrical corporation must:

- List all worker titles relevant to the target role.
- List and explain minimum qualifications for each worker title with an emphasis on qualifications relevant to vegetation management. Note if the job requirements include the following:
    - Special certification requirements, such as being an International Society of Arboriculture Certified Arborist with specialty certification as a Utility Specialist
    - Additional training on biological/cultural resources
- Report the percentage of electrical corporation and contractor full-time equivalents (FTEs) in target roles with specific job titles
- Report plans to improve qualifications of workers relevant to vegetation management. The electrical corporation must explain how it is developing more robust outreach and onboarding training programs for new electric workers to identify hazards that could ignite wildfires

Table 8-18 is an exemplar of the required information. The electrical corporation must provide details regarding training and qualification in Appendix B.

Table 8-18. Exemplar Vegetation Management Qualifications and Training

Worker Title	Minimum Qualifications for Target Role	Special Certification Requirements	Electrical Corporation % FTE Min Quals	Electrical Corporation % Special Certifications	Contractor % FTE Min Quals	Contractor % Special Certifications	Reference to Electrical Corporation Training/Qualification Programs
Pre-inspector	One year of arboriculture experience or degree in relevant field	Certified Arborist, as soon as eligible	x%	x%	x%	x%	

8.3 Situational Awareness and Forecasting

8.3.1 Overview

In this section, the electrical corporation must identify objectives for the next 3- and 10-year periods, targets, and performance metrics related to the following situational awareness and forecasting programmatic areas:

- Environmental monitoring systems
- Grid monitoring systems
- Fire detection and alarm systems
- Notification and communication systems
- Weather forecasting
- Ignition likelihood calculation
- Ignition consequence calculation

8.3.1.1 Objectives

Each electrical corporation must summarize the objectives for its 3-year and 10-year plans for implementing and improving its situational awareness and forecasting.[27] These summaries must include the following:

- Identification of which initiative(s) in the WMP the electrical corporation is implementing to achieve the stated objective, including Utility Initiative Tracking IDs
- Reference(s) to applicable codes, standards, and best practices/guidelines and an indication of whether the electrical corporation exceeds an applicable code, standard, or regulation
- Method of verifying achievement of each objective
- A completion date for when the electrical corporation will achieve the objective
- Reference(s) to the WMP section(s) or appendix, including page numbers, where the details of the objective(s) are documented and substantiated

[27] Annual information included in this section must align with the QDR data

This information must be provided in Table 8-19 for the 3-year plan and Table 8-20 for the 10-year plan. Exemplars of the minimum acceptable level of information are provided below.

Table 8-19. Exemplar Situational Awareness Initiative Objectives (3-year plan)

Objectives for Three Years (2023–2025)	Applicable Initiative(s), Tracking ID(s)	Applicable Regulations, Codes, Standards, and Best Practices (See Note)	Method of Verification (i.e., program)	Completion Date	Reference (section & page #)
Automate ignition detection using third-party software	Ignition detection, SA-03	Wildfire Prevention Guide	Contract w/ third-party and active license for software	March 2025	

Note: An asterisk indicates that the electrical corporation exceeds a particular code, regulation, standard, or best practice. The electrical corporation must provide a reference to the appendix section and page providing further documentation, justification, and substantiation.

Table 8-20. Exemplar Situational Awareness Initiative Objectives (10-year plan)

Objectives for Ten Years (2026–2032)	Applicable Initiative(s), Tracking ID(s)	Applicable Regulations, Codes, Standards, and Best Practices (See Note)	Method of Verification (i.e., program)	Completion Date	Reference (section & page #)
Create 1-km resolution of weather data across grid	Weather forecasting, SA-06	Weather Forecast Standard	Weather forecast outputs with 1-km resolution	December 2028	

Note: An asterisk indicates that the electrical corporation exceeds a particular code, regulation, standard, or best practice. The electrical corporation must provide a reference to the appendix section and page providing further documentation, justification, and substantiation.

8.3.1.2 Targets

Initiative targets are quantifiable measurements of activities identified in the WMP. Electrical corporations will show progress towards completing targets in subsequent reports, including QDRs and WMP Updates.

The electrical corporation must list all targets it will use to track progress on its situational awareness and forecasting for the next three years (2023–2025). Energy Safety's Compliance Assurance Division and third parties must be able to track and audit each target.[28] For each initiative target, the electrical corporation must provide the following:

- Utility Initiative Tracking IDs
- Projected targets for the three years of the Base WMP and relevant units
- Quarterly, rolling projections for end of 2023 and 2024 (inspections only)
- For 2023–2025, the "x% risk impact." The x% risk impact is the percentage risk reduction identified in Table 7-2 for a specific mitigation initiative (see Section 7.2.2.1 for calculation instructions)
- Method of verifying target completion

Identified targets must be of enough detail and scope to effectively inform the performance of the electrical corporation's situational awareness and forecasting initiatives.

An exemplar of the minimum acceptable level of information is provided in Table 8-21.

[28] Annual information included in this section must align with Table 1 of the QDR.

Table 8-21. Exemplar Situational Awareness Initiative Targets by Year

Initiative Activity	Tracking ID	2023 Target & Unit	x% Risk Impact 2023	2024 Target & Unit	x% Risk Impact 2024	2025 Target & Unit	x% Risk Impact 2025	Method of Verification
Install thermal cameras	SA-03	5 thermal cameras installed	0.5%	10 thermal cameras installed	1%	25 thermal cameras installed	2.5%	Completed work orders, GIS Data Submission(s)

8.3.1.3 Performance Metrics

Each electrical corporation must list and describe the performance metrics it uses to evaluate:

- The effectiveness of its situational awareness and forecasting in reducing wildfire and PSPS risk
- The electrical corporation's performance on those metrics since 2020 (if previously collected)
- Projected performance on metrics for 2023-2025
- How the metrics can be verified

Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of situational awareness and forecasting initiatives.[29]

The electrical corporation must:

- Graph the reported metric(s)
- Summarize reported metric(s) in tabular form
- Provide graphs necessary to show trends for the performance metrics and leading indicators (See exemplar in Section 8.2.1.3.)
- Provide a brief narrative that explains its trends

Table 8-22 is an exemplar of the minimum acceptable level of information.

[29] If a utility-identified metric/leading indicator in this section aligns with required annualized metrics/indicators provided in the QDRs, the reporting between this section and the QDR must be consistent. Where utility-defined metrics/indicators identified in this section are not prescribed in the QDRs, the electrical corporation must report those metrics/indicators in Table 3 of the QDR.

Table 8-22. Exemplar Situational Awareness and Forecasting Performance Metrics Results by Year

Performance Metrics	2020	2021	2022	2023 Projected	2024 Projected	2025 Projected	Method of Verification (e.g., third-party evaluation, QDR)

8.3.2 Environmental Monitoring Systems

The electrical corporation must describe its systems, processes, and procedures used to monitor environmental conditions within its service territory. These observations should inform the electrical corporation's near-real-time risk assessment and weather forecast validation. The electrical corporation must document the following:

- Existing systems, technologies, and processes
- Process used to evaluate the need for additional systems
- Implementation schedule for any planned additional systems
- Process to monitor the efficacy of systems at reducing risk

Reference the Utility Initiative Tracking ID where appropriate.

8.3.2.1 Existing Systems, Technologies, and Processes

The electrical corporation must report on the environmental monitoring systems and related technologies and processes currently in use, highlighting any improvements made since the last WMP submission.[30] At a minimum, the electrical corporation must discuss systems/technologies related to the following:

- Current weather conditions:
    - Air temperature
    - Relative humidity
    - Wind velocity (speed and direction)
- Fuel characteristics:
    - Seasonal trends in fuel moisture

Each system must be summarized in Table 8-23 below. The electrical corporation must provide the following additional information for each system in the accompanying narrative:

- Generalized location of the system / locations measured by the system (e.g., HTFD, entire service territory)
- Integration with the broader utility system

[30] Annual information included in this section must align with Table 7 from the QDRs.

- Process to verify measurements from the system
- Frequency of maintenance
- For intermittent systems (e.g., aerial imagery, line patrols), the processes used to trigger collection. This should include flow charts and equations as appropriate to describe the process
- For calculated quantities, the processes used to convert raw measurements to calculated quantities. This should include flow charts and equations as appropriate to describe the process

Table 8-23. Exemplar Environmental Monitoring Systems

System	**Measurement/ Observation**	**Frequency**	**Purpose and Integration**
Example: weather stations	Steady wind velocity Gust wind velocity Air temperature Relative humidity	3,600 observations / hour	Improve weather forecasts through data assimilation Validate model
Example: MODIS satellite imagery	NDVI	4 observations / day	Calculate fuel moisture content

8.3.2.2 Evaluation and Selection of New Systems

The electrical corporation must describe how it evaluates the need for additional environmental monitoring systems. This description must include:

- How the electrical corporation evaluates the impact of new systems on reducing risk (e.g., expected quantitative improvement in weather forecasting)
- The electrical corporation's process to evaluate the efficacy of new technologies

These descriptions should include flow charts as appropriate to describe the process.

8.3.2.3 Planned Improvements

The electrical corporation must describe its planned improvements for its environmental monitoring systems.[31] This must include any plans for the following:

- Expansion of existing systems
- Establishment of new systems

For each planned improvement, the electrical corporation must provide the following in Table 8-24:

- Description – A description of the planned initiative activity
- Impact – Reference to and description of the impact of the initiative activity on each risk and risk component
- Prioritization – A description of the x% risk impact (see Section 8.1.1.2 for explanation)
- Schedule – A description of the planned schedule for implementation

Table 8-24. Exemplar Planned Improvements to Environmental Monitoring Systems

System	Description	Impact	x% Risk Impact	Implementation Schedule

8.3.2.4 Monitoring Mitigation Improvements

The electrical corporation must describe the processes and procedures for each of the following:

- Monitoring and auditing the implementation of the mitigation initiatives
- Assessing the effectiveness of selected improvements/mitigations after deployment
- Monitoring the sufficiency of the environmental monitoring program

[31] Annual information included in this section should align with Tables 8 and 9 from the QDRs.

8.3.3 Grid Monitoring Systems

The electrical corporation must describe its systems, processes, and procedures used to monitor the operational conditions of its equipment. These observations should inform the electrical corporation's near-real-time risk assessment. The electrical corporation must document:

- Existing systems, technologies, and processes
- Process used to evaluate the need for additional systems
- Implementation schedule for any planned additional systems
- Process to monitor the efficacy of systems at reducing risk

Reference the Utility Initiative Tracking ID where appropriate.

8.3.3.1 Existing Systems, Technologies, and Processes

The electrical corporation must report on the grid system monitoring systems and related technologies and processes currently in use, highlighting any improvements made since the last WMP submission. At a minimum, the electrical corporation must discuss systems/technologies related to the detection of:

- Faults (e.g., fault anticipators, Rapid Earth Fault Current Limiters, etc.)
- Failures
- Recloser operations

Each system must be summarized in Table 8-25 below. The electrical corporation must provide the following information for each system in the accompanying narrative:

- Location of the system / locations measured by the system
- Integration with the broader utility system
- Process to verify measurements from the system
- For intermittent systems (e.g., aerial imagery, line patrols), the processes used to trigger collection. This should include flow charts and equations as appropriate to describe the process
- For calculated quantities, the processes used to convert raw measurements to calculated quantities. This should include flow charts and equations as appropriate to describe the process

Table 8-25. Exemplar Grid Operation Monitoring Systems

System	Measurement/ Observation	Frequency	Purpose and Integration
Line sensors	• Electrical current • Electrical voltage • Waveform harmonics	• 3,600 observations / hour	• Early fault detection • Distribution fault anticipator (DFA)

8.3.3.2 Evaluation and Selection of New Systems

The electrical corporation must describe how it evaluates the need for additional grid operation monitoring systems. This description must include:

- How the electrical corporation evaluates the impact of new systems on reducing risk (e.g., expected reduction in ignitions from failures, expected reduction in failures)
- The electrical corporation's process to evaluate the efficacy of new technologies

These descriptions should include flow charts as appropriate to describe the process.

8.3.3.3 Planned Improvements

The electrical corporation must describe its planned improvements in its grid operation monitoring systems. This must include any plans for the following:

- Expansion of existing systems
- Establishment of new systems

For each planned improvement, the electrical corporation must provide the following in Table 8-26:

- Description – A description of the planned initiative activity
- Impact – Reference to and description of the impact of the initiative activity on each risk and risk component
- Prioritization – A description of the x% risk impact (see Section 8.1.1.2 for explanation)

- Schedule – A description of the planned schedule for implementation

Table 8-26. Exemplar Planning Improvements to Grid Operation Monitoring Systems

System	Description	Impact	x% Risk Impact	Implementation Schedule
Line sensors on distribution lines	Installation of DFA sensors on circuit segments in distribution lines in HFTD	Early fault detection to prevent ignition from a line which had failure resulting from contact or equipment failure	80%	Pilot program, 2023–2025 Analysis of pilot, 2025–2026 Installation of systems, 2026–2029

8.3.3.4 Monitoring Mitigation Improvements

The electrical corporation must describe the processes and procedures for each of the following:

- Monitoring and auditing the implementation of the mitigation initiatives
- Assessing the effectiveness of selected improvements/mitigations after deployment
- Monitoring the sufficiency of the grid operation monitoring program

8.3.3.5 Enterprise System for Grid Monitoring

In this section, the electrical corporation must provide an overview of its enterprise system for grid monitoring. This overview must include discussion of:

- Any database(s) utilized for storage
- Describe the utilities internal documentation of its database(s)
- Integration with systems in other lines of business

- Describe any QA/QC or auditing of its system
- Describe internal processes for updating enterprise system including database(s)
- Any changes to the initiative since the last WMP submission and a brief explanation as the why those changes were made. Include any planned improvements or updates to the initiative and timeline for implementation

8.3.4 Ignition Detection Systems

The electrical corporation must describe its systems, technologies, and procedures used to detect ignitions within its service territory and gauge their size and growth rates.

The electrical corporation must document the following:

- Existing ignition detection sensors and systems
- Evaluation and selection of new ignition detection systems
- Planned integration of new ignition detection technologies
- Monitoring of mitigation improvements

Reference the Utility Initiative Tracking ID where appropriate.

8.3.4.1 Existing Ignition Detection Sensors and Systems

The electrical corporation must report on the ignition detection sensors and systems, along with related technologies and processes, that are currently in use, highlighting any improvements made since the last WMP submission. At a minimum, the electrical corporation must document the deployment of each of the following:

- Early fire detection:
  - Satellite infrared imagery
  - High-definition video
  - Infrared cameras
- Fire growth potential software

The electrical corporation must summarize each system in Table 8-27 below. It must provide the following additional information for each system in an accompanying narrative:

- General location of detection sensors (e.g., HFTD or entire service territory)
- Resiliency of sensor communication pathways

- Integration of sensor data into machine learning or AI software
- Role of sensor data in risk response
- False positives filtering
- Time between detection and confirmation
- Security measures for network-based sensors

Table 8-27. Exemplar Fire Detection Systems Currently Deployed

Detection System	Capabilities	Companion Technologies	Contribution to Fire Detection and Confirmation
Video cameras	Real-time viewing of remote area to detect smoke and wildfires	Used with satellite imagery to verify fire detection	Video cameras allow fast and accurate detection or confirmation of wildfires and can help operators assess the scope of resource response needed.

8.3.4.2 Evaluation and Selection of New Detection Systems

The electrical corporation must describe how it evaluates the need for additional ignition detection technologies. This description must include:

- How the electrical corporation evaluates the impact on new detection technologies on reducing and improving detection and response times
- The electrical corporation's process to evaluate the efficacy of new technologies
- The electrical corporation's budgeting process for new detection system purchases

8.3.4.3 Planned Integration of New Detection Technologies

The electrical corporation must provide an implementation schedule for new ignition detection and alarm system technologies. This must include any plans for the following:

- Integration of new systems into existing physical infrastructure
- Integration of new systems into existing data analysis
- Increases in budgets and staffing to support new systems

For each new technology system, the electrical corporation must provide the following in Table 8-28:

- Description – A description of the technology's capabilities
- Impact – A description of the impact the technology will have on each risk and risk component
- Prioritization – A description of the x% risk impact (see Section 8.1.1.2 for explanation)
- Schedule – A description of the planned schedule for implementation

Table 8-28. Exemplar Planning Improvements to Fire Detection and Alarm Systems

System	Description	Impact	x% Risk Impact	Implementation Schedule
High-definition cameras	Installation of high-definition cameras within the HFTD	Estimated reduction in average time to detection within HFTD from 4 hours to 1 hour	80%/10%	Installation of systems – 2024

8.3.4.4 Monitoring Mitigation Improvements

The electrical corporation must describe the processes and procedures for each of the following:

- Monitoring and auditing the implementation of the mitigation initiatives
- Assessing the effectiveness of selected improvements/mitigations after deployment
- Monitoring the efficacy of the fire detection systems

8.3.4.5 Enterprise System for Ignition Detection

In this section, the electrical corporation must provide an overview of its enterprise system for ignition detection. This overview must include discussion of:

- Any database(s) utilized for storage
- Describe the utilities internal documentation of its database(s)
- Integration with systems in other lines of business

- Describe any QA/QC or auditing of its system
- Describe internal processes for updating enterprise system including database(s)
- Any changes to the initiative since the last WMP submission and a brief explanation as the why those changes were made. Include any planned improvements or updates to the initiative and timeline for implementation

8.3.5 Weather Forecasting

The electrical corporation must describe its systems, processes, and procedures used to forecast weather within its service territory. These forecasts should inform the electrical corporation's near-real-time-risk assessment and PSPS decision-making processes. The electrical corporation must document the following:

- Existing modeling approach
- Known limitations of existing approach
- Implementation schedule for any planned changes to the system
- Process to monitor the efficacy of systems at reducing risk

Reference the Utility Initiative Tracking ID where appropriate.

8.3.5.1 Existing Modeling Approach

At a minimum, the electrical corporation must discuss the following components of weather forecasting:

- **Data assimilation** from environmental monitoring systems within the electrical corporation service territory
- **Ensemble forecasting** with control forecast and perturbations
- **Model inputs** including, for example:
    - Land cover / land use type
    - Local topography
- **Model outputs** including, for example:
    - Air temperature
    - Barometric pressure
    - Relative humidity
    - Wind velocity (speed and direction)

- **Separate modules** (e.g., local weather analysis and local vegetation analysis)
- Subject matter expert (SME) assessment of forecasts
- **Spatial granularity** of forecasts including:
  - Horizontal resolution
  - Vertical resolution
- **Time horizon** of the weather forecast throughout the service territory

The electrical corporation must highlight improvements made to the electrical corporation's weather forecasting since the last WMP submission

The electrical corporation must provide the following information about its weather forecasting system:

- Documentation of modeling approach in accordance with the requirements in Appendix B.

8.3.5.2 Known Limitations of Existing Approach

The electrical corporation must describe any known limitations of the modeling approach resulting from assumptions, data availability, and computational resources. It must discuss the impact of these limitations on the modeling.

8.3.5.3 Planned Improvements

The electrical corporation must describe its planned improvements in its weather forecasting systems. This must include any plans for the following:

- Increase in model validation
- Increase in spatial granularity
- Decrease in limitations by removal of assumptions
- Increase in input data quality
- Increase in related frequency

For each planned improvement, the electrical corporation must provide the following in Table 8-29:

- Description – A description of the planned initiative activity
- Impact – Reference to and description of the impact of the initiative activity on each risk and risk component

- Prioritization – A description of the x% risk impact (see Section 8.1.1.2 for explanation)
- Schedule – A description of the planned schedule for implementation

Table 8-29. Exemplar Planned Improvements to Weather Forecasting Systems

System	Description	Impact	x% Risk Impact	Implementation Schedule
Spatial granularity	Increasing spatial granularity of weather forecasts in HFTD tiers 2 and 3 to 1 km	Improve accuracy of localized forecasts in complex terrains	80%/10%	Pilot system, 2023–2024 Integrate system throughout HFTD, 2024–2026

8.3.5.4 Monitoring Mitigation Improvements

The electrical corporation must describe the processes and procedures for each of the following:

- Monitoring and auditing the implementation of the mitigation initiatives
- Assessing the effectiveness of selected improvements/mitigations after deployment
- Monitoring the sufficiency of the weather forecasting program

8.3.5.5 Enterprise System for Weather Forecasting

In this section, the electrical corporation must provide an overview of its enterprise system for weather forecasting. This overview must include discussion of:

- Any database(s) utilized for storage
- Describe the utilities internal documentation of its database(s)
- Integration with systems in other lines of business
- Describe any QA/QC or auditing of its system
- Describe internal processes for updating enterprise system including database(s)
- Any changes to the initiative since the last WMP submission and a brief explanation as the why those changes were made. Include any planned improvements or updates to the initiative and timeline for implementation

8.3.6 Ignition Likelihood Calculation

The electrical corporation must describe its process to calculate the likelihood of ignition in current and forecasted weather scenarios. The electrical corporation must document the following:

- Existing calculation approach
- Known limitations of existing approach
- Implementation schedule for any planned changes to the system
- Process to monitor the efficacy of systems at reducing risk

Reference the Utility Initiative Tracking ID where appropriate.

8.3.6.1 Existing Calculation Approach

The calculation procedure must satisfy each of the related requirements from Appendix B. There are two possible ways to satisfy the reporting requirements for this section:

- If this calculation is the same as that used in risk assessment for long-term risk planning, no additional information needs to be reported in this section.
- If this calculation is not the same as that used in risk assessment for long-term planning, the electrical corporation must provide documentation in this section in accordance with the requirements in Appendix B.

8.3.6.2 Known Limitations of Existing Approach

The electrical corporation must describe any known limitations of the modeling approach resulting from assumptions, data availability, and computational resources. It must discuss the impact of these limitations on the modeling.

8.3.6.3 Planned Improvements

The electrical corporation must describe its planned improvements in its ignition likelihood calculation. For each planned improvement, the electrical corporation must provide the following in Table 8-30:

- Description – A description of the planned initiative activity
- Impact – Reference to and description of the impact of the initiative activity on each risk and risk component
- Prioritization – A description of the x% risk impact (see Section 8.1.1.2 for explanation)

- Schedule – A description of the planned schedule for implementation

Table 8-30. Exemplar Planned Improvements to Ignition Likelihood Calculation

System	Description	Impact	x% Risk Impact	Implementation Schedule

8.3.6.4 Monitoring Mitigation Improvements

The electrical corporation must describe the processes and procedures for each of the following:

- Monitoring and auditing the implementation of the mitigation initiatives
- Assessing the effectiveness of selected improvements/mitigations after deployment
- Monitoring the sufficiency of the ignition likelihood calculation

8.3.7 Ignition Consequence Calculation

The electrical corporation must describe its process to calculate the consequence of ignition in current and forecasted weather scenarios. The electrical corporation must document the following:

- Existing calculation approach
- Known limitations of existing approach
- Implementation schedule for any planned changes to the system
- Process to monitor the efficacy of systems at reducing risk

Reference the Utility Initiative Tracking ID where appropriate.

8.3.7.1 Existing Calculation Approach

The calculation procedure must satisfy each of the related requirements from Appendix B. The electrical corporation wildfire forecasting system must meet each of the following requirements:

- Automated wildfire forecasts whenever real-time risk conditions exceed 90 percent of design conditions
- Input data and model version required to reproduce the wildfire forecast recorded and available on request from Energy Safety
- Separate modules for local weather analysis and local fire behavior analysis
- SME assessment of each automated wildfire forecast meeting the criteria defined above, plus SME assessment of forecasting approach at least once per quarter
- Spatial granularity of wildfire forecasts of ≤1 km
- Time horizon of wildfire forecasts of at least eight hours

If this calculation is the same as that used in risk assessment for long-term risk planning, only the additional information needs to be reported in this section. If this calculation is not the same as that used in risk assessment for long-term planning, the electrical corporation must provide documentation in this section in accordance with the requirements in Appendix B.

8.3.7.2 Known Limitations of Existing Approach

The electrical corporation must describe any known limitations of the modeling approach resulting from assumptions, data availability, and computational resources. It must discuss the impact of these limitations on the modeling.

8.3.7.3 Planned Improvements

The electrical corporation must describe its planned improvements in its ignition consequence calculation. For each planned improvement, the electrical corporation must provide the following in Table 8-31:

- Description – A description of the planned initiative activity
- Impact – Reference to and description of the impact of the initiative activity on each risk and risk component
- Prioritization – A description of the x% risk impact (see Section 8.1.1.2 for explanation)
- Schedule – A description of the planned schedule for implementation

Table 8-31. Exemplar Planned Improvements to Ignition Likelihood Calculation

System	Description	Impact	x% Risk Impact	Implementation Schedule

8.3.7.4 Monitoring Mitigation Improvements

The electrical corporation must describe the processes and procedures for each of the following:

- Planning to monitor and audit the implementation of the mitigation initiatives
- Assessing the effectiveness of selected improvements/mitigations after deployment
- Monitoring the sufficiency of the ignition consequence calculation

8.4 Emergency Preparedness[32]

8.4.1 Overview

Each electrical corporation must develop and adopt an emergency preparedness plan in compliance with the standards established by the CPUC pursuant to Public Utilities Code section 768.6(a). Wildfires and PSPS introduce unique risk management challenges requiring the electrical corporation to evaluate, develop, and implement wildfire- and PSPS-specific emergency preparedness activities as part of a holistic emergency preparedness strategy.

In this section, the electrical corporation must identify objectives for the next 3- and 10-year periods, targets, and performance metrics related to the following emergency preparedness programmatic areas:

- Wildfire and PSPS emergency preparedness plan

[32] The title Emergency and Disaster Preparedness from Public Utilities Code section 768.6 has been shortened to Emergency Preparedness.

- Collaboration and coordination with public safety partners
- Public notification and communication strategy
- Preparedness and planning for service restoration
- Customer support in wildfire and PSPS emergencies
- Learning after wildfire and PSPS events

8.4.1.1 Objectives

Each electrical corporation must summarize the objectives for its 3-year and 10-year plans for implementing and improving its emergency preparedness.[33] These summaries must include the following:

- Identification of which initiative(s) in the WMP the electrical corporation is implementing to achieve the stated objective, including Utility Initiative Tracking IDs
- Reference(s) to applicable codes, standards, and best practices/guidelines and an indication of whether the electrical corporation exceeds an applicable code, standard, or regulation
- Method of verifying achievement of each objective
- A completion date for when the electrical corporation will achieve the objective
- Reference(s) to the WMP section(s) or appendix, including page numbers, where the details of the objective(s) are documented and substantiated

This information must be provided in Table 8-32 for the 3-year plan and Table 8-33 for the 10-year plan. Exemplars of the minimum acceptable level of information are provided below.

[33] Annual information included in this section must align with the QDR data

Table 8-32. Exemplar Emergency Preparedness Initiative Objectives (3-year plan)

Objectives for Three Years (2023–2025)	**Applicable Initiative(s), Tracking ID(s)**	**Applicable Regulations, Codes, Standards, and Best Practices (See Note)**	**Method of Verification (i.e., program)**	**Completion Date**	**Reference (section & page #)**
Update workforce training for emergency response	Emergency Preparedness Plan, EP-01	Emergency Readiness Training Portfolio; GO 166	Updated emergency response training curriculums; training records including pass rates	June 2024	

Note: An asterisk indicates that the electrical corporation exceeds a particular code, regulation, standard, or best practice. The electrical corporation must provide a reference to the appendix section and page providing further documentation, justification, and substantiation.

Table 8-33. Exemplar Emergency Preparedness Initiative Objectives (10-year plan)

Objectives for Ten Years (2026–2032)	**Applicable Initiative(s), Tracking ID(s)**	**Applicable Regulations, Codes, Standards, and Best Practices (See Note)**	**Method of Verification (i.e., program)**	**Completion Date**	**Reference (section & page #)**
Increase granularity and customization of response plans	Emergency Preparedness Plan, EP-01	Emergency Preparedness Plan	Existence of emergency plans based on region of service territory	January 2030	

Note: An asterisk indicates that the electrical corporation exceeds a particular code, regulation, standard, or best practice. The electrical corporation must provide a reference to the appendix section and page providing further documentation, justification, and substantiation.

8.4.1.2 Targets

Initiative targets are quantifiable measurements of activities identified in the WMP. Electrical corporations will show progress towards completing targets in subsequent reports, including QDRs and WMP Updates.

The electrical corporation must list all targets it will use to track progress on its emergency preparedness for the next three years (2023–2025). Energy Safety's Compliance Assurance Division and third parties must be able to track and audit each target.[34] For each initiative target, the electrical corporation must provide the following:

- Utility Initiative Tracking IDs
- Projected targets for the three years of the Base WMP and relevant units
- Quarterly, rolling projections for end of 2023 and 2024 (inspections only)
- For 2023–2025, the "x% risk impact." The x% risk impact is the percentage risk reduction identified in Table 7-2 for a specific mitigation initiative (see Section 7.2.2.1 for calculation instructions)
- Method of verifying target completion

Identified targets must be of enough detail and scope to effectively inform the performance of the electrical corporation's emergency preparedness initiatives.

An exemplar of the minimum acceptable level of information is provided in Table 8-34.

[34] Annual information included in this section must align with Table 1 of the QDR.

Table 8-34. Exemplar Emergency Preparedness Initiative Targets by Year

Initiative Activity	Tracking ID	2023 Target & Unit	x% Risk Impact 2023	2024 Target & Unit	x% Risk Impact 2024	2025 Target & Unit	x% Risk Impact 2025	Method of Verification
Conduct emergency drills	EP-03	4 emergency drills conducted	0.5%	4 drills	0.5%	4 drills	0.5%	After drill reports

8.4.1.3 Performance Metrics

Each electrical corporation must list and describe the performance metrics it uses to evaluate:

- The effectiveness of its emergency preparedness in reducing wildfire and PSPS risk
- The electrical corporation's performance on those metrics since 2020 (if previously collected)
- Projected performance on metrics for 2023-2025
- How the metrics can be verified

Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of emergency preparedness initiatives.[35]

The electrical corporation must:

- Graph the reported metric(s)
- Summarize reported metric(s) in tabular form
- Provide graphs necessary to show trends for the performance metrics and leading indicators (See exemplar in Section 8.2.1.3.)
- Provide a brief narrative that explains its trends

An exemplar of the minimum acceptable level of information is provided in Table 8-35.

[35] If a utility-identified metric/leading indicator in this section aligns with required annualized metrics/indicators provided in the QDRs, the reporting between this section and the QDR must be consistent. Where utility-defined metrics/indicators identified in this section are not prescribed in the QDRs, the electrical corporation must report those metrics/indicators in Table 3 of the QDR.

Table 8-35. Exemplar Emergency Preparedness Performance Metrics Results by Year

Performance Metrics	2020	2021	2022	2023 Projected	2024 Projected	2025 Projected	Method of Verification (e.g., third-party evaluation, QDR)

8.4.2 Emergency Preparedness Plan

In this section, the electrical corporation must provide an overview of how it has evaluated, developed, and integrated wildfire- and PSPS-specific emergency preparedness strategies, practices, policies, and procedures into its overall emergency plan based on the minimum standards described in GO 166. The electrical corporation must provide the title of its latest emergency preparedness report, the date of the report, and an indication of whether the plan complies with CPUC R.15-06-009, D.21-05-019, and GO 166. The overview must be no more than two paragraphs.

In addition, the electrical corporation must provide a list of any other relevant electrical corporation documents that govern its wildfire and PSPS emergency preparedness planning for response and recovery efforts. This must be a bullet point list with document title, version (if applicable), and date. For example:

- Electrical Corporation's Emergency Response Plan (ECERP), dated MM/DD/YYYY

Reference the Utility Initiative Tracking ID where appropriate.

8.4.2.1 Overview of Wildfire and PSPS Emergency Preparedness

In this section of the WMP, the electrical corporation must provide an overview of its wildfire- and PSPS-specific emergency preparedness plan. At a minimum, the overview must describe the following:

- Purpose and scope of the plan.
- Overview of protocols, policies, and procedures for responding to and recovering from a wildfire or PSPS event (e.g., means and methods for assessing conditions, decision-making framework, prioritizations). The electrical corporation must provide an operational flow diagram illustrating key components of its wildfire- and PSPS-specific emergency response procedures from the moment of activation to response, recovery, and restoration of service. It must provide separate overviews and operational flow diagrams for wildfires and PSPS events.
- Key personnel, qualifications, and training.
- Resource planning and allocation (e.g., staffing).
- Drills, simulations, and tabletop exercises.
- Coordination and collaboration with public safety partners (e.g., emergency planning, interoperable communications).

- Notification of and communication to customers during and after a wildfire or PSPS event.
- Improvements/updates made since the last WMP submission.

The overview should be no more than six pages.

In addition, the electrical corporation must provide a table with a list of current gaps and limitations in evaluating, developing, and integrating wildfire- and PSPS-specific preparedness and planning features into its overall emergency preparedness plan(s). Where gaps exist, the electrical corporation must provide a remedial action plan and timeline for resolving. Table 8-36 provides an exemplar of the minimum level of content and detail required for this information.

Table 8-36. Exemplar of Key Gaps and Limitations in Integrating Wildfire- and PSPS-Specific Strategies into Emergency Plan

Gap or Limitation Subject	Remedial Brief Description	Remedial Action Plan
Limited feedback on wildfire-specific components of emergency plan	Limited coordination with local-level public safety partners in the review and development of the wildfire-specific emergency preparedness plan	**Strategy** – Establish a community advisory panel in collaboration with local government and non-governmental organizations. • **Target timeline** – Develop a community advisory panel process, policies, and procedures by end of 2023. Convene advisory panel to review and provide feedback on emergency preparedness plan for 50% of communities by end of 2024.

8.4.2.2 Key Personnel, Qualifications, and Training

In this section, the electrical corporation must provide an overview of the key personnel constituting its emergency planning, preparedness, response, and recovery team(s) for wildfire and PSPS events. This includes identifying key roles and responsibilities, personnel resource planning (internal and external staffing needs), personnel qualifications, and required training programs.

Personnel Qualifications

The electrical corporation must report on the various roles, responsibilities, and qualifications of electrical corporation and contract personnel tasked with wildfire emergency preparedness planning, preparedness, response, and recovery, and those tasked for PSPS-related events. This may include representatives from administration, information technology (IT), human resources, communications, electrical operations, facilities, and any other mission-critical units in the electrical corporation. As part of this section, the electrical corporation must provide a brief narrative on how it determined its personnel resource planning for various key roles and responsibilities. The narrative must be no more than two to four pages.

Table 8-37 provides an exemplar of the minimum level of content and detail required.

Table 8-37. Exemplar Emergency Preparedness Staffing and Qualifications

Role	Incident Type	Responsibilities	Qualifications	# of Dedicated Staff Required	# of Dedicated Staff Provided	# of Contract Workers Required	# of Contract Workers Provided
Program Director	Wildfires	• Lead, oversee, and coordinate emergency preparedness department • Oversee all functions related to preventing, mitigating, responding to, and recovering from emergencies due to all relevant hazards for the electrical corporation • Develop, maintain, and update the electrical corporation emergency preparedness plan with associated policies, practices, and procedures • Direct and manage emergency program managers and supervisors • Evaluate resources, equipment, and personnel available to respond to emergencies • Monitor program performance; recommend and implement modifications to systems and procedures • Develop and oversee the electrical corporation's emergency operations center; evaluate regular and emergency communication systems; make recommendations as appropriate	• Incident Command Certifications: ICS 100, 200, 300, 700, 800 • Master's in Disaster Risk Management • Minimum 15 years' experience in disaster risk management and/or emergency preparedness and planning	1	1	NA	NA

Role	Incident Type	Responsibilities	Qualifications	# of Dedicated Staff Required	# of Dedicated Staff Provided	# of Contract Workers Required	# of Contract Workers Provided
Grid Operations Manager	Wildfires, PSPS	• Maintain facilities used during emergency operations	•	3	3		
Public Information Officer	Wildfires, PSPS	• Plan and host press conferences to announce major news or address crises • Prepare press releases, speeches, articles, social media posts, and other materials for public consumption • Develop strategies and procedures for working effectively with the media • Maintain good working relationships with media organizations • Collaborate with executive management and marketing team to ensure a cohesive public image • Work with various teams to organize and host public events and promotions • Speak directly to the public or media to address questions and represent the organization	• Bachelor's degree in communications, public relations, journalism, or related field • Prior experience in a public relations role • Exceptional written and verbal communication skills • Strong understanding of the media, including social media • Organized and detail-oriented work ethic • Ability to travel on short notice • Great public speaking and interpersonal skills	1	1		
Utility Fire Chief or utility Incident Commander	Wildfires, PSPS	• Maintain firefighting facilities used during emergency operations • Serve as point of contact for all firefighting-related emergencies/disasters in conjunction with the Program Director	•	1	1		

Role	Incident Type	Responsibilities	Qualifications	# of Dedicated Staff Required	# of Dedicated Staff Provided	# of Contract Workers Required	# of Contract Workers Provided
		• Command all emergency response functions at the field response level					
Public Safety Partner Liaison	Wildfires, PSPS	• Develop relations with outside organizations, including local, state, and federal fire suppression organizations, the state Office of Emergency Services, the county sheriff's department, the Red Cross, school districts, etc.; maintain close working relationships to ensure rapid and coherent response in emergency situations • Coordinate with relevant public safety partners in electrical corporation's service territory (e.g., fire, law enforcement, OES, CPUC, Energy Safety, Emergency Management Systems, public health departments, public works) to coordinate emergency preparedness, response and recovery plans, roles and responsibilities, etc. • Meet with public safety officials, private companies, and the general public to get recommendations regarding emergency response plans • Coordinate with local public safety partners to assess damage to communities	•	3	3		

Role	Incident Type	Responsibilities	Qualifications	# of Dedicated Staff Required	# of Dedicated Staff Provided	# of Contract Workers Required	# of Contract Workers Provided
		• Coordinate getting assistance and supplies into impacted community • Oversee and direct a variety of emergency-related community education programs, including disaster preparedness programs and AM radio classes					
Trainer Officer	Wildfires, PSPS	• Run training courses and disaster exercises for staff, volunteers, and local agencies to ensure an effective and coordinated response to an emergency					

Training

Training of all appropriate personnel (internal and external) is a critical aspect of a electrical corporation's capacity to provide prompt, organized, safe, effective, and efficient response to and recovery from wildfire and PSPS events. Training is intended to ensure all members of the electrical corporation's response and recovery teams have a clear understanding of the following, at a minimum:

- The electrical corporation's overall safety practices, those specific to wildfires, and those specific to PSPS events
- The contents of emergency response plans, particularly for wildfire- and PSPS-specific incidents
- The organizational structure of how the electrical corporation responds to, manages, and recovers from wildfire and PSPS events
- The electrical corporation's and public safety partners' roles and responsibilities before, during, and after a wildfire or PSPS event
- The electrical corporation's notification and activation processes for wildfire and PSPS events

Personnel Training

The electrical corporation must report on its internal personnel training program(s) for wildfire and PSPS emergency events. This training must include, at a minimum, training on relevant policies, practices, and procedures before, during, and after a wildfire or PSPS event. The reporting must include, at a minimum, the name of each training program, a brief narrative on the purpose and scope of each program, the type of training method, the frequency of administering internal training programs, the percentage of staff who have completed the most current training program, and the method of verification of training records.

An exemplar of the minimum acceptable level of information is provided in Table 8-38.

Contractor Training

The electrical corporation must report on its external contractor training program(s) for wildfire and PSPS emergency events. This training must include, at a minimum, training on relevant policies, practices, and procedures before, during, and after a wildfire or PSPS event. The reporting must include, at a minimum, the name of each training program, a brief narrative on the purpose and scope of each program, the type of training method, the frequency of external training programs, the percentage of contractors who have completed the most current training program, and the method of verification of training records.

An exemplar of the minimum acceptable level of information is provided in Table 8-39.

Table 8-38. Exemplar of Electrical Corporation Personnel Training Program

Training Topic	Purpose and Scope	Training Method	Training Frequency	Position or Title of Personnel Required to Take Training	# Personnel Requiring Training	# Personnel Provided with Training	Form of Verification or Reference
Introduction to the electrical corporation's emergency preparedness plan	• The contents of emergency response plans, in particular those for wildfire- and PSPS-specific incidents • The electrical corporation's overall safety practices and those specific to wildfire and PSPS incidents • The organizational structure of how the electrical corporation responds to, manages, and recovers from incidents • The electrical corporation's and public safety partners' roles and responsibilities before, during, and after a wildfire or PSPS incident • The electrical corporation's notification and activation processes for wildfire and PSPS incidents	Online course, workshop, or in-person training	Annually	All staff	4,100	3,800	Training materials and training logs
Threats, hazards, and protection actions							
Notification, warning, and communication procedures							
Emergency response procedures during a wildfire							

Training Topic	Purpose and Scope	Training Method	Training Frequency	Position or Title of Personnel Required to Take Training	# Personnel Requiring Training	# Personnel Provided with Training	Form of Verification or Reference
Emergency shutdown procedures							
Activating and deactivating mutual aid							
Practices, policies, and procedures for emergency response and service restoration for PSPS							

Table 8-39. Exemplar of Contractor Training Program

Training Topic	Purpose and Scope	Training Method	Training Frequency	Position or Title of Personnel Required to Take Training	# Contractors Requiring Training	# Contractors Completed Training	Form of Verification or Reference
Introduction to the electrical corporation's mutual aid agreement with aid partner	• Familiarize aid partners with the concepts and actions in the mutual aid operations plan prior to implementation • Allow responding resources the opportunity to practice their procedures and responsibilities • Scope items include: ○ Contents of mutual aid operations plan, in particular those on wildfire- and PSPS-specific incidents ○ The electrical corporation's overall safety practices and those specific to wildfire and PSPS incidents ○ The organizational structure and interoperability of how the mutual aid partners and resources collaborate and coordinate ○ The electrical corporation's and public safety partners' roles and responsibilities before, during, and after a wildfire or PSPS incident ○ The electrical corporation's notification and activation processes for wildfire and PSPS incidents	Online course, workshop, or in-person training	Annually	All potential mutual aid resources	150	135	Training materials and training logs

8.4.2.3 Drills, Simulations, and Tabletop Exercises

Discussion-based and operational-based exercises enhance knowledge of plans, allow personnel to improve their own performance, and identify opportunities to improve capabilities to respond to real wildfire emergency events and PSPS events. Exercises also provide a method to evaluate a electrical corporation's emergency preparedness plan and identify planning and/or procedural deficiencies.

Internal Exercises

The electrical corporation must report on its program(s) for conducting internal discussion-based and operations-based exercises for both wildfire and PSPS emergency events. This must include, at a minimum, the types of discussion-based exercises (e.g., seminars, workshops, tabletop exercises, games) and operations-based exercises (e.g., drills, functional exercises, full-scale exercises), the purpose of the exercises, the frequency of internal exercise programs, the percentage of staff who have completed/participated in exercises, and means for verification of internal exercises.

An exemplar of the minimum acceptable level of information is provided in Table 8-40.

External Exercises

The electrical corporation must report on its program(s) for conducting external discussion-based and operations-based exercises for both wildfire and PSPS emergency events. This must include, at a minimum, the types of discussion-based exercises (e.g., seminars, workshops, tabletop exercises, games) and operations-based exercises (e.g., drills, functional exercises, full-scale exercises), the schedule and frequency of external exercise programs, the percentage of public safety partners who have participated in these exercises, and means for verification of external exercises.

An exemplar of the minimum acceptable level of information is provided in Table 8-41.

Table 8-40. Exemplar of Internal Drill, Simulation, and Tabletop Exercise Program

Category	Exercise Title and Type	Purpose	Exercise Frequency	Position or Title of Personnel Required to Participate	# Personnel Participation Required	# Personnel Participation Completed	Form of Verification or Reference
Discussion-based	PSPS event tabletop exercise	• Provide utility a way to determine its readiness to respond to a PSPS event • Identify gaps or problems with existing policies and plans • Help administration and staff understand their roles during a PSPS event. • Serve as a training tool • Serve as a tool for modifying and improving existing PSPS plans based on lessons learned during the exercise	Annually	• Program Director of Emergency Planning • Grid Operations Program Manager and supervisors • Emergency Operations Center Supervisor • Public Information Officer	10	10	Exercise scoping materials and completion logs
Operations-based	Wildfire emergency drill	• Provide utility a way to determine its readiness to respond to a wildfire • Identify gaps or problems with existing policies and plans • Help personnel understand roles during a wildfire emergency • Serve as a training tool	Annually (before September 1)	• Program Director of Emergency Planning • Grid Operations Program Manager and supervisors • Emergency Operations Center Supervisor and staff • Public Information Officer • Utility fire chief	20	19	Exercise scoping materials and completion logs

Table 8-41. Exemplar of External Drill, Simulation, and Tabletop Exercise Program

Category	Exercise Title and Type	Purpose	Exercise Frequency	Position or Title of Personnel Required to Participate	# Personnel Participation Required	# Personnel Participation Completed	Form of Verification or Reference
Discussion-based	PSPS event tabletop exercise	• Provide utility and public safety partners a way to determine their readiness to respond to and recover from a PSPS event • Clarify gaps or problems with existing mutual aid agreements (MAAs) and memorandums of agreement (MOAs), policies, and plans • Help utility and public safety partners understand their roles during a PSPS event • Serve as a training tool • Help identify needs for other resources • Serve as a tool for modifying and improving existing PSPS coordination and emergency response plans based on the lessons learned during the exercise	Annually	• Program Director of Emergency Planning • Grid Operations Program Manager and supervisors • Emergency Operations Center Supervisor • Fire chief(s) or liaison • Police, sheriff, and CHP chief(s) or liaisons • County Health liaison • American Red Cross liaison • Emergency Operations Supervisor(s) for relevant city/county jurisdictions	20	18	Exercise scoping materials and completion logs
Operations-based	Wildfire emergency drill	• Provide utility a way to determine its readiness to respond to a wildfire • Identify gaps or problems with existing policies and plans • Help personnel understand roles during a wildfire emergency Serve as a training tool	Annually (before September 1)	• Program Director of Emergency Planning • Grid Operations Program Manager and supervisors • Emergency Operations Center Supervisor • Utility fire chief and fire marshal • Fire chief(s) or liaison • Police, sheriff, and CHP chiefs or	20	19	Exercise scoping materials and completion logs

Category	Exercise Title and Type	Purpose	Exercise Frequency	Position or Title of Personnel Required to Participate	# Personnel Participation Required	# Personnel Participation Completed	Form of Verification or Reference
				liaisons • County Health liaison • American Red Cross liaison • Emergency Operations Supervisor(s) for relevant city/county jurisdictions			

8.4.2.4 Schedule for Updating and Revising Plan

The electrical corporation must provide a log of the updates to its emergency preparedness plan since 2019 and the date of its next planned update.

Updates should occur every two years, per R.15-06-009 and D.21-05-019. For each update, the electrical corporation must provide the following:

- Year of updated plan
- Revision type (e.g., addition, modification, elimination)
- Component modified (e.g., communications, training, drills/exercises, protocols/procedures, MOAs)
- A brief description of the lesson learned that informed the revision
- A brief description of the specific addition, modification, or elimination

An exemplar of the minimum acceptable level of information is provided in Table 8-42.

Table 8-42. Exemplar of Wildfire-Specific Updates to the Emergency Preparedness Plan

ID #	Year of Updated Plan	Revision Type	Lesson Learned	Revision Description	Reference Section
1	2022	Addition	Statutory change due to CPUC R.15-06-009, D.21-05-019	Updated plan to comply with California Standardized Emergency Management Systems (SEMS) per GO 166	Sections 3–8, pp. xx–yy
2	2022	Modification	In a public survey administered after the three-day PSPS on MM/DD/YYYY, numerous customers complained of not being able to visually understand which neighborhoods were going to be impacted and when the power was planned to be out and then restored. The electrical corporation website only provided tabulated information.	An additional data layer was added to the interactive PSPS customer interface portal. At least three days in advance of a planned event, this identifies the exact date and time of the planned PSPS, the estimated time of planned power restoration, and specific neighborhoods that will be impacted.	Section X, p. 15
3					
…					
N					

8.4.3 External Collaboration and Coordination

8.4.3.1 Emergency Planning

In this section, the electrical corporation must provide a high-level description of its wildfire and PSPS emergency preparedness coordination with relevant public safety partners at state, county, city, and tribal levels within its service territory. The electrical corporation must indicate if its coordination efforts follow California's SEMS or, where relevant for multi-jurisdictional electrical corporations (e.g., PacifiCorp), the Federal Emergency Management Agency (FEMA) National Incident Management Systems (NIMS), as permitted by GO 166. The description must be no more than a page.

In addition, the electrical corporation must provide the following information in tabular form, with no more than one page of information in the main body of the WMP and the full table in Appendix B:

- List of relevant state, city, county, and tribal agencies within the electrical corporation's service territory and key point(s) of contact, with associated contact information. Where necessary, contact information can be redacted for the public version of the WMP.
- For each agency, whether the agency has provided consultation and/or verbal or written comments in preparation of the most current wildfire- and PSPS-specific emergency preparedness plan. If so, the electrical corporation should provide the date, time, and location of the meeting at which the agency's feedback was received.
- For each agency, whether it has an MOA with the electrical corporation on wildfire and/or PSPS emergency preparedness, response, and recovery activities. The electrical corporation must provide a brief summary of the MOA, including the agreed role(s) and responsibilities of the external agency before, during, and after a wildfire or PSPS emergency.
- In a separate table, a list of current gaps and limitations in the electrical corporation's existing collaboration efforts with relevant state, county, city, and tribal agencies within its territory. Where gaps or limitations exist, the electrical corporation must indicate the remedial action plan and timeline for resolving.
- For all requested information, a form of verification that can be provided upon request for compliance assurance.

Reference the Utility Initiative Tracking ID where appropriate.

Table 8-43 and Table 8-44 provide exemplars of the minimum level of content and detail required.

Table 8-43. Exemplar of State and Local Agency Collaboration(s)

Name of State or Local Agency	Point of Contact and Information	Emergency Preparedness Plan Collaboration – Last Version of Plan Agency Collaborated	Emergency Preparedness Plan Collaboration – Collaborative Role	Memorandum of Agreement (MOA)?	Brief Description of MOA
Local Municipal Fire Department	John Doe, Fire Marshal John.Doe@city.gov XXX-XXX-XXXX	2022 Version (06/2021)	Attended a virtual meeting on 02/02/2022 at 1 pm PDT Provided written comments	Yes	Wildfire incidents: • Before • During • After PSPS events: • Before • During • After

Table 8-44. Exemplar of Key Gaps and Limitations in Collaboration Activities with State and Local Agencies

Gap or Limitation Subject	Remedial Brief Description	Remedial Action Plan
Limited feedback on wildfire and PSPS emergency plan	Less than 10% of the state and local government stakeholders have been able to provide feedback and collaborate on review, development, and/or improvement of the emergency preparedness plan.	**Strategy** – Convene a 1.5-day workshop with relevant state and local agencies to review the key elements of the electrical corporation's wildfire- and PSPS-specific emergency preparedness plan. Solicit verbal and written comments from the stakeholders. Assign a government liaison to conduct follow-up meetings to obtain and discuss any comments, proposed modifications, additions, etc. **Target timeline** – Develop workshop scoping plan by June 2023 and convene workshop by end of 2023. Aim to host workshops with 50% of government stakeholders by end of 2025.

8.4.3.2 Communication Strategy with Public Safety Partners

The electrical corporation must describe at a high level its communication strategy to inform external public safety partners and other interconnected electrical corporation partners of wildfire, PSPS, and re-energization events as required by GO 166 and Public Utilities Code section 768.6. This must include a brief description of the policies, practices, and procedures the electrical corporation adopts to establish appropriate communication protocols with public safety partners for both wildfire- and PSPS-specific incidents to ensure timely, accurate, and complete communications. The electrical corporation must refer to its emergency preparedness plan, as needed, to provide more detail. The narrative must be no more than two pages.

As each public safety partner will have its own unique communication protocols, procedures, and systems, the electrical corporation must coordinate with each entity individually. The electrical corporation must summarize the following information in tabulated format:

- All relevant public safety partner groups (e.g., fire, law enforcement, OES, municipal governments, Energy Safety, CPUC, other electrical corporations) at every level of administration (state, county, city, or tribe), as needed.
- The names of individual public safety entities.
- For each entity, the point of contact for emergency communications coordination, and the contact information. Information may be redacted as needed.
- Key protocols for ensuring the necessary level of voice and data communications (e.g., interoperability channels, methods for information exchange, format for each data typology, communication capabilities, data management systems, backup systems, common alerting protocols, messaging), and associated references in the emergency plan for more details.
- Frequency of prearranged communication review and updates.
- Date of last discussion-based or operations-based exercise(s) on public safety partner communication.

In a separate table, the electrical corporation must list the current gaps and limitations in its public safety partner communication strategy coordination. Where gaps or limitations exist, the electrical corporation must indicate the remedial action plan and timeline for resolving. For all requested information, the electrical corporation must indicate a form of verification that can be provided upon request for compliance assurance.

Table 8-45 and Table 8-46 provide exemplars of the minimum level of content and detail required.

Table 8-45. Exemplar of High-Level Communication Protocols, Procedures, and Systems with Public Safety Partners

Public Safety Partner Group	Name of Entity	Point of Contact and Information	Key Protocols	Frequency of Prearranged Communication Review and Update	Communication Exercise(s): Date of Last Completed	Communication Exercise(s): Date of Planned Next
Fire	Local County Fire Department	Jane Smith, Unit Manager Jane.Smith@county.org XXX-XXX-XXXX	• Communication capabilities (e.g., staffing, resources, technologies) • Methods for information exchange • Format for each data typology • Data management strategy • Backup systems • Common alerting protocols • Messaging • Refer to Sections x, y, and z in Utility's Emergency Preparedness Plan and to the MOA entitled "xxxxx," dated MM/DD/YYYY.	Annually (April)	Tabletop exercise, 04/02/2022 at 1 pm PDT	Workshop, 04/02/2023 at 2 pm PDT

Table 8-46. Exemplar of Key Gaps and Limitations in Communication Coordination with Public Safety Partners

Gap or Limitation Subject	Remedial Brief Description	Remedial Action Plan
Limited feedback on wildfire and PSPS emergency plan	Less than 10% of the state and local government stakeholders have been able to provide feedback and collaborate on review, development, and/or improvement of the emergency preparedness plan.	**Strategy** – Convene a 1.5-day workshop with relevant state and local agencies to review the key elements of the electrical corporation's wildfire- and PSPS-specific emergency preparedness plan. Solicit verbal and written comments from the stakeholders. Assign a government liaison to conduct follow-up meetings to obtain and discuss any comments, proposed modifications, additions, etc. **Target timeline** – Develop workshop scoping plan by June 2023 and convene workshop by end of 2023. Aim to host workshops with 50% of government stakeholders by end of 2025.
Uncertainty of emergency communications being received by government agencies	More than 50% of the partner government agencies have independent and different communication systems and associated protocols. Consistency and timing of notification and receipt notification is not standardized.	**Strategy –** Create an integrated, multi-channel communication system that provides for immediate notification of an event through text, email, or broadcast with secondary communication to confirm receipt. Assess current notification systems and communications protocols at the electrical corporation's monitoring center and create priority communication matrices that support the most resilient channels for sending emergency alert messages. Create a survey to be sent to all responding stakeholders to collect information on their communications capabilities and preferences. Align the electrical corporation's capabilities with each responding stakeholder and then create operating standards for dispatchers and responders to follow. **Target timeline** – Complete assessment of current systems and protocols by end of first quarter 2023. Create survey to be sent to all responding stakeholders by end of second quarter 2023. Complete alignment and testing by end of first quarter 2024.

8.4.3.3 Mutual Aid Agreements

In this section, the electrical corporation must provide a brief overview of the Mutual Aid Agreements (MAA) it has entered into regarding wildfire emergencies and/or disasters, as well as PSPS events. The overview narrative must be no more than one page.

In addition, the electrical corporation must provide the following wildfire emergency information in tabulated format:

- List of entities with which the electrical corporation has entered into a MAA
- Scope of the MAA
- Resources available from the MAA partner

Table 8-47 provides an exemplar of the minimum level of content and detail required.

Table 8-47. Exemplar of High-Level Mutual Aid Agreement for Resources During a Wildfire or De-Energization Incident

Mutual Aid Partner	Scope of Mutual Aid Agreement	Available Resources from Mutual Aid Partner

8.4.4 Public Emergency Communication Strategy

The electrical corporation must describe at a high level its comprehensive communication strategy to inform essential customers and other community stakeholder groups of wildfires, outages due to wildfires, and PSPS and service restoration, as required by Public Utilities Code section 768.6. This should include a discussion on the policies, practices, and procedures the electrical corporation adopts to establish appropriate communication protocols to ensure timely, accurate, and complete communications. The electrical corporation may refer to its Public Utilities Code section 768.6 emergency preparedness plan to provide more detail. The narrative must be no more than one page.

In the following sections, the electrical corporation must provide an overview of the following components of an effective and comprehensive communication strategy:

- Protocols for emergency communications
- Messaging
- Current gaps and limitations

Reference the Utility Initiative Tracking ID where appropriate.

8.4.4.1 Protocols for Emergency Communications

The electrical corporation must identify the relevant community stakeholder groups in its service territory and describe the protocols, practices, and procedures used to provide notification of wildfires, outages due to wildfires and PSPS, and service restoration before, during, and after each incident type. Community stakeholder groups include, but are not limited to, the general public, priority essential services, AFN populations, non-English speakers, tribes, and people in remote or isolated areas. The narrative must include a brief discussion on the decision-making process and use of best practices to ensure timely, accurate, and complete communications. The narrative must be no more than one page.

The electrical corporation must also provide, in tabular form, details of the following:

- Methods for communicating
- Means to verify message receipt

Table 8-48 provides an exemplar of the minimum level of content and detail required.

Table 8-48. Exemplar Protocols for Emergency Communication to Public Stakeholder Groups

Stakeholder Group	Event Type	Method(s) for Communicating	Means to Verify Message Receipt
General public	Wildfire		
General public	Wildfire-related outage		
General public	PSPS-related outage		
General public	Restoration of service		
Priority essential services	Wildfire		
Priority essential services	Wildfire-related outage		
Priority essential services	PSPS-related outage		
Priority essential services	Restoration of service		
AFN populations			
Non-English speakers			
Tribes			
People in remote or isolated areas			

8.4.4.2 Messaging

In this section, the electrical corporation must describe its process and approach for developing effective messaging to reach the largest percentage of public stakeholders in its service territory before, during, and after a wildfire, an outage due to wildfire, or a PSPS event.

In addition, the electrical corporation must provide an overview of the development of the following aspects of its communication messaging strategy:

- Features to maximize accessibility of the messaging (e.g., font size, color analyzer)
- Alert and notification schedules
- Translation of notifications
- Messaging tone and language that is specific, consistent, confident, clear, and accurate
- Key components and order of messaging content (e.g., hazard, location, time)

The narrative must be no more than one page.

8.4.4.3 Current Gaps and Limitations

In tabulated format, the electrical corporation must provide a list of current gaps and limitations in its public communication strategy. Where gaps or limitations exist, the electrical corporation must indicate the remedial action plan and timeline for resolving. For all requested information, the electrical corporation should indicate a form of verification that can be provided upon request for compliance assurance. Table 8-49 provides an exemplar of the minimum level of content and detail required.

Table 8-49. Exemplar of Key Gaps and Limitations in Public Emergency Communication Strategy

Gap or Limitation Subject	Remedial Brief Description	Remedial Action Plan
Limited feedback on wildfire and PSPS emergency plan	Less than 10% of the state and local government stakeholders have been able to provide feedback and collaborate on review, development, and/or improvement of the emergency preparedness plan.	**Strategy** – Convene a 1.5-day workshop with relevant state and local agencies to review the key elements of the electrical corporation's wildfire- and PSPS-specific emergency preparedness plan. Solicit verbal and written comments from the stakeholders. Assign a government liaison to conduct follow-up meetings to obtain and discuss any comments, proposed modifications, additions, etc. **Target timeline** – Develop workshop scoping plan by June 2023 and convene workshop by end of 2023. Aim to host workshops with 50% of government stakeholders by end of 2025.

8.4.5 Preparedness and Planning for Service Restoration

8.4.5.1 Overview of Service Restoration Plan

In this section of the WMP, the electrical corporation must provide an overview of its plan to restore service after an outage due to a wildfire or PSPS event. At a minimum, the overview must include a brief description of the following:

- Purpose and scope of the restoration plan.
- Overview of protocols, policies, and procedures for service restoration (e.g., means and methods for assessing conditions, decision-making framework, prioritizations, degree of customization). The electrical corporation must provide an operational flow diagram illustrating key components of the service restoration procedures from the moment of the incident to response, recovery, and restoration of service.
- Resource planning and allocation (e.g., staffing, equipment).
- Drills, simulations, and tabletop exercises.
- Coordination and collaboration with public safety partners (e.g., interoperable communications).
- Notification of and communication to customers during and after a wildfire- or PSPS-related outage.

The electrical corporation may refer to its Public Utilities Code section 768.6 emergency preparedness plan to provide more detail. Where the electrical corporation has already reported on the requested information in another section of the WMP, it must provide a cross-reference with hyperlink to that section. The overview must be no more than one page.

Reference the Utility Initiative Tracking ID where appropriate.

8.4.5.2 Planning and Allocation of Resources

The electrical corporation must briefly describe its methods for:

- Planning appropriate resources (e.g., equipment, specialized workers), and
- Allocating those resources to assure the safety of the public during service restoration

In addition, the electrical corporation must provide an overview of its plans for contingency measures regarding the resources required to:

- Respond to an increased number of reports concerning unsafe conditions, and

- Expedite a response to a wildfire- or PSPS-related power outage

This must include a brief narrative on how the electrical corporation:

- Uses weather reports to pre-position manpower and equipment before anticipated severe weather that could result in an outage,
- Sets priorities,
- Facilitates internal and external communications, and
- Restores service

The narrative for this section must be no more than two pages.

8.4.5.3 Drills, Simulations, and Tabletop Exercises

Discussion-based and operational-based exercises enhance knowledge of plans, allow personnel to improve their own performance, and identify opportunities to improve capabilities to respond to wildfire- and PSPS-related service outages. Exercises also provide a method to evaluate a electrical corporation's emergency preparedness plan and identify planning and/or procedural deficiencies.

Internal Exercises

The electrical corporation must report on its program(s) for conducting internal discussion-based and operations-based exercises for service restoration. This must include, at a minimum, the types of discussion-based exercises (e.g., seminars, workshops, tabletop exercises, games) and operations-based exercises (e.g., drills, functional exercises, full-scale exercises), the purpose of the exercises, the frequency of internal exercise programs, the percentage of staff who have completed/participated in exercises, and means for verification of internal exercises.

An exemplar of the minimum acceptable level of information is provided in Table 8-50.

External Exercises

The electrical corporation must report on its program(s) for conducting external discussion-based and operations-based exercises for service restoration due to wildfire. This must include, at a minimum, the types of discussion-based exercises (e.g., seminars, workshops, tabletop exercises, games) and operations-based exercises (e.g., drills, functional exercises, full-scale exercises), the schedule and frequency of external exercise programs, the percentage of public safety partners who have participated in these exercises, and means for verification of external exercises.

An exemplar of the minimum acceptable level of information is provided in Table 8-51.

Table 8-50. Exemplar of Internal Drill, Simulation, and Tabletop Exercise Program for Service Restoration

Category	Exercise Title and Type	Purpose	Exercise Frequency	Position of Title of Personnel Required to Participate	Personnel Required	Personnel Completed	Form of Verification or Reference
Discussion-based	PSPS event tabletop exercise	• Provide utility a way to determine its readiness to respond to a PSPS event • Clarify gaps or problems with existing policies and plans • Help administration and staff understand their roles during a PSPS event. • Serve as a training tool • Help identify needs for other resources • Serve as a tool for modifying and improving existing PSPS plans based on the lessons learned during the exercise	Annually	• Program Director of Emergency Planning • Grid Operations Program Manager and supervisors • Emergency Operations Center Supervisor • Public Information Officer	10	10	Exercise scoping materials and completion logs
Operations-based	Wildfire emergency drill		Annually (before September 1)	• Program Director of Emergency Planning • Grid Operations Program Manager and supervisors • Emergency Operations Center Supervisor and staff • Public Information Officer • Utility fire chief	20	19	Exercise scoping materials and completion logs

Table 8-51. Exemplar of External Drill, Simulation, and Tabletop Exercise Program for Service Restoration

Category	Exercise Title and Type	Purpose	Exercise Frequency	Position or Title of Personnel Required to Participate	Personnel Required	Personnel Completed	Form of Verification or Reference
Discussion-based	PSPS event tabletop exercise	• Provide utility and public safety partners a way to determine their readiness to respond and recover from a PSPS event • Clarify gaps or problems with existing MAAs and MOAs, policies, and plans • Help utility and public safety partners understand their roles during a PSPS event • Serve as a training tool • Help identify needs for other resources • Serve as a tool for modifying and improving existing PSPS coordination and emergency response plans based on the lessons learned during the exercise	Annually	• Program Director of Emergency Planning • Grid Operations Program Manager and supervisors • Emergency Operations Center Supervisor • Fire chief(s) or liaison • Police, sheriff, and CHP chief(s) or liaisons • County Health liaison • American Red Cross liaison • Emergency Operations Supervisor(s) for relevant city/county jurisdictions	20	18	Exercise scoping materials and completion logs
Operations-based	Wildfire emergency drill		Annually (before September 1)	• Program Director of Emergency Planning • Grid Operations Program Manager and supervisors • Emergency Operations Center Supervisor • Utility fire chief and fire marshal • Fire chief(s) or liaison • Police, sheriff, and CHP chiefs or liaisons	20	19	Exercise scoping materials and completion logs

8.4.6 Customer Support in Wildfire and PSPS Emergencies

In this section of the WMP, the electrical corporation must provide an overview of its programs, systems, and protocols to support residential and non-residential customers in wildfire emergencies and PSPS events. The overview for each emergency service must be no more than one page. At a minimum, the overview must cover the following customer emergency services, per Public Utilities Code section 8386(c)(21):

- Outage reporting
- Support for low-income customers
- Billing adjustments
- Deposit waivers
- Extended payment plans
- Suspension of disconnection and nonpayment fees
- Repair processing and timing
- List and description of community assistance locations and services
- Medical Baseline support services
- Access to electrical corporation representatives

Reference the Utility Initiative Tracking ID where appropriate.

8.4.7 Learning After Wildfires and PSPS events

8.4.7.1 Overview

The electrical corporation must describe how it continuously monitors and evaluates its emergency preparedness plan with respect to wildfire and PSPS events to identify lessons learned for future updates and improvements. This must include various policies, programs, and procedures for operationalizing feedback mechanisms for structural and programmatic improvements. The electrical corporation must provide a graphic describing the process for identifying, analyzing, evaluating, and implementing lesson(s) learned.

Reference the Utility Initiative Tracking ID where appropriate.

8.4.7.2 Monitoring, Data Collection, and Evaluation

A critical element of wildfire and PSPS risk mitigation strategy is for the electrical corporation to monitor the effectiveness of the mitigations it implements to determine the extent to which the mitigations meet their intended risk management/reduction objectives.

Electrical corporations are required to report on monitoring metrics to address specific risk factors and improvements as part of the quarterly data submission process to Energy Safety. In addition, each electrical corporation must periodically review and audit its WMP to (1) assess performance, (2) identify strengths and weaknesses, and (3) use these results to identify mitigation strategy improvements in a continuous feedback process.

As such, the electrical corporation must describe its processes and procedures for monitoring and auditing the implementation of improvements to mitigation initiatives and reporting results from each audit.

- The audit plan must include:
    - Effectiveness of selected improvements/mitigations after deployment
    - Effectiveness of discretionary inspections and maintenance, including those activities performed by contractors
    - Verification of overall risk reduction targets based on the effectiveness audits of each activity
- Each audit report must include the following elements:
    - What was audited
    - Who conducted the audit
    - When/where the audit was performed
    - What data were collected
    - How the data were analyzed
    - What quality assurance/controls were applied

8.5 Community Outreach and Engagement

8.5.1 Overview

In accordance with California Public Utilities Code section 8386(c)(19)(B) each electrical corporation must provide plans for community outreach and engagement before, during, and after a wildfire. The electrical corporation must also provide plans for outreach and engagement related to PSPS, outages from protective equipment and device settings, and vegetation management.

In this section, the electrical corporation must identify objectives for the next 3- and 10-year periods, targets, and performance metrics related to the following community outreach and engagement mitigation initiatives:

- Public outreach and education awareness for wildfires, PSPS, outages from protective equipment and device settings, and vegetation management
- Public engagement in WMP decision-making process
- Engagement with AFN populations, local governments, and tribal communities
- Collaboration on local wildfire mitigation and planning
- Best practice sharing with other electrical corporations

8.5.1.1 Objectives

Each electrical corporation must summarize the objectives for its 3-year and 10-year plans for implementing and improving its community outreach and engagement.[36] These summaries must include the following:

- Identification of which initiative(s) in the WMP the electrical corporation is implementing to achieve the stated objective, including Utility Initiative Tracking IDs
- Reference(s) to applicable codes, standards, and best practices/guidelines and an indication of whether the electrical corporation exceeds an applicable code, standard, or regulation
- Method of verifying achievement of each objective
- A completion date for when the electrical corporation will achieve the objective
- Reference(s) to the WMP section(s) or appendix, including page numbers, where the details of the objective(s) are documented and substantiated

This information must be provided in Table 8-52 for the 3-year plan and Table 8-53 for the 10-year plan. Exemplars of the minimum acceptable level of information are provided below .

[36] Annual information included in this section must align with the QDR data

Table 8-52. Exemplar Community Outreach and Engagement Initiative Objectives (3-year plan)

Objectives for Three Years (2023–2025)	**Applicable Initiative(s), Tracking ID(s)**	**Applicable Regulations, Codes, Standards, and Best Practices (See Note)**	**Method of Verification (i.e., program)**	**Completion Date**	**Reference (section & page #)**
Assess and resolve any customer issues identified through mobile application within 1 week	Public outreach and engagement, PE-01	Customer support guidance document	Records of open and closed customer tickets including dates	May 2024	

Note: An asterisk indicates that the electrical corporation exceeds a particular code, regulation, standard, or best practice. The electrical corporation must provide a reference to the appendix section and page providing further documentation, justification, and substantiation.

Table 8-53. Exemplar Community Outreach and Engagement Initiative Objectives (10-year plan)

Objectives for Ten Years (2026–2032)	**Applicable Initiative(s), Tracking ID(s)**	**Applicable Regulations, Codes, Standards, and Best Practices (See Note)**	**Method of Verification (i.e., program)**	**Completion Date**	**Reference (section & page #)**
Formalize process to incorporate lessons learned from peers in and outside the state	Best practice sharing, CO-01	Guidance document for sharing data and information externally	Documented instances of collaboration between the electrical corporation and outside entities, including agendas, meeting minutes, and participant lists	June 2026	

Note: An asterisk indicates that the electrical corporation exceeds a particular code, regulation, standard, or best practice. The electrical corporation must provide a reference to the appendix section and page providing further documentation, justification, and substantiation.

8.5.1.2 Targets

Initiative targets are quantifiable measurements of activities identified in the WMP. Electrical corporations will show progress towards completing targets in subsequent reports, including QDRs and WMP Updates.

The electrical corporation must list all targets it will use to track progress on its grid design, operations, and maintenance for the next three years (2023–2025). Energy Safety's Compliance Assurance Division and third parties must be able to track and audit each target.[37] For each initiative target, the electrical corporation must provide the following:

- Utility Initiative Tracking IDs
- Projected targets for the three years of the Base WMP and relevant units
- Quarterly, rolling targets for end of 2023 and 2024 (inspections only)
- For 2023–2025, the "x% risk impact." The x% risk impact is the percentage risk reduction identified in Table 7-2 for a specific mitigation initiative (see Section 7.2.2.1 for calculation instructions)
- Method of verifying target completion

Identified targets must be of enough detail and scope to effectively inform the performance of the electrical corporation's grid design, operations, and maintenance initiatives.

An exemplar of the minimum acceptable level of information is provided in Table 8-54 and Table 8-55.

[37] Annual information included in this section must align with Table 1 of the QDR.

Table 8-54. Exemplar Community Outreach and Engagement Initiative Targets by Year

Initiative Activity	Tracking ID	2023 Target & Unit	x% Risk Impact 2023	2024 Target & Unit	x% Risk Impact 2024	2025 Target & Unit	x% Risk Impact 2025	Method of Verification
Hire additional customer support	PO-02	2 additional supervisors hired	0.01%	4 additional agents hired	0.01%	3 additional agents hired	0.01%	Hiring records and # of positions in workforce tracking platform showing before and after results

Table 8-55. Exemplar PSPS Outreach and Engagement Initiative Targets by Year

Initiative Activity	Tracking ID	Target End of Q2 2023 & Unit	Target End of Q3 2023 & Unit	End of Year Target 2023 & Unit	x% Risk Impact 2023	Target End of Q2 2024 & Unit	Target End of Q3 2024 & Unit	End of Year Target 2024 & Unit	x% Risk Impact 2024	Target 2025 & Unit	x% Risk Impact 2025	Method of Verification
Hold public meetings in high PSPS risk areas	PO-03	1 meeting	10 meetings	12 meetings	0.05%	3 meetings	15 meetings	20 meetings	0.1%	20 meetings	0.1%	Meeting agendas, meeting materials and attendance records

8.5.1.3 Performance Metrics

Each electrical corporation must list and describe the performance metrics it uses to evaluate:

- The effectiveness of its community outreach and engagement in reducing wildfire and PSPS risk
- The electrical corporation's performance on those metrics since 2020 (if previously collected)
- Projected performance on metrics for 2023-2025
- How the metrics can be verified

Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of community outreach and engagement initiatives.[38]

The electrical corporation must:

- Graph the reported metric(s)
- Summarize reported metric(s) in tabular form
- Provide graphs necessary to show trends for the performance metrics and leading indicators (See exemplar in Section 8.2.1.3.)
- Provide a brief narrative that explains its trends

An exemplar of the minimum acceptable level of information is provided in Table 8-56.

[38] If a utility-identified metric/leading indicator in this section aligns with required annualized metrics/indicators provided in the QDRs, the reporting between this section and the QDR must be consistent. Where utility-defined metrics/indicators identified in this section are not prescribed in the QDRs, the electrical corporation must report those metrics/indicators in Table 3 of the QDR.

Table 8-56. Exemplar Community Outreach and Engagement Performance Metrics Results by Year

Performance Metrics	2020	2021	2022	2023 Projected	2024 Projected	2025 Projected	Method of Verification (e.g., third-party evaluation, QDR)

8.5.2 Public Outreach and Education Awareness Program

The electrical corporation must provide a high-level overview of its public outreach and education awareness program(s) for wildfires; outages due to wildfires, PSPS, and protective equipment and device settings; service restoration before, during, and after the incidents (as required by Public Utilities Code section 8386(c)(19)(B)); and vegetation management. This includes outreach efforts in English, Spanish, Chinese (including Cantonese, Mandarin, and other Chinese languages), Tagalog, and Vietnamese, as well as Korean and Russian where those languages are prevalent within the service area.

At a minimum, the overview must include the following:

- Description of the purpose and scope of the program(s).
- Reference the Utility Initiative Tracking ID where appropriate.
- Brief narrative followed by a tabulated list of all the different target community groups across the electrical corporation's service territory. The target groups must include AFN and other vulnerable or marginalized populations, but they may also include other target audiences, such as groups in different geographic locations (e.g., urban neighborhoods, rural, remote), age groups, language and ethnic groups, transient populations, or Medical Baseline customers. In addition, the electrical corporation must summarize the interests or concerns each group may have before, during, or after a wildfire or PSPS event to help inform outreach and education awareness needs. An exemplar of the minimum acceptable level of information is provided in Table 8-57.

Table 8-57. Exemplar List of Target Community Groups

Target Community Group	Interests or Concerns Before, During, and After Wildfire and PSPS events
Non-English speakers	Limited access to understand electrical corporation wildfire hazards and risks, specific actions that can be taken to reduce risk, and awareness of emergency services, resources, etc.
People in remote or isolated areas	[Electrical corporation to add description here]
Elderly	[Electrical corporation to add description here]
People with limited technology	[Electrical corporation to add description here]

- Community partners the electrical corporation is working with or intends to work with to support its community outreach and education programs. Partnerships are important to the success of public education and awareness efforts. Good strategies grow from collaboration, and cooperation is essential for developing consistent, harmonized, and standardized messages that will be scaled up and repeated frequently enough to become common knowledge. An exemplar of the minimum acceptable level of information is provided in Table 8-58.

Table 8-58. Exemplar List of Community Partners

Community Partners	County	City
Regional Fire Safe Council	Local County	Local City
Emergency Relief Organization	Local County	Local City
Local City Government	Local County	Local City

- Description of the various outreach and education awareness programs (i.e., campaigns, informal education, grant programs, participatory learning) that the electrical corporation implements before, during, and after wildfire, vegetation management, and PSPS events. Successful programs may use many approaches, settings, and tools to repeat their messages for maximum impact. In addition, the electrical corporation must describe how it implements its overall program, including staff and volunteer needs, other resource needs, method for implementation (e.g., industry best practice, latest research in methods for risk communication, social marketing), long-term monitoring and evaluation of each program's success, need for improvement, etc. The narrative for this section is limited to two to three pages. The electrical corporation must also provide the requested information in tabulated format. An exemplar of the minimum acceptable level of information is provided in Table 8-59.

Table 8-59. Exemplar of Community Outreach and Education Programs

Core Activity	Event Type	Period of Application (Before, During, After Incident)	Name of Outreach or Education Program	Description of Program	Target Audience	Reference/ Link
Website information	Wildfire	Before	General Wildfire Safety	[Electrical corporation to insert description]	General public	http://www.corporation.com/wildfire-safety
Website information	PSPS	Before	Public Safety Power Shutoff	[Electrical corporation to insert description]	General public	
Website information	Wildfire	Before	Wildfire Safety Advancements	[Electrical corporation to insert description]	General public	
Website information	Vegetation Management	Before	Pre-inspection Notification	[Electrical corporation to insert description]	Customers along inspection route	
Website information	Wildfire and PSPS	Before	Community Resources	This website provides customers and the general public with locations of community resource centers throughout the service territory to provide support to customers affected by PSPS.	General public	
Safety webinars	Wildfire	Before	Community Wildfire Safety Program	These virtual gatherings allow community members to learn more about wildfire safety and emergency preparedness, meet with utility representatives, ask questions, and share feedback. Webinars are available in English, Spanish, Chinese, and Tagalog, as well as accessible versions for AFN customers, blind/low vision customers, deaf/hard of hearing customers, etc.	General public, AFN population, limited English proficiency (LEP) population	

8.5.3 Engagement with Access and Functional Needs Populations

In this section, the electrical corporation must provide an overview of its process for understanding, evaluating, designing, and implementing wildfire and PSPS risk mitigation strategies, policies, and procedures specific to AFN customers across its territory. The electrical corporation must also report, at a minimum, on the following:

- Summary of key AFN demographics, distribution, and percentage of total customer base.
- Evaluation of the specific challenges and needs during a wildfire or PSPS event of the electrical corporation's AFN customer base.
- Plans to address specific needs of the AFN customer base throughout the service territory specific to the unique threats that wildfires and PSPS events may pose for those populations before, during, and after the incidents. This should include high-level strategies, policies, programs, and procedures for outreach, engagement in the development and implementation of the AFN-specific risk mitigation strategies, and ongoing feedback practices.

Reference the Utility Initiative Tracking ID where appropriate.

8.5.4 Collaboration on Local Wildfire Mitigation Planning

In this section, the electrical corporation must provide a high-level overview of its plans, programs, and/or policies for collaborating with communities on local wildfire mitigation planning (e.g., wildfire safety elements in general plans, community wildfire protection plans, local multi-hazard mitigation plans) within its service territory. The narrative must be no more than one page.

In addition, the electrical corporation must provide the following information in tabular form, providing no more than one page of tabulated information in the main body of the WMP and the full table in Appendix B, as needed:

- List of county, city, and tribal agencies and non-governmental organizations (e.g., nonprofits, fire safe councils) within the service territory with which the electrical corporation has collaborated or intends to collaborate on local wildfire mitigation planning efforts (i.e., non-wildfire emergency planning activities)

- For each entity, the local wildfire mitigation planning program/plan/document, level of collaboration (e.g., meeting attendance, verbal or written comments), and date the electrical corporation provided its last feedback

Reference the Utility Initiative Tracking ID where appropriate.

An exemplar of the minimum acceptable level of information is provided in Table 8-60.

Table 8-60. Exemplar Collaboration in Local Wildfire Mitigation Planning

Name of County, City, or Tribal Agency or Civil Society Group (e.g., nongovernment organization, fire safe council)	Program, Plan, or Document	Last Version of Collaboration	Level of Collaboration
Local County Resource Management Agency	Local County General Plan, Safety Element, Wildfires	2022 version (06/2021)	Attended a virtual meeting on 02/02/2022 at 1 pm PDT Provided verbal comments and input
Local Fire Safe Council	Structural hardening grant program	2021/2022	Financier
Local County Resource Conservation District	Chipper program	Planned for 12/2023	Financier
Local Tribal Agency	Tribal Government Wildfire Safety Plan	2022 version (06/2021)	Attended a virtual meeting on 02/02/2022 at 1 pm PDT

Name of County, City, or Tribal Agency or Civil Society Group (e.g., nongovernment organization, fire safe council)	Program, Plan, or Document	Last Version of Collaboration	Level of Collaboration
			Provided verbal comments and input

- In a separate table, the electrical corporation must provide a list of current gaps and limitations in its collaboration efforts with local partners on local wildfire planning efforts. Where gaps or limitations exist, the electrical corporation must indicate proposed means and methods to increase collaborative efforts.

An exemplar of the minimum acceptable level of information is provided in Table 8-61.

Table 8-61. Exemplar of Key Gaps and Limitations in Collaborating on Local Wildfire Mitigation Planning

Subject of Gap or Limitation	Brief Description of Gap or Limitation	Strategy for Improvement
Low collaboration requests	Less than 5% of local government and civil society stakeholder groups seek collaboration activities.	**Strategy** – Create web content notifying the public, local government, and civil society organizations of the electrical corporation's resources to provide support on local wildfire mitigation planning efforts. Assign a local wildfire planning liaison to be available, as needed, for local planning efforts. **Target timeline** – Develop and post web content by May 2023 and hire two local wildfire planning liaisons by March 2023.

8.5.5 Best Practice Sharing with Other Electrical Corporations

In this section, the electrical corporation must provide a high-level overview of its policy for sharing best practices and collaborating with other electrical corporations on technical and programmatic aspects of its WMP program. The narrative must be no more than one page.

In addition, the electrical corporation must provide the following information in tabular form, with no more than two pages of information in the main body of the WMP and the full table in Appendix B, as needed:

- List of relevant electrical corporations and other entities it has shared or collaborated, or intends to continue to share or collaborate or begin sharing or collaborating, with on best practices for technical or programmatic aspects of its WMP program
- For each entity, the best practice subject, date(s) of collaboration, whether the collaboration is technical or programmatic, list of electrical corporation partners, a description of the best practice sharing/collaborative activity with a reference, and any outcomes from that sharing or activity
- Reference the Utility Initiative Tracking ID where appropriate.

An exemplar of the minimum acceptable level of information is provided in Table 8-62.

Table 8-62. Exemplar of Best Practice Sharing with Other Electrical Corporations

Best Practice Subject	Dates of Collaboration (YYYY–YYYY)	Technical or Programmatic	Utility Partner(s)	Description of Best Practice Sharing or Collaborating	Outcome
Covered conductor effectiveness	2020–Current	Technical	PGE, SCE, SDGE, Liberty, PC, BVES	The IOUs commissioned a joint study to assess the effectiveness and reliability of covered conductors (CCs) for overhead distribution system hardening. The aim is to develop consistent criteria and measurements for evaluating effectiveness of CCs. Refer to the report entitled "Effectiveness of Covered Conductors: Failure Mode Identification and Literature Review," dated December 22, 2021, for more details.	Ongoing • CCs are a mature technology (in use since the 1970s) and have the potential to mitigate several safety, reliability, and wildfire risks inherent to bare • conductors. This is due to the reduced vulnerability to arcing/faults afforded by the multi-layered polymeric insulating sheath material. • Of the 10 hazards that affect bare conductors, CCs have the potential to mitigate six (tree/vegetation contact, wind-induced contact, third-party damage, animal-related damage, public/worker impact, • and moisture). • Laboratory studies and field experience have shown that CCs largely mitigated arcing due to external contact. • Several CC-specific failure modes exist that require operators to consider additional personnel training, augmented installation practices, and adoption of new mitigation strategies (e.g., additional lightning arrestors, conductor washing programs).

9. Public Safety Power Shutoff

9.1 Overview

In Sections 9.1–9.5 of the WMP, [39] the electrical corporation must:

- Provide a high-level overview of key PSPS statistics
- Identify circuits that have been frequently de-energized and provide measures for how the electrical corporation will reduce the need for, and impact of, future PSPS of those circuits
- Describe expectations for how the electrical corporation's PSPS program will evolve over the next 3 and 10 years
- Describe any lessons learned for PSPS events occurring since the electrical corporation's last WMP submission
- Describe the electrical corporation's protocols, processes, and procedures for PSPS implementation

9.1.1 Key PSPS Statistics

In this section, the electrical corporation must include a summary table of PSPS event data. These data must be calculated from the same source used in the GIS data submission (i.e., should be internally consistent). If it is not possible to provide these data from the same source, the electrical corporation must explain why. An exemplar is provided in Table 9-1.

[39] Annual information included in the following sections should align with Table 10 from the QDRs.

Table 9-1. Exemplar PSPS Event Statistics

	# of Events	Circuits De-energized	Customers Impacted	Customer Minutes of Interruption
Jan 1 – Dec 31 2020	XX	XXX,XXX	XXX	XXX million
Jan 1 – Dec 31 2021	XX	XXX,XXX	XXX	XXX million
Jan 1 – Dec 31 2022	XX	XXX,XXX	XXX	XXX million

9.1.2 Identification of Frequently De-energized Circuits

Public Utilities Code section 8386(c)(8) requires the “Identification of circuits that have frequently been de-energized pursuant to a PSPS event to mitigate the risk of wildfire and the measures taken, or planned to be taken, by the electrical corporation to reduce the need for, and impact of, future PSPS of those circuits, including, but not limited to, the estimated annual decline in circuit PSPS and PSPS impact on customers, and replacing, hardening, or undergrounding any portion of the circuit or of upstream transmission or distribution lines.” To comply, the electrical corporation is required to populate Table 9-2 and provide a map showing the frequently de-energized circuits.

The map must show the following:

- All circuits listed in Table 9-2, colored or weighted by frequency of PSPS
- HFTD tier 2 and 3 contour overlay

Exemplars of the minimum acceptable level of information are provided in Table 9-2.

Table 9-2. Exemplar Frequently De-energized Circuits

Entry #	Circuit ID	Name of Circuit	Dates of Outages	Number of Customers Served by Circuit	Number of Customers Affected	Measures Taken, or Planned to Be Taken, to Reduce the Need for and Impact of Future PSPS of Circuit
1	157	Panama	Dec 2–4, 2021 Dec 7–9, 2022 Dec 23–24, 2022	1,500	1,220 600 500	• 34.26 miles of overhead hardening completed; 33 miles in scope for 2022/2023 • Eight SCADA (supervisory control and data acquisition) sectionalizing devices added or replaced
2	1215	Costa	Oct 27, 2018 Nov 12–14, 2020 Dec 2–4, 2021 Jan 28–29, 2022	1,200	300 250 542 600	• 0.78 miles of overhead hardening completed • Backup resiliency programs that have benefited 18 customers

Note: Once populated, if this table is longer than two pages, the electrical corporation must append the table.

9.1.3 Objectives

Each electrical corporation must summarize the objectives for its 3-year and 10-year plans to reduce the scale, scope, and frequency of PSPS events.[40] These summaries must include the following:

- Identification of which initiative(s) in the WMP the electrical corporation is implementing to achieve the stated objective, including Utility Initiative Tracking IDs
- Reference(s) to applicable codes, standards, and best practices/guidelines and an indication of whether the electrical corporation exceeds an applicable code, standard, or regulation
- Method of verifying achievement of each objective
- A completion date for when the electrical corporation will achieve the objective
- Reference(s) to the WMP section(s) or appendix, including page numbers, where the details of the objective(s) are documented and substantiated

This information must be provided in Table 9-3 for the 3-year plan and Table 9-4 for the 10-year plan. Exemplars of the minimum acceptable level of information are provided below.

[40] Annual information included in this section should align with the QDR tables.

Table 9-3. Exemplar PSPS Objectives (3-year plan)

Objectives for Three Years (2023–2025)	Applicable Initiative(s) & Tracking ID(s)	Applicable Regulations, Codes, Standards, and Best Practices (See Note)	Method of Verification (i.e., program)	Completion Date	Reference (section & page #)
Automate PSPS notifications to customers	Communication strategy for PSPS, PSPS-02	CPUC's PSPS guidelines and rules	Contract with communications firm to automate notifications; demonstration of automated process; post-event reports	September 2023	

Note: An asterisk indicates that the electrical corporation exceeds a particular code, regulation, standard, or best practice. The electrical corporation must provide a reference to the appendix section and page providing further documentation, justification, and substantiation.

Table 9-4. Exemplar PSPS Objectives (10-year plan)

Objectives for Ten Years (2026–2032)	Applicable Initiative(s) & Tracking ID(s)	Applicable Regulations, Codes, Standards, and Best Practices (See Note)	Method of Verification (i.e., program)	Completion Date	Reference (section & page #)
Eliminate use of PSPS	Protocols on PSPS, PSPS-01	CPUC's PSPS guidelines and rules	Statement from executive officers; revised operational protocols	September 2030	

Note: An asterisk indicates that the electrical corporation exceeds a particular code, regulation, standard, or best practice. The electrical corporation must provide a reference to the appendix section and page providing further documentation, justification, and substantiation.

9.1.4 Targets

Initiative targets are quantifiable measurements of activities identified in the WMP. Electrical corporations will show progress towards completing targets in subsequent reports, including QDRs and WMP Updates.

The electrical corporation must list all targets it uses to track progress on reducing the scope, scale, and frequency of PSPS for the next three years (2023–2025). Energy Safety's Compliance Assurance Division and third parties must be able to track and audit each target.[41] For each initiative target, the electrical corporation must provide the following:

- Utility Initiative Tracking IDs
- Projected targets for the three years of the Base WMP and relevant units
- Quarterly, rolling projections for end of 2023 and 2024 (inspections only)
- For 2023–2025, the "x% risk impact." The x% risk impact is the percentage risk reduction identified in Table 7-2 for a specific mitigation initiative (see Section 7.2.2.1 for calculation instructions)
- Method of verifying target completion

Identified targets must be of enough detail and scope to effectively inform the performance of the electrical corporation's progress on reducing the scope, scale, and frequency of PSPS.

An exemplar of the minimum acceptable level of information is provided in Table 9-5.

[41] Annual information included in this section must align with Table 1 of the QDR.

Table 9-5. Exemplar PSPS Targets

Initiative Activity	Tracking ID	2023 Target & Unit	x% Risk Impact 2023	2024 Target & Unit	x% Risk Impact 2024	2025 Target & Unit	x% Risk Impact 2025	Method of Verification
Install sectionalizing devices	PSPS-05	10 sectionalizing devices installed	2%	5 sectionalizing devices installed	1%	5 sectionalizing devices installed	1%	Completed work orders, GIS Data Submissions

9.1.5 Performance Metrics

Each electrical corporation must list and describe all outcome metrics and leading indicators it uses to evaluate:

- The effectiveness of reducing reliance on PSPS
- The electrical corporation's performance on those metrics since 2020 (if previously collected)
- Projected performance on metrics for 2023-2025
- How the metrics can be verified

Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of reducing the scale, scope, and frequency of PSPS.[42]

The electrical corporation must:

- Graph the reported metric(s)
- Summarize reported metric(s) in tabular form
- Provide graphs necessary to show trends for the performance metrics and leading indicators (See exemplar in Section 8.2.1.3.)
- Provide a brief narrative that explains its trends

An exemplar of the minimum acceptable level of information is provided in Table 9-6.

In addition to the table, the electrical corporation must provide a narrative (two pages maximum) explaining its method for determining its projected performance on these metrics (e.g., PSPS consequence modeling, retrospective analysis).

[42] If a utility-identified metric/leading indicator in this section aligns with required annualized metrics/indicators provided in the QDRs, the reporting between this section and the QDR must be consistent. Where utility-defined metrics/indicators identified in this section are not prescribed in the QDRs, the electrical corporation must report those metrics/indicators in Table 3 of the QDR.

Table 9-6. Exemplar PSPS Performance Metrics Results by Year

Performance Metrics	2020	2021	2022	2023 Projected	2024 Projected	2025 Projected	Method of Verification (e.g., third-party evaluation, QDR)
PSPS notifications							
Circuits de-energized							
Customers impacted							

9.2 Protocols on PSPS

The electrical corporation must describe its protocols, processes, and procedures on PSPS including:

- Risk thresholds (e.g., wind speed, FPI, etc.) and decision-making process that determine the need for a PSPS. Where the electrical corporation provides this information in another section of the WMP, it must provide a cross-reference here rather than duplicating responses
- Method used to compare and evaluate the relative consequences of PSPS and wildfires
- Outline of tactical and strategic decision-making protocol for initiating a PSPS/PSPS (e.g., decision tree). Where the electrical corporation provides this information in another section of the WMP, it must provide a cross-reference here rather than duplicating responses
- Protocols for mitigating the public safety impacts of PSPS, including impacts on first responders, health care facilities, operators of telecommunications infrastructure, and water electrical corporations/agencies

9.3 Communication Strategy for PSPS

The electrical corporation must discuss all public communication strategies for wildfires, outages due to wildfires and PSPS, and service restoration in Section 8.4.4 of the WMP. Thus, in this section, the electrical corporation is only required to provide a cross-reference to Section 8.4.4 and any other section of the WMP providing details of the emergency public communication strategy for PSPS.

9.4 Key Personnel, Qualifications, and Training for PSPS

The electrical corporation must discuss all key personnel planning, qualifications, and training for wildfires, outages due to wildfires, and PSPS, and service restoration in Section 8.4.2.2 of the WMP. Thus, in this section, the electrical corporation is only required to provide a cross-reference to Section 8.4.2.2 and any other section of the WMP providing details of key personnel, qualifications, and training for PSPS.

9.5 Planning and Allocation of Resources for Service Restoration due to PSPS

The electrical corporation must address planning of appropriate resources (e.g., equipment, specialized workers) and allocation of those resources to assure the safety of the public during service restoration in Section 8.4.5.2 of the WMP. Thus, in this section, the electrical corporation is only required to provide a cross-reference to Section 8.4.5.2 and any other section of the WMP providing details of resource planning for PSPS.

10. Lessons Learned

An electrical corporation must use lessons learned to drive continuous improvement in its WMP. Electrical corporations must include lessons learned due to ongoing monitoring and evaluation initiatives, collaboration with other electrical corporations and industry experts, and feedback from Energy Safety and other regulators.

The electrical corporation must provide a summary of new lessons learned since its most recently approved WMP or WMP Update, and any ongoing improvements to address existing lessons learned. This must include a brief narrative describing the new key lessons learned and a status update on any ongoing improvements due to existing lessons learned. The narrative should be limited to two pages.

Lessons learned can be divided into the three main categories: (1) internal monitoring and evaluation, (2) external collaboration with other electrical corporations, and (3) feedback from Energy Safety or other authoritative bodies. The following are examples of more specific sources of lessons learned:

1. Internal monitoring and evaluation initiatives:
    - Tracking of risk events
    - Findings from fire root cause analysis
    - Drills and exercises
    - Operational and procedural reviews
    - After-action reviews
    - Feedback from community engagement
2. Collaboration with other electrical corporations:
    - Sharing of best practices
    - Cross-utility research
    - Industry working groups
3. Feedback from Energy Safety or other authoritative bodies:
    - Areas of continuous improvement identified in Decisions in the previous WMP evaluation period
    - Findings from post-wildfire investigations by Energy Safety, CAL FIRE, and any other authoritative bodies

- Findings from Compliance Division assessments

For each lesson learned, the electrical corporation must identify the following in Table 10-1:

- Year the lesson learned was identified
- Subject of the lesson learned
- Specific type or source of lesson learned (as identified in the bullet lists above)
- Brief description of the lesson learned that informed improvement to the WMP
- Brief description of the proposed improvement to the WMP and which initiative(s) or activity(s) the electrical corporation intends to add or modify
- Estimated timeline for implementing the proposed improvement
- Reference to the documentation that describes and substantiates the need for improvement including:
  - Where relevant, a hyperlinked section and page number in the appendix of the WMP
  - Where relevant, the title of the report, date of report, and link to the electrical corporation webpage where the report can be downloaded
  - If any lessons learned were derived from quantifiable data, visual/graphical representations of these lessons learned in the supporting documentation

An exemplar of the minimum acceptable level of information is provided in Table 10-1.

Table 10-1. Exemplar of Lessons Learned

ID #	Year of Lesson Learned	Subject	Type or Source of Lesson Learned	Description of Lesson Learned	Proposed WMP Improvement	Timeline for Implementation	Reference
1	2020	Collaboration with other electrical corporations	Risk modeling working group	Wildfire risk models need to establish standard weather and vegetative coverage scenarios, as well as extreme-event conditions, for design purposes and long-term contingency planning.	Continue ongoing engagement in wildfire risk modeling working group. Commission research at leading research and academic institutes to help inform standard key assumptions as the basis for long-term design of capital improvements and wildfire risk mitigation initiatives, as well as contingency planning for unexpected, extreme events and/or potential changes to environmental settings and other assumptions due to climate change.	Ongoing Concept design by 12/2022 Detailed design by 2025 Draft report by 2026 Final report by 2027	Weblink to wildfire risk modeling working group and summary report Weblink to utility proposed research
2	2022	Feedback from Energy Safety	Area of continuous improvement	Fire risk models need updated ignition and consequence data; covered conductor research needs to be provided.	Cooperate and share best practices with agencies outside California. Increase efforts to disseminate data and update risk models to include actual ignition and consequence data and incorporation of fire suppression. Distribute benchmarking surveys to understand current state of covered conductor.	Operationalized by 12/2023	Title of covered conductor analysis report, dated MM/DD/YYYY; title of risk model analysis report, dated MM/DD/YYYY

11. Corrective Action Program

In this section, the electrical corporation must describe its corrective action program. The electrical corporation must present a summary description of the relevant portions of its existing processes and procedures.

The electrical corporation must report on how it maintains a corrective action program to track formal actions and activities undertaken to:

- Prevent recurrence of risk events
- Address findings from wildfire investigations (both internal and external)
- Address finding from Energy Safety's Compliance Assurance Division (i.e., audits and notices of defect and violation)
- Address Areas for Continued Improvement (ACI) identified by Energy Safety as part of the WMP evaluation

The electrical corporation must report on how it reviews each improvement area in accordance with its corrective action program. At a minimum, the electrical corporation must:

- **Identify insufficient occurrence and response** – Identify targeted corrective actions for areas where the event occurrence, response, or feature was insufficient.
- **Identify actions to reduce recurrence** – Identify improvement actions (as applicable) to reduce the likelihood of recurrence, improve response/mitigation actions, or improve operational processes, practices, and/or procedures.
- **Track implementation** – Track the improvement action plan and schedule in the electrical corporation's action tracking system.
- **Improve external communication** – For areas where weaknesses were identified in the response of external agencies, develop communication plan to share the information and conclusion with the responsible agency. The completion of this action and the agency's response must be documented.
- **Integrate lessons learned across industry** – Identify applicable generic lessons learned to improve overall effectiveness of the electrical corporation WMP.
- **Share lessons learned with others** – Identify and communicate any significant generic lessons learned that should be disseminated broadly (i.e., to other electrical

corporations and responsible regulatory authorities, such as Energy Safety or CAL FIRE).

The WMP should not include detailed corrective action plans for each risk event, finding, and/or improvement area. However, this documentation must be made available to Energy Safety upon request.

12. Notices of Violation and Defect

Within a Notice of Violation (NOV) or Notice of Defect (NOD), Energy Safety directs an electrical corporation to correct a violation or defect within a specific timeline, depending on the risk category of the violation or defect. The electrical corporation has 30 days to respond to the NOV or NOD and provide a plan for corrective action. Following completion of corrective action, the electrical corporation must provide Energy Safety with documentation validating the resolution or correction of the identified violation or defect. Energy Safety includes the electrical corporation's response and the resolution status of any violations or defects in the summaries it provides to the CPUC.

In Table 12-1 of the WMP, the electrical corporation must provide a list of all open violations and defects.

Table 12-1. Exemplar List of Open Compliance Violations and Defects

ID	Type	Severity	Date of Notice	Date of Response	Summary Description of Violation/Defect	Estimated Completion Date[1]	Summary Description of Correction
NOD_ES_ATJ_20220101-01	Defect	Minor	1/31/2022	2/21/2022	Vegetation contacting guy wire on poles 123456789 and 987654321	1/31/2023	Vegetation to be removed from guy wires.
NOV_ES_ATJ_20220201-01	Violation	Moderate	3/14/2022	4/8/2022	QDR stated covered conductor installed on pole 123456789, but Energy Safety inspection found no covered conductor installed	5/3/2022	Error in reporting procedure led to inaccurate data in QDR. Procedure has been corrected.

[1] *Estimated date for completion of correction of NOV or NOD.*

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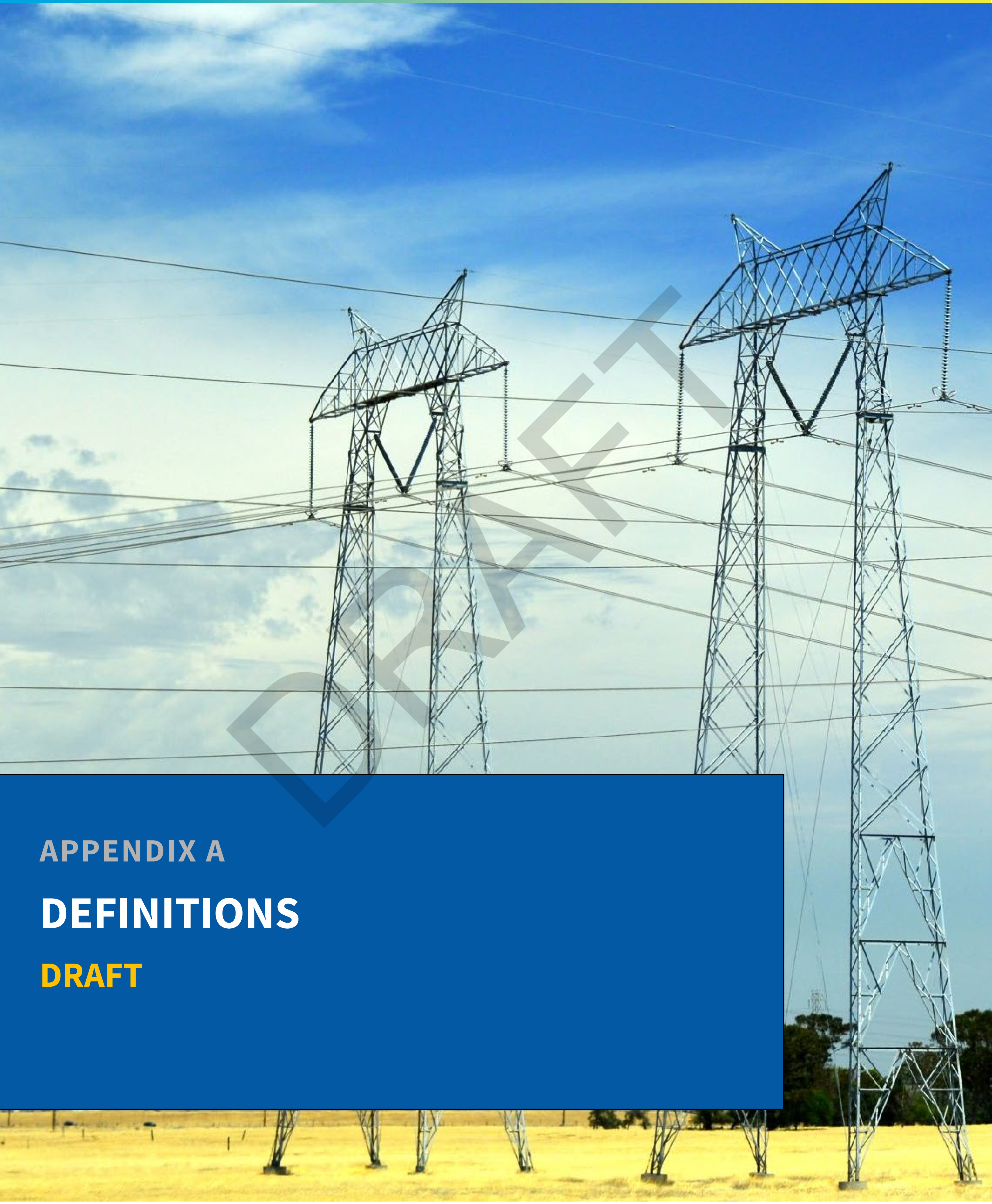

APPENDIX A

DEFINITIONS

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Definitions

Scope

Unless otherwise expressly stated, the following words and terms, for the purposes of these Guidelines, have the meanings shown in this chapter.

1.1.1 Terms Defined in Other Codes

Where terms are not defined in these Guidelines and are defined in the Government Code, Public Utilities Code, or California Public Resources Code, such terms have the meanings ascribed to them in those codes.

1.1.2 Terms Not Defined

Where terms are not defined through the methods authorized by this section, such terms have ordinarily accepted meanings such as the context implies.Definitions

Term	Definition
Access and functional needs population (AFN)	Individuals, including, but not limited to, individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, or injuries; who have limited English proficiency or are non-English speaking; who are older adults, children, or people living in institutionalized settings; or who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or are pregnant. (Public Utilities Code section 8593.3 and D.19-05-042.)
Asset (utility)	Electric lines, equipment, or supporting hardware.
At-risk species	See High-risk species.

Term	Definition
Calibration	Adjustment of a set of code input parameters to maximize the resulting agreement of the code calculations with observations in a specific scenario.[1]
Circuit miles	The total length in miles of separate transmission and/or distribution circuits, regardless of the number of conductors used per circuit (i.e., different phases).
Consequence	The adverse effects from an event, considering the hazard intensity, community exposure, and local vulnerability.
Contact by object ignition likelihood	The likelihood that a non-vegetative object (such as a balloon or vehicle) will contact utility-owned equipment and result in an ignition.
Contact by vegetation ignition likelihood	The likelihood that vegetation will contact utility-owned equipment and result in an ignition.
Contractor	Any individual in the temporary and/or indirect employ of the electrical corporation whose limited hours and/or time-bound term of employment are not considered "full-time" for tax and/or any other purposes.
Critical facilities and infrastructure	Facilities and infrastructure that are essential to public safety and that require additional assistance and advance planning to ensure resiliency during PSPS events. These include the following: Emergency services sector: • Police stations • Fire stations • Emergency operations centers • Public safety answering points Government facilities sector:

[1] Adapted from T. G. Trucano, L. P. Swiler, T. Igusa, W. L. Oberkampf, and M. Pilch, 2006, "Calibration, validation, and sensitivity analysis: What's what," *Reliability Engineering and System Safety*, vol. 91, no. 10–11, pp. 1331–1357.

Term	Definition
	• Schools • Jails and prisons Health care 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 doctors' 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 electrical corporations and electric cooperatives Water and wastewater systems sector: • Facilities associated with provision of drinking water or processing of wastewater, including facilities that 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 manufacturing, maintaining, or distributing hazardous materials and chemicals (including Category N-Customers as defined in D.01-06-085) Transportation sector:

Term	Definition
	• Facilities associated with transportation for civilian and military purposes: automotive, rail, aviation, maritime, or major public transportation
Customer hours	Total number of customers, multiplied by average number of hours (e.g., of power outage).
Danger tree	Any tree located on or adjacent to a utility right-of-way or facility that could damage utility facilities should it fall where (1) the tree leans toward the right-of-way, or (2) the tree is defective because of any cause, such as: heart or root rot, shallow roots, excavation, bad crotch, dead or with dead top, deformity, cracks or splits, or any other reason that could result in the tree or main lateral of the tree falling. (California Code of Regulation Title 14 § 895.1)
Data cleaning	Calibration of 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 General Order (GO) 165, an inspection where individual pieces of equipment and structures are carefully examined, visually and through routine diagnostic testing, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each is rated and recorded.
Disaster	A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability, and capacity, leading to one or more of the following: human, material, economic, and environmental losses and impacts. The effect of the disaster can be immediate and localized but is often widespread and could last a long time. The effect may test or exceed the

Term	Definition
	capacity of a community or society to cope using its own resources. Therefore, it may require assistance from external sources, which could include neighboring jurisdictions or those at the national or international levels. (United Nations Office for Disaster Risk Reduction [UNDRR].)
Discussion-based exercise	Exercise used to familiarize participants with current plans, policies, agreements, and procedures or to develop new plans, policies, agreements, and procedures. Often includes seminars, workshops, tabletop exercises, and games.
Electrical corporation	Every corporation or person owning, controlling, operating, or managing any electric plant for compensation within California, except where the producer generates electricity on or distributes it through private property solely for its own use or the use of its tenants and not for sale or transmission to others.
Emergency	Any incident, whether natural, technological, or human caused, that requires responsive action to protect life or property but does not result in serious disruption of the functioning of a community or society. (FEMA/UNDRR.)
Enhanced inspection	Inspection whose frequency and thoroughness exceed the requirements of a detailed inspection, particularly if driven by risk calculations.
Equipment ignition likelihood	The likelihood that utility-owned equipment will cause an ignition through either normal operation (such as arcing) or failure.
Exercise	An instrument to train for, assess, practice, and improve performance in prevention, protection, response, and recovery capabilities in a risk-free environment. (FEMA.)

Term	Definition
Exposure	The presence of people, infrastructure, livelihoods, environmental services and resources, and other high-value assets in places that could be adversely affected by a hazard.
Fire ecology	A scientific discipline concerned with natural processes involving fire in an ecosystem and its ecological effects, the interactions between fire and the abiotic and biotic components of an ecosystem, and the role of fire as an ecosystem process.
Fire season	The time of year when wildfires are most likely for a given geographic region due to historical weather conditions, vegetative characteristics, and impacts of climate change. The electrical corporation must define the fire season(s) across its service territory based on a recognized fire agency definition for the specific region(s) in California. Goals and targets that have milestones related to the onset, duration, or end of "fire season" must be accompanied by calendar dates as defined by a state agency such as CAL FIRE.
Frequency	The anticipated number of occurrences of an event or hazard over time.
Frequent PSPS events	Three or more PSPS events per calendar year per line circuit.
Fuel density	Mass of fuel (vegetation) per area that could combust in a wildfire.
Fuel management	Removal or thinning of 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 (FTE)	Any individual in the ongoing and/or direct employ of the electrical corporation whose hours and/or term of employment are considered "full-time" for tax and/or any other purposes.

Term	Definition
Game	A simulation of operations that often involves two or more teams, usually in a competitive environment, using rules, data, and procedures designed to depict an actual or assumed real-life situation.
Goals	The general intentions, ambitions, and ends toward which utility efforts that address wildfire mitigations are directed.
GO 95 nonconformance	Condition of a utility asset that does not meet standards established by GO 95.
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 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 PSPS (e.g., ability to deliver electricity from an additional source).
Hazard	A condition, situation, or behavior that presents the potential for harm or damage to people, property, the environment, or other valued resources.[3]
Hazard tree	See danger tree
High Fire Threat District (HFTD)	Areas of the state designated by the CPUC as having elevated wildfire risk, where each utility must take additional action (per GO 95, GO 165, and GO 166) to mitigate wildfire risk. (D.17-01-009.)
Highly rural region	In accordance with 38 CFR 17.701, area with a population of less than seven persons per square mile, as determined by the United States Bureau of the Census. For purposes of the WMP, "area" must be defined as a census tract.

Term	Definition
High-risk species	Species of vegetation that (1) have a higher risk of either coming into contact with powerlines or causing an outage or ignition, or (2) are easily ignitable and within close proximity to potential arcing, sparks, and/or other utility equipment thermal failures. The status of species as "high-risk" must be a function of species-specific characteristics, including growth rate; failure rates of limbs, trunk, and/or roots (as compared to other species); height at maturity; flammability; and vulnerability to disease or insects.
High Wind Warning (HWW)	Level of wind risk from weather conditions, as declared by the National Weather Service (NWS). For historical NWS data, refer to the Iowa State University archive of NWS watches/warnings.[2]
HWW overhead (OH) circuit mile day	Sum of OH circuit miles of utility grid subject to a HWW each day within a given time period, calculated as the number of OH circuit miles under a HWW multiplied by the number of days those miles are under said HWW. For example, if 100 OH circuit miles are under a HWW for one day, and 10 of those miles are under the HWW for an additional day, then the total HWW OH circuit mile days would be 110.
Ignition consequence	The total anticipated adverse effects from an ignition at each location in the electrical corporation service territory. This considers the likelihood that an ignition will transition into a wildfire (wildfire spread likelihood) and the consequences that the wildfire will have on each community it reaches (wildfire consequence).
Ignition likelihood	The total anticipated annualized number of ignitions resulting from utility-owned assets at each location in the electrical corporation service territory. This considers probabilistic

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

Term	Definition
	weather conditions, type and age of equipment, and potential contact of vegetation and other objects with utility assets.
Ignition probability	The relative possibility that an ignition will occur, quantified as a number between 0 percent (impossibility) and 100 percent (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 risk	The total anticipated annualized impacts from ignitions at a specific location. This considers the likelihood that an ignition will occur, the likelihood the ignition will transition into a wildfire, and the potential consequences – considering hazard intensity, exposure potential, and vulnerability – the wildfire will have on each community it reaches.
Impact/consequence of ignition	The effect or outcome of a wildfire ignition upon objectives that may be expressed by terms including, although not limited to, maintaining health and safety, ensuring reliability, and minimizing economic and/or environmental damage.
Incident command system (ICS)	A standardized on-scene emergency management construct. It is specifically designed to provide an integrated organizational structure that reflects the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries. The ICS is the combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure, designed to aid in the management of resources during incidents.
Initiative	Measure or activity, either proposed or in process, designed to reduce the consequences and/or probability of wildfire or PSPS.
Initiative targets	Quantifiable measurements of initiative activity identified in WMPs and subsequent updates to show progress towards reaching objectives.

Term	Definition
Integrated public alert warning system (IPAWS)	System allowing the President to send a message to the American people quickly and simultaneously through multiple communications pathways in a national emergency. IPAWS also is available to United States federal, state, local, territorial, and tribal government officials to alert the public via the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other NWS dissemination channels; the internet; existing unique warning systems; and emerging distribution technologies.
Invasive species	A species (1) that is non-native (or alien) to the ecosystem under consideration and (2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health.
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 safety and/or reliability risk (non-immediate and with high to low probability for significant impact).
Level 3 finding	In accordance with GO 95, an acceptable safety and/or reliability risk.
Limited English proficiency (LEP) population	Population with limited English working proficiency based on the International Language Roundtable scale.
Line miles	The number of miles of transmission and/or distribution conductors, including the length of each phase and parallel conductor segment.
Live fuel moisture content	Moisture content within living vegetation, which can retain water longer than dead fuel.

Term	Definition
Locally relevant	In disaster risk management, generally understood as the scale at which disaster risk strategies and initiatives are considered the most effective at achieving desired outcomes. This tends to be the level closest to impacting residents and communities, reducing existing risks, and building capacity, knowledge, and normative support. Locally relevant scales, conditions, and perspectives depend on the context of application.
Match-drop simulation	Wildfire simulation method forecasting propagation and consequence/impact based on an arbitrary ignition.
Memorandum of Agreement (MOA)	A document of agreement between two or more agencies establishing reciprocal assistance to be provided upon request (and if available from the supplying agency) and laying out the guidelines under which this assistance will operate. It can also be a cooperative document in which parties agree to work together on an agreed-upon project or meet an agreed objective.
Mitigation	Activities to reduce the loss of life and property from natural and/or human-caused disasters by avoiding or lessening the impact of a disaster and providing value to the public by creating safer communities.
Model uncertainty	The amount by which a calculated value might differ from the true value when the input parameters are known (i.e., limitation of the model itself based on assumptions).[3]
Multi-attribute value function (MAVF)	Risk calculation methodology introduced during CPUC's Safety Model Assessment Proceedings (S-MAP) and Risk Assessment and Mitigation Phase (RAMP) proceedings. This methodology is established in D.18-12-014 but may be subject to change pursuant to R.20-07-013.

[3] Adapted from SFPE, 2010, "Substantiating a Fire Model for a Given Application," *Society of Fire Protection Engineers Engineering Guides*.

Term	Definition
Mutual aid	Voluntary aid and assistance by the provision of services and facilities, including but not limited to electrical corporations, communication, and transportation. Mutual aid is intended to provide adequate resources, facilities, and other support to electrical corporations whenever their own resources prove inadequate to cope with a given situation.
National Incident Management System (NIMS)	A systematic, proactive approach to guide all levels of government, nongovernment organizations, and the private sector to work together to prevent, protect against, mitigate, respond to, and recover from the effects of incidents. NIMS provides stakeholders across the whole community with the shared vocabulary, systems, and processes to successfully deliver the capabilities described in the National Preparedness System. NIMS provides a consistent foundation for dealing with all incidents, ranging from daily occurrences to incidents requiring a coordinated federal response.
Near miss	Term previously used for an event with probability of ignition (now "Risk event").
Objectives	Specific, measurable, achievable, realistic, and timely outcomes for the overall WMP strategy, or mitigation initiatives and activities that a utility can implement to satisfy the primary goals and subgoals of the WMP program.
Operations-based exercise	Type of exercise that validates plans, policies, agreements, and procedures; clarifies roles and responsibilities; and identifies resource gaps in an operational environment. Often includes drills, functional exercises (FEs), and full-scale exercises (FSEs).
Outcome-based metric	Measurement of the performance of the electrical corporation and its service territory in terms of both leading and lagging indicators of wildfire, PSPS, and other consequences of wildfire risk. These include the potential unintended consequences of

Term	Definition
	wildfire mitigation work, such as acreage burned by utility-ignited wildfire.
Overall utility risk	The comprehensive risk due to both wildfire and PSPS incidents across a utility's territory; the aggregate potential of adverse impacts to people, property, critical infrastructure, or other valued assets in society.
Overall utility risk, ignition risk	See Ignition risk.
Overall utility risk, PSPS risk	See PSPS risk.
Parameter uncertainty	The amount by which a calculated value might differ from the true value based on unknown input parameters. (Adapted from Society of Fire Protection Engineers [SFPE] guidance.)
Patrol inspection	In accordance with GO 165, a simple visual inspection of applicable utility equipment and structures designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.
Population density	Population density is calculated using the American Community Survey (ACS) one-year estimate for the corresponding year or, for years with no such ACS estimate available, the estimate for the immediately preceding year.
Preparedness	A continuous cycle of planning, organizing, training, equipping, exercising, evaluating, and taking corrective action in an effort to ensure effective coordination during incident response. Within the NIMS, preparedness focuses on planning, procedures and protocols, training and exercises, personnel qualification and certification, and equipment certification.

Term	Definition
Priority essential services	Critical first responders, public safety partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water electrical corporations/agencies.
Property	Private and public property, buildings and structures, infrastructure, and other items of value that may be destroyed by wildfire, including both third-party property and utility assets.
PSPS consequence	The total anticipated adverse effects of a PSPS for a community. This considers the PSPS exposure potential and inherent PSPS vulnerabilities of communities at risk.
PSPS event	The period from notification of the first public safety partner of a planned public safety PSPS to re-energization of the final customer.
PSPS exposure potential	The potential physical, social, or economic impact of a PSPS event on people, property, critical infrastructure, livelihoods, health, local economies, and other high-value assets.
PSPS likelihood	The likelihood of a PSPS being required by a utility given a probabilistic set of environmental conditions.
PSPS risk	The total anticipated annualized impacts from a PSPS event at a specific location. This considers the likelihood a PSPS event will be required due to environmental conditions exceeding design conditions and the potential consequences – considering exposure potential and vulnerability – of the PSPS event for each affected community.
Public safety partners	First/emergency responders at the local, state, and federal levels; water, wastewater, and communication service providers; community choice aggregators (CCAs); affected publicly owned electrical corporations/electrical cooperatives; tribal governments; Energy Safety; the Commission; the California Office of Emergency Services; and CAL FIRE.

Term	Definition
Red Flag Warning (RFW)	Level of wildfire risk from weather conditions, as declared by the NWS. For historical NWS data, refer to the Iowa State University archive of NWS watches/warnings.[4]
Reportable ignition	Any event where utility facilities are associated with the following conditions: (a) A self-propagating fire of material other than electrical and/or communication facilities, and (b) The resulting fire traveled greater than one linear meter from the ignition point This includes all ignitions determined by an Authority Having Jurisdiction (AHJ) investigation to originate from utility infrastructure or employees.
RFW OH circuit mile day	Sum of OH circuit miles of utility grid subject to RFW each day within a given time period, calculated as the number of OH circuit miles under RFW multiplied by the number of days those miles are under said RFW. For example, if 100 OH circuit miles are under RFW for one day, and 10 of those miles are under RFW for an additional day, then the total RFW OH circuit mile days would be 110.
Risk	A measure of the anticipated adverse effects from a hazard considering the consequences and frequency of the hazard occurring.[5]
Risk evaluation	The process of comparing the results of a risk analysis with risk criteria to determine whether the risk and/or its magnitude is acceptable or tolerable. (ISO 31000:2009.)

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

[5] Adapted from D. Coppola, 2020, "Risk and Vulnerability," *Introduction to International Disaster Management*, 4th ed.

Term	Definition
Risk event	An event with probability of ignition, such as wire down, contact with objects, line slap, event with evidence of heat generation, or other event that causes sparking or has the potential to cause ignition. The following all qualify as risk events: • Ignitions • Outages not caused by vegetation • Outages caused by vegetation • Wire-down events • Faults • Other events with potential to cause ignition
Risk management	Systematic application of management policies, procedures, and practices to the tasks of communication, consultation, establishment of context, and identification, analysis, evaluation, treatment, monitoring, and review of risk. (ISO 31000.)
Rule	Section of Public Utilities Code requiring a particular activity or establishing a particular threshold.
Rural region	In accordance with GO 165, area with a population of less than 1,000 persons per square mile, as determined by the U.S. Bureau of the Census.[6] For purposes of the WMP, "area" must be defined as a census tract.
Seminar	An informal discussion, designed to orient participants to new or updated plans, policies, or procedures (e.g., to review a new external communications standard operating procedure).
Sensitivity analysis	Process used to determine the relationships between the uncertainty in the independent variables ("input") used in an

[6] https://www.cpuc.ca.gov/gos/GO95/go_95_rule_18.htm

Term	Definition
	analysis and the uncertainty in the resultant dependent variables (“output”). (SFPE guidance.)
Slash	Branches or limbs less than four inches in diameter, and bark and split products debris left on the ground as a result of utility vegetation management. (This definition is consistent with California Public Resources Code section 4525.7.)
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.
Tabletop exercise (TTX)	A discussion-based exercise intended to stimulate discussion of various issues regarding a hypothetical situation. Tabletop exercises can be used to assess plans, policies, and procedures or to assess types of systems needed to guide the prevention of, response to, or recovery from a defined incident.
Trees with strike potential	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.
Uncertainty	The amount by which an observed or calculated value might differ from the true value. For an observed value, the difference is “experimental uncertainty”; for a calculated value, it is “model” or “parameter uncertainty.” (Adapted from SFPE guidance.)
Urban region	In accordance with GO 165, area with a population of more than 1,000 persons per square mile, as determined by the U.S. Bureau of the Census. For purposes of the WMP, “area” must be defined as a census tract.
Utility-related ignition	See reportable ignition.
Validation	Process of determining the degree to which a calculation method accurately represents the real world from the perspective of the intended uses of the calculation method

Term	Definition
	without modifying input parameters based on observations in a specific scenario. (Adapted from ASTM E 1355.)
Vegetation management (VM)	Trimming and removal of trees and other vegetation at risk of contact with electric equipment.
Verification	Process to ensure that a model is working as designed, that is, that the equations are being properly solved. Verification is essentially a check of the mathematics. (SFPE guidance.)
Vulnerability	The propensity or predisposition of a community to be adversely affected by a hazard, including the characteristics of a person, group, or service and their situation that influences their capacity to anticipate, cope with, resist, and recover from the adverse effects of a hazard.
Wildfire consequence	The total anticipated adverse effects from a wildfire on a community that is reached. This considers the wildfire hazard intensity, the wildfire exposure potential, and the inherent wildfire vulnerabilities of communities at risk.
Wildfire exposure potential	The potential physical, social, or economic impact of wildfire on people, property, critical infrastructure, livelihoods, health, environmental services, local economies, cultural/historical resources, and other high-value assets. This may include direct or indirect impacts, as well as short- and long-term impacts.
Wildfire intensity	The potential intensity of a wildfire at a specific location within the service territory given a probabilistic set of weather profiles, vegetation, and topography.
Wildfire mitigation strategy	Overview of the key mitigation initiatives at enterprise level and component level across the electrical corporation's service territory, including interim strategies where long-term mitigation initiatives have long implementation timelines. This includes a description of the enterprise-level monitoring and

Term	Definition
	evaluation strategy for assessing overall effectiveness of the WMP.
Wildfire risk	See Ignition risk.
Wildfire spread likelihood	The likelihood that a fire with a nearby but unknown ignition point will transition into a wildfire and will spread to a location in the service territory based on a probabilistic set of weather profiles, vegetation, and topography.
Wildland-urban interface (WUI)	The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetation fuels (National Wildfire Coordinating Group). Enforcement agencies also designate the WUI as the area at 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.
Workshop	Discussion that resembles a seminar but is employed to build specific products, such as a draft plan or policy (e.g., a multi-year training and exercise plan).

APPENDIX B

SUPPORTING DOCUMENTATION

DRAFT

Supporting Documentation

Responsible Persons

The electrical corporation must provide all detailed documentation from Section 2 in this appendix.

Statutory Requirements Checklist

The electrical corporation must provide all detailed documentation from Section 3 in this appendix.

Overview

The electrical corporation must provide all detailed documentation from Sections 4 and 5 in this appendix.

1.1.3 Primary Goal of the WMP

1.1.4 Risk Reduction Objective(s) of the WMP

1.1.5 WMP Risk-informed Framework

1.1.6 Overview of Utility Territory and Infrastructure

1.1.7 Overview of Wildfire Environmental Settings

1.1.8 Overview of Community Values at Risk

1.1.9 Referenced Regulations, Codes, and Standards

In this appendix, the electrical corporation must provide in tabulated format a list of referenced codes, regulations, and standards. An exemplar follows.

Emergency Preparedness	
Public Utilities Code section 768.6	Statute related to emergency and disaster preparedness plans

Emergency Preparedness	
General Order 166	Standards for Operation, Reliability, and Safety During Emergencies and Disasters
California Standardized Emergency Management Systems (SEMS)	
National Incident Management System (NIMS)	
Government Code section 8593.3	

1.1.10 Documents and Drawings

Risk Methodology and Assessment

The risk modeling and assessment in the main body of the Guidelines and electrical corporation's WMP are focused on providing a streamlined overview of the electrical corporation risk framework and key findings from the assessment necessary to understand the wildfire mitigation strategy presented in Section 7.

The focus of this appendix is to provide additional information pertaining to the risk modeling approach used by the electrical corporation. This includes the following:

- Additional detail on model calculations supporting the calculation of risk and risk components
- Additional detail on the calculation of risk and risk components
- More detailed presentation of the risk findings

Within each of these subsections, additional minimum requirements are established for each of these calculations.

1.1.11 Model Documentation

Utility risk analyses presented in the WMP program are complex, with several layers of interactions between models. Therefore, it is critical that the electrical corporation document its risk analysis approach, detail each model and sub-model used in the analysis, and describe efforts undertaken to validate risk models for its specific application.

The following sections establish the reporting requirements for the approaches used by the electrical corporation to calculate each risk and risk component. These have been synthesized and adapted from guidance documents on model quality assurance developed by many agencies, with a focus on guidance related to machine learning, artificial intelligence, and fire science and engineering. These guidance documents include those from the Institute of Electrical and Electronics Engineers (IEEE),[7] the Society of Fire Protection Engineers (SFPE),[8] the American Society for Testing and Materials (ASTM International),[9] the U.S. Nuclear Regulatory Commission (NRC),[10] the Electric Power Research Institute (EPRI),[52] the National Institute of Standards and Technology (NIST),[11] and the International Organization for Standardization (ISO).[12]

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[7] IEEE, 2022, "P2841/D2: Draft Framework and Process for Deep Learning Evaluation."

[8] SFPE, 2010, "Substantiating a Fire Model for a Given Application," Engineering Guides.

[9] ASTM, 2005, "ASTM E1472: Standard Guide for Documenting Computer Software for Fire Models," ASTM International.

ASTM, 2005, "ASTM E1895: Standard Guide for Determining Uses and Limitations of Deterministic Fire Models," ASTM International.

ASTM, 2005, "ASTM E1355: Standard Guide for Evaluating the Predictive Capability of Deterministic Fire Models," ASTM International.

[10] U.S. NRC, EPRI, Jensen Hughes, NIST, 2016, "NUREG-1824: Verification and Validation of Selected Fire Models for Nuclear Power Plant Applications. Supplement 1."

U.S. NRC, EPRI, Hughes Associates, Inc., NIST, California Polytechnic State University, Westinghouse Electric Company, University of Maryland, Science Applications International Corporation, ERIN Engineering, 2012, "NUREG-1934: Nuclear Power Plant Fire Modeling Application Guide."

[11] NIST, 1981, "NBS SP 500-73: Computer Model Documentation Guide."

[12] ISO, 2013, "ISO/TR 16730:2013: Fire Safety Engineering: Assessment, Verification and Validation of Calculation Methods."

ISO, 2021, "ISO/IEC TR 24027:2021: Information Technology: Artificial Intelligence (AI) – Bias in AI Systems and AI Aided Decision Making."

ISO, 2021, "ISO/IEC TR 24029:2021: Artificial Intelligence (AI): Assessment of the Robustness of Neural Networks."

Summary Documentation

The electrical corporation must provide high-level information on the calculation of each risk and risk component used in its risk analysis. The summary documentation must include each of the following:

- **High-level bow tie schematic** showing the inputs, outputs, and interaction between risk components in the format shown in Figure C.10-1. An exemplar is provided below.
- **High-level calculation procedure schematic** in the format defined in Figure C.10-2. An exemplar is provided below. This schematic must show the logical flow from input data to outputs, including separate items for any intermediate calculations in models or sub-models and any input from subject matter experts.
- **High-level narrative describing the calculation procedure** in a concise executive summary of the detailed documentation discussed in Section **Error! Reference source not found.**. This narrative must include the following:
    - Purpose of the calculation/model
    - Assumptions and limitations
    - Description of the calculation procedure shown in the bow tie and high-level schematics
    - Description of how outputs will be characterized and presented (e.g., visualization) to decision makers
    - Concise description and timeline of planned changes to the calculation procedure over the triennial WMP cycle, including any key improvements from the Energy Safety Wildfire Risk Modeling Working Group and plans to align with the consensus Risk Modeling Requirements by January 1, 2024.

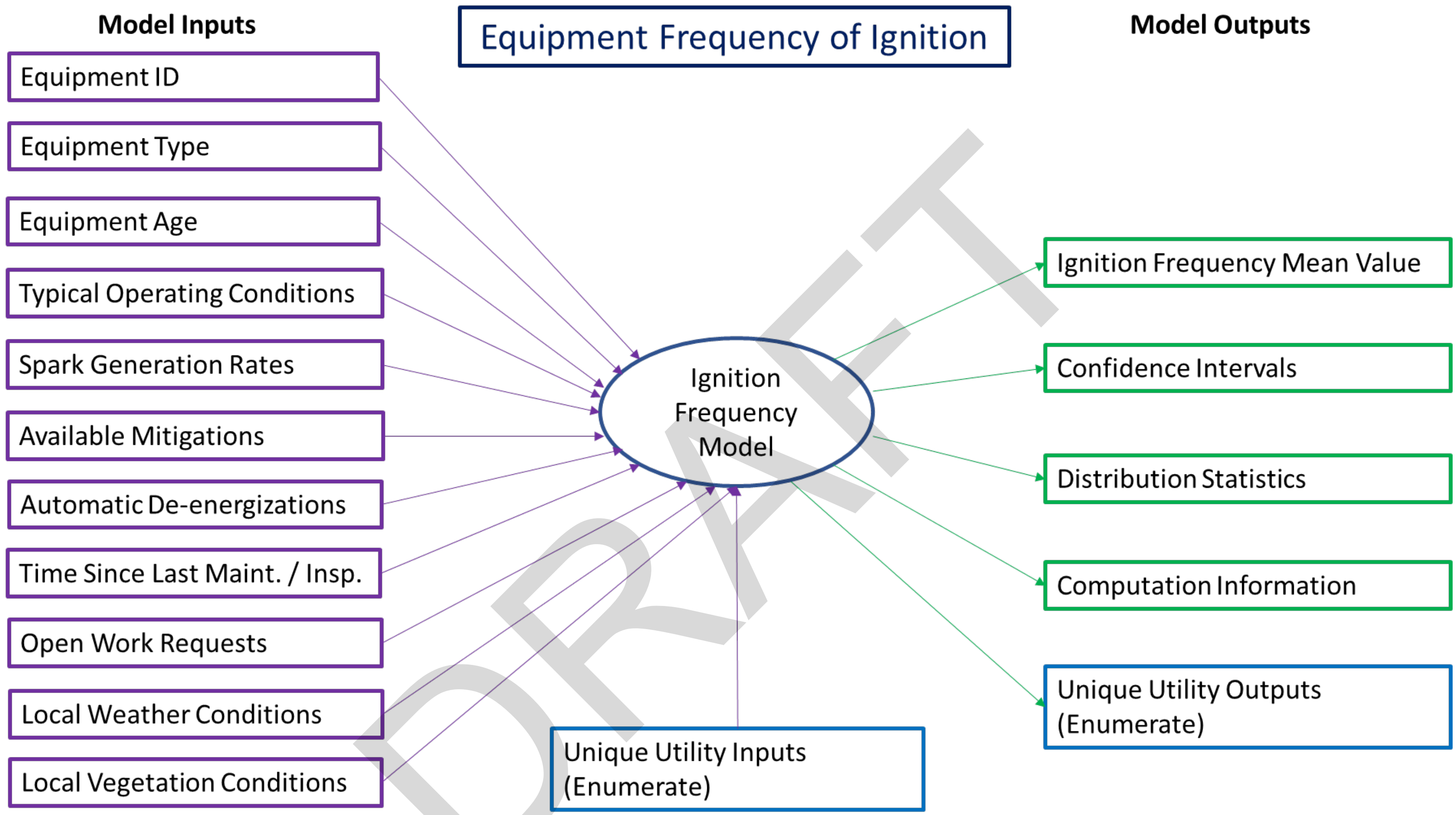

Figure C.10-1. Example Bow Tie Schematic

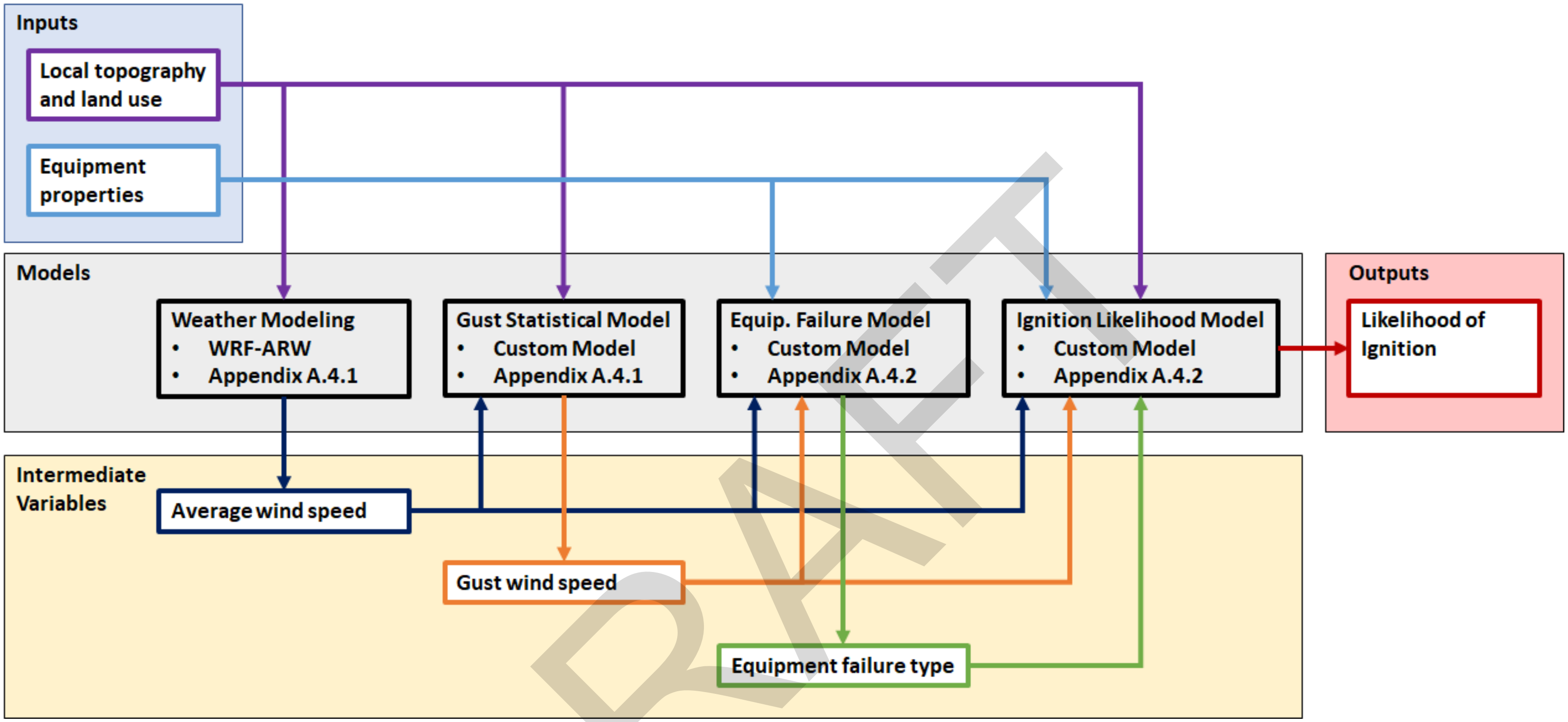

Figure C.10-2. Example Calculation Schematic

Detailed Model Documentation

The electrical corporation must provide detailed documentation for each model and sub-model discussed in the summary documentation in Section **Error! Reference source not found.**. At a minimum, this documentation must include each of the following:

- **Purpose of the model / problem identification:**
    - Define the objectives/goals of the model.
    - Summarize and define the relevant outcomes to be predicted by the model.
    - Define the circumstances in which the model is to be used.
    - Time horizon (i.e., real time, annual planning, or both)
    - Spatial scales (i.e., service territory, region, local)
    - Deterministic (specific forecasts) or probabilistic (statistical)
- **Model version:**
    - Provide the name and version number of the software, including major and minor release number. Provide version control (git) commit level if available.
    - Document any utility-specific changes to the model and provide the reason for the change(s).
- **Theoretical foundation:**
    - Describe the theoretical basis of the model and the governing equations or physical laws on which the model is based.
    - Identify assumptions made in the model, their impact in the governing equations, and resulting limitations.
- **Mathematical foundation:**
    - Describe numerical techniques and computational algorithms used to solve/approximate the governing equations.
    - Describe the precision of the results and any reliance on specific computing hardware or facilities.
    - Discuss model convergence criteria, studies, and resulting grid resolution required to meet the criteria.
    - Identify any additional limitations in the model based on the numerical techniques and implementation.

- **External dependencies:**
    - Describe external programs or software libraries used by the software.
    - Describe data used by the software, including utility-collected and external sources. This should include the following:
    - Characteristics of the data (field definitions/schema, uncertainties, acquisition frequency).
    - Scope and granularity (or resolution) of data in time and location (i.e., date range, spatial granularity for each data element).
    - Sources of data, frequency of data updates, and verification of data quality. Explain in detail measurement approaches and procedures.
    - Any processes used to modify the data (such as adjusting vegetative fuel models for wildfire spread based on prior history and vegetation growth).
- **Model substantiation:**
    - Identify existing data that can be used to validate model performance.
    - All models need to be verified and validated for the specific application in which they are to be used in accordance with the guidance provided in Section **Error! Reference source not found.**.
- **Sensitivity**
    - Describe the efforts to evaluate the impact of model and input parameter uncertainty on the model predicted outcomes.
    - Describe the efforts to evaluate the propagation of uncertainty into downstream models.

One approach to fulfill these requirements is to provide the following documents to demonstrate the substantiation of each model:

- **Technical documentation** according to ASTM E 1472 – Standard Guide for Documenting Computer Software for Fire Models. Include a listing of assumptions and known limitations of the model according to ASTM E 1895 – Standard Guide for Determining Uses and Limitations of Deterministic Fire Models.
- **Verification and validation documentation** according to the SFPE's Guidelines for Substantiating a Fire Model for a Given Application or ASTM E 1355 – Standard Guide for Evaluating the Predicting Capability of Deterministic Fire Models.

In lieu of providing customized documentation, the electrical corporation may provide a copy of documentation generated by a commercial provider of a model or an open-source project if all the following conditions are met:

- The specific version documentation of the model and any underlying data in use by the electrical corporation are the same.
- Any custom modifications to the model by the electrical corporation have been integrated into the model documentation and are available in the same format as the model (i.e., custom modules to an open-source project must be open source and integrated into the project).
- The electrical corporation lists and justifies the options used within the model for its application, including all non-default features or assumptions.

Model Substantiation

Model substantiation is the process used to ensure that a model is correct and suitable to an application. These Guidelines adopt the following definitions:

- **Calibration** – Adjustment of a set of code input parameters associated with one or more calculations to maximize the resulting agreement of the code calculations with observations in a specific scenario.[13]
- **Model uncertainty** – The amount by which a calculated value might differ from the true value when the input parameters are known (i.e., limitations of the model itself based on assumptions).[14]
- **Parameter uncertainty** – The amount by which a calculated value might differ from the true value based on unknown input parameters.
- **Sensitivity analysis** – The process used to determine the relationships between the uncertainty in the independent variables (input) used in an analysis and the uncertainty in the resultant dependent variables (output).

[13] Adapted from T. G. Trucano, L. P. Swiler, T. Igusa, W. L. Oberkampf, and M. Pilch, 2006, “Calibration, validation, and sensitivity analysis: What’s what,” *Reliability Engineering and System Safety*, vol. 91, no. 10–11, pp. 1331–1357.

[14] Adapted from SFPE, 2010, “Substantiating a Fire Model for a Given Application,” *Society of Fire Protection Engineers Engineering Guides.*

- **Uncertainty** – The amount by which an observed (experimental uncertainty) or calculated (model or parameter uncertainty) value might differ from the true value.
- **Validation** – The process of determining the degree to which a calculation method is an accurate representation of the real world from the perspective of the intended uses of the calculation method without modifying input parameters based on observations in a specific scenario.[15]
- **Verification** – The process of ensuring that the model is working as designed and that the equations are being properly solved. It is essentially a check of the mathematics.

For each model, the electrical corporation must complete and provide documentation of the following model substantiation studies:

- **Validation data** – Identify existing data that can be used to validate model performance.
- **Model verification** – Describe efforts to verify that the model is working as designed and that the equations are being properly solved. Verification is often conducted through independent review of source code and use of unit and integration test suites by the software developer. If the end user of a model is not the same as the model developers, the SFPE guidance includes an additional step on user training and certification to the verification process. The verification study of each model must include each of the following:
  - Verification of the basic functionality of the model through simple test cases.
  - Verification of consistency of input parameters. For example, wind speed varies substantially as a function of height and space. Individual wildfire models may assume wind speed is specified at a fixed height (such as 20 feet, 32 feet, or mid-flame height). Specifying the wind speed at the wrong height may result in incorrect model predictions.
  - Independent review, which may consist of one of the following:
  - Independent third-party review of software implementation and data integration where the third-party is neither an employee nor a subcontractor of the electrical corporation or software supplier.

[15] Adapted from ASTM, 2005, "ASTM E1355: Standard Guide for Evaluating the Predictive Capability of Deterministic Fire Models," ASTM International.

  - Software verification suite, including software source code and automated verification code, provided by the electrical corporation to Energy Safety. See the Fire Dynamics Suite (FDS) developed by NIST for an example.[16]
- **Model validation** – Models are validated by comparing model predictions to observations from historic events or experiments. It is important to note that validation does not mean that a model's predictions are perfect. Rather, the predictions are good enough for the intended use case. The validation study and uncertainty assessment of each model must do each of the following:
  - Document the efforts undertaken by the electrical corporation to quantify the uncertainty in the model when input parameters are known (i.e., open calculation). This should include a discussion of relevant experiments/datasets used to benchmark performance as well as a statistical summary of performance. See the FDS validation suite developed by NIST.[17]
  - Document the efforts undertaken by the electrical corporation to quantify the variability in input parameters in practice. This should include a discussion of the input data currently used in the model, the process used to update these data, the sensitivity of model predictions to this variability, and the degree to which this variability is within the validation range presented for the software model.
  - Document the type of model validation based on the characterizations defined in ASTM E 1355 (i.e., blind calculation, specified calculation, open calculation).
  - Open calculations consist of modeling efforts where the expected model output and input parameters are based on post-event knowledge. This is a reasonable approach for risk assessment where there is time to gather and process these data. However, the accuracy of a model in open calculation may not directly translate to accuracy in other calculation classes.
  - The predictive power of the model to generate forecasts of ongoing events is best captured through blind validation due to the impact of uncertainties in model inputs. For example, in forecasting the spread of a wildfire, there is high

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[16] Fire Dynamics Simulator, FDS Verification Process - https://github.com/firemodels/fds/wiki/FDS-Verification-Process.

[17] Fire Dynamics Simulator, FDS Validation Process - https://github.com/firemodels/fds/wiki/FDS-Validation-Process.

uncertainty in vegetation and weather conditions. The focus of blind validation is to understand how accurate the forecasts are when the inputs include uncertainty.

- **Model calibration** – Calibration in the context of wildfire risk assessment is focused on modifying model inputs and model parameters to achieve better agreement for a specific scenario. Calibration is an important process to develop validation scenarios as well as to support real-time decision making. In general, calibration approaches limit the propagation of error by correcting to new data but have limited effectiveness in improving the quality of the forecast. However, calibrating the model to each individual scenario does not provide confidence in the predictive capability of the model for new scenarios. For each model that uses real-time calibration, the following must be documented:
    - Data sources used in calibrating the model
    - Model parameters that are modified during calibration and the process used to modify parameters
    - Uncertainty as a function of lead time (i.e., forecast time) with and without calibration
    - The degree to which a model predicted value might differ from the true value, including systematic bias and statistical variance (i.e., model uncertainty assessment). This should be presented in an open calculation.

1.1.12 Additional Models Supporting Risk Calculation

1.1.12.1 Weather Analysis

At a minimum, the electrical corporation must evaluate the 30-year weather history within its service territory to determine realistic design scenarios. The calculation of the weather history used by the electrical corporation must meet the following requirements:

- **Model outputs** must include at least the following:
    - Air temperature
    - Barometric pressure
    - Fuel moisture
    - Relative humidity
    - Wind velocity (speed and direction)

- **Sensitivity** of downstream models to uncertainty in weather modeling must be evaluated.
- **Separate modules** must be used for local weather analysis and local vegetation analysis.
- **Spatial granularity** of forecasts must meet the following minimum criteria:
    - Horizontal resolution ≤4 km
    - Vertical resolution sufficient to evaluate average conditions at environmental monitoring system locations
- **Time horizon** of the weather analysis must include at least 30 years throughout the service territory.
- **Uncertainty** of the input parameters and model assumptions, limitations, and parameterizations on the model results.

1.1.12.2 Fuel Conditions

The electrical corporation must describe how it monitors and accounts for the contribution of fuel conditions to ignition risk in its decision-making processes. The electrical corporation must track, calculate, and report the following:

- Measurement and calculation methods used for assessing fuel conditions (e.g., live and dead fuel moisture, fuel density)
- Methodology used for projecting future fuel conditions
- Calculation of any proprietary fuel condition indices (or other measures tracked)
- Thresholds used to identify extreme fuel conditions, including any factors used to modify thresholds (e.g., fuel type, topography)
- Geospatial polygons of extreme fuel conditions within the service territory as defined in the geospatial schema (GIS Data Reporting Standard, current version)
- Geospatial statistical frequency of extreme fuel conditions over the last five years throughout the service territory

1.1.12.3 Calculation of Risk and Risk Components

This section identifies the key components of a wildfire risk analysis that the electrical corporation must quantify and report on across its service territory. The following subsections establish the general risk analysis requirements and additional requirements, where relevant, for the calculation of each risk and risk component.

Each electrical corporation must evaluate each risk and risk component discussed in Section 6.2.1 throughout its service territory. For each risk and risk component, the electrical corporation must provide the following:

- **High-level description** of the procedure for determining each risk and risk component.
- **High-level bow tie schematic** showing the inputs, outputs, and consequences, per requirements in Section **Error! Reference source not found.**, in the format defined in this section
- **High-level calculation schematic** showing the calculation procedure, per requirements in Section **Error! Reference source not found.**, in the format defined in this section
- **Detailed technical documentation** for each model and sub-model, per the requirements in Section **Error! Reference source not found.**, in Appendix 0
- **Detailed model verification and validation documentation** for each model and sub-model, per the requirements in Section **Error! Reference source not found.**, in Appendix 0

The electrical corporation must evaluate each risk and risk component in each of the risk scenarios presented in Section **Error! Reference source not found.**.

1.1.12.4 Likelihood

The following subsections establish specific requirements that must be considered in the evaluation of each likelihood risk component. These are the minimum requirements and are intended to establish baseline evaluation and reporting for all electrical corporations. If the electrical corporation defines other key factors as important, it should report them in the WMP in a similar format.

These risk components may be combinations of other fundamental risk components. The process the electrical corporation uses to combine these risk components must be documented in its WMP. If the electrical corporation approach uses a common not natural unit (i.e., resulting from MAVF defined in the 2018 S-MAP or cost), the electrical corporation must provide a table in this section along with discussion and justification of each parameter (e.g., limits, scaling functions, and weights) used.

Ignition Likelihood

The electrical corporation must outline the methodology used to determine the likelihood of an ignition throughout its service territory. The calculation must include a combination of at least the following:

- Equipment likelihood of ignition
- Contact by vegetation likelihood of ignition
- Contact by object likelihood of ignition

General Order 95 establishes the minimum wind loading that electrical equipment must withstand: 6 lb/ft^2 (48 mph) for heavy loading areas and 8 lb/ft^2 (55 mph) for light loading areas. However, recent research indicates designing to 13 lb/ft^2 (70 mph) could lead to a reduction in excess outages by a factor of 10 compared with existing requirements.[18] The electrical corporation must discuss its process to determine whether and where to exceed GO-95 design requirements within its territory based on the results of the statistical weather analysis.

Equipment Likelihood of Ignition

The electrical corporation must describe in detail each type of equipment-related ignition included in the calculation of this risk component. It must consider failure in at least each of the following types of equipment:

- Arrestors
- Capacitors / Capacitor banks
- Circuit breakers
- Conductors
- Connection points (conductors, insulators, splices, hotline clamps, and other connectors)
- Crossarms
- Fuses
- Poles

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[18] J. W. Mitchell, 2013, “Power line failures and catastrophic wildfires under extreme weather conditions,” *Engineering Failure Analysis*, vol. 35, pp. 726–735.

- Splices
- Switches
- Transformers
- Tie wires

The calculation for the equipment likelihood of ignition from each type of equipment must include the following minimum information:

- Typical operating conditions
- Equipment-specific failure rates
- Spark generation rates from normal operation
- Age of equipment
- Presence of mitigation (i.e., covered conductors, vibration dampers)
- Automatic PSPS systems (i.e., protective equipment and device settings)
- Time since most recent asset inspection
- Open work requests
- Local weather conditions
- Local surface vegetation conditions

The electrical corporation must outline the methodology used to determine ignition likelihood from events and include basis data used, such as past ignition events, number of risk events, description of events, and the statistical tools used as part of the analysis.

Contact from Vegetation Likelihood of Ignition

The electrical corporation must describe in detail each type of contact from vegetation included in the calculation of this risk component. These must include, at a minimum:

- Contact from vegetation grow-in
- Contact from vegetation fall-in
- Contact from vegetation blow-in

The calculation for the contact from vegetation likelihood of ignition from each contact event must include the following minimum information:

- Type of contact (i.e., grow-in, fall-in, blow-in)

- Vegetation species evaluated
- Protective equipment and device settings
- Time since most recent vegetation inspection
- Local weather conditions
- Local surface vegetation conditions

The electrical corporation must outline the methodology used to determine ignition likelihood from events and include basis data used, such as past ignition events, number of risk events, and description of events, and the statistical tools used as part of the analysis.

Contact from Object Likelihood of Ignition

The electrical corporation must describe in detail each type of contact from object included in the calculation of this risk component. This must include, as a minimum:

- Vehicle contact (pole strike)
- Balloon contact
- Animal contact
- Unknown contact

The electrical corporation must outline the methodology used to determine ignition likelihood from events, including data used, such as past ignition events, number of risk events, and description of events, and the statistical tools used as part of the analysis.

Wildfire Spread Likelihood

The electrical corporation must outline the methodology used to determine the likelihood that an ignition will transition into a wildfire and spread to individual locations within the community. The calculation for the wildfire spread likelihood must include the following minimum information:

- Local topography (i.e., elevation, slope, aspect)
- Local weather (i.e., statistical extreme conditions based on a 30-year average and seasonal weather)
- Local vegetation (i.e., type/class/species/fuel model, canopy height/base height/cover, growth rates, and moisture content)

- Climate change impact on fuel aridity (i.e., impact in seasonal extreme moisture content)

PSPS Likelihood

The electrical corporation must discuss the method used to evaluate the annual likelihood of its issuing a PSPS for a circuit segment within its service territory. At a minimum, the electrical corporation must evaluate the impact of the following factors:

- Weather (i.e., statistical extreme conditions based on a 30-year average and seasonal weather)
- Ignition risk

1.1.12.5 Consequence

The following subsections establish specific requirements that must be considered in the evaluation of each consequence risk component. These are the minimum requirements and are intended to establish baseline evaluation and reporting for all electrical corporations. If the electrical corporation identifies other key factors as important, it should report them in the WMP in a similar format.

These risk components may be the combination of other fundamental risk components. The process the electrical corporation uses to combine these risk components must be documented in its WMP. If the electrical corporation approach uses a common not natural unit (i.e., resulting from MAVF defined in the 2018 S-MAP or cost), the electrical corporation must provide a table in this section along with discussion and justification of each parameter (e.g., limits, scaling functions, and weights) used.

Wildfire Consequence

The electrical corporation must outline the methodology used to determine the consequence of a wildfire at each location throughout its service territory. The calculation must include a combination of at least the following:

- Wildfire hazard intensity
- Wildfire exposure potential
- Wildfire vulnerability

Wildfire Hazard Intensity

The electrical corporation must outline the methodology used to determine the intensity of a wildfire at a location it reaches within the community. The calculation must include at least the following:

- Local topography (i.e., elevation, slope, aspect)
- Local weather (i.e., statistical extreme conditions based on a 30-year average and seasonal weather)
- Local vegetation (i.e., type/class/species/fuel model, canopy height/base height/cover, growth rates, and moisture content)
- Local fire behavior (e.g., heat release rate, flame length)

Wildfire Exposure Potential

The electrical corporation must outline the methodology used to determine the exposure potential of a wildfire that reaches a community. The calculation must include at least the following:

- Population density
- Residential, community, and critical infrastructure
- Environmental resources
- Social or cultural assets
- Economic factors (businesses and individual livelihoods)

Wildfire Vulnerability

The electrical corporation must outline the methodology used to determine the vulnerability/resilience of a community to a wildfire that reaches the community. The calculation must include at least the following:

- Vulnerable populations (AFN, LEP, elderly)
- Legacy building codes
- Community collaborative wildfire preparedness initiatives (e.g., Firewise USA)
- Availability of ingress and egress

1.1.12.6 PSPS Consequence

The electrical corporation must outline the methodology used to determine the consequence of a PSPS at each location throughout its service territory. The calculation must include a combination of at least the following:

- PSPS exposure potential
- Vulnerability of community to PSPS

PSPS Exposure Potential

The electrical corporation must outline the methodology used to determine the exposure potential of a PSPS at an affected location within the community. The calculation must include at least the following:

- Population density
- Residential, community, and critical infrastructure
- Social or cultural assets
- Economic factors (businesses and individual livelihoods)

Vulnerability of a Community to PSPS

The electrical corporation must outline the methodology used to determine the vulnerability/resilience of a community to a PSPS that affects the community. The calculation must include at least the following:

- Vulnerable populations (e.g., AFN, LEP, elderly)
- Presence of critical infrastructure
- Presence of redundant systems (e.g., secondary power systems)

1.1.12.7 Risk

The following subsections establish specific requirements that must be considered in the calculation of the ignition risk, PSPS risk, and overall utility risk. These are the minimum requirements and are intended to establish the baseline evaluation and reporting of all electrical corporations. If the electrical corporation identifies other key factors as important, it should report them in the WMP in a similar format.

These risks are combinations of other risk components. The process the electrical corporation uses to combine these risk components must be documented in its WMP. If the electrical corporation approach uses a common not natural unit (i.e., resulting from MAVF defined in the 2018 S-MAP or cost), the electrical corporation must provide a table in this section along with discussion and justification of each parameter (e.g., limits, scaling functions, and weights) used.

Ignition Risk

The electrical corporation must outline the methodology used to determine the ignition risk throughout its service territory. The calculation must include a combination of at least the following:

- Ignition likelihood (ignition LoRE)
- Ignition consequence (ignition CoRE)

The calculation of ignition risk should be in alignment with the most recent CPUC decision governing RAMP filings. In the 2018 S-MAP process, this is the direct multiplication of the ignition LoRE and ignition CoRE (see S-MAP, step 3, row 13).

PSPS Risk

The electrical corporation must outline the methodology used to determine the PSPS risk throughout its service territory. The calculation must include a combination of at least the following:

- PSPS likelihood (PSPS LoRE)
- PSPS consequence (PSPS CoRE)

The calculation of PSPS risk should be in alignment with the most recent CPUC decision governing RAMP filings. In the 2018 S-MAP process, this is the direct multiplication of the PSPS LoRE and PSPS CoRE (see S-MAP, step 3, row 13).

Overall Utility Risk

The electrical corporation must outline the methodology used to determine the overall utility risk throughout its service territory. The calculation must include a combination of at least the following:

- Ignition risk
- PSPS risk

The calculation of overall risk should be in alignment with the most recent CPUC decision governing RAMP filings. The 2018 S-MAP process does not explicitly cover the combination of ignition risk and PSPS risk to determine overall utility risk. However, combination through MAVFs (see step 1A) is a logical extension of the concepts presented in the settlement agreement.[19] The electrical corporation may choose an alternative approach to combine these risks; however, it must describe the process in its WMP submission.

1.1.13 Risk Assessment and Presentation

In this appendix, the electrical corporation must provide a presentation of the risk across its service territory supporting its mitigation decisions. This is intended to augment the analysis provided in the main body of the WMP to help evaluators better understand concepts and decisions made by the electrical corporation.

The electrical corporation must provide maps and summary tables in the following subsections. In addition to static maps, it must submit geospatial layers in accordance with the GIS schema (GIS Data Reporting Standard, current version). The following submissions are required for each risk and risk component:

- **Geospatial maps of utility-identified areas with heightened risk of fire**, including any zoomed-in sections of the service territory supporting the analysis.
- **Tabular summary of risks and risk components** within the areas with heightened fire risk identified by the electrical corporation. The table should include the top 20 percent or 100 highest-risk circuits (whichever is lesser). The circuits should be listed using numerical indices based on their risk ranking, not confidential identifiable information.
- **Spatially integrated risks and risk components** within each HFTD tier, non-HFTD area, and utility-identified area with heightened fire risk.

The following tables provide examples of the tabular summaries to be provided in this section.

[19] (D.) 16-08-018 Interim Decision Adopting the Multi-Attribute Approach (or Utility Equivalent Features) and Directing Electrical corporations to Take Steps Toward a More Uniform Risk Management Framework. CPUC, 2016.

Table A.5-1. Exemplar Summary of Top Risk Circuits

Circuit ID	Risk 1 – Overall Risk	Risk 2 – Ignition Risk	Risk 3 – PSPS Risk	Like. 1 – Ignition Like.	Like. 2 – Equip. Like. of Ign.	Like. 3 – Contact from Veg. Like. of Ign.	Like. 4 – Contact from Obj. Like. of Ign.	Like. 5 – Wildfire Spread Like.	Like. 6 – PSPS Like.	Cons. 1 – Wildfire Cons.	Cons. 2 – Wildfire Hazard Intensity	Cons. 3 – Wildfire Exposure Potential	Cons. 4 – Wildfire Vuln.	Cons. 5 – PSPS Cons.	Cons. 6 – PSPS Exposure Potential	Cons. 7 – Vuln. of Comm. to PSPS
ID001																
ID002																

Table A.5-2. Exemplar Summary of Spatially Integrated Risk

Fire Threat Area	Risk 1 – Overall Risk	Risk 2 – Ignition Risk	Risk 3 – PSPS Risk	Like. 1 – Ignition Like.	Like. 2 – Equip. Like. of Ign.	Like. 3 – Contact from Veg. Like. of Ign.	Like. 4 – Contact from Obj. Like. of Ign.	Like. 5 – Wildfire Spread Like.	Like. 6 – PSPS Like.	Cons. 1 – Wildfire Cons.	Cons. 2 – Wildfire Hazard Intensity	Cons. 3 – Wildfire Exposure Potential	Cons. 4 – Wildfire Vuln.	Cons. 5 – PSPS Cons.	Cons. 6 – PSPS Exposure Potential	Cons. 7 – Vuln. of Comm. to PSPS
Non-HFTD																
HFTD tier 2																
HFTD tier 3																

1.1.13.1 Areas with a Heightened Risk of Fire

The electrical corporation must evaluate the outputs from its risk modeling to identify areas where its service territory is at a heightened risk of fire (independent of HFTD status). The electrical corporation must present its approach to calculate areas with a heightened risk of fire throughout its service territory. The electrical corporation must provide the following:

- **High-level description** of the procedure for determining each risk and risk component, per requirements in Section **Error! Reference source not found.**, in the format defined in this appendix
- **High-level bow tie schematic** showing the inputs, outputs, and consequences, per requirements in Section **Error! Reference source not found.**, in the format defined in this appendix
- **High-level calculation schematic** showing the calculation procedure, per requirements in Section **Error! Reference source not found.**, in the format defined in this appendix
- **Geospatial polygons of areas with a heightened risk of fire** within the service territory as defined in the spatial data schema (GIS Data Reporting Standard, current version)

Fire Potential Index

The electrical corporation must present its approach to calculate Fire Potential Index (FPI) throughout its service territory. The electrical corporation must provide the following:

- **High-level description** of the procedure for determining each risk and risk component, per requirements in Section **Error! Reference source not found.**, in the format defined in this appendix
- **High-level bow tie schematic** showing the inputs, outputs, and consequences, per requirements in Section **Error! Reference source not found.**, in the format defined in this appendix
- **High-level calculation schematic** showing the calculation procedure, per requirements in Section **Error! Reference source not found.**, in the format defined in this appendix
- **Geospatial polygons of high FPI** within the service territory, as defined in the spatial data schema (GIS Data Reporting Standard, current version)

- **Statistical frequency of high FPI** within the service territory (FPI days/year) over the last five years, including a map showing regions within the service territory with the top 20 percent statistical frequency of FPI
- **Risk events and ignitions** in the service territory broken down by HFTD tier and FPI status (see QDR data submission guidelines)

Red Flag Warnings

Red Flag Warnings (RFW) are a measure of near-term high wildfire risk from weather conditions as declared by the National Weather Service (NWS). The electrical corporation must track, calculate, and report the following:

- **Geospatial polygons of RFW** within its service territory, as defined in the spatial data schema (GIS Data Reporting Standard, current version).
- **Statistical frequency of RFW** within its service territory (RFW days/year) over the last five years, including a map showing regions within the service territory with the top 20 percent statistical frequency of RFW.
- **RFW Overhead Circuit Mile (RFW-OCM) Days** in its service territory, broken down by HFTD tier. RFW-OCM is to be calculated as the number of circuit miles that are under an RFW multiplied by the number of days those miles are under said RFW (see QDR data submission guidelines).
- **Risk events and ignitions** in its service territory broken down by HFTD tier and RFW status (see QDR data submission guidelines).

High Wind Warnings

High Wind Warnings (HWW) are a measure of near-term high wind risk from weather conditions as declared by the NWS. The electrical corporation must track, calculate, and report the following:

- **Geospatial polygons of HWW** within its service territory, as defined in the spatial data schema (GIS Data Reporting Standard, current version)/
- **Statistical frequency of HWW** within its service territory (HWW days/year) over the last five years, including a map showing regions within the service territory with the top 20 percent statistical frequency of HWW/
- **High Wind Warning Overhead Circuit Mile (HWW-OCM) Days** in its service territory, broken down by HFTD tier. HWW-OCM is to be calculated as the number of circuit

miles that are under a HWW multiplied by the number of days those miles are under said HWW/

- **Risk events and ignitions** in its service territory, broken down by HFTD tier and HWW status (see QDR data submission guidelines).

1.1.13.2 Utility-Identified Metrics

For each key metric identified by the electrical corporation, it must provide the following in the WMP:

- Name/unique identifier and units for the metric.
- Narrative description of the basis for the metric and its intended use.
- Input data and equations to calculate the metric. with all calculation steps clearly defined. If the metric is calculated using software, the electrical corporation must document appropriate verification and validation.
- Methods used to analyze the outcomes of the metric (e.g., thresholds that define unacceptable performance, trending methods used with criteria to identify occurrence of unacceptable trends). If the analysis is calculated using software, the electrical corporation must document appropriate verification and validation in the WMP.
- Expected actions (including responsibilities, timelines, reporting requirements) to be taken in response to an indication of declining performance.

Values that characterize performance and trends must be calculated and provided to Energy Safety as part of the quarterly report in accordance with the QDR data submission, including both the nonspatial template and the “Additional Key Metrics” class in the spatial schema.

1.1.13.3 Macro Trends in Risk Components and Risk Drivers

The electrical corporation must evaluate macro trends in key inputs and metrics in its service territory and provide geospatial maps of the trends. The electrical corporation must provide geospatial layers for each key metric and must provide sufficient maps of these metrics in the appendix to support long-term mitigation decisions.

The electrical corporation must evaluate each of the following:

- **Climate change impacts on risk components**
- **Invasive species impacts on risk components** (e.g., bark beetles)

- **Population changes that could be impacted** (e.g., AFN, LEP, and elderly populations):
    - Across the service territory
    - Within the HFTD
    - Within the WUI
- **Changes in distribution of utility infrastructure:**
    - Across the service territory
    - Within the HFTD
    - Within urban, rural, and highly rural areas

1.1.13.4 Statistical Assessment of Risk Within Key Areas

The electrical corporation must perform a statistical assessment of the risks and risk components within each area of its service territory. This assessment should use hypothesis testing to evaluate areas with a heightened risk of fire that are statistically similar to existing HFTD areas. In this section of the appendix, the electrical corporation must provide the following:

- **Statistical assessment of the fire risk within areas with a heightened risk of fire** compared with the fire risk within HFTD tier 2 and tier 3 areas (hypothesis testing to evaluate if the mean and standard deviation of the risk calculation are similar).
- **Identification of any areas for potential HFTD modification** based on the electrical corporation's assessment of the fire threat rating within its service territory (e.g., the actual fire threat is greater than indicated by the CPUC's Fire Threat Map and HFTD designations).
- **Geospatial maps showing areas for potential HFTD modification** based on the analysis. These maps must also be provided in accordance with the geospatial data schema (GIS Data Reporting Standard, current version).

1.1.13.5 Wildfire Mitigation Strategy

The electrical corporation must provide all detailed documentation from Section 7 in this appendix.

1.1.13.6 Mitigation Initiatives

Grid Design, Operations, and Maintenance

The electrical corporation must provide all detailed documentation from Section 8.1 in this appendix.

Vegetation Management and Inspection

The electrical corporation must provide all detailed documentation from Section 8.2 in this appendix.

Situational Awareness and Forecasting

The electrical corporation must provide all detailed documentation from Section 8.3 in this appendix.

Emergency Preparedness

The electrical corporation must provide all detailed documentation from Section 8.4 in this appendix.

Community Outreach and Engagement

The electrical corporation must provide all detailed documentation from Section 8.5 in this appendix.

1.1.13.7 Public Safety Power Shutoff

The electrical corporation must provide all detailed documentation from Section 9 in this appendix.

Lessons Learned

The electrical corporation must provide all detailed documentation from Section 10 in this appendix.

1.1.13.8 Corrective Action Program

The electrical corporation must address each finding from wildfire investigation reports issued by Energy Safety or other relevant state agency (e.g., CAL FIRE). The electrical corporation must enter each finding into its formal corrective action program to track actions and activities undertaken to address it.

In this appendix, the electrical corporation must provide the following:

- **Tabular summary of findings** – A table listing the findings from each investigation report and including a reference to the corrective action plan related to each finding.
- **Corrective action plan** – A detailed corrective action plan for each finding. The corrective action plan must include a detailed assessment of the finding.

1.1.13.9 Notices of Violation and Defect

The electrical corporation must provide all detailed documentation from Section 12 in this appendix.

APPENDIX C

2023-2025 ELECTRICAL COPORATION WILDFIRE MITIGATION MATURITY MODEL

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2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model

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C.1 Introduction

The 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (Maturity Model) is a quick and quantitative method to assess electrical corporation wildfire risk mitigation capabilities and examine how electrical corporations propose to continuously improve in key areas of their Wildfire Mitigation Plan (WMP). The model is designed to guide electrical corporations to achieve year-over-year improvements in the design, implementation, and maintenance of an effective wildfire mitigation program by assessing and monitoring the maturities of a range of wildfire mitigation capabilities that define an electrical corporation's WMP.

In addition to assessing an electrical corporation's capabilities for reducing electrical corporation-related wildfire risk, the Maturity Model also examines the relative maturity of each electrical corporation's wildfire mitigation program and encourages continuous improvement through the sharing of lessons learned and best practices across the industry. Thus, the four main objectives of the Maturity Model are:

1. Provide a simple, quantitative tool to measure an electrical corporation's maturity in mitigating wildfire and Public Safety Power Shutoff (PSPS) risk
2. Drive year-over-year continuous improvement
3. Identify and share best practices
4. Provide high-level information to key stakeholders

Given that the state of the art in electrical corporation-related wildfire risk management knowledge, science, engineering, and best practices evolves over time, the requirements that must be met to reach each maturity level are intended to change with time. Thus, maintaining a given maturity level, in theory, would require improved outcomes over time. Conversely, maintaining a static capability would result in a decreasing level of maturity over time. The 2023-2025 Maturity Model is the first significant update since the first WMP Guidelines cycle and reflects many of these changes.

The Maturity Model consists of 37 individual capabilities describing the ability of electrical corporations to mitigation wildfire and PSPS risk within their service territory. Maturity levels range from 0 (below minimum requirements) to 4 (beyond best practice). The level of each capability is evaluated with respect to 20 possible scoring philosophies, with unique requirements for each level. Each capability is organized into one of 7 key categories which are used to calculate category maturity levels. In addition, the Maturity Model establishes additional cross-category metrics to assess maturity. These include cross-category themes which are important across the entire program (such as data governance), and risk metrics which quantify the ability of the electrical corporation to mitigate specific risk drivers.

To assess the maturity level of an electrical corporation's wildfire mitigation program, the electrical corporation must perform the following steps:

1. Each electrical corporation responds to each question in the Electrical Corporation Wildfire Mitigation Maturity Survey (Maturity Survey) based on its current and forecasted response.
2. The electrical corporation self-assesses its maturity level across each capability, category, cross-category theme, and risk metric using the results of the survey and the scoring criteria described herein.
3. The electrical corporation presents their maturity level in each section of the WMP and discusses how their planned mitigation activities will increase maturity in the specific area. Note that activities undertaken which are not related to maturity may also be described and used to recommend inclusion in the 2026 Maturity Model update.

The following sections describe the Maturity Model in additional detail.

C.2 Maturity Model Development

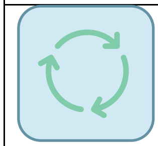
The first electrical corporation Maturity Model was developed in 2020 and was integrated as part of the 2020-2022 Wildfire Mitigation Plan (WMP) Guidelines. Per Resolution WSD-002, Attachment 2, the Maturity Model is re-examined by Energy Safety every three years to identity any new additions, modifications and/or deletions to help improve and advance the model for the next three-year WMP cycle.

The 2023-2025 Maturity Model is the first significant update since the first WMP Guidelines cycle. The following subsections provide an overview of lessons learned from the 2020–2022 Maturity Model, objectives of the redesign, and a summary of key changes.

C.2.1 Lessons Learned from the 2020–2022 Maturity Model

The original Maturity Model used in 2020-2022 was a first step towards quantitative assessment of electrical corporation capabilities in wildfire risk mitigation. There were several lessons learned during its use over the three-year cycle which were considered in the development of the update for 2023-2025. The critical lessons learned are summarized in Table C-1.

Table C-1. Summary of lessons learned from 2020-2022 Maturity Model.

	***Transparency*** • The technical bases of capabilities and how they relate to risk reduction could be clearer. • Transparency in how maturity levels are scored could help electrical corporations focus their improvements to reduce wildfire and PSPS risk.
	***Comprehensiveness*** The electrical corporations are making progress in areas which were not captured in the 2020-2022 Maturity Model. Addressing these gaps is important to measure the progress electrical corporations are making. The scoring approach used in 2020-2022 did not provide specific guidance on what the electrical corporations needed to improve to achieve higher maturity levels.
	***Standardization*** Improving clarity in survey questions could improve consistency in question interpretation and responses across electrical corporations. Establishing guidance on the usage of the Maturity Model in the WMP could improve consistency in electrical corporation submissions.

C.2.2 Objectives of Redesign for 2023-2025

The lessons learned from the 2020-2022 Maturity Model were used to establish 4 core objectives for the redesign for the 2023-2025 Maturity Model. These objectives are described in Table C-2.

Table C-2. Summary of objectives of redesign for 2023-2025.

Objective	Detailed Description
1. Establish link between increased maturity and reduced risk	• Integrate maturity capabilities with updated risk assessment framework in WMP Guidelines • Identify technical basis for each capability and how it links to overall electrical corporation risk • Evaluate existing capabilities in each subject matter area and identify gaps to be addressed with additional capabilities
2. Improve standardization in use of maturity model among electrical corporations	• Standardize metrics used in assessment and reporting of outcomes and maturity • Integrate maturity self-assessment in the WMP Guidelines • Enhance feedback between mitigation initiatives and continuous improvement in WMP/Maturity Model
3. Improve quantitative assessment of maturity	• Identify data/metrics linked to improved maturity, including related activities (e.g., frequency of inspections) and outcomes (e.g., findings from inspections) • Identify comprehensive maturity levels/metrics to support evaluation of electrical corporation maturity • Coordinate data/metrics improvements related to maturity with the data collected in the quarterly data reports (QDR)
4. Increase transparency in maturity assessment	• Establish transparent criteria for determining maturity levels • Develop metrics to provide insights into electrical corporation progress beyond existing capability and category maturity levels • Redesign maturity levels and survey questions to facilitate third-party and compliance review

C.2.3 Summary of Key Changes

The objectives discussed in Section C.2.2 were accomplished through 6 key changes to design and implementation of the Maturity Model. These key changes are summarized in Table C-3.

Table C-3. Summary of key changes in the 2023-2025 Maturity Model.

Description	Related Obj.
1. Reorganized the Maturity Model • Restructured into 7 categories and 37 capabilities (see Section C.3.1) • Merged existing "grid design and system hardening" and "asset management and inspections" categories into "grid design, inspections, and maintenance" category (Category C) • Merged/split existing capabilities to create more distinct individual capabilities characterized by the expanded list of scoring philosophies • Replaced "resource allocation methodology" and "data governance" categories with cross category theme maturity levels (see number 3)	**1, 2**
2. Identified links between capabilities and risk outcomes • Linked each maturity capability to related risks and risk components (see Section C.3.4) • Linked each maturity capability to related outcome metrics (see Section C.3.5) • Enabled determination of maturity levels for risks and risk components (see number 4)	**1, 3**
3. Expanded capability scoring and increased transparency in level determination • Expanded list of scoring philosophies from 4 to 19 (see Table C-5 for details) • Improved granularity in the maturity of each capability based on the different scoring philosophies (see Section C.5) • Enabled determination of maturity levels for cross-category themes based on sub-capability maturity levels or each scoring philosophy (see number 4)	**2, 3, 4**
4. Introduced cross-category maturity levels • Established maturity levels for cross-category themes (see Section C.3.3) • Established maturity levels for risks and risk components (see Section C.4.4)	**2, 3, 4**
5. Increased transparency in maturity level determination • Documented the approach to determine maturity levels (see Section C.4)	**4**

• Required the electrical corporations to identify their maturity levels and discuss in their WMP	
6. Linked maturity assessment to electrical corporation WMP • Added maturity assessment reporting requirements in WMP for the electrical corporation to describe how it expects the initiatives to advance its maturity • Provided space for electrical corporations to describe efforts undertaken in each capability that are expanding the state of the art and are not captured in the existing maturity level definitions, for potential inclusion in the 2026 update	**2**

C.3 Overview of the Maturity Model

The Maturity Model is organized into seven (7) categories that define key components of an electrical corporation's wildfire mitigation program. Each category consists of a set of capabilities (e.g., 3-6) that characterize in more detail, the specific methods, plans and activities the electrical corporation must achieve as part of that category. Each capability is defined by several scoring philosophies (e.g., automation, comprehensiveness) with associated maturity levels (Levels 0 to 4) that quantitively and qualitatively describe the maturity of the electrical corporation's wildfire risk mitigation activities. The maturity levels range from being below statutory minimums up to leading industry best practices.

The 2023-2025 Maturity Model consists of two methods for assessing an electrical corporation's maturity level for its WMP, as follows:

1. **Maturity Levels for Capabilities, Categories, and Overall WMP**
   - **Capability Maturity** –The maturity level of a specific capability is determined from the minimum maturity level achieved across all the scoring philosophies of that capability.
   - **Category Maturity** – The maturity level of a single category is determined from the average of all the capability maturity levels within that category.
   - **Overall WMP Maturity** – The maturity levels across all categories are then further averaged to develop a single maturity level for the entire WMP.
2. **Cross-Category Maturity Levels**
   - **Cross-Category Theme Maturity** – In addition to assessing maturity levels at the capability and category levels, the maturity model also incorporates cross-category maturity assessments to capture key functional characteristics of an electrical corporation's WMP that are cross-cutting themes (e.g., data governance, risk prioritization). These themes provide additional information on underlying functional features of the electrical corporation's WMPs that may not readily be defined by a single capability or category.
   - **Capability Risk Scoring** – Capabilities are also aggregated into the risk components that they contribute to, allowing for additional high-level performance information on the electrical corporation's WMP. The following sections provide a more detailed description of these aspects of the Maturity Model.

C.3.1 Capabilities and Categories

The Maturity Model is organized into thirty-seven (37) capabilities aggregated into seven (7) categories. This organizational structure is provided in Table C-4. Independent capabilities aggregate to independent categories that comprehensively address all aspects of their defined scope. More detailed summary information about each capability is provided in Section C.3.5, and a detailed description of the maturity requirements for each capability is provided in Section C.5.

Table C-4. Maturity Model capability and category organization.

Category	I. Capability	II. Capability	III. Capability	IV. Capability	V. Capability	VI. Capability
A. Risk assessment and mitigation strategy	1. Statistical weather, climate, and wildfire modeling	2. Calculation of wildfire and PSPS hazard and exposure to societal values	3. Calculation of community vulnerability to wildfire and PSPS	4. Calculation of risk and risk components	5. Risk event tracking and integration of lessons learned	6. Risk-informed wildfire mitigation strategy
B. Situational awareness and forecasting	7. Ignition likelihood estimation	8. Weather forecasting ability	9. Wildfire spread forecasting	10. Data collection for near-real-time conditions	11. Wildfire detection and alarm systems	12. Centralized monitoring of real-time conditions
C. Grid design, inspections, and maintenance	13. Asset inventory and condition database	14. Asset inspections	15. Asset maintenance and repair	16. Grid design and resiliency	17. Asset and grid personnel training and quality	
D. Vegetation management and inspections	18. Vegetation inventory and condition database	19. Vegetation inspections	20. Vegetation treatment and removal	21. Vegetation personnel training and quality		
E. Grid operations and protocols	22. Protective equipment and device settings	23. Incorporation of ignition risk factors in grid control	24. PSPS operating model	25. Protocols for PSPS re-energization	26. Ignition prevention and suppression	
F. Emergency preparedness	27. Wildfire- and PSPS-emergency & disaster preparedness plan	28. Collaboration and coordination with public safety partners	29. Public emergency communication strategy	30. Preparedness and planning for service restoration	31. Customer support in wildfire and PSPS emergencies	32. Learning after wildfires and PSPS events
G. Community outreach and engagement	33. Public outreach and education awareness	34. Public engagement in electrical corporation wildfire mitigation planning process	35. Engagement with AFN and socially vulnerable populations	36. Collaboration on local wildfire mitigation planning	37. Cooperation and best practice sharing with other electrical corporations	

C.3.2 Scoring Philosophies

Each capability comprises a set of relevant scoring philosophies that together determine the maturity level for that capability. Table C-5 lists all the scoring philosophies used in the Maturity Model. Each capability includes only a subset of these scoring philosophies.

Table C-5. Scoring philosophies used to determine the maturity level of electrical corporations for each capability in the Maturity Model.

Philosophy	Definition	Maturity Indicators
Anticipation	The electrical corporation's ability to identify the potential for issues that could result in a hazardous event before they occur	More mature programs have mechanisms, systems, algorithms, and procedures in place to assess the potential for faults, ignitions, and high fire-risk weather before they occur.
Automation	The electrical corporation's ability to receive, process, and act on information in a prescribed, consistent, and timely fashion that reduces wildfire risk	More mature programs have fully automated, time-sensitive processes that maximize wildfire risk reduction. Note: not all processes and procedures benefit from full automation.
Climate change	The ability of the electrical corporation to evaluate the impact of long-term climate change on the wildfire and PSPS risk.	More mature programs evaluate the impact of climate change on a broader range of modeling inputs and decisions.
Comprehensiveness	The breadth of the factors considered in the capability. One example is the breadth of inputs and outputs included in models.	More mature systems include a larger breadth of factors, more detailed modeling inputs, resolve more physics in the modeling algorithms, and consider a broader range of model inputs.
Coordination and integration	The extent to which the electrical corporation coordinates its mitigation, planning, and response activities with other Public Safety Partners.	More mature programs coordinate with a broader range of partners on a larger quantity of activities.
Documentation and disclosures	The electrical corporation's ability to effectively record processes, procedures, and models as well as properly disseminate information to stakeholders such as Energy Safety, other electrical corporations, and the public	More mature programs have consistent and navigable documentation across activities and disseminate documentation to appropriate shareholders in a timely fashion.

Philosophy	Definition	Maturity Indicators
Effectiveness	The extent to which the decisions, actions, and activities undertaken by the electrical corporation increase the resilience of the community and reduce negative outcomes of a risk event, wildfire, and/or PSPS.	More mature programs have time-efficient decisions, actions, and activities.
Frequency	The time granularity associated with the electrical corporation's wildfire mitigation activities such as inspections, data collection, analysis, and modeling	More mature programs conduct inspections, obtain and document data, and update and improve models at shorter time intervals.
IT infrastructure and database management	The electrical corporation's ability to develop and maintain the underlying technological platforms and databases necessary to support wildfire and PSPS risk mitigation activities and information	More mature programs have comprehensive, navigable, and accessible information databases that are updated in real time as risk mitigation activities and events occur, and appropriately link related databases.
Learning and improvement	The electrical corporation's ability to improve processes, procedures, and models based on lessons learned from risk events, stakeholder feedback, and WMP activities	More mature programs conduct more extensive analysis, more widespread integration of lessons learned across the programs, and benchmarking of lessons learned with other electrical corporations.
Level of sophistication	The inclusiveness and importance of factors considered in the electrical corporation's wildfire mitigation activities such as inspections, data collection, analysis, and modeling	More mature programs consider more characteristic considerations in their wildfire mitigation activities and communicate these to Energy Safety and other relevant stakeholders,
Modularization	The degree to which software is designed with related but separate components that can be easily enabled or disabled at runtime.	More mature programs develop and use modeling software which contains a greater number of sub-modules as well as sub-modules which are narrower in scope.
Quality assurance and quality control (QA/QC)	The degree to which the electrical corporation's observations, predictions, and decisions are verified, and wildfire-related systems, features, and procedures are maintained	More mature programs include redundant measurements, procedures to verify operations and maintenance, cross-validation of model results, and regular performance evaluations.
Risk spend efficiency	The cost efficiency of the electrical corporation's wildfire mitigation activities, determined from activity cost and resulting reduction in overall wildfire and PSPS risk	More mature programs have a higher marginal benefit of spending on each initiative in reducing the overall wildfire and PSPS risk.

Philosophy	Definition	Maturity Indicators
Spatial granularity	The physical resolution associated with the electrical corporation's data collection, analysis, modeling, mitigation prioritization, and mitigation activities such as inspections and maintenance	More mature programs have finer spatial granularity in data collection, analysis, modeling, mitigation prioritization, mitigation activities, and asset inventory and condition databases.
Stability of assumptions	The degree to which the assumed information used by an electrical corporation in its mitigation program remains accurate over time and changes to such information are not warranted	More mature programs regularly assess the assumptions used and find the assumptions, if still needed, remain valid.
Standardized processes	The electrical corporation's ability to have personnel receive, process, and act on information is a prescribed and consistent fashion	More mature programs have detailed and tested workflow systems that have additional redundancies to verify system adherence and effectiveness.
Subject matter expert verification and evaluation	The degree to which the electrical corporation's analyses, decisions, modeling, emergency procedures, and other aspects of its mitigation activities are evaluated and verified by qualified experts	More mature programs include external and more rigorous verification, higher SME qualifications, and transparency of the review process.
Transparency	The electrical corporation's openness toward sharing data, analyses, methods, algorithms, and procedures with other stakeholders, such as other electrical corporations and the public	More mature programs have a publicly shared, comprehensive, and centralized catalogue of data, algorithms, software, and validation bases.
Validation	The electrical corporation's ability to demonstrate the accuracy, repeatability, stability, and thoroughness of its models and procedures. This includes an understanding of the uncertainty in the process and how this uncertainty propagates through the process.	More mature programs have expanded validation bases, integrate redundant systems to reduce systematic bias, use transparent methodologies, and present sensitivity studies.

Each scoring philosophy within a capability will have a maturity level fitting the following general pattern:

- Level 0: Electrical corporation does not meet the minimum expectations or regulatory requirements
- Level 1: Electrical corporation meets the minimum expectations or regulatory requirements
- Level 2: Electrical corporation exceeds the minimum expectations or regulatory requirements but is not consistent with industry best practices
- Level 3: Electrical corporation is consistent with industry best practices
- Level 4: Electrical corporation exceeds industry best practices

The requirements to achieve maturity levels for each capability are specific to that capability; however, a set of exemplar descriptions that represent typical scores are provided in Figure C-1 for four scoring philosophies. An electrical corporation must meet specified qualitative and/or quantitative requirements to achieve specific maturity levels for each scoring philosophy within a capability. The detailed requirements for each maturity level for each capability are presented in Section C.5.

Figure C-1. Exemplar maturity levels associated with a selection of scoring philosophies.

Maturity

	0	1	2	3	4
Scoring philosophy	**Below minimum expectations or requirements** (e.g., GO-95, FERC)	**Meets minimum expectations or requirements** (e.g., GO-95, FERC)	**Beyond minimum expectations or requirements** but not consistent with best practices	**Consistent with best practice**	**Improvement over best practice**
Automation	• No automation	• Automated processes to support decision makers in time-sensitive applications	• Automated processes in time-sensitive applications link data collected and ensemble forecasts to real-time risk model	• Automated processes monitor the quality of system predictions and automatically document and send discrepancies for review	• Automated processes integrate observed discrepancies to improve future performance (e.g., real-time machine learning)
Learning and Continuous Improvement	• Insufficient structures to incorporate learnings in updated processes	• Procedures in place to incorporate lessons learned • Subject matter experts review decision-making and identify corrective actions	• Procedures in place to monitor incorporation of lessons learned • Subject matter experts review events from other utilities to identify corrective actions	• Procedures in place to track and adjudicate stakeholder comments on decisions and methods • Participation in industry task groups	• Utility finances and/or participates in research to evaluate and extend best practices
Level of Sophistication	• Insufficient activities in inspections, data collection, analysis, and/or modeling	• Utility conducts activities meeting the minimum requirements in inspections, data collection, analysis and/ or modeling	• Utility conducts activities beyond the minimum requirements (e.g., more detailed inspections)	• Utility activities are aligned with best practices supported by scientific literature and conducted by other utilities	• Utility finances and/or participates in research to develop/improve mitigation activities
Spatial Granularity	• Sporadic or inconsistent data collection • Little granularity across grid	• Consistent data collection processes and procedures • Regional / circuit-level granularity across grid	• Circuit segment-level granularity	• Span-level granularity	• Asset-level granularity
Validation	• Sporadic or inconsistent data validation • Ad-hoc data validation by experts	• Systematic data validation using historical measurements and expert input	• Sensitivity of predictions and the downstream impacts of uncertainty is known	• Uncertainty in measurements used in validation is known	• Uncertainty propagation is analytically calculated and presented using standard methods

C.3.3 Cross-Category Themes

In addition to capabilities and categories, the 2023–2025 Maturity Model includes cross-category themes. Maturity levels on cross category themes are calculated by averaging the levels on related scoring philosophies across capabilities and categories. This provides high-level slices of electrical corporation performance in several concept- and infrastructure-level areas. Table C-6 lists the cross-category themes in the 2023 Maturity Model, along with their definitions and the scoring philosophies used in their determination.

Table C-6. Cross-category themes, definitions, and scoring philosophies.

Theme	Definition	Scoring Philosophies
Plan quality	The electrical corporation's ability to ensure wildfire mitigation activities are conducted with high levels of accuracy and free of errors.	• Documentation and Disclosures • QA/QC • SME verification • Validation
Risk prioritization	The electrical corporation's ability to determine which wildfire mitigation activities will have the largest impact on wildfire risk reduction and implement identified activities with financial efficiency.	• Anticipation • Risk-spend efficiency
Data governance	The capability of the electrical corporation to ensure high-quality data exist throughout the complete life cycle of data. This includes processes for data collection as well as controls for its use in modeling and decision making.	• IT infrastructure and database management • QA/QC • Stability of assumptions • SME verification
Automation and systemization	The electrical corporation's ability to quickly integrate new information into its wildfire risk mitigation processes without the need for manual intervention. This includes the integration of sensor data, inspection and maintenance data, and lessons learned.	• Automation • IT infrastructure and database management • Learning and improvement • Systemization, policies, and procedures

Theme	Definition	Scoring Philosophies
Continuous improvement	The electrical corporation's ability to identify where shortcomings in its wildfire risk mitigation processes are and leverage knowledge from across multiple sources to improve its mitigation activities to effectively reduce wildfire risk in its service area.	• Learning and improvement • Risk-spend efficiency • Stability of assumptions • Systemization, policies, and procedures • Transparency

C.3.4 Risk and Risk Components

The 2023–2025 Maturity Model also includes maturity levels for each risk and risk component defined in Section 6.1 of the WMP Guidelines. Each capability is linked to one or more fundamental risk components. Risk and risk component maturity levels are calculated by averaging the levels of capabilities linked to each risk component. These maturity levels are intended to provide a more holistic picture of the electrical corporation's ability to understand and mitigate risk across the program. The fundamental risk components and their links to maturity capabilities are summarized in Table C-7.

Table C-7. Summary of fundamental risk components aggregated from relevant Maturity Model Capabilities.

Risk Component	Definition	Included Capabilities
Equipment ignition likelihood	The likelihood that electrical corporation-owned equipment will cause an ignition either through normal operation (such as arcing) or through failure.	1. Statistical weather, climate, and wildfire modeling 4. Calculation of risk and combination of risk components 5. Risk event tracking and integration of lessons learned 6. Risk-informed wildfire mitigation strategy 7. Ignition likelihood estimation 8. Weather forecasting ability 10. Data collection for near-real-time conditions 11. Wildfire detection and alarm systems 12. Centralized monitoring of real-time conditions 13. Asset inventory and condition database 14. Asset inspections 15. Asset maintenance and repair 16. Grid design and resiliency 17. Asset and grid personnel training and quality assurance 22. Protective equipment and device settings 23. Incorporation of ignition risk factors in grid control 30. Preparedness and planning for service restoration 32. Learning after wildfires and PSPS incidents 37. Collaboration and best practice sharing with other electrical corporations

Risk Component	Definition	Included Capabilities
Contact from vegetation ignition likelihood	The likelihood that vegetation will contact electrical corporation-owned equipment and result in an ignition.	4. Calculation of risk and combination of risk components 5. Risk event tracking and integration of lessons learned 6. Risk-informed wildfire mitigation strategy 7. Ignition likelihood estimation 8. Weather forecasting ability 10. Data collection for near-real-time conditions 11. Wildfire detection and alarm systems 12. Centralized monitoring of real-time conditions 18. Vegetation inventory and condition database 19. Vegetation inspections 20. Vegetation treatment and removal 21. Vegetation personnel training and quality assurance 22. Protective equipment and device settings 23. Incorporation of ignition risk factors in grid control 33. Public outreach and education awareness program 34. Public engagement in electrical corporation wildfire mitigation planning 30. Preparedness and planning for service restoration 32. Learning after wildfires and PSPS events 37. Collaboration and best practice sharing with other electrical corporations

Risk Component	Definition	Included Capabilities
Contact by object ignition likelihood	The likelihood that a non-vegetative object (such as balloons or vehicles) will contact electrical corporation-owned equipment and result in an ignition.	1. Statistical weather, climate, and wildfire modeling 4. Calculation of risk and combination of risk components 5. Risk event tracking and integration of lessons learned 6. Risk-informed wildfire mitigation strategy 7. Ignition likelihood estimation 8. Weather forecasting ability 10. Data collection for near-real-time conditions 11. Wildfire detection and alarm systems 12. Centralized monitoring of real-time conditions 22. Protective equipment and device settings 23. Incorporation of ignition risk factors in grid control 30. Preparedness and planning for service restoration 32. Learning after wildfires and PSPS events 33. Public outreach and education awareness program 34. Public engagement in electrical corporation wildfire mitigation planning 37. Cooperation and best practice sharing with other electrical corporations

Risk Component	Definition	Included Capabilities
Wildfire spread likelihood	The likelihood that a fire with a nearby but unknown ignition point will transition into a wildfire and will spread to a location in the service territory based on a probabilistic set of weather profiles, vegetation, and topography.	1. Statistical weather, climate, and wildfire modeling 4. Calculation of risk and combination of risk components 5. Risk event tracking and integration of lessons learned 6. Risk-informed wildfire mitigation strategy 8. Weather forecasting ability 9. Wildfire spread forecasting 10. Data collection for near-real-time conditions 12. Centralized monitoring of real-time conditions 26. Ignition prevention and suppression 28. Collaboration and coordination with Public Safety Partners 32. Learning after wildfires and PSPS events 36. Collaboration on local wildfire mitigation planning 37. Cooperation and best practice sharing with other electrical corporations

Risk Component	Definition	Included Capabilities
Wildfire hazard intensity	The potential intensity of a wildfire at a specific location within the service territory given a probabilistic set of weather profiles, vegetation, and topography.	2. Calculation of wildfire and PSPS hazard and exposure to societal values 4. Calculation of risk and combination of risk components 5. Risk event tracking and integration of lessons learned 6. Risk-informed wildfire mitigation strategy 8. Weather forecasting ability 9. Wildfire spread forecasting 10. Data collection for near-real-time conditions 12. Centralized monitoring of real-time conditions 32. Learning after wildfires and PSPS events 36. Collaboration on local wildfire mitigation planning

Risk Component	Definition	Included Capabilities
Wildfire exposure potential	The potential physical, social, or economic impact of wildfire on people, property, critical infrastructure, livelihoods, health, environmental services, local economies, cultural/historical resources, and other high-value assets. This may include direct or indirect impacts, as well as short- and long-term impacts.	2. Calculation of wildfire and PSPS hazard and exposure to societal values 4. Calculation of risk and combination of risk components 5. Risk event tracking and integration of lessons learned 6. Risk-informed wildfire mitigation strategy 27. Wildfire and PSPS emergency & disaster preparedness plan 28. Collaboration and coordination with Public Safety Partners 29. Public emergency communication strategy 30. Preparedness and planning for service restoration 31. Customer support in wildfire and PSPS emergencies 32. Learning after wildfires and PSPS events 33. Public outreach and education awareness program 34. Public engagement in electrical corporation wildfire mitigation planning 35. Engagement with AFN and socially vulnerable populations 36. Collaboration on local wildfire mitigation planning 37. Collaboration and best practice sharing with other electrical corporations

Risk Component	Definition	Included Capabilities
Wildfire vulnerability	The susceptibility of people or a community to adverse effects of a wildfire, including all characteristics that influence their capacity to anticipate, cope with, resist, and recover from the adverse effects of a wildfire (e.g., access and functional needs [AFN], age of structures, firefighting capacities).	3. Calculation of community vulnerability to wildfire and PSPS 4. Calculation of risk and combination of risk components 5. Risk event tracking and integration of lessons learned 6. Risk-informed wildfire mitigation strategy 27. Wildfire and PSPS emergency & disaster preparedness plan 28. Collaboration and coordination with Public Safety Partners 29. Public emergency communication strategy 30. Preparedness and planning for service restoration 31. Customer support in wildfire and PSPS emergencies 32. Learning after wildfires and PSPS events 33. Public outreach and education awareness program 34. Public engagement in electrical corporation wildfire mitigation planning 35. Engagement with AFN and socially vulnerable populations 36. Collaboration on local wildfire mitigation planning 37. Collaboration and best practice sharing with other electrical corporations

Risk Component	Definition	Included Capabilities
PSPS likelihood	The likelihood of an electrical corporation requiring a PSPS given a probabilistic set of environmental conditions.	1. Statistical weather, climate, and wildfire modeling 4. Calculation of risk and combination of risk components 5. Risk event tracking and integration of lessons learned 6. Risk-informed wildfire mitigation strategy 7. Ignition likelihood estimation 8. Weather forecasting ability 10. Data collection for near-real-time conditions 11. Wildfire detection and alarm systems 12. Centralized monitoring of real-time conditions 15. Asset maintenance and repair 16. Grid design and resiliency 17. Asset and grid personnel training and quality assurance 22. Protective equipment and device settings 23. Incorporation of ignition risk factors in grid control 32. Learning after wildfires and PSPS events 36. Collaboration on local wildfire mitigation planning 37. Collaboration and best practice sharing with other electrical corporations

Risk Component	Definition	Included Capabilities
PSPS exposure potential	The potential physical, social, or economic impact of a PSPS event on people, property, critical infrastructure, livelihoods, health, local economies, and other high-value assets.	2. Calculation of wildfire and PSPS hazard and exposure to societal values 4. Calculation of risk and combination of risk components 5. Risk event tracking and integration of lessons learned 6. Risk-informed wildfire mitigation strategy 15. Asset maintenance and repair 16. Grid design and resiliency 17. Asset and grid personnel training and quality assurance 24. PSPS operating model 25. Protocols for PSPS re-energization 27. Wildfire and PSPS emergency & disaster preparedness plan 28. Collaboration and coordination with Public Safety Partners 29. Public emergency communication strategy 31. Customer support in wildfire and PSPS emergencies 32. Learning after wildfires and PSPS events 33. Public outreach and education awareness program 34. Public engagement in electrical corporation wildfire mitigation planning 35. Engagement with AFN and socially vulnerable populations 36. Collaboration on local wildfire mitigation planning 37. Collaboration and best practice sharing with other electrical corporations

Risk Component	Definition	Included Capabilities
PSPS vulnerability	The susceptibility of people or a community to adverse effects of a PSPS event, including all characteristics that influence their capacity to anticipate, cope with, resist, and recover from the adverse effects of a PSPS event (e.g., AFN, energy resiliency, low socioeconomics).	3. Calculation of community vulnerability to wildfire and PSPS 4. Calculation of risk and combination of risk components 5. Risk event tracking and integration of lessons learned 6. Risk-informed wildfire mitigation strategy 27. Wildfire and PSPS emergency & disaster preparedness plan 28. Collaboration and coordination with Public Safety Partners 29. Public emergency communication strategy 31. Customer support in wildfire and PSPS emergencies 32. Learning after wildfires and PSPS events 33. Public outreach and education awareness program 34. Public engagement in electrical corporation wildfire mitigation planning 35. Engagement with AFN and socially vulnerable populations 36. Collaboration on local wildfire mitigation planning 37. Collaboration and best practice sharing with other electrical corporations

C.3.5 Summary of Capabilities

The following pages include a table summarizing the following for each Maturity Model capability organized by category:

Summary description of the capability
Fundamental risk components linked to the capability
Metrics that are expected to be related to improved maturity.

The risk components and outcome metrics are intended to provide additional context into the expected impact of improved maturity on the broader wildfire mitigation program.

The risk components indicate the specific parts of risk which could be reduced through improved maturity. This is intended to support the risk informed engineering process to identify mitigations; however, the specific risk reduction achieved through increased maturity in any individual capability will not be quantifiable due to the interconnectivity of these capabilities.

The metrics indicate key parts of the wildfire mitigation program that are expected to be related to improved maturity. These include specific outcomes, such as ignitions or number of customers notified, quantitative indicators of maturity, such as number of experiments / data sets included in validation studies, and quantitative mitigation efforts, such as average time between a severe vegetation finding and trimming. This is intended to provide additional context on how increased maturity is expected to improve the program in measurable ways. Due to the interconnectivity of these capabilities, it is not expected that independent progress in any one capability will result in direct improvement in these metrics. However, it is expected that improved performance in these metrics would be a result of the electrical corporation improving in maturity across all capabilities over time.

Table C-8. Summary of capabilities

Category	Capability	Capability Description	Fundamental Risk Components	Metrics
Risk assessment and mitigation strategy	1. Statistical weather, climate, and wildfire modeling	For planning purposes, the ability of the electrical corporation to model various weather and climate scenarios, characterize the statistical distribution of various weather and climate conditions, and quantify the likelihood of extreme weather conditions on a seasonal, annual, and decadal basis, as well as the ability of the electrical corporation to model various wildfire scenarios, characterize the statistical distribution of various outcomes, and quantify the likelihood of fire spread from all points of the electrical corporation's infrastructure.	• Equipment likelihood of ignition • Contact by object likelihood of ignition • Wildfire spread likelihood • PSPS likelihood	• Number of experiments in validation • Validation error (systematic bias and standard deviation) • Observed wind percentiles compared with calculated statistical percentiles • Observed input percentiles compared with calculated statistical percentiles (e.g., fuel aridity) • Risk events normalized by observed weather percentile
	2. Calculation of wildfire and PSPS hazard and exposure to societal values	The ability of the electrical corporation to estimate the hazard and exposure potential to a wildfire or PSPS of specific regions within its service area. This capability is intended to neglect the probability of occurrence and vulnerability components of the risk equation, instead focusing solely on the intensity of the hazard and potential exposures (people, structures, valued resources, etc.) of a wildfire or PSPS if it reaches a specific geographic location.	• Wildfire hazard intensity • Wildfire exposure potential • PSPS exposure potential	• Wildfire losses normalized by RFW • Comparison of consequence model results with actual observed losses after an event • PSPS customer hours (absolute and normalized by RFW days) • PSPS infrastructure downtime (absolute and normalized by RFW days)
	3. Calculation of community vulnerability to wildfire and PSPS	The ability of the electrical corporation to estimate the vulnerability of a community to a wildfire or PSPS in specific regions within its service area. This capability is intended to focus on the predisposition of communities to be disproportionately at risk to the negative impacts of a wildfire or PSPS if it reaches a specific geographic location. This typically includes the presence of AFN populations, socially vulnerable groups, rural and underrepresented communities, etc.	• Wildfire vulnerability • PSPS vulnerability	• Wildfire losses normalized by RFW • Comparison of consequence model results with actual observed losses after an event • PSPS customer hours (absolute and normalized by RFW days) • PSPS infrastructure downtime (absolute and normalized by RFW days)

Category	Capability	Capability Description	Fundamental Risk Components	Metrics
	4. Calculation of risk and combination of risk components	The ability of the electrical corporation to determine the total risk in their service area by incorporating the different components of the risk equation (likelihood, hazard intensity, exposure potential, and vulnerability). This capability focuses on the combination of risk components to determine overall risk and the maturity in the approach used in this combination (i.e., considering a broader range of attributes). Improving the quality of individual likelihood and consequence components is a co-factor for this capability, but those requirements are presented in the other related capabilities.	• Equipment likelihood of ignition • Contact by vegetation likelihood of ignition • Contact by object likelihood of ignition • Wildfire spread likelihood • Wildfire hazard intensity • Wildfire exposure potential • Wildfire vulnerability • PSPS likelihood • PSPS exposure potential • PSPS vulnerability	• Wildfire losses normalized by RFW • Comparison of consequence model results with actual observed losses after an event • PSPS customer hours (absolute and normalized by RFW days) • PSPS infrastructure downtime (absolute and normalized by RFW days)
	5. Risk event tracking and integration of lessons learned	The ability of the electrical corporation to track and retrieve a variety of situational, operational, and risk data to drive decisions. This includes the types of risk events tracking, the ability of the electrical corporation to understand the root cause of the events, identify lessons learned, and develop and implement corrective action plans to reduce the likelihood of recurrence. It also includes identification of generic lessons to improve overall WMP effectiveness.	• Equipment likelihood of ignition • Contact by vegetation likelihood of ignition • Contact by object likelihood of ignition • Wildfire spread likelihood • Wildfire hazard intensity • Wildfire exposure potential • Wildfire vulnerability • PSPS likelihood • PSPS exposure potential • PSPS vulnerability	• Wildfire losses normalized by RFW • Comparison of consequence model results with actual observed losses after an event • PSPS customer hours (absolute and normalized by RFW days) • PSPS infrastructure downtime (absolute and normalized by RFW days)

Category	Capability	Capability Description	Fundamental Risk Components	Metrics
	6. Risk-informed wildfire mitigation strategy	The ability of the electrical corporation to prioritize mitigation initiatives by their potential risk reduction. This includes the processes and procedures used to prioritize areas for mitigation and to select specific mitigation initiatives for implementation and to determine the need to implement interim risk mitigation measures in the event long-term/permanent measures will require substantial time to put in place. In addition, this includes quantifying the risk reduction impact of mitigation initiatives (such as grid hardening and vegetation management) on each risk component and the overall risk.	• Equipment likelihood of ignition • Contact by vegetation likelihood of ignition • Contact by object likelihood of ignition • Wildfire spread likelihood • Wildfire hazard intensity • Wildfire exposure potential • Wildfire vulnerability • PSPS likelihood • PSPS exposure potential • PSPS vulnerability	• Wildfire losses normalized by RFW • Comparison of consequence model results with actual observed losses after an event • PSPS customer hours (absolute and normalized by RFW days) • PSPS infrastructure downtime (absolute and normalized by RFW days)
Situational awareness and forecasting	7. Ignition likelihood estimation	The ability of the electrical corporation to assess the likelihood of ignition across the grid under near-real-time and short-range forecasted weather and grid operating conditions. This capability focuses on the integration of near-real-time weather forecasting (Capability 10) with historic failure/ignition data on equipment and vegetation-related ignitions to evaluate the likelihood in the short-term. This should also be informed by real-time monitoring of grid system faults, failures, etc. (Capability 12).	• Equipment likelihood of ignition • Contact by vegetation likelihood of ignition • Contact by object likelihood of ignition • PSPS likelihood	• Ignition likelihood maps compared with observed ignition maps • Grid risk maps
	8. Weather forecasting ability	The ability of the electrical corporation to generate accurate short-range (days to weeks) weather forecasts across the electrical corporation's service territory. This capability is intended to cover the accuracy of forecasts of weather which can result in an ignition and large fire spread.	• Equipment likelihood of ignition • Contact by vegetation likelihood of ignition • Contact by object likelihood of ignition • Wildfire spread likelihood • Wildfire hazard intensity • PSPS likelihood	• Monitoring of forecast performance at different lead times

Category	Capability	Capability Description	Fundamental Risk Components	Metrics
	9. Wildfire spread forecasting	For near-real-time monitoring and forecasting purposes, the ability of the electrical corporation to model various wildfire scenarios, characterize the statistical distribution of outcomes, and quantify the likelihood of fire spread from all electrical corporation T&D lines and equipment in the electrical corporation's service area. This capability is intended to cover the accuracy of forecasts of wildfire propagation in near-real time.	• Wildfire spread likelihood • Wildfire hazard intensity	• Forecasted fire perimeters (i.e., the spatial distribution of the fire line) evaluated at different positive lead times compared with observed fire perimeters
	10. Data collection for near-real-time conditions	The ability of the electrical corporation to collect and process measurements of key quantities across the electrical corporation's service area. Measurements may be obtained from electrical corporation-owned instruments or from external sources such as National Oceanic and Atmospheric Administration (NOAA). This capability is intended to cover the collection of data for assessment and prediction of wildfire occurrence and spread in near-real time.	• Equipment likelihood of ignition • Contact by vegetation likelihood of ignition • Contact by object likelihood of ignition • Wildfire spread likelihood • Wildfire hazard intensity • PSPS likelihood	• Geo-spatial grid health (i.e., how often is repair/inspection required across service area)
	11. Wildfire detection and alarm systems	The ability of the electrical corporation to detect incipient fires prior to rapid growth within the electrical corporation's area of service (particularly along the electrical corporation's transmission and distribution lines and equipment) and to notify relevant stakeholders and customers of the ignition. This includes the availability of sensors to detect fires and anomalies throughout the service area and relay that data through communications frameworks (means of transmission, bandwidth of the transmission, and interpretability of the signal) to responsible electrical corporation personnel and other stakeholders. This communication contains sufficient information for the operator to follow established procedures to distinguish between the presence of a fire, a nuisance condition, or a false alarm.	• Equipment likelihood of ignition • Contact by vegetation likelihood of ignition • Contact by object likelihood of ignition • PSPS likelihood	• Time to detection (i.e., performance when ignition time is known) • Quantity of false detections and missed ignitions (detection accuracy) • Time to notify customers and stakeholders after a detection • Effectiveness of notification strategies • Quality of detection information (such as location)

Category	Capability	Capability Description	Fundamental Risk Components	Metrics
	12. Centralized monitoring of real-time conditions	The intent of this capability is for an electrical corporation to aggregate information from various near-real-time weather monitoring, grid ignition monitoring, grid diagnostics, wildfire detection and alarm systems, as well as other analytical systems and models (e.g., weather forecasting, wildfire spread modeling) and apply this information to evaluate the ongoing wildfire and PSPS risks to support emergency management decision making. This capability also includes the physical location of the centralized monitoring systems, redundancy of systems, operational resiliency (e.g., power supplies, emergency/standby power, construction type, size), staffing, training, and qualifications of staff managing and operating the central monitoring station or emergency operation center.	• Equipment likelihood of ignition • Contact by vegetation likelihood of ignition • Contact by object likelihood of ignition • Wildfire spread likelihood • Wildfire hazard intensity • PSPS likelihood	• Time to notify customers and stakeholders after a detection • Quality of detection information • Time to verify a detection
Grid design, inspections, and maintenance	13. Asset inventory and condition database	The ability of the electrical corporation to collect and process the inventory and condition of deployed lines and assets within their service area including the timeliness and accuracy of data entry from inspections as well as the accuracy and accessibility of the information for the development of risk models	• Equipment likelihood of ignition	• Database reflects current condition of assets Completeness Timeliness • Percentage of lessons-learned flagged for correction
	14. Asset inspections	The ability of the electrical corporation to inspect assets and characterize the condition of these assets. This includes inspection frequency, scope, quality assurance/training, and reporting	• Equipment likelihood of ignition	• Percentage of HFTD areas inspected per year • Findings per inspection • QA/QC, Quantity of equipment failures that were not flagged in the inspections (%)
	15. Asset maintenance and repair	The ability of the electrical corporation to effectively maintain and repair assets in a timely and risk-informed manner to mitigate risk-inducing failure.	• Equipment likelihood of ignition • PSPS likelihood • PSPS exposure potential	• Average time delay between inspection findings and maintenance in HFTD areas • Average time delay between inspection findings and maintenance in non-HFTD areas • Average number of customers, customer hours, and critical infrastructure impacted by a PSPS per single circuit in HFTD areas. • Total percentage of grid segmentation/localization features normalized by circuit length in HFTD areas.

Category	Capability	Capability Description	Fundamental Risk Components	Metrics
	16. Grid design and resiliency	The electrical corporation's approach towards grid design that focuses on reducing the likelihood of ignition and consequences of PSPS. Grid design encompasses the selection of circuit locations, circuit segmentation, integration of microgrids, and the selection of circuit type to reduce the area affected by wildfires and PSPS events. Grid hardening includes redundant measures to prevent ignition if equipment does fail and the resiliency of the grid to existing fires.	• Equipment likelihood of ignition • PSPS likelihood • PSPS exposure potential	• Average time delay between inspection findings and maintenance in HFTD areas • Average time delay between inspection findings and maintenance in non-HFTD areas • Average number of customers affected by de-energization in a specific circuit segment per event in HFTD areas
	17. Asset and grid personnel training and quality assurance	The ability of the electrical corporation to train employees, contractors, and subcontractors to effectively design, install, inspect, maintain, and repair grid assets. This includes the training of staff, contractors, and subcontractors, documenting qualifications and certificates, evaluating capabilities, and providing necessary tools and equipment to perform required activities (unless otherwise provided by contractors/subcontractors meeting specified standards).	• Equipment likelihood of ignition • PSPS likelihood • PSPS exposure potential	• Frequency of drills, simulations, and exercises • Passing rate of drills and training activities • Completeness and consistency of training materials (manuals, exams, self-tests) Fraction of procedures covered in training Quality controls to update previously trained employees on changes to procedures Quality of materials is independently reviewed by third-party SMEs • Fraction of personnel (employee and contractor) working in HFTD areas that are current in their training
Vegetation management and inspections	18. Vegetation inventory and condition database	The ability of the electrical corporation to generate and maintain an accurate inventory database of vegetation along rights of way, and vegetation with strike potential within its service area, including the type and condition of each vegetation. This capability includes the scope, precision, and quality of the electrical corporation's documentation of vegetation inventory.	• Contact by vegetation likelihood of ignition	• Database reflects current condition of assets Completeness Timeliness • Database flags new risks since last survey
	19. Vegetation inspections	The ability of the electrical corporation to inspect vegetation along rights of way, and vegetation with strike potential for its assets. This includes both the quality and frequency of vegetation inspections.	• Contact by vegetation likelihood of ignition	• Percentage of high-risk fire areas inspected per year • Findings per inspection • Findings from QA/QC • Time between initial and detailed inspections

Category	Capability	Capability Description	Fundamental Risk Components	Metrics
	20. Vegetation treatment and removal	The electrical corporation's standards and actions for treating vegetation that is around lines and equipment which has the potential to cause an ignition. This includes both vegetation grow-in and fall-in (strike potential) mitigation efforts. This capability focuses on how quickly and effectively the electrical corporation responds to findings from inspections.	• Contact by vegetation likelihood of ignition	• Vegetation risk events • Time between routine findings and vegetation trimming • Time between imminent hazard findings and vegetation trimming
	21. Vegetation personnel training and quality assurance	The ability of the electrical corporation to train employees, contractors, and subcontractors to effectively inspect and treat vegetation that is around lines and equipment that has the potential to cause an ignition. This includes the training of staff, contractors, and subcontractors, documenting qualifications and certificates, evaluating capabilities, and providing necessary tools and equipment to perform required activities (unless otherwise provided by contractors/subcontractors meeting specified standards).	• Contact by vegetation likelihood of ignition	• Frequency of drills, simulations, and exercises • Passing rate of drills and training activities • Completeness and consistency of training materials (manuals, exams, self-tests) Fraction of procedures covered in training Quality controls to update previously trained employees on changes to procedures Quality of materials is independently reviewed by third-party SMEs • Fraction of personnel (employee and contractor) working in HFTD areas that are current in their training
Grid operations and protocols	22. Protective equipment and device settings	The ability of the electrical corporation to effectively and automatically de-energize segments of the grid rapidly when faults occur. This ability is enabled by the use of protective devices such as reclosers, which under normal operating conditions reclose the circuit once the line is cleared of a temporary fault. Under wildfire threat conditions, these devices may be set to activate more quickly and be programmed to remain open leaving a segment of the circuit de-energized. The frequent use of high threshold settings can have a negative impact on communities. Mature calibrations, using locally relevant thresholds based on data and forecasting, will optimize these settings to minimize nuisance de-energizations.	• Equipment likelihood of ignition • Contact by vegetation likelihood of ignition • Contact by object likelihood of ignition • PSPS likelihood	• Fraction of circuit miles in HFTD areas protected by early/sensitive detection systems • Average time between de-energization and inspection of line • Average customers impacted per automated de-energization • Number of automated de-energizations per RFW-OCM

Category	Capability	Capability Description	Fundamental Risk Components	Metrics

	23. Incorporation of ignition risk factors in grid control	The ability of the electrical corporation to incorporate risk considerations into real-time grid control. This includes defined procedures to control operation above rated nameplate capacity (over-load operation), tracking and recording operation conditions, and estimating equipment life based on grid operational history.	• Equipment likelihood of ignition
			• Contact by vegetation likelihood of ignition
			• Contact by object likelihood of ignition
			• PSPS likelihood
				• Circuit mile days operated above nameplate capacity
				  ○ In HFTD areas
				  ○ Overall grid
				• RFW-OCM operated above nameplate capacity
				  ○ In HFTD areas
				  ○ Overall grid

	24. PSPS operating model	The ability of the electrical corporation to effectively implement a PSPS to reduce the likelihood of an ignition. This includes the ability to accurately assess the net change in risk associated with a PSPS event (i.e., accurate comparison of the wildfire and PSPS risk) and to use this assessment to inform PSPS decision making as well as the establishment of protocols for the initiation of a PSPS.	• PSPS exposure potential	• Accuracy of PSPS decisions • Granularity of PSPS decisions • PSPS customer hours normalized by RFW-OCM • PSPS critical infrastructure hours normalized by RFW-OCM
	25. Protocols for PSPS re-energization	The ability of the electrical corporation to effectively re-energize their grid after implementing a PSPS. This includes conducting inspections of their own equipment as well as protocols in place to notify customers who own non-electrical corporation overhead distribution equipment. In addition, electrical corporations must have procedures and equipment in place to prevent back-feed of power from connected non-electrical corporation backup power from energizing electrical corporation equipment unintentionally.	• PSPS exposure potential	• Circuit miles inspected per manhour • Speed of re-energization • Number of re-energization related ignitions • Customers notified of re-energization timing
	26. Ignition prevention and suppression	The ability of the electrical corporation to train employees, contractors, and subcontractors to prevent and/or reduce the likelihood of causing an ignition, control or suppress an incipient phase fire and respond effectively per emergency management protocols. This includes the training of staff, contractors, and subcontractors, documenting qualifications and certificates, evaluating capabilities, and providing necessary tools and equipment to perform required activities (unless otherwise provided by contractors/subcontractors meeting specified standards).	• Wildfire spread likelihood	• Fraction of risk events which result in a sustained ignition • Fraction of ignitions which transition to a wildfire • Fraction of maintenance activities in HFTD areas with fire suppression and safety teams on-site • Fraction of vegetation management activities in HFTD areas with fire suppression and safety teams on-site • Fraction of personnel (employee and contractor) working in HFTD areas that are current in their training

Category	Capability	Capability Description	Fundamental Risk Components	Metrics
Emergency and Disaster Planning and Preparedness	27. Wildfire- and PSPS-emergency and disaster preparedness plan	The extent and frequency of evaluating, developing, integrating, and maintaining wildfire- and PSPS-specific emergency and disaster preparedness strategies, practices, and procedures into the electrical corporation's overall Emergency and Disaster Preparedness Plan. This includes protocols, policies and procedures for preparation and planning before, during and after an incident; defining roles and responsibilities for key personnel, qualifications, and training; resource planning and allocation; plans for drills, simulations, and tabletop exercises; strategies for coordinating and collaborating with Public Safety Partners through common standards and structures to ensure safety and timeliness. Increasing maturity is dependent on the extent, frequency and scale of preparedness and planning practices (e.g., frequency and scope of drills, collecting data from drills and after-action reports to integrate lessons learned, and remedial actions into improving plans).	• Wildfire exposure potential • Community vulnerability to wildfire • PSPS exposure potential • Community vulnerability to PSPS	• Frequency of coordinating, reviewing, and updating plans • Frequency of drills, simulations, and exercises • Fraction of relevant agencies with integrated plans • Percent of stakeholder feedback integrated into plan updates • Fraction of relevant stakeholders involved in drills • Fraction of lessons learned integrated into updated plans
	28. Collaboration and coordination with Public Safety Partners	The ability of the electrical corporation to coordinate and collaborate with Public Safety Partners at state, county, city, and tribal levels on wildfire and PSPS emergency and disaster preparedness, response, and recovery activities within the electrical corporation's service territory. This includes identifying all relevant public safety partners, their contact information and having MOAs in place for defined role & responsibilities before, during and after an incident. This also includes actions for evaluating, designing, and coordinating appropriate protocols and procedures for effective emergency communication strategies (e.g., voice and data), use of systems and technologies. This includes the capacities to synthesize and communicate near-real-time information. This also includes frequently conducting internal and external exercises and drills.	• Wildfire exposure potential • Community vulnerability to wildfire • PSPS exposure potential • Community vulnerability to PSPS	• Frequency of coordinating, reviewing, and updating communication plan • Percent of stakeholder feedback integrated into plan updates • Frequency of drills, simulations, and exercises • Percent of relevant stakeholders involved in drills • Percentage of lessons learned integrated into improving communication plan and associated systems

Category	Capability	Capability Description	Fundamental Risk Components	Metrics
	29. Public emergency communication strategy	The ability of the electrical corporation to develop, integrate and maintain an effective, near-real time communication strategy for informing essential customers and the general public before, during and after wildfires, outages due to wildfires and PSPS events, and service restoration. This includes policies, practices, and procedures to establish appropriate communication protocols to ensure timeliness, accuracy, and completeness of communications, particularly for access and functional needs (AFN) and other vulnerable populations. This also includes effectiveness of communicating information on high fire danger and PSPS conditions, location, and extent of electrical corporation-initiated wildfires or PSPS events, and referrals to relevant public wildfire response and recovery resources.	• Wildfire exposure potential • Community vulnerability to wildfire • PSPS exposure potential • Community vulnerability to PSPS	• Frequency of coordinating, reviewing, and updating communication plan • Percent of stakeholder feedback integrated into plan updates • Frequency of drills, simulations, and exercises • Percent of relevant stakeholders involved in drills • Percentage of lessons learned integrated into improving communication plan and associated systems
	30. Preparedness and planning for service restoration	The ability of the electrical corporation to restore service after a wildfire-related outages and PSPS events in a timely, safe, and coordinated manner. This includes having enough highly qualified staff and contract personnel, appropriate training programs, planning and allocation of resources (personnel and equipment), coordination with public safety partners and other electrical corporations, and plans for notifying customers. This also includes having policies, practices, and protocols in place to coordinate power restoration with other interconnected power entities.	• Equipment likelihood of ignition • Wildfire exposure potential • Community vulnerability to wildfire	• Number of re-energization related ignitions • Frequency of coordinating, reviewing, and updating restoration plans • Percent of stakeholder feedback integrated into restoration plan updates • Frequency of drills, simulations, and exercises • Percent of relevant stakeholders involved in drills • Percentage of lessons learned integrated into improving restoration plan
	31. Customer support in wildfire and PSPS emergencies	Resources dedicated to customer support during emergencies, such as outage reporting, support for low-income customers, billing adjustments, repair processing and timing, community assistance locations and services, medical baseline support services, etc.	• Wildfire exposure • Wildfire vulnerability • PSPS exposure • PSPS vulnerability	• Reduced percentage of customer “busies” • Reduced impact to AFN and other vulnerable populations during and after wildfires and PSPS events • Reduced secondary, indirect impact to life-safety and livelihoods from wildfires and PSPS incidents

Category	Capability	Capability Description	Fundamental Risk Components	Metrics
	32. Learning after wildfires and PSPS events	The ability of the electrical corporation to perform post-wildfire investigations (e.g., causal analysis, precursor risk events, after action reviews), as well as proactive diagnostic/performance testing and near miss studies to identify technical and human behavior shortcomings and other sources of error that can inform improvements to operations, management, technical systems, and other fire safety features of the Wildfire Mitigation Plan.	• Equipment likelihood of ignition • Contact by vegetation likelihood of ignition • Contact by object likelihood of ignition • Wildfire spread likelihood • Wildfire hazard intensity • Wildfire exposure potential • Wildfire vulnerability • PSPS likelihood • PSPS exposure potential • PSPS vulnerability	• Results and lessons learned from wildfire and PSPS events that have occurred • Frequency of stakeholder feedback • Frequency of plan updates based on lessons learned • Number of human-caused errors/omissions • Number of equipment failures • Number of equipment failures on de-energized segments • Number of potential ignition sources on de-energized segments • Number of ignitions • Percent of fire leading to catastrophic outcomes • Percent of near miss fires leading to catastrophic outcomes • PSPS consequences (e.g., number of customers impacted, duration of PSPS event)

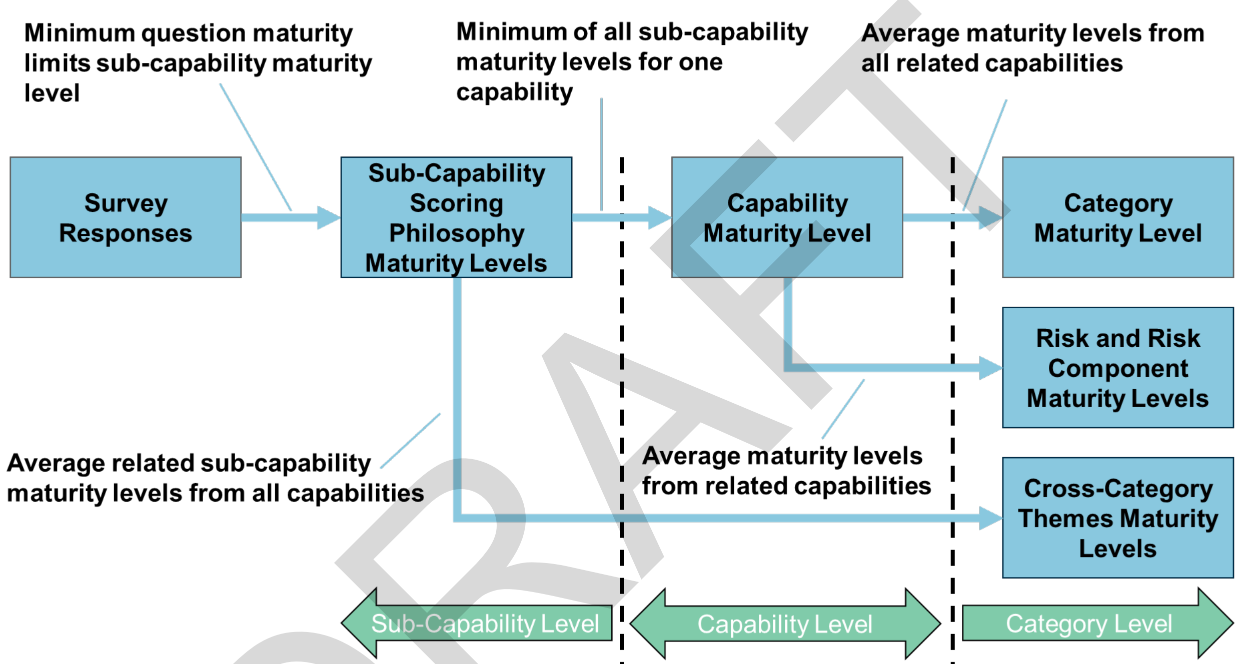
Category	Capability	Capability Description	Fundamental Risk Components	Metrics
Community outreach and engagement	33. Public outreach and education awareness program	The ability of the electrical corporation to develop, update and maintain an effective public outreach program to educate and raise the awareness of the public on the risks of wildfires and PSPS incidents, as well as appropriate preparedness activities for each incident type. This includes designing and establishing a public outreach program that addresses the specific needs of the community, effectively engages all key community stakeholder groups (e.g., individuals, families, homeowners, ranchers, AFN,, rural & urban populations, businesses, other civil society groups), and provides locally relevant information to assist individuals, families, and civil society groups on how to prepare and plan for wildfire and PSPS events before, during and after.	• Wildfire exposure potential • Wildfire vulnerability • PSPS exposure potential • PSPS vulnerability	• Reduced loss of life and property due to wildfires, and outages due to wildfires or PSPS events • Reductions in consequences to social capital • Increased access to landowner properties for vegetation management • Increased participation of the general public, medical baseline, AFN, socially vulnerable groups, and other vulnerable populations on providing feedback on WMP
	34. Public engagement in electrical corporation wildfire mitigation planning	The ability of the electrical corporation to implement strategies and actions to provide various methods for customers, the general public, and other community groups to actively participate in the electrical corporation's wildfire mitigation planning process. This includes various opportunities for the public to participate, offer views, have open and transparent communications, etc. with the electrical corporation.	• Wildfire exposure • Wildfire vulnerability • PSPS exposure • PSPS vulnerability	• Reduced loss of life and property due to wildfires, and outages due to wildfires or PSPS events • Increased participation of customers, the general public, and other community groups in the electrical corporation's wildfire mitigation planning process • Reduced impacts to AFN, medical baseline, and socially vulnerable populations
	35. Engagement with AFN and socially vulnerable populations	The ability of the electrical corporation to develop, integrate and maintain a targeted communication, outreach, and engagement program (policies, procedures, systems) to identify, understand and serve the specific needs of AFN, medical baseline, and socially vulnerable populations to the risks before, during and after wildfire and PSPS events. This includes designing, adapting, and implementing strategies that provide diverse, equitable and inclusive public outreach programs (community education and awareness raising), stakeholder participation & engagement initiatives, communication strategies, response and recovery resources that work for the whole community.	• Wildfire vulnerability • PSPS vulnerability	• Reduced impacts to AFN, medical baseline and socially vulnerable populations • Increased depth, breadth, and access of information to AFN, medical baseline, and socially vulnerable populations • Increased participation of AFN, medical baseline, and socially vulnerable populations on WMP and other wildfire mitigation programs/needs.

Category	Capability	Capability Description	Fundamental Risk Components	Metrics
	36. Collaboration on local wildfire mitigation planning	The extent and effectiveness of the electrical corporation's collaboration with local governments and community groups that are involved in local wildfire and PSPS risk reduction initiatives (e.g., community wildfire protection plans, wildfire safety elements in general plans, community chipper events, grazing programs, home ignition zone assessments, structural hardening activities). This includes the electrical corporation's level of support and commitment of resources for community-led, grass-roots initiatives that reduce wildfire & PSPS risks, reduce individual and community vulnerabilities, and increase local capacities to prepare, prevent, respond, and recover.	• Wildfire spread likelihood • Wildfire hazard intensity • Wildfire exposure potential • Wildfire vulnerability • PSPS likelihood • PSPS exposure potential • PSPS vulnerability	• Reduced loss of life and property due to wildfires, and outages due to wildfires or PSPS events • Reduced impacts to AFN, medical baseline, and socially vulnerable populations • Increased access to landowner properties for vegetation management • Increased number of collaborators • Increased frequency of collaborations • Increased coordination efforts between electrical corporation and local partners
	37. Collaboration and best practice sharing with other electrical corporations	The extent and degree of the electrical corporation's collaboration with other electrical corporations and electrical corporations in sharing and implementing lessons learned, best practices, and standards for wildfire and PSPS risk mitigation programs. This includes the electrical corporation's degree of involvement in establishing consensus standards and evaluating the relevance and validity of best practices.	• Equipment likelihood of ignition • Contact by vegetation likelihood of ignition • Contact by object likelihood of ignition • Wildfire spread likelihood • Wildfire hazard intensity • Wildfire exposure potential • Wildfire vulnerability • PSPS likelihood • PSPS exposure potential • PSPS vulnerability	• Frequency of collaborations • Percent of best practices integrated into plan updates • Frequency of benchmarking • Frequency of plan updates based on lessons learned • Reductions in wildfire consequences • Reductions in number and impacts of PSPS

C.4 Maturity Level Determination

Energy Safety determines maturity levels based on the electrical corporation's self-reported survey responses through the process shown in Figure C-2. In general, the maturity level at all sub-capability and capability levels is determined by the **minimum** of all related input factors, and the maturity level at all summary levels is determined by the **average** of all related input factors. The following subsections provide additional detail on this process.

Figure C-2. High-level overview of maturity level determination process.



C.4.1 Sub-Capability Scoring Philosophy Maturity Levels

Energy Safety uses the survey responses to calculate the sub-capability maturity level for each scoring philosophy within each capability. This is done comparing the response to each survey question to the detailed maturity levels provided for each capability in Section C.5. The maturity level for each sub-capability scoring philosophy is the **minimum** value based on the survey responses related to that sub-capability.

For example, scoring philosophy C (learning and improvement and QA/QC) for Capability 10 (data collection for near-real-time conditions) contains requisites for SME review, processes for handling data discrepancies, processes for data implementation, participation in industry groups, and third-party data benchmarks for increasing maturity levels. Each of these requisites has a corresponding question in the survey. If an electrical corporation leverages

SME review and participates in industry groups but does not satisfy the requirements on data discrepancies, data implementation, and third-party data benchmarks, it does not meet the requirements of level 1. The electrical corporation would therefore receive a maturity level of 0 for this scoring philosophy.

C.4.2 Capability Maturity Levels

To reach a given level of maturity, an electrical corporation must meet all requirements for that level and each previous level for all scoring philosophies relevant to that capability. The capability level is thus the **minimum** of the relevant sub-capability scoring philosophy maturity levels. The maximum attainable maturity for each scoring philosophy is 4 and, for scoring philosophies which do not have additional criteria associated with level 4 maturity, meeting all of the preceding criteria qualifies the electrical corporation for a score of 4 in that philosophy.

For example, an electrical corporation that receives a mix of maturity levels ranging from 1 to 3 for the various sub-capability scoring philosophies will receive a maturity level of 1 for the capability, as seen in Table C-9.

Table C-9. Example determination of capability maturity level based on sub-capability scoring philosophy maturity levels

Capability	Scoring Philosophy	Maturity Level
10. Data collection for near-real-time conditions	a. Automation	2
	b. Frequency	2
	c. Learning and continuous improvement & QA/QC	2
	d. Level of sophistication	1 (minimum)
	e. Spatial granularity	3
	f. Transparency	3
	g. Validation	2
	Capability Maturity Level	**1**

C.4.3 Category Maturity Levels

The category maturity levels are determined by taking the **average** of all capabilities within that category, as shown in Table C-10.

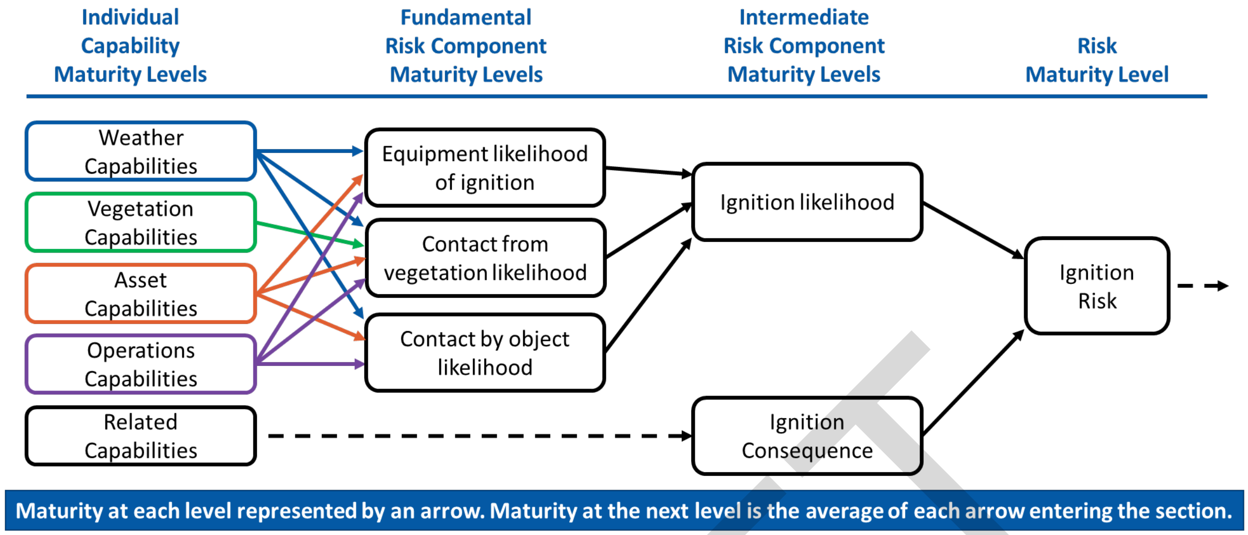
Table C-10. Example calculation of electrical corporation category maturity level calculation based on individual capability maturity levels.

Category	Capability	Maturity Level
C. Grid design, inspections, and maintenance	13. Asset inventory and condition database	3
	14. Asset inspections	2
	15. Asset maintenance and repair	1
	16. Grid design and resiliency	3
	17. Asset and grid personnel training and quality assurance	0
	Capability Maturity Level	**1.8 (Average)**

C.4.4 Risk and Risk Component Maturity Levels

A fundamental risk component maturity level is the **average** of the maturity levels of all capabilities linked to that risk component. This is calculated as it is for the category maturity levels. The maturity level of each intermediate risk component, hazard risk, and overall risk the **average** of the maturity levels of the risk components composing the maturity level. Figure C-3 provides an overview of this process.

Figure C-3. High-level overview of risk and risk component maturity level determination.



C.4.5 Cross Category Theme Maturity Levels

Maturity levels on cross category themes are calculated by **averaging** the levels on related scoring philosophies across capabilities and categories. This is done in the same way as it is for the category maturity levels (shown in Section C.4.3).

C.5 Detailed Maturity Levels

The following pages provide an overview of the detailed requirements to reach each maturity level for each capability.

C.5.1 A. Risk Assessment and Mitigation Strategy

C.5.1.1 1. Statistical weather, climate, and wildfire modeling

Statistical weather, climate, and wildfire modeling		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Climate change	Impact of long-term climate change on the statistical weather and fire behavior modeling. More mature systems evaluate the impact of climate change on the length of the fire season, statistical weather conditions, statistical vegetation growth and moisture, vegetative species / invasive species, and extension of the WUI.	Electrical corporation does not consider long term climate change in statistical weather and fire modeling used for long-term planning.	Electrical corporation considers the impact of climate change on at least one of the following: 1. Population growth in the WUI and extension of the WUI 2. Increasing temperature affecting length and severity of fire season 3. The intensity and frequency of precipitation affecting seasonal moisture and vegetation growth 4. Long-term climate changes affecting change in predominant vegetative species	Electrical corporation considers the impact of climate change on at least two of the following: 1. Population growth in the WUI and extension of the WUI 2. Increasing temperature affecting length and severity of fire season 3. The intensity and frequency of precipitation affecting seasonal moisture and vegetation growth 4. Long-term climate changes affecting change in predominant vegetative species	Electrical corporation considers the impact of climate change on at least three of the following: 1. Population growth in the WUI and extension of the WUI 2. Increasing temperature affecting length and severity of fire season 3. The intensity and frequency of precipitation affecting seasonal moisture and vegetation growth 4. Long-term climate changes affecting change in predominant vegetative species	Electrical corporation considers the impact of climate change on all the following: 1. Population growth in the WUI and extension of the WUI 2. Increasing temperature affecting length and severity of fire season 3. The intensity and frequency of precipitation affecting seasonal moisture and vegetation growth 4. Long-term climate changes affecting change in predominant vegetative species

Statistical weather, climate, and wildfire modeling		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Comprehensiveness	Inputs to estimate statistical weather, climate, and wildfire behavior are comprehensive including all key physics in weather, fire, and vegetation. Statistical conditions are evaluated at required percentiles.	Electrical corporation does not account for statistical weather, climate, and fire behavior.	Fire weather conditions meet the minimum design scenarios established by Energy Safety requirements. Electrical corporation calculates weather parameters (e.g., wind speed, relative humidity, temperature, and fuel moisture content) required to estimate the likelihood of ignition, wildfire spread probability, and wildfire hazard intensity.	Fire weather conditions meet the minimum design scenarios established by Energy Safety requirements. Model inputs at a minimum include all the following: 1. Local topography 2. Local weather 3. Local vegetation 4. Climate change requirements for level 2 Model outputs at a minimum include all the following: 1. Statistical fire weather conditions at 20-year, 60-year, and 300-year return intervals 2. Relative fire spread likelihood across service territory	Fire weather conditions meet the minimum design scenarios established by Energy Safety requirements. Model inputs at a minimum include all the following: 1. Local topography 2. Local weather 3. Local vegetation 4. Climate change requirements for level 3 Model outputs at a minimum include all the following: 1. Statistical fire weather conditions at 20-year, 60-year, and 300-year return intervals 2. Relative fire spread likelihood across service territory 3. Estimated acres burned at 20-year, 60-year, and 300-year return intervals	Fire weather conditions meet the minimum design scenarios. established by Energy Safety requirements. Model inputs at a minimum include all the following: 1. Local topography 2. Local weather 3. Local vegetation 4. Climate change requirements for level 4 5. Fire service activities / containment and suppression activities 6. Community-specific vegetation treatment plans throughout service territory Model outputs at a minimum include all the following: 1. Statistical fire weather conditions at 20-year, 60-year, and 300-year return intervals 2. Relative fire spread likelihood across service territory Estimated acres burned at 20-year, 60-year, and 300-year return intervals 4. Air quality effects including GHG emissions and population health impacts

Statistical weather, climate, and wildfire modeling		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
IT infrastructure and database management	Clarity and completeness of documentation of database schema and definitions. The model inputs and outputs at the time used to prioritize mitigation efforts should be maintained in the database along with the calculation methodology (i.e., model version #). More mature systems appropriately link databases (assets, weather, vegetation, model results, etc.) to support on-going evaluation.	Electrical corporation database management does not meet the minimum Energy Safety requirements.	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained. This includes weather, climate, and wildfire input data and modeling results used to prioritize mitigation activities.	No additional requirements beyond level 1	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained. This includes weather, climate, and wildfire input data and modeling results used to prioritize mitigation activities. The database(s) of model inputs, data, and outputs are appropriately linked with each relevant electrical corporation database (assets, weather, vegetation).	No additional requirements beyond level 3

Statistical weather, climate, and wildfire modeling		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Learning and continuous improvement	Historic model performance is consistently compared to observed conditions to determine discrepancies and biases in the model not covered by the validation basis. Processes are in place to document these findings and improve the models over time.	No process in place to inform model based on errors in model predictions or comments from stakeholders.	Electrical corporation has a clearly defined operational process in place to track discrepancies between model predictions and observed behavior during annual planning. Electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on modeling efforts which are recorded and shared in a consistent format.	No additional requirements beyond level 1	Electrical corporation has a clearly defined operational process in place to track discrepancies between model predictions and observed behavior during annual planning. Electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on modeling efforts which are recorded and shared in a consistent format. Electrical corporation participates in task groups focused on sharing and improving best practices, including participation by industry, government, and academic institutions.	Electrical corporation has a clearly defined operational process in place to track discrepancies between model predictions and observed behavior during annual planning. Electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on modeling efforts which are recorded and shared in a consistent format. Electrical corporation participates in task groups focused on sharing and improving best practices, including participation by industry, government, and academic institutions. Electrical corporation funds and participates in both independent and collaborative research that focuses on extending best practices.

Statistical weather, climate, and wildfire modeling		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Modularization	Modularization of the software models. Higher maturity includes more modular code which can be used to evaluate the impact of different assumptions on the statistical results.	Software code is not modular.	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include at least the following: 1. Statistical weather analysis 2. Statistical fire behavior analysis 3. Statistical seasonal vegetation analysis	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include at least the following: 1. Statistical weather analysis 2. Statistical fire behavior analysis 3. Statistical seasonal vegetation analysis 4. Impact of climate change on statistical weather 5. Impact of weather on seasonal vegetation moisture 6. Impact of weather on seasonal vegetation growth cycle	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include at least two of the following: 1. Statistical weather analysis 2. Statistical fire behavior analysis 3. Statistical seasonal vegetation analysis 4. Impact of climate change on statistical weather 5. Impact of weather on seasonal vegetation moisture 6. Impact of weather on seasonal vegetation growth cycle 7. Synoptic scale weather 8. Mesoscale weather	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include all the following: 1. Statistical weather analysis 2. Statistical fire behavior analysis 3. Statistical seasonal vegetation analysis 4. Impact of climate change on statistical weather 5. Impact of weather on seasonal vegetation moisture 6. Impact of weather on seasonal vegetation growth cycle 7. Synoptic scale weather 8. Mesoscale weather 9. Large eddy scale weather
Spatial granularity	Vertical and horizontal / geo-coordinate resolution of the weather, climate, and wildfire predictions. Higher maturity is achieved by using a sufficiently fine resolution to resolve the local effects of fire and weather.	Electrical corporation does not meet the minimum expectations for resolution reporting.	Horizontal resolution of the statistical weather and climate modeling is evaluated at a resolution <= 4 km. Horizontal resolution of the statistical fire modeling is evaluated at a resolution <= 1 km. Vertical resolution of the statistical weather modeling is sufficient to evaluate average conditions at measured locations in the service territory.	Horizontal resolution of the statistical weather and climate modeling is evaluated at a resolution <= 2 km. Horizontal resolution of the statistical fire modeling is evaluated at a resolution <= 100 m. Vertical resolution of the statistical weather and climate modeling is sufficiently resolved to evaluate the local conditions at the average height of lines on a circuit.	Horizontal resolution of the statistical weather and climate modeling is evaluated at a resolution <= 1 km. Horizontal resolution of the statistical fire modeling is evaluated at a resolution <= 30 m. Vertical resolution of the statistical weather and climate modeling is sufficiently resolved to evaluate the local conditions at the average height of lines on a span.	Horizontal resolution of the statistical weather and climate modeling is evaluated at a resolution <= 100 m. Horizontal resolution of the statistical fire modeling is evaluated at a resolution <= 10 m. Vertical resolution of the statistical weather and climate modeling is sufficiently resolved to evaluate the local conditions at the average height of individual lines.

Statistical weather, climate, and wildfire modeling		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Stability of assumptions	Assumptions and limitations of the model are known, and the model does not need significant changes in future updates to the WMP	Assumptions and limitations of the model(s) are unknown and/or not documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are evaluated using hindcast in the development environment. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are developed in the previous year and are planned for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Validation results justify no changes to modeling assumptions for a period **greater than one year**. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.

Statistical weather, climate, and wildfire modeling		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Transparency	Sharing of data and methods with the public and research community. More mature systems provide access to input data, source code, and an automated verification and validation suite to the public.	Electrical corporation does not share data and methods.	Data and methods meet the minimum Energy Safety reporting requirements.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical documentation is available to the public.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial data with the community.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial and geospatial data with the community. Model software source code and data for verification and validation provided by the electrical corporation to the public.

Validation	Documentation of the uncertainty in weather, climate, and fire behavior predictions and the resulting sensitivity of the overall risk model predictions to 1) inputs to these models 2) modeling assumptions, limitations, and parameterizations, and 3) down-stream impacts of uncertainty propagation in model predictions.	The statistical uncertainty in model inputs parameters (aleatory) and model assumptions, limitations, and parameterizations (epistemic) and the impact on model outputs is unknown or not documented. Sensitivity of down-stream models to uncertainty in modeling is unknown or not documented.	The statistical uncertainty in model inputs parameters (aleatory) and model assumptions, limitations, and parameterizations (epistemic) and the impact on model outputs is known and documented in accordance with Energy Safety requirements. Sensitivity of down-stream models to uncertainty in modeling is unknown or not documented.	The statistical uncertainty in model inputs parameters (aleatory) and model assumptions, limitations, and parameterizations (epistemic) and the impact on model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. Sensitivity analyses are used to evaluate model predictions at different percentiles for use in down-stream models and decision making. The choice of percentile is justified in the WMP.	The statistical uncertainty in model inputs parameters (aleatory) and model assumptions, limitations, and parameterizations (epistemic) and the impact on model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. Sensitivity analyses are used to evaluate model predictions at different percentiles for use in down-stream models and decision making. The choice of percentile is justified in the WMP. The uncertainty in measurements used in model validation is known and documented.	The statistical uncertainty in model inputs parameters (aleatory) and model assumptions, limitations, and parameterizations (epistemic) and the impact on model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. Sensitivity analyses are used to evaluate model predictions at different percentiles for use in down-stream models and decision making. The choice of percentile is justified in the WMP. The uncertainty in measurements used in model validation is known and documented. Uncertainty propagation is analytically calculated and presented using standard methods such as Bayesian inference and uncertainty quantification.

Statistical weather, climate, and wildfire modeling		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation, documentation, and disclosures	Documentation of model substantiation efforts. Higher maturity includes automated verification and validation suites which are provided to the regulator for third-party review. In addition, more mature systems demonstrate a lower systematic bias and standard deviation in error in the Validation Documentation.	No model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Discrepancies between production model and observed reality are quantified and statistically evaluated to validate performance. Model performance on each key metric demonstrates a **systematic bias < 20%.** Model performance on each key metric demonstrates a standard **deviation in error < 40%.** Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Discrepancies between production model and observed reality are quantified and statistically evaluated to validate performance. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a **systematic bias < 10%.** Model performance on each key metric demonstrates a standard **deviation in error < 20%.** Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Discrepancies between production model and observed reality are quantified and statistically evaluated to validate performance. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a **systematic bias < 5%.** Model performance on each key metric demonstrates a standard **deviation in error < 15%.** Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.

C.5.1.2 2. Calculation of wildfire and PSPS hazard and exposure to societal values

Calculation of wildfire and PSPS hazard and exposure to societal values		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation	Automated calculation of wildfire and PSPS hazard and exposure potential in the service area.	Calculation of wildfire and PSPS hazard intensity and exposure potential in the service area are not automated.	Calculation of wildfire and PSPS hazard intensity and exposure potential in the service area are not automated.	Calculation of wildfire and PSPS hazard intensity and exposure potential in the service area are automated.	Calculation of wildfire and PSPS hazard intensity and exposure potential in the service area are automated. Discrepancies between model calculation and observed reality are automatically identified, documented, and sent to Subject Matter Experts for review.	Calculation of wildfire and PSPS hazard intensity and exposure potential in the service area are automated. Discrepancies between model calculation and observed reality are automatically identified, documented, and sent to Subject Matter Experts for review. Discrepancies are automatically integrated into the predictive model to improve future performance.

Calculation of wildfire and PSPS hazard and exposure to societal values		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Comprehensiveness	Model inputs and outputs to quantify wildfire and PSPS hazard and exposure potential in the service area are comprehensive including all aspects of weather, vegetation, and community composition.	Model inputs and outputs to quantify wildfire and PSPS hazard and exposure potential in the service area do not meet the minimum expectations or requirements.	Model inputs to calculate wildfire and PSPS hazard and exposure potential include the following: 1. Population 2. Buildings 3. Fire intensity Model outputs include the following: 1. Loss of life 2. Injuries 3. Property damage 4. Acres burned 5. Number of customers impacted by the PSPS 6. Number of AFN, medical baseline, and socially vulnerable customers impacted by the PSPS	Model inputs to calculate wildfire and PSPS hazard and exposure potential include the following: 1. Population 2. Buildings 3. Fire intensity Model outputs include the following: 1. Loss of life 2. Injuries 3. Property damage 4. Acres burned 5. Number of customers impacted by the PSPS 6. Number of AFN, medical baseline, and socially vulnerable customers impacted by the PSPS 7. Customer hours of PSPS 8. Customer hours of PSPS for AFN, medical baseline, and socially vulnerable customers	Model inputs to calculate wildfire and PSPS hazard and exposure potential include the following: 1. Population 2. Buildings 3. Fire intensity 4. Ingress & egress capacity and planning Model outputs include the following: 1. Loss of life 2. Injuries 3. Property damage 4. Acres burned 5. Number of customers impacted by the PSPS 6. Number of AFN, medical baseline, and socially vulnerable customers impacted by the PSPS 7. Customer hours of PSPS 8. Customer hours of PSPS for AFN, medical baseline, and socially vulnerable customers 9. Economic impact on small businesses	Model inputs to calculate wildfire and PSPS hazard and exposure potential include the following: 1. Population 2. Buildings 3. Fire intensity 4. Ingress & egress capacity and planning 5. Containment & suppression difficulty Model outputs include the following: 1. Loss of life 2. Injuries 3. Property damage 4. Acres burned 6. Number of AFN, medical baseline, and socially vulnerable customers impacted by the PSPS 7. Customer hours of PSPS 8. Customer hours of PSPS for AFN, medical baseline, and socially vulnerable customers 9. Economic impact on small businesses

Calculation of wildfire and PSPS hazard and exposure to societal values		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
IT infrastructure and database management	Clarity and completeness of documentation of database schema and definitions. The model inputs and outputs at the time used to prioritize mitigation efforts should be maintained in the database along with the calculation methodology (i.e., model version #). More mature systems appropriately link databases (assets, weather, vegetation, model results, etc.) to support on-going evaluation.	Electrical corporation database management does not meet the minimum Energy Safety requirements.	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained.	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained. Definition of each element contained in the databases is clearly explained.	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained. Definition of each element contained in the databases is clearly explained. The database(s) of model inputs, data, and outputs are appropriately linked with each relevant electrical corporation database (assets, weather, vegetation).	No additional requirements beyond level 3
QA/QC	Process to evaluate the accuracy of wildfire and PSPS hazard and exposure potential estimation.	No process in place to evaluate the quality of model calculations.	The quality of model calculations is assessed annually through subject matter expert (SME) review.	The quality of model calculations is assessed quarterly through subject matter expert (SME) review.	The quality of model calculations is assessed monthly through subject matter expert (SME) review. Electrical corporation benchmarks wildfire and PSPS hazard and exposure estimation with other electrical corporations.	The quality of model calculations is assessed monthly through subject matter expert (SME) review. Electrical corporation benchmarks wildfire and PSPS hazard and exposure estimation with other electrical corporations. Regular monitoring is complemented with more in-depth analysis to provide a comprehensive understanding of strengths and weaknesses of the system.

Calculation of wildfire and PSPS hazard and exposure to societal values		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Spatial granularity	Granularity of wildfire and PSPS hazard and exposure potential estimation.	Model calculations are conducted at a spatial granularity less than a regional level.	Model calculations are conducted at a regional level (i.e., at a scale larger than individual circuits)	Model calculations are conducted at a circuit level (i.e., independent values for each circuit)	Model calculations are conducted at a span level (i.e., independent values for each span within a circuit)	Model calculations are conducted at an asset level (i.e., independent values for each asset)

Calculation of wildfire and PSPS hazard and exposure to societal values		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Stability of assumptions	Assumptions and limitations of the models used to calculate the wildfire and PSPS hazard and exposure potential are known, and the models do not need significant changes in future updates to the WMP	Assumptions and limitations of the model(s) are unknown and/or not documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are evaluated using hindcast in the development environment. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are developed in the previous year and are planned for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Validation results justify no changes to modeling assumptions for a period **greater than one year**. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.

Calculation of wildfire and PSPS hazard and exposure to societal values		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Transparency	Sharing of data and methods with the public and research community. More mature systems provide access to input data, source code, and an automated verification and validation suite to the public.	Electrical corporation does not share data and methods.	Data and methods meet the minimum Energy Safety reporting requirements.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical documentation is available to the public.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial data with the community.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial and geospatial data with the community. Model software source code and data for verification and validation provided by the electrical corporation to the public.

Calculation of wildfire and PSPS hazard and exposure to societal values		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation	Documentation of model substantiation efforts. Higher maturity includes automated verification and validation suites which are provided to the regulator for third-party review. In addition, more mature systems demonstrate a lower systematic bias and standard deviation in error in the Validation Documentation.	No model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Discrepancies between production model and observed reality are quantified and statistically evaluated to performance. Model performance on each key metric demonstrates a systematic bias < 20%. Model performance on each key metric demonstrates a standard deviation in error < 40%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 10%. Model performance on each key metric demonstrates a standard deviation in error < 20%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 5%. Model performance on each key metric demonstrates a standard deviation in error < 15%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.

C.5.1.3 3. Calculation of community vulnerability to wildfire and PSPS

Calculation of community vulnerability to wildfire and PSPS		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation	Automated calculation of community vulnerability to wildfire and PSPS in the service area.	Calculation of vulnerability to wildfire and PSPS are not automated	Calculation of vulnerability to wildfire and PSPS are not automated.	Calculation of vulnerability to wildfire and PSPS are automated.	Calculation of vulnerability to wildfire and PSPS are automated. Discrepancies between model calculation and observed reality are automatically identified, documented, and sent to Subject Matter Experts for review.	Calculation of vulnerability to wildfire and PSPS are automated. Discrepancies between model calculation and observed reality are automatically identified, documented, and sent to Subject Matter Experts for review. Discrepancies are automatically integrated into the predictive model to improve future performance.
Comprehensiveness	Model inputs and outputs to quantify community vulnerability to wildfire and PSPS in the service area are comprehensive including all aspects of weather, vegetation, and community composition.	Model inputs and outputs to quantify wildfire and PSPS hazard and exposure potential in the service area do not meet the minimum expectations or requirements.	Model inputs to calculate community vulnerability to wildfire and PSPS include the following: 1. Vulnerable populations (AFN, LEP, elderly) 2. Critical infrastructure Model outputs include the following: 1. Affected number of people for PSPS event occurring 2. Affected number of people for a wildfire occurring	Model inputs to calculate community vulnerability to wildfire and PSPS include the following: 1. Vulnerable populations (AFN, LEP, elderly) 2. Critical infrastructure 3. Redundant systems such as generators 4. Legacy building codes Model outputs include the following: 1. Affected number of people for PSPS event occurring 2. Affected number of people for a wildfire occurring	Model inputs to calculate community vulnerability to wildfire and PSPS include the following: 1. Vulnerable populations (AFN, LEP, elderly) 2. Critical infrastructure 3. Redundant systems such as generators 4. Legacy building codes 5. Community collaborative wildfire preparedness initiatives (e.g., firewise) Model outputs include the following: 1. Affected number of people for PSPS event occurring 2. Affected number of people for a wildfire occurring 3. Potential life and property loss for a wildfire occurring	Model inputs to calculate community vulnerability to wildfire and PSPS include the following: 1. Vulnerable populations (AFN, LEP, elderly) 2. Critical infrastructure 3. Redundant systems such as generators 4. Legacy building codes 5. Community collaborative wildfire preparedness initiatives (e.g., firewise) 6. Availability of ingress and egress Model outputs include the following: 1. Affected number of people for PSPS event occurring 2. Affected number of people for wildfire occurring 3. Potential life and property loss for a wildfire occurring

Calculation of community vulnerability to wildfire and PSPS		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
IT infrastructure and database management	Clarity and completeness of documentation of database schema and definitions. The model inputs and outputs at the time used to prioritize mitigation efforts should be maintained in the database along with the calculation methodology (i.e., model version #). More mature systems appropriately link databases (assets, weather, vegetation, model results, etc.) to support on-going evaluation.	Electrical corporation database management does not meet the minimum Energy Safety requirements.	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained.	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained. Definition of each element contained in the databases is clearly explained.	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained. Definition of each element contained in the databases is clearly explained. The database(s) of model inputs, data, and outputs are appropriately linked with each relevant electrical corporation database (assets, weather, vegetation).	No additional requirements beyond level 3
QA/QC	Process to evaluate the accuracy of community vulnerability to wildfire and PSPS.	No process in place to evaluate the quality of model calculations.	The quality of model calculations is assessed annually through subject matter expert (SME) review.	The quality of model calculations is assessed quarterly through subject matter expert (SME) review.	The quality of model calculations is assessed monthly through subject matter expert (SME) review. Electrical corporation benchmarks wildfire and PSPS hazard and exposure estimation with other electrical corporations.	The quality of model calculations is assessed monthly through subject matter expert (SME) review. Electrical corporation benchmarks wildfire and PSPS hazard and exposure estimation with other electrical corporations. Regular monitoring is complemented with more in-depth analyses to provide a comprehensive understanding of strengths and weaknesses of the system.
Spatial granularity	Granularity of community vulnerability to wildfire and PSPS.	Model calculations are conducted at a spatial granularity less than a regional level.	Model calculations are conducted at a regional level (i.e., at a scale larger than individual circuits)	Model calculations are conducted at a circuit level (i.e., independent values for each circuit)	Model calculations are conducted at a span level (i.e., independent values for each span within a circuit)	Model calculations are conducted at an asset level (i.e., independent values for each asset)

Calculation of community vulnerability to wildfire and PSPS		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Stability of assumptions	Assumptions and limitations of the models used to calculate the community vulnerability to wildfire and PSPS are known, and the models do not need significant changes in future updates to the WMP	Assumptions and limitations of the model(s) are unknown and/or not documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are evaluated using hindcast in the development environment. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are developed in the previous year and are planned for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Validation results justify no changes to modeling assumptions for a period **greater than one year**. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.

Calculation of community vulnerability to wildfire and PSPS		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Transparency	Sharing of data and methods with the public and research community. More mature systems provide access to input data, source code, and an automated verification and validation suite to the public.	Electrical corporation does not share data and methods.	Data and methods meet the minimum Energy Safety reporting requirements.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical documentation is available to the public.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial data with the community.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial and geospatial data with the community. Model software source code and data for verification and validation provided by the electrical corporation to the public.

Calculation of community vulnerability to wildfire and PSPS		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation	Documentation of model substantiation efforts. Higher maturity includes automated verification and validation suites which are provided to the regulator for third-party review. In addition, more mature systems demonstrate a lower systematic bias and standard deviation in error in the Validation Documentation.	No model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Discrepancies between production model and observed reality are quantified and statistically evaluated to performance. Model performance on each key metric demonstrates a systematic bias < 20%. Model performance on each key metric demonstrates a standard deviation in error < 40%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 10%. Model performance on each key metric demonstrates a standard deviation in error < 20%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 5%. Model performance on each key metric demonstrates a standard deviation in error < 15%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.

C.5.1.4 4. Calculation of risk and risk components

Calculation of risk and risk components		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Climate change	Impact of long-term climate change on the statistical risk analysis. More mature systems evaluate the impact of climate change on the length of the fire season, statistical weather conditions, statistical vegetation growth and moisture, vegetative species / invasive species, and extension of the WUI.	Electrical corporation does not consider long term climate change in statistical weather and fire modeling used for long-term planning.	Electrical corporation considers the impact of climate change on at least one of the following: 1. Population growth in the WUI and extension of the WUI 2. Increasing temperature affecting length and severity of fire season 3. The intensity and frequency of precipitation affecting seasonal moisture and vegetation growth 4. Long-term climate changes affecting change in predominant vegetative species	Electrical corporation considers the impact of climate change on at least two of the following: 1. Population growth in the WUI and extension of the WUI 2. Increasing temperature affecting length and severity of fire season 3. The intensity and frequency of precipitation affecting seasonal moisture and vegetation growth 4. Long-term climate changes affecting change in predominant vegetative species	Electrical corporation considers the impact of climate change on at least three of the following: 1. Population growth in the WUI and extension of the WUI 2. Increasing temperature affecting length and severity of fire season 3. The intensity and frequency of precipitation affecting seasonal moisture and vegetation growth 4. Long-term climate changes affecting change in predominant vegetative species	Electrical corporation considers the impact of climate change on all the following: 1. Population growth in the WUI and extension of the WUI 2. Increasing temperature affecting length and severity of fire season 3. The intensity and frequency of precipitation affecting seasonal moisture and vegetation growth 4. Long-term climate changes affecting change in predominant vegetative species

Calculation of risk and risk components		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Comprehensiveness	Inputs to calculate each risk and risk component are comprehensive including all key physics, required values / attributes, and statistical percentiles.	Electrical corporation does not sufficiently calculate risks and risk components.	Electrical corporation calculates each risk and risk component in accordance with Energy Safety requirements. The combination of risks and risk components includes evaluation of the relative importance of the following performance objectives: 1. Life Safety 2. Reliability 3. Affordability	Electrical corporation calculates each risk and risk component in accordance with Energy Safety requirements. Model inputs and outputs at a minimum meet the Level 2 requirements for each of the following capabilities: 1. Statistical Weather, Climate, and Fire Modeling 2. Estimation of Wildfire and PSPS Hazard and Exposure 3. Estimation of Community Vulnerability to Wildfire and PSPS 4. Ignition Likelihood Estimation 5. Weather Forecasting Ability 6. Wildfire Forecasting Ability The combination of risks and risk components includes evaluation of the relative importance of the following performance objectives: 1. Life Safety 2. Property Protection 3. Reliability 4. Affordability	Electrical corporation calculates each risk and risk component in accordance with Energy Safety requirements. Model inputs and outputs at a minimum meet the Level 3 requirements for each of the following capabilities: 1. Statistical Weather, Climate, and Fire Modeling 2. Estimation of Wildfire and PSPS Hazard and Exposure 3. Estimation of Community Vulnerability to Wildfire and PSPS 4. Ignition Likelihood Estimation 5. Weather Forecasting Ability 6. Wildfire Forecasting Ability The combination of risks and risk components includes evaluation of the relative importance of the following performance objectives: 1. Life Safety 2. Property Protection 3. Resiliency 4. Reliability 5. Affordability 6. Environmental Protection	Electrical corporation calculates each risk and risk component in accordance with Energy Safety requirements. Model inputs and outputs at a minimum meet the Level 4 requirements for each of the following capabilities: 1. Statistical Weather, Climate, and Fire Modeling 2. Estimation of Wildfire and PSPS Hazard and Exposure 3. Estimation of Community Vulnerability to Wildfire and PSPS 4. Ignition Likelihood Estimation 5. Weather Forecasting Ability 6. Wildfire Forecasting Ability The combination of risks and risk components includes evaluation of the relative importance of the following performance objectives: 1. Immediate Life Safety 2. Long-Term Health Impacts 3. Property Protection 4. Resiliency 5. Reliability 6. Affordability 7. Environmental Protection 8. Public Perception

Calculation of risk and risk components		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
IT infrastructure and database management	Clarity and completeness of documentation of database schema and definitions. The model inputs and outputs at the time used to prioritize mitigation efforts should be maintained in the database along with the calculation methodology (i.e., model version #). More mature systems appropriately link databases (assets, weather, vegetation, model results, etc.) to support on-going evaluation.	Electrical corporation database management does not meet the minimum Energy Safety requirements.	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained.	No additional requirements beyond level 1	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained. The database(s) of model inputs, data, and outputs are appropriately linked with each relevant electrical corporation database (assets, weather, vegetation).	No additional requirements beyond level 3

Calculation of risk and risk components		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Learning and continuous improvement & QA/QC	Historic model performance is consistently compared to observed conditions to determine discrepancies and biases in the model not covered by the validation basis. Processes are in place to document these findings and improve the models over time.	No process in place to inform model based on errors in model predictions or comments from stakeholders.	Electrical corporation has a clearly defined operational process in place to track discrepancies between model predictions and observed behavior during annual planning. Electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on modeling efforts which are recorded and shared in a consistent format. Risk maps are annually assessed through subject matter expert (SME) review.	Electrical corporation has a clearly defined operational process in place to track discrepancies between model predictions and observed behavior during annual planning. Electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on modeling efforts which are recorded and shared in a consistent format. Risk maps are annually assessed through an independent third-party subject matter expert (SME) review.	Electrical corporation has a clearly defined operational process in place to track discrepancies between model predictions and observed behavior during annual planning. Electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on modeling efforts which are recorded and shared in a consistent format. Risk maps are annually assessed through an independent third-party subject matter expert (SME) review. Electrical corporation participates in task groups focused on sharing and improving best practices, including participation by industry, government, and academic institutions.	Electrical corporation has a clearly defined operational process in place to track discrepancies between model predictions and observed behavior during annual planning. Electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on modeling efforts which are recorded and shared in a consistent format. Risk maps are annually assessed through an independent third-party subject matter expert (SME) review. Electrical corporation participates in task groups focused on sharing and improving best practices, including participation by industry, government, and academic institutions. Electrical corporation funds and participates in both independent and collaborative research that focuses on extending best practices.

Calculation of risk and risk components		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Modularization	Modularization of the software models. Higher maturity includes more modular code which can be used to evaluate the impact of different assumptions on the statistical results.	Software code is not modular.	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include at least the following: 1. Ignition risk 2. PSPS risk	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include at least the following: 1. Ignition risk 2. PSPS risk 3. Ignition likelihood 4. Ignition consequence	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include at least the following: 1. Ignition risk 2. PSPS risk 3. Ignition likelihood 4. Ignition consequence 5. Equipment likelihood of ignition 6. Contact from vegetation likelihood of ignition 7. Contact from object likelihood of ignition 8. Wildfire spread likelihood 9. Wildfire consequence 10. PSPS likelihood 11. PSPS consequence	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include at least the following: 1. Ignition risk 2. PSPS risk 3. Ignition likelihood 4. Ignition consequence 5. Equipment likelihood of ignition 6. Contact from vegetation likelihood of ignition 7. Contact from object likelihood of ignition 8. Wildfire spread likelihood 9. Wildfire consequence 10. PSPS likelihood 11. PSPS consequence 12. Wildfire hazard intensity 13. Wildfire exposure potential 14. Community vulnerability to wildfire 15. PSPS exposure potential 16. Community vulnerability to PSPS

Calculation of risk and risk components		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Spatial granularity	Spatial granularity of the model inputs, outputs, calculation steps, and validation basis on which the risk and risk components calculations build. Higher maturity is achieved by using a sufficiently fine resolution to resolve the local impacts of each modeling capability on the local region.	Electrical corporation does not meet the minimum expectations for resolution reporting.	Spatial granularity of model inputs, outputs, calculation steps, and validation basis at a minimum meet the Level 1 requirements for each of the following capabilities defined in the respective definitions (number reflects the corresponding Maturity capability): 1. Statistical Weather, Climate, and Fire Modeling 2. Estimation of Wildfire and PSPS Hazard and Exposure 3. Estimation of Community Vulnerability to Wildfire and PSPS 7. Ignition Likelihood Estimation 8. Weather Forecasting Ability 9. Wildfire Forecasting Ability	Spatial granularity of model inputs, outputs, calculation steps, and validation basis at a minimum meet the Level 2 requirements for each of the following capabilities defined in the respective definitions (number reflects the corresponding Maturity capability): 1. Statistical Weather, Climate, and Fire Modeling 2. Estimation of Wildfire and PSPS Hazard and Exposure 3. Estimation of Community Vulnerability to Wildfire and PSPS 7. Ignition Likelihood Estimation 8. Weather Forecasting Ability 9. Wildfire Forecasting Ability	Spatial granularity of model inputs, outputs, calculation steps, and validation basis at a minimum meet the Level 3 requirements for each of the following capabilities defined in the respective definitions: (number reflects the corresponding Maturity capability): 1. Statistical Weather, Climate, and Fire Modeling 2. Estimation of Wildfire and PSPS Hazard and Exposure 3. Estimation of Community Vulnerability to Wildfire and PSPS 7. Ignition Likelihood Estimation 8. Weather Forecasting Ability 9. Wildfire Forecasting Ability	Spatial granularity of model inputs, outputs, calculation steps, and validation basis at a minimum meet the Level 4 requirements for each of the following capabilities defined in the respective definitions: (number reflects the corresponding Maturity capability): 1. Statistical Weather, Climate, and Fire Modeling 2. Estimation of Wildfire and PSPS Hazard and Exposure 3. Estimation of Community Vulnerability to Wildfire and PSPS 7. Ignition Likelihood Estimation 8. Weather Forecasting Ability 9. Wildfire Forecasting Ability

Calculation of risk and risk components		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Stability of assumptions	Assumptions and limitations of the model are known, and the model does not need significant changes in future updates to the WMP	Assumptions and limitations of the model(s) are unknown and/or not documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements.). Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are evaluated using hindcast in the development environment. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are developed in the previous year and are planned for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Validation results justify no changes to modeling assumptions for a period **greater than one year**. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.

Calculation of risk and risk components		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Transparency	Sharing of data and methods with the public and research community. More mature systems provide access to input data, source code, and an automated verification and validation suite to the public.	Electrical corporation does not share data and methods.	Data and methods meet the minimum reporting requirements of Energy Safety requirements.	Data and methods meet the minimum reporting requirements of Energy Safety requirements. Statistical summary of data and model performance is provided to the public. Model technical documentation is available to the public.	Data and methods meet the minimum reporting requirements of Energy Safety requirements. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial data with the community.	Data and methods meet the minimum reporting requirements of Energy Safety requirements. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial and geospatial data with the community. Model software source code and data for verification and validation provided by the electrical corporation to the public.

Calculation of risk and risk components		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation	Documentation of the uncertainty in risk components and the resulting sensitivity of the overall risk model predictions to 1) inputs to these models and 2) down-stream impacts of uncertainty propagation in model predictions.	The statistical uncertainty in model inputs parameters and outputs is unknown or not documented. Sensitivity of down-stream models to uncertainty in modeling is unknown or not documented.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. Sensitivity of down-stream models to uncertainty in modeling is unknown or not documented.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. Sensitivity analyses are used to evaluate model predictions at different percentiles for use in down-stream models and decision making. The choice of percentile is justified in the WMP.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. The uncertainty in measurements used in model validation is known and documented. Sensitivity analyses are used to evaluate model predictions at the 84th percentile in down-stream models and decision making.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. The uncertainty in measurements used in model validation is known and documented. Sensitivity analyses are used to evaluate model predictions at the 97.5th percentile in down-stream models and decision making. Uncertainty propagation is analytically calculated and presented using standard methods such as Bayesian inference and uncertainty quantification.

Calculation of risk and risk components		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation & Documentation and disclosures	Documentation of model substantiation efforts. Higher maturity includes automated verification and validation suites which are provided to the regulator for third-party review. In addition, more mature systems demonstrate a lower systematic bias and standard deviation in error in the Validation Documentation.	No model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Discrepancies between production model and observed reality are quantified and statistically evaluated to performance. Model performance on each key metric demonstrates a systematic bias < 20%. Model performance on each key metric demonstrates a standard deviation in error < 40%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 10%. Model performance on each key metric demonstrates a standard deviation in error < 20%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 5%. Model performance on each key metric demonstrates a standard deviation in error < 15%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.

C.5.1.5 5. Risk event tracking and integration of lessons learned

Risk event tracking and integration of lessons learned		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation	Automated integration of risk estimation with informing decision making.	Incident reports from risk events are not automatically entered into the corrective action program.	No additional requirements beyond level 0	Incident reports from risk events are automatically entered into the corrective action program.	Incident reports from risk events are automatically entered into the corrective action program. Risk events are automatically prioritized for SME review based on details of the event.	Incident reports from risk events are automatically entered into the corrective action program. Risk events are automatically prioritized for SME review based on details of the event. Data from risk events are automatically integrated into the risk analysis to improve model quality and validation.
Documentation and disclosures	Documentation of electrical corporation risk event tracking, corrective action program, and integration of lessons learned. Higher maturity includes a more robust and transparent corrective action program which is audited by a third party.	Risk events are not tracked in accordance with Energy Safety requirements.	Risk events are tracked in accordance with Energy Safety requirements.	Risk events are tracked in accordance with Energy Safety requirements. Wildfire and PSPS related risk events are formally tracked in the electrical corporation corrective action program.	Risk events are tracked in accordance with Energy Safety requirements. Wildfire and PSPS related risk events are formally tracked in the electrical corporation corrective action program. Actions to prevent recurrence are formally documented and tracked within the electrical corporation WMP.	Risk events are tracked in accordance with Energy Safety requirements. Wildfire and PSPS related risk events are formally tracked in the electrical corporation corrective action program. Actions to prevent recurrence are formally documented and tracked within the electrical corporation WMP.

Risk event tracking and integration of lessons learned		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Frequency	The frequency at which risk events are tracked, evaluated, entered into the corrective action program, and resolved.	Risk events are not tracked in the corrective action program.	Risk events are evaluated and entered into the corrective action program annually.	Risk events are evaluated and entered into the corrective action program **at least quarterly.** Corrective actions are closed within one year of entering the program or, for long lead-time items, have an approved schedule for closure.	Risk events are evaluated and entered into the corrective action program **at least monthly.** Corrective actions are closed within six months of entering the program or, for long lead-time items, have an approved schedule for closure.	Risk events are evaluated and entered into the corrective action program **at least weekly.** Corrective actions are closed within one quarter of entering the program or, for long lead-time items, have an approved schedule for closure.
IT infrastructure and database management	Clarity and completeness of documentation of database schema and definitions. Each risk event should be maintained in the database along with any reconstructions and root cause analysis. More mature systems appropriately link databases (assets, weather, vegetation, model results, etc.) to support on-going evaluation.	Electrical corporation database management does not meet the minimum Energy Safety requirements.	Risk event data, model inputs, and outputs are maintained in the electrical corporation database(s) with versions documented and maintained. This includes all data tracked on risk events as part of the electrical corporation corrective action program.	No additional requirements beyond level 1	Risk event data, model inputs, and outputs are maintained in the electrical corporation database(s) with versions documented and maintained. This includes all data tracked on risk events as part of the electrical corporation corrective action program. The database(s) of risk events, model inputs, data, and outputs are appropriately linked with each relevant electrical corporation database (assets, weather, vegetation).	No additional requirements beyond level 3

Risk event tracking and integration of lessons learned		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Learning and continuous improvement	Processes and procedures are in place to integrate lessons learned from risk events to improve the electrical corporation WMP program.	No process in place to integrate lessons learned from risk events to improve the electrical corporation WMP program.	The electrical corporation has clearly defined operational processes and procedures in place to integrate lessons learned from risk events to improve the electrical corporation WMP program.	The electrical corporation has clearly defined operational processes and procedures in place to integrate lessons learned from risk events to improve the electrical corporation WMP program. The electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on the lessons learned from risk events and their corrective action program.	The electrical corporation has clearly defined operational processes and procedures in place to integrate lessons learned from risk events to improve the electrical corporation WMP program. The electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on the lessons learned from risk events and their corrective action program. Electrical corporation participates in task groups focused on sharing and improving best practices, including participation by industry, government, and academic institutions.	The electrical corporation has clearly defined operational processes and procedures in place to integrate lessons learned from risk events to improve the electrical corporation WMP program. The electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on the lessons learned from risk events and their corrective action program. Electrical corporation participates in task groups focused on sharing and improving best practices, including participation by industry, government, and academic institutions. Electrical corporation funds and participates in both independent and collaborative research that focuses on extending best practices based on data from risk events.

Risk event tracking and integration of lessons learned		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
QA/QC	Process to evaluate the quality of the electrical corporation processes and procedures risk event tracking, corrective action program, and integration of lessons learned.	No process in place to evaluate the quality of risk event tracking and electrical corporation corrective action program.	Electrical corporation has established internal processes and procedures to evaluate the quality of risk event tracking and the electrical corporation corrective action program. The electrical corporation corrective action program is annually audited by internal QA/QC.	Electrical corporation has established internal processes and procedures to evaluate the quality of risk event tracking and the electrical corporation corrective action program. Electrical corporation regularly submits their corrective action program to independent third-party review.	Electrical corporation has established internal processes and procedures to evaluate the quality of risk event tracking and the electrical corporation corrective action program. Electrical corporation regularly submits their corrective action program to independent third-party review. Electrical corporation benchmarks risk event data and corrective actions with other electrical corporations.	No additional requirements beyond level 3
Spatial granularity	Spatial resolution at which the risk events are tracked.	Electrical corporation does not meet the minimum expectations for resolution reporting.	Risk events are tracked at the regional level (HFTD tier 2/3 and non-HFTD).	Risk events are tracked at the circuit segment level.	Risk events are tracked at the span level.	Risk events are tracked at the asset level.

C.5.1.6 6. Risk-informed wildfire mitigation strategy

Risk-informed wildfire mitigation strategy		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation	Automated estimation of the impact of risk reduction and mitigation initiatives.	Estimation of the impact of risk reduction and mitigation initiatives is not automated.	Estimation of the impact of risk reduction and mitigation initiatives are partially automated (<50%). Estimation of the impact of risk reduction and mitigation initiatives are automated for the following sources: 1. Weather forecast models 2. Ignition likelihood estimates models 3. Sensor data of vegetation conditions	Estimation of the impact of risk reduction and mitigation initiatives are mostly automated (>=50%). Estimation of the impact of risk reduction and mitigation initiatives are automated for the following sources: 1. Weather forecast models 2. Ignition likelihood models 3. Sensor data of vegetation conditions 4. Other factors specific to the location in which the initiative is being undertaken	Estimation of the impact of risk reduction and mitigation initiatives is fully automated. Estimation of the impact of risk reduction and mitigation initiatives are automated for the following sources: 1. Weather forecast models 2. Ignition likelihood models 3. Sensor data of vegetation conditions 4. Other factors specific to the location in which the initiative is being undertaken 5. Air quality effects including GHG emissions and population health impacts 6. RSE for individual initiatives Discrepancies between risk estimation and observed reality are automatically identified, documented, and sent to Subject Matter Experts for review.	Estimation of the impact of risk reduction and mitigation initiatives is fully automated. Estimation of the impact of risk reduction and mitigation initiatives are automated for the following sources: 1. Weather forecast models 2. Ignition likelihood models 3. Sensor data of vegetation conditions 4. Other factors specific to the location in which the initiative is being undertaken 5. Air quality effects including GHG emissions and population health impacts 6. RSE for individual initiatives Discrepancies between risk estimation and observed reality are automatically identified, documented, and sent to Subject Matter Experts for review. Discrepancies between observed data / outcomes and the predictive models are evaluated and resultant enhancements are integrated into the predictive model to improve future performance.

Risk-informed wildfire mitigation strategy		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Comprehensiveness	Inputs to quantify the impact of risk reduction and mitigation initiatives are comprehensive including all aspects of weather, vegetation, grid health, and factors that are relevant to the risk reduction or mitigation initiative being undertaken. Higher maturity includes the impact of each risk reduction and mitigation initiative on reducing each risk component and the calculation of the RSE.	Model inputs and outputs are not sufficient to quantify the impact of risk mitigation initiatives or assess RSE.	Model inputs at a minimum include the following: 1. Basic weather data including air temperature, relative humidity, wind velocity (speed and direction) 2. Grid performance data including faults, failures, and recloser de-energizations throughout the service area 3. Basic vegetation data including vegetation type, and seasonal trends in fuel moisture Model outputs at a minimum include the following: 1. impact of each mitigation initiative on reducing each risk component 2. RSE for each individual risk reduction or mitigation initiative	No additional requirements beyond level 1	Model inputs at a minimum include the following: 1. Basic weather data including air temperature, relative humidity, wind velocity (speed and direction) 2. Grid performance data including faults, failures, and recloser de-energizations throughout the service area 3. Basic vegetation data including vegetation type, and seasonal trends in fuel moisture 4. Community-specific vegetation treatment plans throughout service territory Model outputs at a minimum include the following: 1. impact of each mitigation initiative on reducing each risk component 2. RSE for each individual risk reduction or mitigation initiative 3. Impact of community vulnerabilities	No additional requirements beyond level 3

Risk-informed wildfire mitigation strategy		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Frequency and risk spend efficiency	Frequency of risk spend efficiency (RSE) metric calculation.	RSE is not calculated or updated.	RSE is updated with management review at least once per year (annual update) for each individual risk reduction and mitigation initiative.	RSE is updated with management review at least twice per year (semi-annual update) for each individual risk reduction and mitigation initiative.	RSE is updated with management review at least four times per year (quarterly update) for each individual risk reduction and mitigation initiative.	RSE is updated at least once per month (monthly update) for each individual initiative.
IT infrastructure and database management	Clarity and completeness of documentation of database schema and definitions. The model inputs and outputs at the time used to prioritize mitigation efforts should be maintained in the database along with the calculation methodology (i.e., model version #). More mature systems appropriately link databases (assets, weather, vegetation, model results, etc.) to support on-going evaluation.	Electrical corporation database management does not meet the minimum Energy Safety requirements.	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained.	No additional requirements beyond level 1	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained. The database(s) of model inputs, data, and outputs are appropriately linked with each relevant electrical corporation database (assets, weather, vegetation).	No additional requirements beyond level 3

Risk-informed wildfire mitigation strategy		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
QA/QC	Process to evaluate the accuracy of risk reduction estimates for risk reduction measures which will be implemented.	No process in place to evaluate the accuracy of risk reduction estimates for risk reduction measures which will be implemented.	Evaluation of the accuracy of risk reduction estimates for risk reduction measures which will be implemented is assessed through subject matter expert (SME) review at least **once per 3-year WMP cycle**.	Evaluation of the accuracy of risk reduction estimates for risk reduction measures which will be implemented is assessed through subject matter expert (SME) review at least **once per year**. Evaluation of the risk reductions that are achieved for risk improvements that are implemented are assessed and compared to estimates and results used to further enhance risk management processes. Electrical corporation engages with external stakeholders to provide risk reduction estimates for risk reduction measures which will be implemented over the WMP cycle.	Evaluation of the accuracy of risk reduction estimates for risk reduction measures which will be implemented is assessed through subject matter expert (SME) review at least **once per month**. Evaluation of the risk reductions that are achieved for risk improvements that are implemented are assessed in collaboration with external stakeholders (including other electrical corporations and government) with results compared to estimates. Results are used to further enhance risk management processes. Electrical corporation engages with external stakeholders to provide risk reduction estimates for risk reduction measures which will be implemented over the next year.	Evaluation of the accuracy of risk reduction estimates for risk reduction measures which will be implemented is assessed through subject matter expert (SME) review at least **once per month**. Evaluation of the risk reductions that are achieved for risk improvements that are implemented are assessed in collaboration with external stakeholders (including other electrical corporations and government) with results compared to estimates. Results are used to further enhance risk management processes. Electrical corporation engages with external stakeholders to provide risk reduction estimates for risk reduction measures which will be implemented over the next year. Electrical corporation engages with external stakeholders to report actual risk reductions achieved compared to original estimates and describes lessons learned and process enhancements to improve decision making for risk reduction initiatives.

Risk-informed wildfire mitigation strategy		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Spatial granularity	Resolution of risk reduction estimation of mitigation activities. Higher maturity is achieved by using a sufficiently fine resolution to estimate risk reduction at an asset level.	Electrical corporation does not meet the minimum expectations for resolution reporting.	Resolution of risk reduction estimation of mitigation activities is evaluated at a resolution <= 1 km.	Resolution of risk reduction estimation of mitigation activities is evaluated at a resolution <= 500 m.	Resolution of risk reduction estimation of mitigation activities is evaluated at a resolution <= 100 m.	Resolution of risk reduction estimation of mitigation activities is evaluated at a resolution <= 50 m.

Risk-informed wildfire mitigation strategy		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Stability of assumptions	Assumptions and limitations of the model are known, and the model does not need significant changes in future updates to the WMP	Assumptions and limitations of the model are unknown and/or not documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are evaluated using hindcast in the development environment. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are developed in the previous year and are planned for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Validation results justify no changes to modeling assumptions for a period **greater than one year**. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.

Risk-informed wildfire mitigation strategy		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation	Documentation of model substantiation efforts. Higher maturity includes automated verification and validation suites which are provided to the regulator for third-party review. In addition, more mature systems demonstrate a lower systematic bias and standard deviation in error in the Validation Documentation.	No model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Discrepancies between production model and observed reality are quantified and statistically evaluated to performance. Model performance on each key metric demonstrates a systematic bias < 20%. Model performance on each key metric demonstrates a standard deviation in error < 40%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the start of the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 10%. Model performance on each key metric demonstrates a standard deviation in error < 20%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the start of the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 5%. Model performance on each key metric demonstrates a standard deviation in error < 15%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the start of the fire season.

C.5.2 B. Situational Awareness and Forecasting

C.5.2.1 7. Ignition likelihood estimation

Ignition likelihood estimation		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation	Automated integration of real-time monitoring system with other relevant systems, such as grid monitoring, weather data collection, weather forecasting, vegetation moisture, and short-term risk modeling.	Equipment data, weather data, and weather forecasts are not used in assessing ignition likelihood.	Equipment data, weather data, and weather forecasts are used in assessing likelihood of ignition without significant automation. Ignition likelihood estimation is linked to deterministic real-time risk model and weather forecasts.	Equipment data, weather data, and weather forecasts are used in assessing likelihood of ignition with partial automation. Integration of systems into the likelihood of ignition estimation is automated for the following sources: 1. Weather data and forecasts 2. Grid performance data and forecasts 3. Vegetative fuel moisture forecasts Ignition likelihood estimation is linked to ensemble weather forecasts and resulting probabilistic real-time risk model	Equipment data, weather data, and weather forecasts are used in assessing likelihood of ignition with partial automation. Integration of systems into the likelihood of ignition estimation is automated for the following sources: 1. Weather data and forecasts 2. Grid performance data and forecasts 3. Vegetative fuel moisture data and forecasts 4. Equipment condition data Ignition likelihood estimation is linked to ensemble weather forecasts and resulting probabilistic real-time risk model Discrepancies between ignition likelihood estimate and observed reality (i.e., high likelihood of ignition was predicted but no risk event occurred) are automatically identified, documented, and sent to Subject Matter Experts for review.	Equipment data, weather data, and weather forecasts are used in assessing likelihood of ignition with partial automation. Integration of systems into the likelihood of ignition estimation is automated for the following sources: 1. Weather data and forecasts 2. Grid performance data and forecasts 3. Vegetative fuel moisture data and forecasts 4. Equipment condition data Ignition likelihood estimation is linked to ensemble weather forecasts and resulting probabilistic real-time risk model Discrepancies between ignition likelihood estimate and observed reality (i.e., high likelihood of ignition was predicted but no risk event occurred) are automatically identified, documented, and sent to Subject Matter Experts for review. Discrepancies are automatically integrated into the predictive model to improve future performance.

Ignition likelihood estimation		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Comprehensiveness	Inputs to estimate ignition likelihood are comprehensive including all aspects of weather, vegetation, grid health, and asset management.	Electrical corporation does sufficiently calculate ignition likelihood.	Ignition likelihood estimation considers each type of equipment operation/failure, vegetation contact, and object contact. Model inputs at a minimum include the following: 1. Basic equipment data including type (including differentiation for the presence of mitigation such as covered conductors, vibration dampers, etc.), equipment age, and equipment maintenance history. 2. Basic operations data including presence of automatic de-energization systems (i.e., fast trip), time since most recent inspection of equipment, presence of open work requests, and spark generation rates from normal operations. 3. Basic weather data including air temperature, relative humidity, wind velocity (speed and direction) 4. Basic vegetation data including type of potential contact, vegetation species, time since most recent vegetation inspection, and seasonal fuel moisture content.	Ignition likelihood estimation considers each type of equipment operation/failure, vegetation contact, and object contact. Model inputs at a minimum include the following: 1. Basic equipment data including type (including differentiation for the presence of mitigation such as covered conductors, vibration dampers, etc.), equipment age, and equipment maintenance history. 2. Basic operations data including presence of automatic de-energization systems (i.e., fast trip), time since most recent inspection of equipment, presence of open work requests, and spark generation rates from normal operations. 3. Basic weather data including air temperature, relative humidity, wind velocity (speed and direction) 4. Basic vegetation data including type of potential contact, vegetation species, time since most recent vegetation inspection, and seasonal fuel moisture content. 5. Equipment performance indicators including long-term trends in inspection and maintenance.	Ignition likelihood estimation considers each type of equipment operation/failure, vegetation contact, and object contact. Model inputs at a minimum include the following: 1. Basic equipment data including type (including differentiation for the presence of mitigation such as covered conductors, vibration dampers, etc.), equipment age, and equipment maintenance history. 2. Basic operations data including presence of automatic de-energization systems (i.e., fast trip), time since most recent inspection of equipment, presence of open work requests, and spark generation rates from normal operations. 3. Basic weather data including air temperature, relative humidity, wind velocity (speed and direction) 4. Basic vegetation data including type of potential contact, vegetation species, time since most recent vegetation inspection, and seasonal fuel moisture content. 5. Equipment performance indicators including long-term trends in inspection and maintenance. 6. Grid performance indicators including faults,	Ignition likelihood estimation considers each type of equipment operation/failure, vegetation contact, and object contact. Model inputs at a minimum include the following: 1. Basic equipment data including type (including differentiation for the presence of mitigation such as covered conductors, vibration dampers, etc.), equipment age, and equipment maintenance history. 2. Basic operations data including presence of automatic de-energization systems (i.e., fast trip), time since most recent inspection of equipment, presence of open work requests, and spark generation rates from normal operations. 3. Basic weather data including air temperature, relative humidity, wind velocity (speed and direction) 4. Basic vegetation data including type of potential contact, vegetation species, time since most recent vegetation inspection, and seasonal fuel moisture content. 5. Equipment performance indicators including long-term trends in inspection and maintenance. 6. Grid performance indicators including faults,

Ignition likelihood estimation		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
			Model outputs at a minimum include the following: 1. Equipment likelihood of ignition 2. Contact from vegetation likelihood of ignition 3. Contact from object likelihood of ignition	Model outputs at a minimum include the following: 1. Equipment likelihood of ignition 2. Contact from vegetation likelihood of ignition 3. Contact from object likelihood of ignition	failures, and recloser de-energizations throughout the service area 7. Recent trends in fuel moisture. 8. Long-term grid health trends at the asset resolution. Model outputs at a minimum include the following: 1. Equipment likelihood of ignition 2. Contact from vegetation likelihood of ignition 3. Contact from object likelihood of ignition 4. Ignition from human activity	failures, and recloser de-energizations throughout the service area 7. Recent trends in fuel moisture. 8. Long-term grid health trends at the asset resolution. 9. Height of equipment lines are known In HFTD, and weather data used in model predictions is evaluated at the height of individual lines. Model outputs at a minimum include the following: 1. Equipment likelihood of ignition 2. Contact from vegetation likelihood of ignition 3. Contact from object likelihood of ignition 4. Ignition from human activity

Ignition likelihood estimation		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
IT infrastructure and database management	Clarity and completeness of documentation of database schema and definitions. The model inputs and outputs at the time used to prioritize mitigation efforts should be maintained in the database along with the calculation methodology (i.e., model version #). More mature systems appropriately link databases (assets, weather, vegetation, model results, etc.) to support on-going evaluation.	Electrical corporation database management does not meet the minimum Energy Safety requirements.	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained.	No additional requirements beyond level 1	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained. The database(s) of model inputs, data, and outputs are appropriately linked with each relevant electrical corporation database (assets, weather, vegetation).	No additional requirements beyond level 3

Ignition likelihood estimation		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Learning and continuous improvement	Historic model performance is consistently compared to observed conditions to determine discrepancies and biases in the model not covered by the validation basis. Processes are in place to document these findings and improve the models over time.	No process in place to inform model based on errors in model predictions or comments from stakeholders.	Electrical corporation has a clearly defined operational process in place to track discrepancies between model predictions and observed behavior during annual planning. Electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on modeling efforts which are recorded and shared in a consistent format.	Electrical corporation has a clearly defined operational process in place to track discrepancies between model predictions and observed behavior during annual planning. Electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on modeling efforts which are recorded and shared in a consistent format.	Electrical corporation has a clearly defined operational process in place to track discrepancies between model predictions and observed behavior during annual planning. Electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on modeling efforts which are recorded and shared in a consistent format. Electrical corporation participates in task groups focused on sharing and improving best practices, including participation by industry, government, and academic institutions.	Electrical corporation has a clearly defined operational process in place to track discrepancies between model predictions and observed behavior during annual planning. Electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on modeling efforts which are recorded and shared in a consistent format. Electrical corporation participates in task groups focused on sharing and improving best practices, including participation by industry, government, and academic institutions. Electrical corporation funds and participates in both independent and collaborative research that focuses on extending best practices.

Ignition likelihood estimation		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Modularization	Modularization of the software models. Higher maturity includes more modular code which can be used to evaluate the impact of different assumptions on the results.	Software code is not modular.	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include at least the following: 1. Impact of vegetation characteristics 2. Impact of weather conditions 3. Impact of equipment characteristics	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include at least the following: 1. Impact of vegetation characteristics 2. Impact of weather conditions 3. Impact of equipment characteristics 4. Impact of long-term climate change	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include at least two of the following: 1. Impact of vegetation characteristics 2. Impact of weather conditions 3. Impact of equipment characteristics 4. Impact of long-term climate change 5. Impact of weather on seasonal vegetation moisture	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include all the following: 1. Impact of vegetation characteristics 2. Impact of weather conditions 3. Impact of equipment characteristics 4. Impact of long-term climate change 5. Impact of weather on seasonal vegetation moisture 6. Impact of weather on seasonal vegetation growth cycle
QA/QC	Process to evaluate the accuracy of ignition likelihood calculations.	No process in place to evaluate ignition likelihood maps.	Electrical corporation has established internal processes and procedures to evaluate the quality of ignition likelihood calculations. The electrical corporation ignition likelihood calculation is annually audited by internal QA/QC.	Electrical corporation has established internal processes and procedures to evaluate the quality of ignition likelihood calculations. Electrical corporation regularly submits their ignition likelihood calculations to independent third-party review.	Electrical corporation has established internal processes and procedures to evaluate the quality of ignition likelihood calculations. Electrical corporation regularly submits their ignition likelihood calculations to independent third-party review. Electrical corporation benchmarks ignition likelihood data and calculations with other electrical corporations.	No additional requirements beyond level 3

Ignition likelihood estimation		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Spatial granularity	Resolution of ignition likelihood estimation. Higher maturity is achieved by using a sufficiently fine resolution to estimate ignition likelihood at an asset level.	Electrical corporation does not meet the minimum expectations for resolution reporting.	Ignition likelihood calculations are evaluated at the circuit level within HFTD tier 2 and 3.	Ignition likelihood calculations are evaluated at the circuit segment level within HFTD tier 2 and 3. Ignition likelihood calculations are evaluated at the region level in non-HFTD region.	Ignition likelihood calculations are evaluated at the span level within HFTD tier 2 and 3. Ignition likelihood calculations are evaluated at the circuit-segment level in non-HFTD regions.	Ignition likelihood calculations are evaluated at the asset level within HFTD tier 2 and 3. Ignition likelihood calculations are evaluated at the span level in non-HFTD regions.

Ignition likelihood estimation		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Stability of assumptions	Assumptions and limitations of the model are known, and the model does not need significant changes in future updates to the WMP	Assumptions and limitations of the model are unknown and/or not documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are evaluated using hindcast in the development environment. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are developed in the previous year and are planned for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Validation results justify no changes to modeling assumptions for a period **greater than one year**. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.

Ignition likelihood estimation		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Transparency	Sharing of data and methods with the public and research community. More mature systems provide access to input data, source code, and an automated verification and validation suite to the public.	Electrical corporation does not share data and methods.	Data and methods meet the minimum Energy Safety reporting requirements.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical documentation is available to the public.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial data with the community.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial and geospatial data with the community. Model software source code and data for verification and validation provided by the electrical corporation to the public.

Ignition likelihood estimation		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation	Documentation of the uncertainty in ignition likelihood predictions and the resulting sensitivity of the overall risk model predictions to 1) inputs to these models and 2) down-stream impacts of uncertainty propagation in model predictions.	The statistical uncertainty in model inputs parameters and outputs is unknown or not documented. Sensitivity of down-stream models to uncertainty in modeling is unknown or not documented.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. Sensitivity of down-stream models to uncertainty in modeling is unknown or not documented.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. Sensitivity analyses are used to evaluate model predictions at different percentiles for use in down-stream models and decision making. The choice of percentile is justified in the WMP.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. The uncertainty in measurements used in model validation is known and documented. Sensitivity analyses are used to evaluate model predictions at the 84th percentile in down-stream models and decision making.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. The uncertainty in measurements used in model validation is known and documented. Sensitivity analyses are used to evaluate model predictions at the 97.5th percentile in down-stream models and decision making. Uncertainty propagation is analytically calculated and presented using standard methods such as Bayesian inference and uncertainty quantification.

Ignition likelihood estimation		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation, documentation, and disclosures	Documentation of model substantiation efforts. Higher maturity includes automated verification and validation suites which are provided to the regulator for third-party review. In addition, more mature systems demonstrate a lower systematic bias and standard deviation in error in the Validation Documentation.	No model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Discrepancies between production model and observed reality are quantified and statistically evaluated to performance. Model performance on each key metric demonstrates a systematic bias < 20%. Model performance on each key metric demonstrates a standard deviation in error < 40%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 10%. Model performance on each key metric demonstrates a standard deviation in error < 20%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 5%. Model performance on each key metric demonstrates a standard deviation in error < 15%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.

C.5.2.2 8. Weather forecasting ability

Weather forecasting ability		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation	Automated short-term weather forecasting and its integration with other systems.	Weather forecasting models are not automated.	Short-term weather forecasting is automated.	Short-term weather forecasting is automated.	Short-term weather forecasting is automated. Discrepancies between weather forecasting and observed reality are automatically identified, documented, and sent to Subject Matter Experts for review.	Short-term weather forecasting is automated. Discrepancies between weather forecasting and observed reality are automatically identified, documented, and sent to Subject Matter Experts for review. Discrepancies are automatically integrated into the predictive model to improve future performance.

Weather forecasting ability		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Comprehensive	Inputs to generate accurate short-range (days to weeks) weather forecasts across the electrical corporation's service territory are comprehensive including all key physics in weather.	Electrical corporation does not sufficiently generate short-range weather forecasts across the electrical corporation's service territory.	Electrical corporation sufficiently generates short-range weather forecasts aligned with minimum Energy Safety requirements. Model inputs at a minimum include the following: 1. Local topography 2. Land cover / land use type 3. Solar radiation Model output at a minimum include the following: 1. Forecast horizon of three (3) days. 2. Barometric pressure 3. Wind velocity (speed and direction) 4. Air temperature 5. Relative humidity	Electrical corporation sufficiently generates short-range weather forecasts aligned with the minimum Energy Safety requirements. Model inputs at a minimum include the following: 1. Local topography 2. Land cover / land use type 3. Solar radiation 4. Synoptic scale patterns Model output at a minimum include the following: 1. Forecast horizon of five (5) days. 2. Barometric pressure 3. Wind velocity (speed and direction) 4. Air temperature 5. Relative humidity	Electrical corporation sufficiently generates short-range weather forecasts aligned with the minimum Energy Safety requirements. Model inputs at a minimum include the following: 1. Local topography 2. Land cover / land use type 3. Solar radiation 4. Synoptic scale patterns 5. Mesoscale patterns Model output at a minimum include the following: 1. Forecast horizon of seven (7) days. 2. Barometric pressure 3. Wind velocity (speed and direction) 4. Air temperature 5. Relative humidity 6. Vegetation moisture content 7. Air quality impacts from smoke	Electrical corporation sufficiently generates short-range weather forecasts aligned with the minimum Energy Safety requirements. Model inputs at a minimum include the following: 1. Local topography 2. Land cover / land use type 3. Solar radiation 4. Synoptic scale patterns 5. Mesoscale patterns Model output at a minimum include the following: 1. Forecast horizon of ten (10) days. 2. Barometric pressure 3. Wind velocity (speed and direction) 4. Air temperature 5. Relative humidity 6. Vegetation moisture content 7. Air quality impacts from smoke
Frequency	Data assimilation frequency of collected weather observations	Data assimilation is not performed.	Data assimilation is performed at least twice per day (12-h interval).	Data assimilation is performed at least four times per day (6-h interval).	Data assimilation is performed at least six times per day (4-h interval).	Data assimilation is performed at least twelve times per day (2-h interval).

Weather forecasting ability		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
IT infrastructure and database management	Clarity and completeness of documentation of database schema and definitions. The model inputs and outputs at the time used to prioritize mitigation efforts should be maintained in the database along with the calculation methodology (i.e., model version #). More mature systems appropriately link databases (assets, weather, vegetation, model results, etc.) to support on-going evaluation.	Electrical corporation database management does not meet the minimum Energy Safety requirements.	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained.	No additional requirements beyond level 1	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained. The database(s) of model inputs, data, and outputs are appropriately linked with each relevant electrical corporation database (assets, weather, vegetation).	No additional requirements beyond level 3
Level of sophistication	Number of forecasts produced in ensemble forecasting varying initial conditions.	Ensemble forecasting is not used.	Ensemble forecasting is performed with at least ten (10) forecasts in which one is the control forecast and is produced with the best available data and unperturbed models. Inherent uncertainty is quantified for at least one of the following weather forecasting elements as a function of positive lead time: 1. Temperature 2. Wind speed and direction 3. Precipitation 4. Relative Humidity	Ensemble forecasting is performed with at least thirty (30) forecasts in which one is the control forecast and is produced with the best available data and unperturbed models. Inherent uncertainty is quantified for at least two of the following weather forecasting elements as a function of positive lead time: 1. Temperature 2. Wind speed and direction 3. Precipitation 4. Relative Humidity	Ensemble forecasting is performed with at least fifty-one (51) forecasts in which one is the control forecast and is produced with the best available data and unperturbed models. Inherent uncertainty is quantified for at least three of the following weather forecasting elements as a function of positive lead time: 1. Temperature 2. Wind speed and direction 3. Precipitation 4. Relative Humidity	Ensemble forecasting is performed with at least fifty-one (51) forecasts in which one is the control forecast and is produced with the best available data and unperturbed models. Inherent uncertainty is quantified for the following weather forecasting elements as a function of positive lead time: 1. Temperature 2. Wind speed and direction 3. Precipitation 4. Relative Humidity

Weather forecasting ability		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Modularization	Modularization of the software models. Higher maturity includes more modular code which can be used to evaluate the impact of different assumptions on the results.	Software code is not modular.	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include the following: 1. Local weather analysis 2. Local vegetation analysis	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include the following: 1. Local weather analysis 2. Local vegetation analysis 3. Impact of climate change on weather 4. Impact of weather on vegetation moisture 5. Impact of weather on vegetation growth cycle	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include the following: 1. Local weather analysis 2. Local vegetation analysis 3. Impact of climate change on weather 4. Impact of weather on vegetation moisture 5. Impact of weather on vegetation growth cycle 6. Synoptic scale weather 7. Mesoscale weather	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include the following: 1. Local weather analysis 2. Local vegetation analysis 3. Impact of climate change on weather 4. Impact of weather on vegetation moisture 5. Impact of weather on vegetation growth cycle 6. Synoptic scale weather 7. Mesoscale weather 8. Large eddy scale weather

Weather forecasting ability		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
QA/QC	Process to evaluate the accuracy of weather forecasting.	No process in place to evaluate the quality of weather forecasting.	Accuracy of weather forecasting is assessed through comparison with nearby electrical corporation owned and publicly available data in hindcast. Weather forecasts are assessed through subject matter expert (SME) review at least once per month.	Accuracy of weather forecasting is assessed through comparison with nearby electrical corporation owned and publicly available data in hindcast. Weather forecasts are assessed through subject matter expert (SME) review at least twice per month. Accuracy of weather forecasts are assessed in near-real-time through regular comparison of weather forecasts with available data.	Accuracy of weather forecasting is assessed through comparison with nearby electrical corporation owned and publicly available data in hindcast. Weather forecasts are assessed through subject matter expert (SME) review at least once per week. Accuracy of weather forecasts are assessed in near-real-time through regular comparison of weather forecasts with available data. Electrical corporation benchmarks weather forecasts with those of other electrical corporations and government agencies.	Accuracy of weather forecasting is assessed through comparison with nearby electrical corporation owned and publicly available data in hindcast. Weather forecasts are assessed through subject matter expert (SME) review daily. Accuracy of weather forecasts are assessed in near-real-time through regular comparison of weather forecasts with available data. Electrical corporation benchmarks weather forecasts with those of other electrical corporations and government agencies. Historic discrepancies between weather forecasts and observations in similar conditions are synthesized and used to analyze the expected quality of current forecasts.

Weather forecasting ability		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Spatial granularity	Vertical and horizontal / geo-coordinate resolution of the weather forecasts. Higher maturity is achieved by using a sufficiently fine resolution to resolve the local effects of weather.	Electrical corporation does not meet the minimum expectations for resolution reporting.	Horizontal resolution of the weather forecasts is evaluated at a resolution <= 4 km. Vertical resolution of the weather forecasts is sufficient to evaluate average conditions at measured locations in the service territory.	Horizontal resolution of the weather forecasts is evaluated at a resolution <= 2 km. Vertical resolution of the weather forecasts is sufficient to evaluate the local conditions at the average height of lines on a circuit.	Horizontal resolution of the weather forecasts in non-HFTD regions is evaluated at a resolution <= 2 km. Vertical resolution of the weather forecasts in non-HFTD regions is sufficient to evaluate the local conditions at the average height of lines on a circuit. Horizontal resolution of the weather forecasts in HFTD tier 2 and 3 is evaluated at a resolution <= 1 km. Vertical resolution of the weather forecasts in HFTD tier 2 and 3 is sufficient to evaluate the local conditions at the average height of lines on a span.	Horizontal resolution of the weather forecasts in non-HFTD regions is evaluated at a resolution <= 2 km. Vertical resolution of the weather forecasts in non-HFTD regions is sufficient to evaluate the local conditions at the average height of lines on a circuit. Horizontal resolution of the weather forecasts in HFTD tier 2 and 3 is evaluated at a resolution <= 100 m. Vertical resolution of the weather forecasts in HFTD tier 2 and 3 is sufficient to evaluate the local conditions at the average height of individual lines.

Weather forecasting ability		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Stability of assumptions	Assumptions and limitations of the model are known, and the model does not need significant changes in future updates to the WMP	Assumptions and limitations of the model are unknown and/or not documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are planned during the year of WMP submittal for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are evaluated using hindcast in the development environment. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Changes to model formulation are developed in the previous year and are planned for implementation in a future year. Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.	Assumptions and limitations of the model(s) are known and documented in accordance with Energy Safety requirements. Validation results justify no changes to modeling assumptions for a period **greater than one year.** Electrical corporation has an established process in place to develop and document changes to the model formulation in a development environment that is version controlled and independent from the production/deployed model. Changes to model formulation are used in the development environment in parallel to the existing production model during development of annual WMP update. Discrepancies between the development and production model are quantified and statistically evaluated to demonstrate improved performance. Validation results are used to justify changes (or lack of changes) to modeling assumptions.

Weather forecasting ability		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Transparency	Sharing of data and methods with the public and research community. More mature systems provide access to input data, source code, and an automated verification and validation suite to the public.	Electrical corporation does not share data and methods.	Data and methods meet the minimum Energy Safety reporting requirements.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical documentation is available to the public.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial data with the community.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial and geospatial data with the community. Model software source code and data for verification and validation provided by the electrical corporation to the public.

Weather forecasting ability		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation	Documentation of the uncertainty in ignition likelihood predictions and the resulting sensitivity of the overall risk model predictions to 1) inputs to these models and 2) down-stream impacts of uncertainty propagation in model predictions.	The statistical uncertainty in model inputs parameters and outputs is unknown or not documented. Sensitivity of down-stream models to uncertainty in modeling is unknown or not documented.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. Sensitivity of down-stream models to uncertainty in modeling is unknown or not documented.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. Sensitivity analyses are used to evaluate model predictions at different percentiles for use in down-stream models and decision making. The choice of percentile is justified in the WMP.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. The uncertainty in measurements used in model validation is known and documented. Sensitivity analyses are used to evaluate model predictions at the 84th percentile in down-stream models and decision making.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. The uncertainty in measurements used in model validation is known and documented. Sensitivity analyses are used to evaluate model predictions at the 97.5th percentile in down-stream models and decision making. Uncertainty propagation is analytically calculated and presented using standard methods such as Bayesian inference and uncertainty quantification.

Weather forecasting ability		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation, documentation, and disclosures	Documentation of model substantiation efforts. Higher maturity includes automated verification and validation suites which are provided to the regulator for third-party review. In addition, more mature systems demonstrate a lower systematic bias and standard deviation in error in the Validation Documentation.	No model substantiation is provided.	Model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements.B.10.3) Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Discrepancies between production model and observed reality are quantified and statistically evaluated to performance. Model performance on each key metric demonstrates a systematic bias < 20%. Model performance on each key metric demonstrates a standard deviation in error < 40%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 10%. Model performance on each key metric demonstrates a standard deviation in error < 20%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 5%. Model performance on each key metric demonstrates a standard deviation in error < 15%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.

C.5.2.3 9. Wildfire spread forecasting

Wildfire spread forecasting		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation and frequency	Automated wildfire spread forecasting models, frequency of evaluation, and integration with other systems.	Wildfire spread forecasting is not used, automated, or integrated with other systems.	Wildfire spread forecasting is conducted in accordance with Energy Safety requirements. Fire Potential Index (FPI) is calculated in accordance with Energy Safety requirements. Weather forecasting meets the Level 1 automation requirements in capability 8. Wildfire spread forecasts are conducted whenever real-time risk conditions exceed 90% of design conditions. Wildfire spread forecasting is automatically integrated with at least 1 of the following systems/tools: 1. Decision making policies and procedures 2. PSPS decision making 3. Notification with external government agencies 4. Notification with the public	Wildfire spread forecasting is conducted in accordance with Energy Safety requirements. Fire Potential Index (FPI) is calculated in accordance with Energy Safety requirements. Weather forecasting meets the Level 2 automation requirements in capability 8. Wildfire spread forecasts are conducted whenever real-time risk conditions exceed 80% of design conditions. Wildfire spread forecasting is automatically integrated with at least 2 of the following systems/tools: 1. Decision making policies and procedures 2. PSPS decision making 3. Notification with external government agencies 4. Notification with the public	Wildfire spread forecasting is conducted in accordance with Energy Safety requirements. Fire Potential Index (FPI) is calculated in accordance with Energy Safety requirements. Weather forecasting meets the Level 3 automation requirements in capability 8. Wildfire spread forecasts are conducted whenever real-time risk conditions exceed 70% of design conditions. Wildfire spread forecasting is automatically integrated with at least 3 of the following systems/tools: 1. Decision making policies and procedures 2. PSPS decision making 3. Notification with external government agencies 4. Notification with the public Discrepancies between wildfire spread forecasting and observed reality are automatically identified, documented, and sent to Subject Matter Experts for review.	Wildfire spread forecasting is conducted in accordance with Energy Safety requirements. Fire Potential Index (FPI) is calculated in accordance with Energy Safety requirements. Weather forecasting meets the Level 4 automation requirements in capability 8. Wildfire spread forecasts are conducted whenever real-time risk conditions exceed 60% of design conditions. Wildfire spread forecasting is automatically integrated with the following systems/tools: 1. Decision making policies and procedures 2. PSPS decision making 3. Notification with external government agencies 4. Notification with the public Discrepancies between wildfire spread forecasting and observed reality are automatically identified, documented, and sent to Subject Matter Experts for review. Discrepancies are automatically integrated into the predictive model to improve future performance.

Wildfire spread forecasting		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Comprehensiveness	Inputs to generate accurate short-range (hours to days) wildfire spread forecasts across the electrical corporation's service territory are comprehensive including all key physics in fire behavior, vegetation, and weather.	Electrical corporation does not sufficiently forecast wildfire spread.	Electrical corporation sufficiently generates short-range wildfire spread forecasts aligned with Energy Safety requirements. Model inputs at a minimum include the following: 1. Weather forecast requirements for level 1 (capability 8) 2. Local topography 3. Local vegetation type 4. Local vegetation moisture Model output at a minimum include the following: 1. Forecast horizon of eight (8) hours 2. Fire arrival times / fire perimeter 3. Fire intensity	Electrical corporation sufficiently generates short-range wildfire spread forecasts aligned with Energy Safety requirements. Model inputs at a minimum include the following: 1. Weather forecast requirements for level 2 (capability 8) 2. Local topography 3. Local vegetation type 4. Local vegetation moisture Model output at a minimum include the following: 1. Forecast horizon of twelve (12) hours 2. Fire arrival times / fire perimeter 3. Fire intensity	Electrical corporation sufficiently generates short-range wildfire spread forecasts aligned with Energy Safety requirements. Model inputs at a minimum include the following: 1. Weather forecast requirements for level 3 (capability 8) 2. Local topography 3. Local vegetation type 4. Local vegetation moisture 5. Ensemble weather forecasts Model output at a minimum include the following: 1. Forecast horizon of twenty-four (24) hours 2. Fire arrival times / fire perimeter 3. Fire intensity 4. Statistical distribution of various outcomes (50th, 84th, and 98th percentiles)	Electrical corporation sufficiently generates short-range wildfire spread forecasts aligned with Energy Safety requirements. Model inputs at a minimum include the following: 1. Weather forecast requirements for level 3 (capability 8) 2. Local topography 3. Local vegetation type 4. Local vegetation moisture 5. Ensemble weather forecasts 6. Suppression likelihood Model output at a minimum include the following: 1. Forecast horizon of forty-eight (48) hours 2. Fire arrival times / fire perimeter 3. Fire intensity 4. Statistical distribution of various outcomes (50th, 84th, and 98th percentiles) 5. Air quality impacts

Wildfire spread forecasting		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
IT infrastructure and database management	Clarity and completeness of documentation of database schema and definitions. The model inputs and outputs at the time used to prioritize mitigation efforts should be maintained in the database along with the calculation methodology (i.e., model version #). More mature systems appropriately link databases (assets, weather, vegetation, model results, etc.) to support on-going evaluation.	Electrical corporation database management does not meet the minimum Energy Safety requirements.	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained.	No additional requirements beyond level 1	Model inputs, data, and outputs are maintained in the electrical corporation database(s) with the model, input, and data versions documented and maintained. The database(s) of model inputs, data, and outputs are appropriately linked with each relevant electrical corporation database (assets, weather, vegetation).	No additional requirements beyond level 3
Level of sophistication	Degree of interaction between wildfire and weather modeling.	Weather conditions are not used in wildfire spread forecasts.	30-year historic weather conditions are used in determination of Fire Potential Index (FPI) Mass consistent steady-state wind maps are used in detailed wildfire spread forecasting. Wildfire spread forecasting is calculated using an empirical, phenomenological, physics-based, or physics-informed model.	30-year historic weather conditions are used in determination of Fire Potential Index (FPI) Weather forecasts are used in wildfire spread forecasts. Wildfire spread forecasting is calculated using an empirical, phenomenological, physics-based, or physics-informed model.	30-year historic weather conditions are used in determination of Fire Potential Index (FPI) Weather and wildfire spread forecasts are calculated together through a two-way coupled approach. Wildfire spread forecasting is calculated using an empirical, phenomenological, physics-based, or physics-informed model.	30-year historic weather conditions are used in determination of Fire Potential Index (FPI) Weather and wildfire spread forecasts are calculated together through a two-way coupled approach. Wildfire spread is calculated through a physics-based or physics-informed model.

Wildfire spread forecasting		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Modularization	Modularization of the software models. Higher maturity includes more modular code which can be used to evaluate the impact of different assumptions on the statistical results.	Software code is not modular.	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include the following: 1. Weather forecasting 2. Fire behavior forecasting	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include the following: 1. Weather forecasting 2. Fire behavior forecasting 3. Impact of weather on seasonal vegetation moisture	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include the following: 1. Weather forecasting 2. Fire behavior forecasting 3. Impact of weather on seasonal vegetation moisture 4. Synoptic scale weather 5. Mesoscale weather	Software design is modular with sub-modules which can be replaced to evaluate the impact of different assumptions on the results. Sub-modules include the following: 1. Weather forecasting 2. Fire behavior forecasting 3. Impact of weather on seasonal vegetation moisture 4. Synoptic scale weather 5. Mesoscale weather 6. Large eddy scale weather

Wildfire spread forecasting		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
QA/QC	Process to evaluate the accuracy of wildfire spread forecasting.	No process in place to evaluate the quality of wildfire spread forecasting.	Accuracy of wildfire spread forecasting is assessed through comparison with nearby electrical corporation owned and publicly available data in hindcast. Wildfire spread forecasts are assessed through subject matter expert (SME) review at least once per quarter.	Accuracy of wildfire spread forecasting is assessed through comparison with nearby electrical corporation owned and publicly available data in hindcast. Wildfire spread forecasts are assessed through subject matter expert (SME) review at least once per month during fire season. Accuracy of wildfire spread forecasts are assessed in near-real-time through regular comparison of wildfire spread forecasts with available data.	Accuracy of wildfire spread forecasting is assessed through comparison with nearby electrical corporation owned and publicly available data in hindcast. Wildfire spread forecasts are assessed through subject matter expert (SME) review at least once during fire season. Accuracy of wildfire spread forecasts are assessed in near-real-time through regular comparison of wildfire spread forecasts with available data. Electrical corporation benchmarks wildfire spread forecasts with those of other electrical corporations and government agencies.	Accuracy of wildfire spread forecasting is assessed through comparison with nearby electrical corporation owned and publicly available data in hindcast. Wildfire spread forecasts are assessed through subject matter expert (SME) review daily during fire season. Accuracy of wildfire spread forecasts are assessed in near-real-time through regular comparison of wildfire spread forecasts with available data. Electrical corporation benchmarks wildfire spread forecasts with those of other electrical corporations and government agencies. Historic discrepancies between wildfire spread forecasts and observations in similar conditions are synthesized and used to analyze the expected quality of current forecasts.
Spatial granularity	Horizontal resolution of the wildfire forecasts. Higher maturity is achieved by using a sufficiently fine resolution to resolve the local effects of fire and weather.	Electrical corporation does not meet the minimum expectations for resolution reporting.	Horizontal resolution of the weather forecasting meets the Level 1 requirements (capability 8). Horizontal resolution of the wildfire forecasting is evaluated at a resolution <= 1 km.	Horizontal resolution of the weather forecasting meets the Level 2 requirements (capability 8). Horizontal resolution of the wildfire forecasting is evaluated at a resolution <= 100 m.	Horizontal resolution of the weather forecasting meets the Level 3 requirements (capability 8). Horizontal resolution of the wildfire forecasting is evaluated at a resolution <= 30 m.	Horizontal resolution of the weather forecasting meets the Level 4 requirements (capability 8). Horizontal resolution of the wildfire forecasting is evaluated at a resolution <= 10 m.

Wildfire spread forecasting		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Transparency	Sharing of data and methods with the public and research community. More mature systems provide access to input data, source code, and an automated verification and validation suite to the public.	Electrical corporation does not share data and methods.	Data and methods meet the minimum Energy Safety reporting requirements.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical documentation is available to the public.	Data and methods meet the minimum Energy Safety reporting. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial data with the community.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data and model performance is provided to the public. Model technical, verification, and validation documentation is available to the public. Electrical corporation shares relevant nonspatial and geospatial data with the community. Model software source code and data for verification and validation provided by the electrical corporation to the public.

Wildfire spread forecasting		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation	Documentation of the uncertainty in ignition likelihood predictions and the resulting sensitivity of the overall risk model predictions to 1) inputs to these models and 2) down-stream impacts of uncertainty propagation in model predictions.	The statistical uncertainty in model inputs parameters and outputs is unknown or not documented. Sensitivity of down-stream models to uncertainty in modeling is unknown or not documented.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. Sensitivity of down-stream models to uncertainty in modeling is unknown or not documented.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. Sensitivity analyses are used to evaluate model predictions at different percentiles for use in down-stream models and decision making. The choice of percentile is justified in the WMP.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. The uncertainty in measurements used in model validation is known and documented. Sensitivity analyses are used to evaluate model predictions at the 84th percentile in down-stream models and decision making.	The statistical uncertainty in model outputs is known and documented in accordance with Energy Safety requirements. The sensitivity of model output predictions to uncertainty in each input parameter is known and documented. The uncertainty in model predictions inherent to model limitations is known and documented. Sensitivity of down-stream models to uncertainty in modeling is known and documented. The uncertainty in measurements used in model validation is known and documented. Sensitivity analyses are used to evaluate model predictions at the 97.5th percentile in down-stream models and decision making. Uncertainty propagation is analytically calculated and presented using standard methods such as Bayesian inference and uncertainty quantification.

Wildfire spread forecasting		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation, documentation, and disclosures	Documentation of model substantiation efforts. Higher maturity includes automated verification and validation suites which are provided to the regulator for third-party review. In addition, more mature systems demonstrate a lower systematic bias and standard deviation in error in the Validation Documentation.	No model substantiation is provided.	Model substantiation is provided in accordance with Energy Safety requirements.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Discrepancies between production model and observed reality are quantified and statistically evaluated to performance. Model performance on each key metric demonstrates a systematic bias < 20%. Model performance on each key metric demonstrates a standard deviation in error < 40%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 10%. Model performance on each key metric demonstrates a standard deviation in error < 20%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.	Model substantiation is provided in accordance with Energy Safety requirements. Model verification and validation suites are automated, version controlled, and re-evaluated every time underlying data or models are updated. Model verification and validation suite (data + code) is provided to the regulator for third-party review. Model performance on each key metric demonstrates a systematic bias < 5%. Model performance on each key metric demonstrates a standard deviation in error < 15%. Annual blind model validation is accomplished by analyzing model performance for the previous year based on the data available at the time of WMP submission and on the assumptions presented in the WMP accepted prior to the fire season.

C.5.2.4 10. Data collection for near-real-time conditions

Data collection for near-real-time conditions		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation	Automated integration of real-time monitoring system for data collection with other relevant models and/or decision-making tools, such as weather forecasting and short-term risk modeling.	Data collected on weather, grid performance, and vegetative fuel are not linked to relevant models and/or decision-making tools, such as weather forecasting and short-term risk modeling.	Data collected on weather, grid performance, and vegetative fuel are linked to deterministic relevant models and/or decision-making tools, such as weather forecasting and short-term risk modeling without significant automation. Integration of data collected into the relevant models and/or decision-making tools is automated for at least 1 of the following sources: 1. Weather data 2. Grid performance data 3. Vegetative fuel data 4. Equipment condition data	Data collected on weather, grid performance, and vegetative fuel are linked to deterministic relevant models and/or decision-making tools, such as weather forecasting and short-term risk modeling. Integration of data collected into the relevant models and/or decision-making tools is automated for at least 2 of the following sources: 1. Weather data 2. Grid performance data 3. Vegetative fuel data 4. Equipment condition data	Data collected on weather, grid performance, and vegetative fuel are linked to deterministic relevant models and/or decision-making tools, such as weather forecasting and short-term risk modeling. Integration of data collected into the relevant models and/or decision-making tools is automated for at least 3 of the following sources: 1. Weather data 2. Grid performance data 3. Vegetative fuel data 4. Equipment condition data Data collected are linked to ensemble weather forecasts and resulting probabilistic real-time risk model.	Data collected on weather, grid performance, and vegetative fuel are linked to deterministic relevant models and/or decision-making tools, such as weather forecasting and short-term risk modeling. Integration of data collected into the relevant models and/or decision-making tools is automated for the following sources: 1. Weather data 2. Grid performance data 3. Vegetative fuel data 4. Equipment condition data Data collected are linked to ensemble weather forecasts and resulting probabilistic real-time risk model.
Frequency	Frequency of collected data.	Intermittent data collection (less frequently than hourly).	Intermittent data collection (at least hourly).	Intermittent data collection (at least four (4) times per hour).	Intermittent data collection (at least sixty (60) times per hour).	Continuous data collection (at least three-thousand six hundred (3,600) times per hour).

Data collection for near-real-time conditions		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Learning, continuous improvement, and QA/QC	Processes are in place to evaluate the quality of data. Historic data collection is consistently compared to observed conditions to determine discrepancies and biases in sensor data. Processes are in place to document these findings and ensure consistency in data collection over time.	No process in place to evaluate the quality of data collected. No process in place to inform models based on data collected.	Data quality is assessed through subject matter expert (SME) review during annual planning. Electrical corporation has a clearly defined operational process in place to track discrepancies between current data collections and historic observations. Electrical corporation has a clearly defined operational process to inform models based on data collected.	Data quality is assessed through subject matter expert (SME) review at least once per quarter. Electrical corporation has a clearly defined operational process in place to track discrepancies between current data collections and historic observations. Electrical corporation has a clearly defined operational process to inform models based on data collected.	Data quality is assessed through subject matter expert (SME) review at least once per month. Electrical corporation has a clearly defined operational process in place to track discrepancies between current data collections and historic observations. Electrical corporation has a clearly defined operational process to inform models based on data collected. Electrical corporation participates in task groups focused on improving best practices in data collection, including participation by industry, government, and academic institutions.	Data quality is assessed through subject matter expert (SME) review at least once per week. Electrical corporation has a clearly defined operational process in place to track discrepancies between current data collections and historic observations. Electrical corporation has a clearly defined operational process to inform models based on data collected. Electrical corporation participates in task groups focused on improving best practices in data collection, including participation by industry, government, and academic institutions. Electrical corporation benchmarks data collected with other electrical corporations.

Data collection for near-real-time conditions		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Level of sophistication	Data type collected	Collected data do not meet the minimum expectations or requirements.	Collected data include each of the following: 1. Basic weather data including air temperature, relative humidity, wind velocity (speed and direction) 2. Grid performance data including faults, failures, and recloser de-energizations throughout the service area 3. Basic vegetation data including vegetation type, and seasonal trends in fuel moisture	Collected data include each of the following: 1. Basic weather data including air temperature, relative humidity, wind velocity (speed and direction) 2. Grid performance data including faults, failures, and recloser de-energizations throughout the service area 3. Basic vegetation data including vegetation type, and seasonal trends in fuel moisture 4. Equipment inspection and maintenance trends for individual circuits	Collected data include each of the following: 1. Basic weather data including air temperature, relative humidity, wind velocity (speed and direction) 2. Grid performance data including faults, failures, and recloser de-energizations throughout the service area 3. Basic vegetation data including vegetation type, and seasonal trends in fuel moisture 4. Equipment inspection and maintenance trends for individual circuits 5. Intermittent collection (minimum frequency of once per month during fire season) within HFTD regions of additional weather-related parameters such as fuel moisture content	Collected data include each of the following: 1. Basic weather data including air temperature, relative humidity, wind velocity (speed and direction) 2. Grid performance data including faults, failures, and recloser de-energizations throughout the service area 3. Basic vegetation data including vegetation type, and seasonal trends in fuel moisture 4. Equipment inspection and maintenance trends for individual circuits 5. Intermittent collection (minimum frequency of once per month during fire season) within HFTD regions of additional weather-related parameters such as fuel moisture content 6. Long-term grid health trends at the asset resolution using historic data 7. Height of equipment lines are known in HFTD, and weather data used in model predictions is evaluated at the height of individual lines
Spatial granularity	Granularity of sensors used to collect data. Higher maturity is achieved by using collected data with sufficiently fine resolution to resolve the local effects of fire and weather.	Electrical corporation does not meet the minimum expectations for resolution reporting.	Collected data allows for validation of statistical weather and weather forecasting at a horizontal resolution <= 4 km.	Collected data allows for validation of statistical weather and weather forecasting at a horizontal resolution <= 2 km.	Collected data allows for validation of statistical weather and weather forecasting at a horizontal resolution <= 1 km.	Collected data allows for validation of statistical weather and weather forecasting at a horizontal resolution <= 100 m.

Data collection for near-real-time conditions		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Transparency	Sharing of data and methods with the public and research community. More mature systems provide access to electrical corporation collected data to the public.	Electrical corporation does not share data and methods.	Data and methods meet the minimum Energy Safety reporting requirements.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data is provided to the public. Data collection methods technical documentation is available to the public.	Data and methods meet the minimum Energy Safety reporting requirements. Statistical summary of data is provided to the public. Data collection methods technical documentation is available to the public. Electrical corporation shares relevant nonspatial data with the community.	No additional requirements beyond level 3
Validation, documentation, and disclosures	Documentation of the uncertainty in data collection is known and the resulting sensitivity of the overall risk model predictions is quantified in the model validation basis documents.	The statistical uncertainty in data collection is unknown or not documented.	The statistical uncertainty in data collection is known and documented in accordance with Energy Safety requirements.	No additional requirements beyond level 1	No additional requirements beyond level 1	No additional requirements beyond level 1

C.5.2.5 11. Wildfire detection and alarm systems

Wildfire detection and alarm systems		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation	Automatic processing of signals received from fire detection systems	Electrical corporation currently has no automation of wildfire detection system signaling	Electrical corporation uses computer automation software to process signals received from individual sensors	Electrical corporation uses computer automation software to process signals received from multiple sensor technologies	Electrical corporation uses computer automation software to process signals received and algorithms for data aggregation from multiple sensors Automation software compiles sensor data.	No additional requirements beyond level 3
Documentation and disclosures	Documentation detailing wildfire detection methods, coverage areas, and confirmation strategies	Electrical corporation has not provided documentation on its wildfire detection methods, coverage areas, or confirmation strategies	Electrical corporation provides detailed documentation on at least one of the following: 1. Wildfire detection methods 2. Detection technologies 3. Distribution of detection technologies 4. Wildfire confirmation strategies	Electrical corporation provides detailed documentation on at least two of the following: 1. Wildfire detection methods 2. Detection technologies 3. Distribution of detection technologies 4. Wildfire confirmation strategies	Electrical corporation provides detailed documentation on at least three of the following: 1. Wildfire detection methods 2. Detection technologies 3. Distribution of detection technologies 4. Wildfire confirmation strategies	Electrical corporation provides detailed documentation for the following: 1. Wildfire detection methods 2. Detection technologies 3. Distribution of detection technologies 4. Wildfire confirmation strategies
Frequency	Frequency of reporting to central monitoring from field sensors, frequency of updates	Sensors do not report status and are not part of a controller-based network	Sensors report status only when queried but are part of a stand-alone controller-based network.	Sensors continually report status to controllers at prescribed intervals. Controllers report sensor status to receivers at the central monitoring facility.	Sensors continually report status to controllers at prescribed intervals. Controllers report sensor status to receivers at the central monitoring facility.	No additional requirements beyond level 3

Wildfire detection and alarm systems		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Learning and continuous improvement	Processes and procedures are in place to integrate lessons learned from risk events to improve the capabilities of currently deployed wildfire detection and alarm systems.	No process in place to integrate lessons learned from risk events to improve the capabilities of wildfire detection systems.	The electrical corporation has clearly defined operational processes and procedures in place to integrate lessons learned from risk events to improve the capabilities of its fire detection and alarm systems.	No additional requirements beyond level 1	The electrical corporation has clearly defined operational processes and procedures in place to integrate lessons learned from risk events to improve the capabilities of its fire detection and alarm systems. The electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on the lessons learned from risk events and their corrective action program.	The electrical corporation has clearly defined operational processes and procedures in place to integrate lessons learned from risk events to improve the capabilities of its fire detection and alarm systems. The electrical corporation has a clearly defined process to track and adjudicate comments from stakeholders on the lessons learned from risk events and their corrective action program. Electrical corporation participates in task groups focused on sharing and improving best practices, including participation by industry, government, and academic institutions. Electrical corporation funds and participates in both independent and collaborative research that focuses on extending best practices based on data from risk events.
Spatial granularity	Density of sensors or high sensor resolution within high fire risk areas	Electrical corporation does not have sensors located in high fire risk areas or is using sensors with low resolution or sensitivity	Electrical corporation has minimal sensor coverage in high fire risk areas. Sensors are spaced with gaps between coverage areas.	Electrical corporation has moderate sensor coverage in high fire risk areas. Sensors deployed are spaced at 100% of the maximum distance of sensitivity but with no overlap between sensors.	Electrical corporation has a high level of sensor coverage in high fire risk areas. Sensors deployed are spaced at 50% or less of the maximum distance of sensitivity with significant overlap between sensors.	No additional requirements beyond level 3

Wildfire detection and alarm systems		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation	Sensors and algorithms used in detection must be explained and each deployed technology must be preceded by testing and validation.	Electrical corporation provides no documentation regarding their installed wildfire detection capabilities.	Electrical corporation provides detailed documentation regarding sensor technology deployed for ignition detection and wildfire confirmation	Electrical corporation provides detailed documentation regarding sensor technology deployed for ignition detection and wildfire confirmation. Results of sensor and system capability testing are provided for review. At least one sensor technology is installed for each circuit in the grid.	Electrical corporation provides detailed documentation regarding sensor technology deployed for ignition detection and wildfire confirmation. Test results of sensors and systems are provided for review. At least two sensor technologies are installed for each circuit in the grid.	Electrical corporation provides detailed documentation regarding sensor technology deployed for ignition detection and wildfire confirmation. Test results of sensors and systems are provided for review. At least two sensor technologies are installed for each circuit in the grid with automatic verification.

C.5.2.6 12. Centralized monitoring of real-time conditions

Centralized monitoring of real-time conditions		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation	Automation of wildfire and fault reporting	Electrical corporation currently has no automation of reporting processes	Electrical corporation uses computer software to identify relevant staff of identified faults and wildfires	No additional requirements beyond level 1	No additional requirements beyond level 1	No additional requirements beyond level 1
Documentation and disclosures	Documentation of facility operation and location Staff hiring, training, and certification processes Job descriptions with staff member qualifications Organizational chart	Electrical corporation does not provide documentation of facility design to show its operation, location, staffing, and redundancy of critical power, lighting, and life-safety systems.	Electrical corporation provides documentation on the following: 1. Facility operational guidelines and location 2. Staff hiring, training, and certification processes	Electrical corporation provides documentation on the following: 1. Facility operational guidelines and location 2. Staff hiring, training, and certification processes 3. Frequency of drills, simulations, and exercises	Electrical corporation provides documentation on the following: 1. Facility operational guidelines and location 2. Staff hiring, training, and certification processes; job descriptions with staff qualifications 3. Frequency of drills, simulations, and exercises 4. Organizational chart	Electrical corporation provides documentation on the following: 1. Facility operational guidelines and location 2. Staff hiring, training, and certification processes; job descriptions with staff member qualifications 3. Frequency of drills, simulations, and exercises 4. Organizational chart 5. Ability to act as an Emergency Operations Center during wildfire events
Level of sophistication	Construction of buildings and infrastructure Redundancy of critical power, lighting, communication, and life-safety systems Security measures and systems	Electrical corporation does not maintain documentation of facility construction, critical systems, or security measures and systems.	Electrical corporation maintains documentation on the construction of buildings. Electrical corporation maintains redundancy in all critical systems (e.g., critical power, lighting, communications, and life-safety systems). Electrical corporation provides access to the documentation to authorized external agencies (e.g., Energy Safety, US Department of Homeland Security, etc.) when required. Operational and physical security measures are in place and documented.	No additional requirements beyond level 1	No additional requirements beyond level 1	No additional requirements beyond level 1

Centralized monitoring of real-time conditions		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Standardized processes	Electrical corporation central monitoring station is fully automated using detection algorithms or software to detect ignitions along grid. Sensor data is aggregated with near-real-time weather monitoring, grid diagnostics, wildfire detection and alarm systems, as well as other analytical models (e.g., weather forecasting, wildfire spread modeling) to evaluate the ongoing risk for emergency management decision making.	Electrical corporation does not own a central monitoring station and does not outsource monitoring service for detection of ignitions along the grid.	Electrical corporation owns or contracts with a central monitoring station but does not support automated wildfire detection algorithms or software. Wildfire detection is based on operator interpretation of sensor data.	Electrical corporation owns or contracts with a central monitoring station providing automated wildfire detection algorithms or software.	Electrical corporation owns a central monitoring station providing automated wildfire detection algorithms or software. Sensor data is aggregated with near-real-time weather monitoring, grid diagnostics, wildfire detection and alarm systems, as well as other analytical models (e.g., weather forecasting, wildfire spread modeling) to evaluate the ongoing risk for emergency management decision making.	No additional requirements beyond level 3
Transparency	Sharing of facility design and operation with the public and industry partners	Electrical corporation does not share facility guidelines	Electrical corporation shares facility guidelines with industry partners	Electrical corporation shares facility guidelines with industry partners and the public and accepts recommendations for revisions	Electrical corporation shares facility guidelines with industry partners and the public and incorporates recommendations for revisions	No additional requirements beyond level 3

C.5.3 C. Grid Design, Inspections, and Maintenance

C.5.3.1 13. Asset inventory and condition database

Asset inventory and condition database		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Frequency	Frequency of updates to database. More mature systems incorporate more frequent updates to the database from inspections.	Database is never updated. There is no existence of protocols to incorporate inspection findings into the database.	Database is updated annually. Additionally, protocols are developed to incorporate asset inspection findings within 2 weeks of the inspection.	Database is updated monthly. Additionally, protocols are developed to incorporate asset inspection findings within 1 week of the inspection.	Database is updated weekly. Additionally, protocols are developed to incorporate asset inspection findings within 1 day of the inspection.	Database is updated daily. Additionally, protocols are developed to incorporate asset inspection findings within 1 day of the inspection. Asset inspection findings are verified through QA/QC process within 1 day of the inspection.

Asset inventory and condition database		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Level of sophistication	Information contained in the asset inventory and condition database that should include: the geo-spatial path of each transmission and distribution circuit (including locations of poles and lines which deviate from the average direction) as well as each transformer and switch gear in accordance with the GIS reporting standards published by Energy Safety. More mature systems include additional named asset features.	Information contains in the database does not meet the minimum expectations or requirements.	Database contains the geo-spatial path of each transmission and distribution circuit (including locations of poles and lines which deviate from the average direction) as well as each transformer and switch gear in accordance with the GIS reporting standards published by Energy Safety. The database contains the following features for each equipment within the service area: 1. Name 2. Lifespan 3. Age 4. Voltage 5. Inspection finding history	Database contains the geo-spatial path of each transmission and distribution circuit (including locations of poles and lines which deviate from the average direction) as well as each transformer and switch gear in accordance with the GIS reporting standards published by Energy Safety. The database contains the following features for each equipment within the service area: 1. Name 2. Lifespan 3. Age 4. Voltage 5. Inspection finding history 6. Operating history At least 80% of assets and components have age data.	Database contains the geo-spatial path of each transmission and distribution circuit (including locations of poles and lines which deviate from the average direction) as well as each transformer and switch gear in accordance with the GIS reporting standards published by Energy Safety. The database contains the following features for each equipment within the service area: 1. Name 2. Lifespan 3. Age 4. Voltage 5. Inspection finding history 6. Operating history 7. Overload history At least 90% of assets and components have age data.	Database contains the geo-spatial path of each transmission and distribution circuit (including locations of poles and lines which deviate from the average direction) as well as each transformer and switch gear in accordance with the GIS reporting standards published by Energy Safety. The database contains the following features for each equipment within the service area: 1. Name 2. Lifespan 3. Age 4. Voltage 5. Inspection finding history 6. Operating history 7. Overload history 8. Minimum line clearance beyond GO based on risk analysis 9. Manufacturer 10. Repair history At least 99% of assets and components have age data.

Asset inventory and condition database		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Spatial granularity	Spatial granularity of the asset inventory and condition database within their service area.	Electrical corporation does not meet the minimum expectations for resolution reporting.	Asset inventory and condition database within their service area are evaluated at a circuit segment resolution. The resolution of the asset inventory and condition of deployed lines and assets within their service area is sufficient to the development of spatially informed risk models at circuit segment level.	Asset inventory and condition database within their service area are evaluated at a span resolution. The resolution of the asset inventory and condition of deployed lines and assets within their service area is sufficient to the development of spatially informed risk models at span level.	Asset inventory and condition database within their service area are evaluated at an individual asset resolution. The resolution of the asset inventory and condition of deployed lines and assets within their service area is sufficient to the development of spatially informed risk models at an individual asset level.	No additional requirements beyond level 3
Subject matter expert (SME) verification/(QA/QC)	Subject Matter Expert (SME) verification to evaluate the accuracy of asset inventory and condition database.	No subject matter expert verification in place to evaluate asset Inventory and condition database.	The asset Inventory and condition database is assessed through subject matter expert (SME) review at least once per year.	The asset Inventory and condition database is assessed through subject matter expert (SME) review at least once per year. Other electrical corporations and government participate in the auditing process.	The asset Inventory and condition database is assessed through subject matter expert (SME) review at least twice per year. Other electrical corporations and government participate in the auditing process.	The asset inventory and condition of deployed lines and assets database is assessed through subject matter expert (SME) review at least four times per year. Other electrical corporations and government participate in the auditing process. Verification is complemented with more in-depth diagnosis to provide a comprehensive understanding of strengths and weaknesses of the data and collection process.

C.5.3.2 14. Asset inspections

Asset inspections		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Frequency	Frequency of asset inspections within HFTD and service areas. In more mature systems, inspection frequency is prioritized incorporating a dynamic, risk-informed inspection cycle based on real-time monitoring of conditions.	Asset inspections are less frequent than regulations require.	Detailed inspection and patrol inspection frequency consistent with regulations	Detailed inspections and patrol inspections of electric lines and equipment scheduled based on: 1. an up-to-date static map of equipment type and environment 2. more frequent inspections for highest risk areas 3. more frequent inspections for HFTD areas	Detailed inspections and patrol inspections of electric lines and equipment scheduled based on: 1. an up-to-date dynamic map of equipment type and environment based on real-time risk 2. more frequent inspections for highest risk areas 3. more frequent inspections for HFTD areas 4. accurate predictive modeling of equipment failure probability 5. analysis of early indicators of failure probability via analysis of actual failures 6. additional inspection types (i.e., beyond routine patrols and detailed) implemented as needed 7. 80% of line miles are continuously monitored by sensors to monitor the condition of electric lines and equipment areas with fire risk	Detailed inspections and patrol inspections of electric lines and equipment scheduled based on: 1. an up-to-date dynamic map of equipment type and environment based on real-time risk 2. more frequent inspections for highest risk areas 3. more frequent inspections for HFTD areas 4. **content of each inspection (I.e., checklist or technology being used) determined independently** by accurate predictive modeling of equipment failure probability 5. analysis of early indicators of failure probability via analysis of actual failures 6. additional inspection types (i.e., beyond routine patrols and detailed) implemented as needed 7. 95% of line miles are continuously monitored by sensors to monitor the condition of electric lines and equipment areas with fire risk

Asset inspections		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Level of sophistication	Measured parameters, procedure, and checklist during the asset inspection to determine the depth and detail (quality) of inspections. Higher maturity is achieved by having a greater ability to determine equipment failure probability, identify higher risk areas and assets.	Measured parameters and procedure during asset inspections do not allow for identifying higher risk areas and assets.	Measured parameters and procedure during asset inspections allow for identifying higher risk areas and assets.	Measured parameters and procedure during asset inspections allow for identifying higher risk areas and assets. In addition, measured parameters allow for determining equipment failure probability.	Measured parameters and procedure during asset inspections allow for identifying higher risk areas and assets. In addition, measured parameters allow for determining equipment failure probability and timing of inspections.	No additional requirements beyond level 3
QA/QC	Process to evaluate the quality of asset inspections. Higher maturity includes audit through third-party of the quality/training of inspectors and inspection outcomes.	No process in place to evaluate the quality/training of pre-inspectors and inspection outcomes.	The quality of asset inspections is assessed through subject matter expert (SME) review at least once per year.	The quality of asset inspections is assessed through subject matter expert (SME) review at least once per year. Other electrical corporations and government participate in the auditing process.	The quality of asset inspections is assessed through subject matter expert (SME) review at least twice per year. Other electrical corporations and government participate in the auditing process.	The quality of asset inspections is assessed through subject matter expert (SME) review at least four times per year. Other electrical corporations and government participate in the auditing process.

C.5.3.3 15. Asset maintenance and repair

Asset maintenance and repair		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Frequency	Frequency of maintenance on assets to mitigate risk-inducing failure. In more mature systems, frequency of maintenance is prioritized based on identified wildfire and PSPS risk as well as usage and environmental conditions.	Maintenance frequency is not risk-informed.	Maintenance frequency is determined based on each of the following: 1. Wildfire risk in relevant circuit 2. PSPS risk 3. Usage	Maintenance frequency is determined based on each of the following: 1. Wildfire risk in relevant circuit 2. PSPS risk 3. Usage 4. Environmental conditions	Maintenance frequency is determined based on each of the following: 1. Wildfire risk in relevant circuit 2. PSPS risk 3. Usage 4. Environmental conditions 5. Performance history 6. 95% of line miles are continuously monitored by sensors to monitor the condition of electric lines and equipment areas with fire risk	Maintenance frequency is determined based on each of the following: 1. Wildfire risk in relevant circuit 2. PSPS risk 3. Usage 4. Environmental conditions 5. Performance history 6. 95% of line miles are continuously monitored by sensors to monitor the condition of electric lines and equipment areas with fire risk
Level of sophistication	Time between inspection findings and maintenance or repair. Lower times between inspection findings and maintenance are indicative of a more mature system.	Level 1 findings (as defined in GO-95 rule 18) are not addressed immediately. Level 2 findings (as defined in GO-95 rule 18) are not addressed within the time identified in GO-95. Routine findings (level 3 as defined in GO-95 rule 18) in service area are not addressed within five (5) years.	Level 1 findings (as defined in GO-95 rule 18) **are addressed immediately**. Level 2 findings within HFTD Tier 3 are addressed **within 6 months**. Level 2 findings within HFTD Tier 2 are addressed **within 12 months.** Level 2 findings in non-HFTD areas are addressed **within 5 years.** Routine findings (level 3 as defined in GO-95 rule 18) in service area are addressed within five (5) years.	Level 1 findings (as defined in GO-95 rule 18) **are addressed immediately**. Level 2 findings within HFTD Tier 3 are addressed **within 3 months**. Level 2 findings within HFTD Tier 2 are addressed **within 6 months**. Level 2 findings in non-HFTD areas are addressed **within 1 year**. Routine findings (level 3 as defined in GO-95 rule 18) in service area are addressed within five (5) years.	Level 1 findings (as defined in GO-95 rule 18) **are addressed immediately**. Level 2 findings within HFTD Tier 3 are addressed **within 1 month.** Level 2 findings within HFTD Tier 2 are addressed **within 3 months.** Level 2 findings in non-HFTD areas are addressed **within 6 months**. Routine findings (level 3 as defined in GO-95 rule 18) in service area are addressed within five (5) years.	Level 1 findings (as defined in GO-95 rule 18) **are addressed immediately**. Level 2 findings within HFTD Tier 3 are addressed **within 2 weeks.** Level 2 findings within HFTD Tier 2 are addressed **within 1 month.** Level 2 findings in non-HFTD areas are addressed **within 3 months**. Routine findings (level 3 as defined in GO-95 rule 18) in service area are addressed within five (5) years.

Asset maintenance and repair		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
QA/QC	Process in place to evaluate the maintenance quality. Higher maturity is achieved with more robust QA/QC procedures.	No process in place to evaluate the maintenance quality or ensure the identification of compromised or aging equipment.	Maintenance quality and procedures are assessed through subject matter expert (SME) review at least once per year.	Maintenance quality and procedures are assessed through subject matter expert (SME) review at least twice per year. Other electrical corporations and government participate in the auditing process. Electrical corporation estimates equipment service life reduction based on usage and environmental conditions.	Maintenance quality and procedures are assessed through subject matter expert (SME) review at least quarterly. Other electrical corporations and government participate in the auditing process. Electrical corporation estimates equipment service life reduction based on usage and environmental conditions.	Maintenance quality and procedures are assessed through subject matter expert (SME) review at least monthly. Other electrical corporations and government participate in the auditing process. Electrical corporation estimates equipment service life reduction based on usage and environmental conditions.
Risk spend efficiency (RSE)	The utilization of risk-spend-efficiency (RSE) for maintenance prioritization. Higher maturity is achieved using other elements such as wildfire and PSPS risk, inspection findings, and vegetation management.	RSE is not used for maintenance prioritization.	At least the following elements are used for maintenance prioritization: 1. Inspection findings	At least the following elements are used for maintenance prioritization: 1. Inspection findings 2. Wildfire and PSPS risk Additionally, the degree of wildfire and PSPS risk reduction achieved by maintenance prioritization is estimated.	At least the following elements are used for maintenance prioritization: 1. Inspection findings 2. Wildfire and PSPS risk 3. Vegetation management Additionally, the degree of wildfire and PSPS risk reduction achieved by maintenance prioritization is estimated.	At least the following elements are used for maintenance prioritization: 1. Inspection findings 2. Wildfire and PSPS risk 3. Vegetation management 4. RSE Additionally, the degree of wildfire and PSPS risk reduction achieved by maintenance prioritization is estimated.

C.5.3.4 16. Grid design and resiliency

Grid design and resiliency		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Frequency	Frequency of grid design evaluation and circuit load assessment.	Grid design evaluation and circuit load assessment are never performed.	Grid design evaluation and circuit load assessment are performed on an annual basis.	Grid design evaluation and circuit load assessment are performed every 6 months.	Grid design evaluation and circuit load assessment are performed at least once per quarter.	No additional requirements beyond level 3
Learning and continuous improvement	The efforts the electrical corporation undertakes and funds to improve the state-of-the-art in grid design and resilience. This includes internal department of the electrical corporation or third-party institutions such as independent labs, consulting companies, research organizations, universities, etc.	No established program for developing innovative grid design to advance the state-of-the-art.	New initiatives developed and evaluated based on each of the following: 1. Installation of hardening initiatives into grid 2. Measuring direct reduction in ignition events	New initiatives developed and evaluated based on each of the following: 1. Installation of hardening initiatives into grid 2. Measuring direct reduction in ignition events 3. Measuring reduction impact on risk event metrics 4. Including an evaluation of the total cost of the initiative	New initiatives developed and evaluated based on each of the following: 1. Installation of hardening initiatives into grid 2. Measuring direct reduction in ignition events 3. Measuring reduction impact on risk event metrics **at a span level** 4. Including an evaluation of the total cost of the initiative 5. Developed and independently evaluated using lab facilities by a trained team of grid innovation specialists 6. Validated by field testing based on installation into grid	New initiatives developed and evaluated based on each of the following: 1. Installation of hardening initiatives into grid 2. Measuring direct reduction in ignition events 3. Measuring reduction impact on risk event metrics **at an asset level** 4. Including an evaluation of the total cost of the initiative 5. Developed and independently evaluated using lab facilities by a trained team of grid innovation specialists 6. Validated by field testing based on installation into grid 7. Independent auditing of performance in grid 8. Extensive data sharing with industry, academia, and other electrical corporations utilizing the same initiatives to share results

Grid design and resiliency		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Level of sophistication	Elements considered and documented during grid design, design evaluation, and grid impact evaluation. More mature systems consider evaluation of the impact of PSPS on community and egress reliance and identify high risk configuration in the existing grid based on ignition likelihood and overall risk.	The grid design, design evaluation, and grid impact evaluation do not meet the minimum expectations or requirements.	The grid design, design evaluation, and grid impact evaluation consider and document the following: 1. Geo-spatial number of customers and critical infrastructure impacted by PSPS in HFTD areas 2. Total percentage of grid localization features normalized by circuit length in HFTD areas	The grid design, design evaluation, and grid impact evaluation consider and document the following: 1. Geo-spatial number of customers and critical infrastructure impacted by PSPS in HFTD areas 2. Total percentage of grid localization features normalized by circuit length in HFTD areas 3. Number and type of specific grid localization features in HFTD areas 4. Type and location of non-electrical corporation overhead distribution equipment in HFTD areas	The grid design, design evaluation, and grid impact evaluation consider and document the following: 1. Geo-spatial number of customers and critical infrastructure impacted by PSPS in HFTD areas 2. Total percentage of grid localization features normalized by circuit length in HFTD areas 3. Number and type of specific grid localization features in HFTD areas 4. Type and location of non-electrical corporation overhead distribution equipment in HFTD areas 5. Identification of high-risk configurations in the existing grid based on ignition likelihood and overall risk	The grid design, design evaluation, and grid impact evaluation consider and document the following: 1. Geo-spatial number of customers and critical infrastructure impacted by PSPS in HFTD areas 2. Total percentage of grid localization features normalized by circuit length in HFTD areas 3. Number and type of specific grid localization features in HFTD areas 4. Type and location of non-electrical corporation overhead distribution equipment in HFTD areas 5. Identification of high-risk configurations in the existing grid based on ignition likelihood and overall risk 6. Evaluation of the design on circuits that are experiencing frequent overload operation to prioritize modifications in grid design

Grid design and resiliency		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Risk spend efficiency (RSE)	The utilization of risk-spend-efficiency (RSE) for selection/exclusion of grid design features and identify the level or risk reduction afforded by different hardening activities.	RSE is not used for selection/exclusion of grid design features and identify the level or risk reduction afforded by different hardening activities.	RSE is used for selection/exclusion of grid design features and identify the level or risk reduction afforded by different hardening activities.	RSE is used for selection/exclusion of grid design features and identify the level or risk reduction afforded by different hardening activities. Each grid hardening initiative, indicating pros, cons, and an estimate of normalized implementation cost (per circuit, circuit mile, or another appropriate metric) is described and documented.	RSE is used for selection/exclusion of grid design features and identify the level or risk reduction afforded by different hardening activities. Each grid hardening initiative, indicating pros, cons, and an estimate of normalized implementation cost (per circuit, circuit mile, or another appropriate metric) is described and documented. The degree of wildfire risk reduction achieved by each grid hardening initiative is estimated.	RSE is used for selection/exclusion of grid design features and identify the level or risk reduction afforded by different hardening activities. Each grid hardening initiative, indicating pros, cons, and an estimate of normalized implementation cost (per circuit, circuit mile, or another appropriate metric) is described and documented. The degree of wildfire risk reduction achieved by each grid hardening initiative and weight of these reductions against the cost of those initiatives are estimated.

Grid design and resiliency		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Spatial granularity	Spatial granularity of grid design evaluation.	Electrical corporation does not meet the minimum expectations for resolution reporting.	Grid design is evaluated at a resolution <= 20 km (circuit level). The resolution of grid design evaluation is sufficient for determining each of the following: 1. The length of spans 2. Degree of circuit isolation 3. The geo-spatial number of customers and critical infrastructure impacted by PSPS of specific circuits in the HFTD	Grid design is evaluated at a resolution <= 2 km (segment level). The resolution of grid design evaluation is sufficient for determining each of the following: 1. The length of spans 2. Degree of circuit isolation 3. The geo-spatial number of customers and critical infrastructure impacted by PSPS of specific circuits in the HFTD 4. High-risk configurations in the existing grid based on ignition likelihood and overall risk	Grid design is evaluated at a resolution <= 400 m (span level). The resolution of grid design evaluation is sufficient for determining each of the following: 1. The length of spans 2. Degree of circuit isolation 3. The geo-spatial number of customers and critical infrastructure impacted by PSPS of specific circuits in the HFTD 4. High-risk configurations in the existing grid based on ignition likelihood and overall risk 5. Number and type of specific grid localization features in HFTD areas	No additional requirements beyond level 3

Grid design and resiliency		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Subject matter expert (SME) verification	Subject Matter Expert (SME) verification for grid design decisions approval.	No subject matter expert verification for grid design decisions approval.	At minimum each of the following grid design decisions is assessed through subject matter verification (SME): 1. Circuit routing 2. Determination of circuit span lengths Each of the following elements are considered during grid design decisions: 1. Resilient egress and traffic 2. Community resilience	At minimum each of the following grid design decisions is assessed through subject matter verification (SME) in collaboration with other electrical corporations and government: 1. Circuit routing 2. Determination of circuit span lengths 3. Selection of design type Each of the following elements are considered during grid design decisions: 1. Resilient egress and traffic 2. Community resilience	At minimum each of the following grid design decisions is assessed through subject matter verification (SME) in collaboration with other electrical corporations, government, and research community: 1. Circuit routing 2. Determination of circuit span lengths 3. Selection of design type 4. Integration of microgrids Each of the following elements are considered during grid design decisions: 1. Resilient egress and traffic 2. Community resilience	At minimum each of the following grid design decisions is assessed through subject matter verification (SME) in collaboration with other electrical corporations, government, and research community: 1. Circuit routing 2. Determination of circuit span lengths 3. Selection of design type 4. Integration of microgrids 5. Integration of new technologies Each of the following elements are considered during grid design decisions: 1. Resilient egress and traffic 2. Community resilience

C.5.3.5 17. Asset and grid personnel training and quality

Asset and grid personnel training and quality		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Documentation and disclosures	The degree to which electrical corporations collaborate and share best practices in personnel training and quality assessment.	Electrical corporation has no procedures for sharing or receiving best practices and lessons learned regarding the training and QA of asset maintenance and repair personnel with or from other California electrical corporations.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the training and QA of asset personnel. Electrical corporation procedures include at least 1 of the following: 1. Actively seeking information from and providing information to other electrical corporations. 2. Has a consistent format and venue/medium through which information is exchanged. 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the training and QA of personnel. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the training and QA of personnel.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the training and QA of personnel. Electrical corporation procedures include at least 2 of the following: 1. Actively seeking information from and providing information to other electrical corporations. 2. Has a consistent format and venue/medium through which information is exchanged. 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the training and QA of personnel. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the training and QA of personnel.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the training and QA of personnel. Electrical corporation procedures include at least 3 of the following: 1. Actively seeking information from and providing information to other electrical corporations. 2. Has a consistent format and venue/medium through which information is exchanged. 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the training and QA of personnel. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the training and QA of personnel.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the training and QA of personnel. Electrical corporation procedures include all the following: 1. Actively seeking information from and providing information to other electrical corporations. 2. Has a consistent format and venue/medium through which information is exchanged. 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the training and QA of personnel. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the training and QA of personnel.

Asset and grid personnel training and quality		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Frequency	Frequency at which personnel are trained.	Electrical corporation has no formal training program and no standardized training documentation.	Electrical corporation provides standard training material to all employees. Electrical corporation requires wildfire related conditions and work aspects to be discussed with work teams before daily work begins.	Electrical corporation conducts onboard training for new employees and provides standard training material on wildfire related conditions and work aspects to all relevant employees. Electrical corporation requires wildfire related conditions and work aspects to be discussed with work teams before daily work begins.	Electrical corporation conducts onboard training for new employees and provides standard training material on wildfire related conditions and work aspects to all relevant employees. Electrical corporation requires wildfire related conditions and work aspects to be discussed with work teams before daily work begins. Electrical corporation conducts refresher training on wildfire risk and work aspects for all relevant employees at least once per year.	No additional requirements beyond level 3

Asset and grid personnel training and quality		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Level of sophistication	Content covered by training	Electrical corporation training content does not address wildfire risk related conditions and work content.	Electrical corporation training content includes the following: 1. Wildfire related conditions and work aspects expected to be encountered in the field. 2. Process for reporting ignitions caused by workers or in the immediate vicinity of workers. 3. Procedures and protocols for routine inspections.	Electrical corporation training content includes the following: 1. Wildfire related conditions and work aspects expected to be encountered in the field. 2. Process for reporting ignitions caused by workers or in the immediate vicinity of workers. 3. Procedures and protocols for routine and detailed inspections. 4. Use of specialized equipment (e.g., LiDAR and drones) for inspecting assets for conditions that increase wildfire risk.	Electrical corporation training content includes the following: 1. Wildfire related conditions and work aspects expected to be encountered in the field. 2. Process for reporting ignitions caused by workers or in the immediate vicinity of workers. 3. Procedures and protocols for routine and detailed inspections. 4. Use of specialized equipment (e.g., LiDAR and drones) for inspecting assets for conditions that increase wildfire risk. 5. Suppression of ignitions caused by workers or in the immediate vicinity of workers. 6. Simulated inspections in controlled environments with known reportable conditions.	Electrical corporation training content includes the following: 1. Wildfire related conditions and work aspects expected to be encountered in the field. 2. Process for reporting ignitions caused by workers or in the immediate vicinity of workers. 3. Procedures and protocols for routine and detailed inspections. 4. Use of specialized equipment (e.g., LiDAR and drones) for inspecting assets for conditions that increase wildfire risk. 5. Suppression of ignitions caused by workers or in the immediate vicinity of workers. 6. Simulated inspections in controlled environments with known reportable conditions.

Asset and grid personnel training and quality		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
QA/QC	Verification of the effectiveness of personnel training.	Results of post construction and repair inspections and audits are not used to inform training of personnel	Results of post construction and repair inspections and audits are used to identify systematic deficiencies and recommend training improvements for electrical corporation asset management personnel based on weaknesses. Asset and grid personnel drills are conducted with pass/fail criteria	Results of post construction and repair inspections and audits are used to identify systematic deficiencies and recommend training improvements for electrical corporation and contractor asset personnel based on weaknesses annually. Asset and grid personnel drills are conducted with pass/fail criteria and at least 75% of drills are passed	Results of post construction and repair inspections and audits are used to identify systematic deficiencies and recommend training improvements for electrical corporation, contractor, and subcontractor asset management personnel based on weaknesses annually. Results of post training assessments and audits are used to identify systematic deficiencies and recommend modifications to training material for electrical corporation asset management personnel based on weaknesses. Asset and grid personnel drills are conducted with pass/fail criteria and at least 75% of drills are passed Asset and grid personnel drills are conducted at least once annually	Results of post construction and repair inspections and audits are used to identify systematic deficiencies, grade individuals, and recommend personalized pre-made and tested training modules for individual electrical corporation, contractor, and subcontractor employees based on weaknesses. Results of post training assessments and audits are used to identify systematic deficiencies and recommend modifications to training material for electrical corporation asset management personnel based on weaknesses. Asset and grid personnel drills are conducted with pass/fail criteria and at least 95% of drills are passed Asset and grid personnel drills are conducted at least once annually

C.5.4 D. Vegetation Management and Inspections

C.5.4.1 18. Vegetation inventory and condition database

Vegetation inventory and condition database		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Frequency	Frequency of updates to database from inspections. More mature systems incorporate more frequent updates to the database from inspections/activities.	Electrical corporation does not update its vegetation database at a sufficient frequency.	Database is updated within 30 days of an inspection/activity.	Database is updated within 2 weeks of an inspection/activity.	Database is updated within 1 week of an inspection/activity.	Database is updated within 1 day of an inspection/activity.
Level of sophistication	Information contained in the vegetation database that should include tree species, typical environmental conditions, and vegetation growth rate in inspection prioritization. Higher maturity is achieved by recording of more specific information on the tree species and expected growth rates to prioritize future inspections.	Information in the vegetation database do not meet the minimum expectations or requirements.	Information in the vegetation database at a minimum includes the following: 1. All vegetation within the right of way and within strike potential of the assets 2. Logs documenting findings and remedial actions taken 3. General information on the tree such as common name and genus 4. Typical environmental conditions such as slope, aspect, soil type, and wind exposure	Information in the vegetation database at a minimum includes the following: 1. All vegetation within the right of way and within strike potential of the assets 2.Logs documenting findings and remedial actions taken 3. General information on the tree such as common name, genus, and species 4. Typical environmental conditions such as slope, aspect, soil type, and wind exposure. 5. Individual high risk-trees across grid	Information in the vegetation database at a minimum includes the following: 1. All vegetation within the right of way and within strike potential of the assets 2.Logs documenting findings and remedial actions taken 3. General information on the tree such as common name, genus, and species 4. Typical environmental conditions such as slope, aspect, soil type, and wind exposure 5. Individual high risk-trees across grid 6. Vegetation growth rate for inspection prioritization	Information in the vegetation database at a minimum includes the following: 1. All vegetation within the right of way and within strike potential of the assets 2. Logs documenting findings and remedial actions taken 3. General information on the tree such as common name, genus, and species 4. Typical environmental conditions such as slope, aspect, soil type, and wind exposure 5. Individual high risk-trees across grid 6. Vegetation growth rate for inspection prioritization 7. Up-to-date tree health and moisture content to determine risk of ignition and propagation

Vegetation inventory and condition database		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
QA/QC	Process to evaluate the accuracy of vegetation database. Higher maturity includes a well-defined auditing process of the vegetation database.	No process in place to evaluate vegetation database.	Vegetation database is assessed through subject matter expert (SME) review **at least once per year**.	Vegetation database is assessed through subject matter expert (SME) review **at least once per year**. QA/QC processes and procedures for ensuring data quality in the vegetation database are benchmarked with other electrical corporations.	Vegetation database is assessed through subject matter expert (SME) review **at least twice per year**. QA/QC processes and procedures for ensuring data quality in the vegetation database are benchmarked with other electrical corporations.	Vegetation database is assessed through subject matter expert (SME) review **at least four times per year**. QA/QC processes and procedures for ensuring data quality in the vegetation database are benchmarked with other electrical corporations. Electrical corporation internal audits are complemented with more in-depth analyses to provide a comprehensive understanding of strengths and weaknesses of the data and collection process.
Spatial granularity	Spatial granularity of the vegetation inventory along rights of way, and vegetation with strike potential, including condition of each vegetation.	Electrical corporation does not meet the minimum expectations for resolution reporting.	Vegetation inventory and condition are evaluated at a resolution <= 20 km (Circuit level). The resolution of vegetation inventory is sufficient for identifying higher risk areas and vegetation at the circuit level.	Vegetation inventory and condition are evaluated at a resolution <= 2 km (Segment level) The resolution of vegetation inventory is sufficient for identifying higher risk areas and vegetation at the circuit segment level.	Vegetation inventory and condition are evaluated at a resolution <= 400 m (Span level). The resolution of vegetation inventory is sufficient for identifying higher risk areas and vegetation at the span level.	Vegetation inventory and condition are evaluated at a resolution <= 15 m (Asset level). The resolution of vegetation inventory is sufficient for identifying higher risk areas and vegetation at the asset level.

C.5.4.2 19. Vegetation inspections

Vegetation inspections		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Frequency	Frequency of inspections for the entire grid and HFTD areas. In more mature systems, inspection frequency is prioritized based on risk modeling, and have a shorter window between Level 1 and Level 2/Level 3 inspections.	Inspections are less frequent than regulations require.	Vegetation inspections for the entire grid and HFTD areas are conducted at least annually.	Vegetation inspections for the entire grid and HFTD areas are conducted at least every 6 months. The inspection frequency is prioritized based on risk modeling considering predicted species-specific vegetation growth and equipment type for each circuit of the service territory	Vegetation inspections for the entire grid and HFTD areas are conducted at least every 6 months. The inspection frequency is prioritized based on risk modeling considering predicted species-specific vegetation growth, tree health, and other vegetation risk factors along with equipment type and age for each span of the service territory to conduct more frequent inspections in less healthy areas. The frequency of inspections allow for understanding vegetation growth, characteristics, and failure probability.	Vegetation inspections for the entire grid and HFTD areas are conducted at least every 3 months. The inspection frequency is prioritized based on risk modeling considering predicted species-specific vegetation growth, tree health, and other continuously monitored vegetation risk factors along with equipment type, age, condition, and operating history for each asset of the service territory to conduct more frequent inspections in areas with high rates of dead or dying vegetation. The frequency of inspections allows for understanding vegetation growth, characteristics, failure probability, and timing inspections.

Vegetation inspections		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Level of sophistication	Measured parameters, procedure, and checklist during the vegetation inspection to determine the depth and detail (quality) of inspections. Higher maturity is achieved by having a greater ability to identify higher risk areas.	Measured parameters and procedure during vegetation inspections do not allow for identifying higher risk areas and vegetation.	Measured parameters and procedure during detailed vegetation inspections allow for identifying higher risk areas and vegetation.	Measured parameters and procedure during detailed vegetation inspections allow for identifying higher risk areas and vegetation. The electrical corporation describes the types of inspections and the procedure performed and parameters that should be measured in each one.	Measured parameters and procedure during detailed vegetation inspections allow for identifying higher risk areas and vegetation. The electrical corporation describes the types of inspections and the procedure performed and parameters that should be measured in each one. The parameters measured during detailed inspections allow for understanding vegetation growth, characteristics, and failure probability.	Measured parameters and procedure during detailed vegetation inspections allow for identifying higher risk areas and vegetation. The electrical corporation describes the types of inspections and the procedure performed and parameters that should be measured in each one. The parameters measured during detailed inspections allow for understanding vegetation growth, characteristics, failure probability, and timing inspections.
QA/QC	Process to evaluate the quality of vegetation inspections. Higher maturity includes audit through third-party of the quality/training of inspectors and inspection outcomes.	No process in place to evaluate the quality/training of inspectors and inspection outcomes.	Vegetation inspections are assessed through subject matter expert (SME) review **at least once per year**.	Vegetation inspections are assessed through subject matter expert (SME) review **at least once per year**. QA/QC processes and procedures for ensuring vegetation inspections are benchmarked with other electrical corporations.	Vegetation inspections are assessed through subject matter expert (SME) review **at least twice per year**. QA/QC processes and procedures for ensuring vegetation inspections are benchmarked with other electrical corporations.	Vegetation inspections are assessed through subject matter expert (SME) review **at least four times per year**. QA/QC processes and procedures for ensuring vegetation inspections are benchmarked with other electrical corporations.

Vegetation inspections		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Risk spend efficiency (RSE)	The utilization of risk-spend-efficiency (RSE) for making decisions regarding vegetation inspections. High maturity involves utilizing risk-spend-efficiency (RSE) in determining which areas in the electrical corporation service area should be prioritized in conducting more frequent and/or more in-depth inspections.	RSE is not used to determine areas subjected to vegetation inspections.	RSE is utilized to determine areas that should be prioritized in conducting more frequent inspections.	RSE is utilized to determine areas that should be prioritized in conducting more frequent inspections. RSE is used to determine the inspection level.	RSE is utilized to determine areas that should be prioritized in conducting more frequent inspections. RSE is used to determine the inspection level. The degree of risk reduction achieved by inspections and specific initiatives is estimated.	RSE is utilized to determine areas that should be prioritized in conducting more frequent inspections. RSE is used to determine the inspection level. The degree of risk reduction achieved by inspections and specific initiatives is estimated. Relative risk reduction and the cost of inspections are considered in strategy development.

C.5.4.3 20. Vegetation treatment and removal

Vegetation treatment and removal		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Anticipation	The electrical corporation capacity of anticipating reducing risk considering historic trends (e.g., refusal rates, periodic grow-in findings, etc.) in the geo-spatial regions of their service area to prioritize mitigation efforts. Higher maturity includes modifying the grid design to reduce risk based on these observed trends.	The electrical corporation does not consider historic trends (e.g., refusal rates, periodic grow-in findings, etc.) to prioritize mitigation efforts.	The electrical corporation considers historic trends (e.g., refusal rates, periodic grow-in findings, etc.) in the geo-spatial regions of their service area to prioritize mitigation efforts.	The electrical corporation considers historic trends (e.g., refusal rates, periodic grow-in findings, etc.) in the geo-spatial regions of their service area to prioritize mitigation efforts. Re-evaluation of the grid design is performed based on historic trends.	The electrical corporation considers historic trends (e.g., refusal rates, periodic grow-in findings, etc.) in the geo-spatial regions of their service area to prioritize mitigation efforts. Revaluation of the grid design is performed based on historic trends. Decisions related to increasing isolation of affected circuits or integration of advanced sensor systems such as fast trip to reduce the likelihood of ignition from grow-in are based on historic trends.	No additional requirements beyond level 3

Vegetation treatment and removal		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Level of sophistication	Time between inspection findings or predictive model results (such as species-specific vegetative growth and limb, trunk, or root failure rates) and vegetation trimming. More mature systems respond quickly to findings from inspections. This scoring also includes the removal time after trimming and vegetative waste disposal outside the wildland (e.g., routine treatment versus dying tree which is likely to fall on a line).	The electrical corporation does not perform any mitigation efforts to routine findings from inspections. In addition, the electrical corporation does not remove vegetative waste outside the wildland (e.g., in a homeowner's yard, along a street, etc.).	The electrical corporation responds to findings from inspections within thirty (30) days. The electrical corporation responds to severe findings (e.g., dying tree which is likely to fall on a line) from inspections within seven (7) days. The electrical corporation removes vegetative waste after trimming and outside the wildland (e.g., in a homeowner's yard, along a street, etc.) within 1 week after disposal.	The electrical corporation responds to findings from inspections within 1 week or less. The electrical corporation responds to severe findings (e.g., dying tree which is likely to fall on a line) from inspections within sixteen (16) hours. The electrical corporation systematically removes vegetative waste after trimming and outside the wildland (e.g., in a homeowner's yard, along a street, etc.) within 3 days after trimming.	The electrical corporation responds to findings from inspections on the same day. The electrical corporation responds to severe findings (e.g., dying tree which is likely to fall on a line) from inspections within eight (8) hours. The electrical corporation systematically removes vegetative waste after trimming and outside the wildland (e.g., in a homeowner's yard, along a street, etc.) on the same day after disposal. The electrical corporation proactively trims trees based on predictive model results (such as species-specific vegetative growth and limb, trunk, or root failure rates).	The electrical corporation responds to findings from inspections on the same day. The electrical corporation responds to severe findings (e.g., dying tree which is likely to fall on a line) from inspections within four (4) hours. The electrical corporation systematically removes vegetative waste after trimming and outside the wildland (e.g., in a homeowner's yard, along a street, etc.) on the same day after disposal, **informing relevant communities of removal**. The electrical corporation proactively trims trees based on predictive model results (such as species-specific vegetative growth and limb, trunk, or root failure rates).

Vegetation treatment and removal		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
QA/QC	Process to evaluate the quality of vegetation trimming and training tree contractors.	No process in place to evaluate the quality of vegetation trimming.	The quality of vegetation trimming is assessed through post vegetation treatment inspections of employee and contractor work and non-conformances are corrected through additional treatment. QA/QC information is used identify deficiencies in inspection procedures and execution.	The quality of vegetation trimming is assessed through post vegetation treatment inspections of employee and contractor work and non-conformances are corrected through additional treatment. QA/QC information is used identify deficiencies in inspection procedures and execution. Procedures are updated to address deficiencies identified from QA/QC information at least once per year. Contractors and subcontractors are required to follow processes and standards set forth for the electrical corporation	The quality of vegetation trimming is assessed through post vegetation treatment inspections of employee and contractor work and non-conformances are corrected through additional treatment. QA/QC information is used identify deficiencies in inspection procedures and execution. Procedures are updated to address deficiencies identified from QA/QC information at least once per quarter. Contractors and subcontractors are required to follow processes and standards set forth for the electrical corporation	The quality of vegetation trimming is assessed through post vegetation treatment inspections of employee and contractor work and non-conformances are corrected through additional treatment. QA/QC information is used identify deficiencies in inspection procedures and execution. Procedures are updated to address deficiencies identified from QA/QC information at least once per month. Contractors and subcontractors are required to follow processes and standards set forth for the electrical corporation
Risk spend efficiency (RSE)	The utilization of risk-spend-efficiency (RSE) for vegetation mitigation planning.	RSE is not used to plan vegetation mitigation efforts.	RSE is utilized to plan vegetation mitigation efforts.	RSE is utilized to plan vegetation mitigation efforts. Additionally, the degree of wildfire risk reduction achieved by specific vegetation management initiatives is estimated.	RSE is utilized to plan vegetation mitigation efforts. Additionally, the degree of wildfire risk reduction achieved by specific vegetation management initiatives is estimated. The degree of wildfire risk reduction achieved by each initiative and the cost of those initiatives are considered in strategy development.	No additional requirements beyond level 3

C.5.4.4 21. Vegetation personnel training and quality

Vegetation personnel training and quality		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Documentation and disclosures	The degree to which electrical corporations collaborate and share best practices in personnel training and quality assessment.	Electrical corporation has no procedures for sharing or receiving best practices and lessons learned regarding the training and QA of vegetation personnel with or from other California electrical corporations.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the training and QA of vegetation personnel. Electrical corporation procedures include at least 1 of the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the training and QA of vegetation personnel. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the training and QA of vegetation personnel.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the training and QA of vegetation personnel. Electrical corporation procedures include at least 2 of the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the training and QA of vegetation personnel. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the training and QA of vegetation personnel.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the training and QA of vegetation personnel. Electrical corporation procedures include at least 3 of the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the training and QA of vegetation personnel. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the training and QA of vegetation personnel.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the training and QA of vegetation personnel. Electrical corporation procedures include all the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the training and QA of vegetation personnel. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the training and QA of vegetation personnel.

Vegetation personnel training and quality		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Frequency	Frequency at which personnel are trained.	Electrical corporation has no formal training program and no standardized training documentation.	Electrical corporation provides standard training material to all employees. Electrical corporation requires wildfire related conditions and work aspects to be discussed with work teams before daily work begins.	Electrical corporation conducts onboard training for new employees and provides standard training material on wildfire related conditions and work aspects to all relevant employees. Electrical corporation requires wildfire related conditions and work aspects to be discussed with work teams before daily work begins.	Electrical corporation conducts onboard training for new employees and provides standard training material on wildfire related conditions and work aspects to all relevant employees. Electrical corporation requires wildfire related conditions and work aspects to be discussed with work teams before daily work begins. Electrical corporation conducts refresher training on wildfire risk and work aspects for all relevant employees at least once per year.	No additional requirements beyond level 3

Vegetation personnel training and quality		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Level of sophistication	Content covered by training	Electrical corporation training content does not address wildfire risk related conditions and work content.	Electrical corporation training content includes the following: 1. Wildfire related conditions and work aspects expected to be encountered in the field. 2. Process for reporting ignitions caused by workers or in the immediate vicinity of workers. 3. Procedures and protocols for basic vegetation inspections.	Electrical corporation training content includes the following: 1. Wildfire related conditions and work aspects expected to be encountered in the field. 2. Process for reporting ignitions caused by workers or in the immediate vicinity of workers. 3. Procedures and protocols for basic and detailed vegetation inspections. 4. Use of specialized equipment (e.g., LiDAR and drones) for inspecting vegetation conditions that increase wildfire risk.	Electrical corporation training content includes the following: 1. Wildfire related conditions and work aspects expected to be encountered in the field. 2. Process for reporting ignitions caused by workers or in the immediate vicinity of workers. 3. Procedures and protocols for basic and detailed vegetation inspections. 4. Use of specialized equipment (e.g., LiDAR and drones) for inspecting vegetation conditions that increase wildfire risk. 5. Suppression of ignitions caused by workers or in the immediate vicinity of workers. 6. Simulated inspections in controlled environments with known reportable conditions.	Electrical corporation training content includes the following: 1. Wildfire related conditions and work aspects expected to be encountered in the field. 2. Process for reporting ignitions caused by workers or in the immediate vicinity of workers. 3. Procedures and protocols for basic and detailed vegetation inspections. 4. Use of specialized equipment (e.g., LiDAR and drones) for inspecting vegetation conditions that increase wildfire risk. 5. Suppression of ignitions caused by workers or in the immediate vicinity of workers. 6. Simulated inspections in controlled environments with known reportable conditions.

Vegetation personnel training and quality		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
QA/QC	Verification of the effectiveness of personnel training.	Results of post treatment inspections and audits are not used to inform training of personnel	Results of post treatment inspections and audits are used to identify systematic deficiencies, and recommend training for electrical corporation vegetation management personnel based on weaknesses Vegetation personnel drills are conducted with pass/fail criteria	Results of post treatment inspections and audits are used to identify systematic deficiencies and recommend training for electrical corporation and contractor vegetation personnel based on weaknesses. Vegetation personnel drills are conducted with pass/fail criteria and at least 75% of drills are passed	Results of post treatment inspections and audits are used to identify systematic deficiencies and recommend training for electrical corporation, contractor, and subcontractor vegetation management personnel based on weaknesses. Results of post training assessments and audits are used to identify systematic deficiencies and recommend modifications to training material for electrical corporation vegetation management personnel based on weaknesses. Vegetation personnel drills are conducted with pass/fail criteria and at least 75% of drills are passed Vegetation personnel drills are conducted at least once annually	Results of post treatment inspections and audits are used to identify systematic deficiencies, grade individuals, and recommend personalized pre-made and tested training for individual electrical corporation, contractor, and subcontractor employees based on weaknesses. Results of post training assessments and audits are used to identify systematic deficiencies, and recommend modifications to training material for electrical corporation vegetation management personnel based on weaknesses. Vegetation personnel drills are conducted with pass/fail criteria and at least 95% of drills are passed Vegetation personnel drills are conducted at least once annually

C.5.5 E. Grid Operations and Protocols

C.5.5.1 22. Protective equipment and device settings

Protective equipment and device settings		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation	The degree of automation used in setting thresholds for grid elements and protective equipment.	Electrical corporation does not automatically set sensitivity of grid elements and protective equipment.	Electrical corporation has multiple sets of thresholds for grid elements and protective equipment programmed locally at the device	Electrical corporation has multiple sets of thresholds for grid elements and protective equipment selected remotely	Electrical corporation has multiple sets of thresholds for grid elements and protective equipment automatically selected remotely based on RFW and area-wide fuel moisture conditions	Electrical corporation has multiple sets of thresholds for grid elements and protective equipment automatically selected remotely based on RFW and fuel moisture conditions on individual circuit segments

Protective equipment and device settings		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Learning and improvement	The degree to which Electrical corporation exchanges on a regular basis best practices and lessons learned with other California electrical corporations and implements information from other electrical corporations regarding the utilization and operation of protective equipment.	Electrical corporation has no procedures for sharing or receiving best practices and lessons learned regarding the utilization and operation of protective equipment with or from other California electrical corporations.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the utilization and operation of protective equipment. Electrical corporation procedures include at least 1 of the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the utilization and operation of protective equipment. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the utilization and operation of protective equipment.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the utilization and operation of protective equipment. Electrical corporation procedures include at least 2 of the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the utilization and operation of protective equipment. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the utilization and operation of protective equipment.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the utilization and operation of protective equipment. Electrical corporation procedures include at least 3 of the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the utilization and operation of protective equipment. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the utilization and operation of protective equipment.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the utilization and operation of protective equipment. Electrical corporation procedures include all the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the utilization and operation of protective equipment. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the utilization and operation of protective equipment.

Protective equipment and device settings		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Level of sophistication	The amount of information used to determine appropriate thresholds for protective devices and implementation	Electrical corporation does not consider current wildfire threat conditions for setting appropriate fault thresholds for protective devices.	Electrical corporation does appropriately adjust control settings on protective devices for high wildfire threat weather conditions. Electrical corporation monitors and documents fault events that occur. Electrical corporation records data on the effectiveness of adjusted control settings.	Electrical corporation does appropriately adjust control settings on protective devices for high wildfire threat weather conditions. Electrical corporation monitors and documents fault events that occur. Electrical corporation records data on the effectiveness of adjusted control settings and continuously improves setting thresholds.	Electrical corporation does appropriately adjust control settings on protective devices **based on predictive risk modeling** for high wildfire threat weather conditions. Electrical corporation monitors and documents fault events that occur. Electrical corporation records data on the effectiveness of adjusted control settings and continuously improves setting thresholds.	No additional requirements beyond level 3
QA/QC	The amount of review conducted of the policies, procedures, and conditions used for grid elements and protective equipment	Policies and procedures for determining and applying thresholds of grid elements and protective equipment as well as inspecting equipment following de-energization do not undergo SME review.	Policies and procedures for determining and applying thresholds of grid elements and protective equipment as well as inspecting equipment following de-energization undergo SME review at least **once per year**	No additional requirements beyond level 1	Policies and procedures for determining and applying thresholds of grid elements and protective equipment as well as inspecting equipment following de-energization undergo SME review at least **once per 6 months**	Policies and procedures for determining and applying thresholds of grid elements and protective equipment as well as inspecting equipment following de-energization undergo SME review at least **once per quarter**
Spatial granularity	The fraction and location of circuits protected by fast protective equipment within an electrical corporation's service area	Electrical corporation does not incorporate fast protective equipment into grid	No additional requirements beyond level 0	Electrical corporation incorporates fast protective equipment into **50% grid within HFTDs**	Electrical corporation incorporates fast protective equipment into **75% grid within HFTDs**	Electrical corporation incorporates fast protective equipment into **entire grid within HFTDs**

Protective equipment and device settings		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Standardized processes	The degree to which policies and procedures to set grid element and protective equipment sensitivities is standardized. This includes evaluation of conditions, determination of sensitivities, and re-energization of de-energized equipment	Electrical corporation does not have a predetermined protocol for determining the sensitivity of grid elements and protective equipment based on current fire risk conditions.	Electrical corporation does not have a predetermined protocol for determining the sensitivity of grid elements and protective equipment based on current fire risk conditions. Electrical corporation has procedures in place to inspect assets after de-energization by protective equipment.	No additional requirements beyond level 1	Electrical corporation has a predetermined protocol for determining the sensitivity of grid elements and protective equipment based on current fire risk conditions. Electrical corporation has procedures in place to inspect assets after de-energization by protective equipment.	Electrical corporation has automatic protocol for determining the sensitivity of grid elements and protective equipment based on current fire risk conditions. Electrical corporation has procedures in place to inspect assets after de-energization by protective equipment as well as when protective equipment causes intermittent de-energization.

C.5.5.2 23. Incorporation of ignition risk factors in grid control

Incorporation of ignition risk factors in grid control		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Anticipation	The level to which the electrical corporation uses historical operating details to inform grid operation and health.	Electrical corporation does not consider operating history when determining the left expectancy of equipment.	No additional requirements beyond level 0	Electrical corporation uses predictive modeling to shorten the expected life of equipment based on documented grid operating history Electrical corporation uses data on faults to prioritize response on individual circuits in high-risk areas.	Electrical corporation uses predictive modeling to shorten the expected life of equipment based on documented grid operating history and replaces the equipment before predicted failure Electrical corporation uses data on faults to prioritize response on individual circuits in high-risk areas.	No additional requirements beyond level 3
Documentation and disclosures	The ability of the electrical corporation to document the operational history of equipment, particularly when operating above nameplate capacity	Electrical corporation does not record when operating equipment above current carrying capacity	Electrical corporation tracks and documents electric operational history of circuits when operating equipment above current carrying capacity at the circuit level	No additional requirements beyond level 1	Electrical corporation tracks and documents electric operational history of assets continuously and flags when ratings are exceeded.	No additional requirements beyond level 3

Incorporation of ignition risk factors in grid control		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Learning and improvement	The degree to which Electrical corporation exchanges on a regular basis best practices and lessons learned with other California electrical corporations and implements information from other electrical corporations regarding the use of ignition risk factors in grid control.	Electrical corporation has no procedures for sharing or receiving best practices and lessons learned regarding the use of ignition risk factors in grid control with or from other California electrical corporations.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the use of ignition risk factors in grid control. Electrical corporation procedures include at least 1 of the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the use of ignition risk factors in grid control. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the use of ignition risk factors in grid control.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the use of ignition risk factors in grid control. Electrical corporation procedures include at least 2 of the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the use of ignition risk factors in grid control. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the use of ignition risk factors in grid control.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the use of ignition risk factors in grid control. Electrical corporation procedures include at least 3 of the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the use of ignition risk factors in grid control. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the use of ignition risk factors in grid control.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the use of ignition risk factors in grid control. Electrical corporation procedures include all the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the use of ignition risk factors in grid control. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the use of ignition risk factors in grid control.

Incorporation of ignition risk factors in grid control		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
QA/QC	The amount of SME review conducted on the processes and models used in grid control	Process for wildfire risk incorporation and predictive modeling of equipment expected life are not reviewed by SME	No additional requirements beyond level 0	Process for incorporating wildfire risk in determination of electric control limits beyond current carrying capacity undergoes SME review at least once per year.	Process for incorporating wildfire risk in determination of electric control limits beyond equipment current carrying capacity undergoes SME review at least once per year. Predictive model used for shortening the expected life of equipment undergoes SME review at least once per year.	Process for incorporating wildfire risk in determination of electric control limits beyond equipment current carrying capacity undergoes SME review at least once per 6 months. Predictive model used for shortening the expected life of equipment undergoes SME review at least once per 6 months.
Standardized processes	The amount of standardization of grid operation control procedures and the extent to which equipment is operated beyond nameplate capacity.	Electrical corporation does not have process for incorporating wildfire risk in determination of electric control limits beyond equipment nameplate capacities.	Electrical corporation has a clearly defined process for incorporating wildfire risk in determination of electric control limits beyond equipment nameplate capacities	No additional requirements beyond level 1	No additional requirements beyond level 1	Equipment is never operated above nameplate capacity within HFTD areas

C.5.5.3 24. PSPS operating model

PSPS operating model		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Effectiveness	The amount and effectiveness of communication to the community about PSPS events as well as the amount of support provided by the electrical corporation to the community to mitigate PSPS impacts	Electrical corporation communicates upcoming PSPS events to <95% of affected customers and <99% of medical baseline customers. Electrical corporation website goes offline during communication about PSPS events or during PSPS events. Electrical corporation does not provide resources to mitigate PSPS impact to customers.	Electrical corporation communicates upcoming PSPS events to >95% of affected customers and >99% of medical baseline customers. Electrical corporation website remains online during communication about PSPS events and during the PSPS events. Electrical corporation provides resources to mitigate PSPS impact to all customers including water and phone charging.	Electrical corporation communicates upcoming PSPS events to >98% of affected customers and >99.5% of medical baseline customers. Electrical corporation website remains online during communication about PSPS events and during the PSPS events. Electrical corporation has fewer than 0.5% of customers complain of lack of communication. Electrical corporation provides resources to mitigate PSPS impact to all customers including water and phone charging.	Electrical corporation communicates upcoming PSPS events to >99% of affected customers and >99.9% of medical baseline customers. Electrical corporation website remains online during communication about PSPS events and during the PSPS events. Electrical corporation has fewer than 0.5% of customers complain of lack of communication. Electrical corporation provides resources to mitigate PSPS impact to all customers including water and phone charging. Electrical corporation provides additional resources to vulnerable and other select customers to mitigate PSP impact (such as backup generators and batteries).	Electrical corporation communicates upcoming PSPS events to >99.9% of affected customers and 100% of medical baseline customers. Electrical corporation website remains online during communication about PSPS events and during the PSPS events. Electrical corporation has fewer than 0.5% of customers complain of lack of communication. Electrical corporation provides resources to mitigate PSPS impact to all customers including water and phone charging. Electrical corporation provides additional resources to vulnerable and other select customers to mitigate PSP impact (such as backup generators and batteries).

PSPS operating model		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Learning and improvement	The degree to which Electrical corporation exchanges on a regular basis best practices and lessons learned with other California electrical corporations and implements information from other electrical corporations regarding PSPS implementation.	Electrical corporation has no procedures for sharing or receiving best practices and lessons learned regarding the effective implementation PSPS with or from other California electrical corporations.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the effective implementation PSPS.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the effective implementation PSPS. Electrical corporation procedures include at least 2 of the following: 1. Actively seeking information from and providing information to other electrical corporations. 2. Has a consistent format and venue/medium through which information is exchanged. 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the effective implementation PSPS. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the effective implementation PSPS.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the effective implementation PSPS. Electrical corporation procedures include all the following: 1. Actively seeking information from and providing information to other electrical corporations. 2. Has a consistent format and venue/medium through which information is exchanged. 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the effective implementation PSPS. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the effective implementation PSPS.	No additional requirements beyond level 3

PSPS operating model		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Level of sophistication	The factors used in determining whether to initiate a PSPS as well as frequency of PSPS events initiated by the electrical corporation	Electrical corporation has more than 1 hour of average PSPS per customer per year.	Electrical corporation has less than 1 hour of average PSPS per customer per year. Electrical corporation considers ignition likelihood associated with upcoming conditions in initiating a PSPS event	Electrical corporation has less than 0.5 hours of average PSPS per customer per year. Electrical corporation considers overall PSPS risk to general population in initiating a PSPS event	Electrical corporation has less than 0.25 hours of average PSPS per customer per year. Electrical corporation considers overall PSPS risk to general population as well as critical facilities and vulnerable populations in initiating a PSPS event. Electrical corporation maintains grid in a sufficiently low risk condition to only require PSPS events due to damaged equipment, contact with a foreign object, or maintain safety of suppression and other personnel.	Electrical corporation has less than 0.1 hours of average PSPS per customer per year. Electrical corporation considers overall PSPS risk to general population as well as critical facilities and vulnerable populations in initiating a PSPS event. Electrical corporation maintains grid in a sufficiently low risk condition to only require PSPS events due to damaged equipment, contact with a foreign object, or maintain safety of suppression and other personnel. PSPS events are conducted such that de-energized circuits have sufficient redundancy to create not disruption in energy supply to customers.
QA/QC	The amount and frequency of material regarding PSPS initiation that is reviewed by SMEs.	Policies and procedures as well as ignition and risk thresholds to initiate a PSPS do not undergo SME review. SME review is conducted as part of PSPS initiation decisions	No additional requirements beyond level 0	Policies and procedures as well as risk thresholds used to initiate a PSPS event undergo SME review at least once per year.	No additional requirements beyond level 2	Policies and procedures as well as risk thresholds used to initiate a PSPS event undergo SME review at least once per year and after every PSPS event.
Standardized processes	The level of standardization for thresholds and conditions used to initiate a PSPS event	Electrical corporation has no well-defined and clearly explained thresholds and conditions for initiation PSPS	Electrical corporation has explicitly and well-defined policies, thresholds, and conditions for PSPS initiation	No additional requirements beyond level 1	No additional requirements beyond level 1	No additional requirements beyond level 1

PSPS operating model		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Validation	The ability of the electrical corporation to accurately initiate or not initiate PSPS events when conditions warrant	Electrical corporation PSPS events are initiated with more than 50% of events occurring when actual conditions would not warrant a PSPS.	Electrical corporation PSPS events are appropriately initiated with fewer than 50% of events occurring when actual conditions would not warrant a PSPS	Electrical corporation PSPS events are appropriately initiated with fewer than 33% of events occurring when actual conditions would not warrant a PSPS	Electrical corporation PSPS events are appropriately initiated with fewer than 25% of events occurring when actual conditions would not warrant a PSPS	Electrical corporation PSPS events are appropriately initiated with fewer than 10% of events occurring when actual conditions would not warrant a PSPS

C.5.5.4 25. Protocols for PSPS re-energization

Protocols for PSPS re-energization		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation	The degree of advanced equipment and techniques used in inspecting the lines prior to re-energization.	Electrical corporation uses only manual processes to inspect de-energized circuits prior to re-energization.	No additional requirements beyond level 0	Electrical corporation uses automated processes (such as drones or LiDAR) to inspect at least 33% of de-energized circuits prior to re-energization.	Electrical corporation uses automated processes (such as drones or LiDAR) to inspect at least 66% of de-energized circuits prior to re-energization.	Electrical corporation uses automated processes (such as drones or LiDAR) to inspect at least 90% of de-energized circuits prior to re-energization.
Effectiveness	The amount and effectiveness of communication to the community about PSPS re-energization as well as the amount of support provided by the electrical corporation to the community to mitigate PSPS impacts	Electrical corporation does not communicate re-energization process and timeline with owners of non-electrical corporation overhead distribution equipment.	Electrical corporation notifies owners of non-electrical corporation overhead distribution equipment of re-energization process and timeline to help prevent backfeed of power from these systems in HFTD areas.	No additional requirements beyond level 1	Electrical corporation notifies owners of non-electrical corporation overhead distribution equipment of re-energization process and timeline to help prevent backfeed of power from these systems over entire service territory	No additional requirements beyond level 3
Frequency	The amount of delay in communication to the community about PSPS re-energization.	Electrical corporation requires more than 24 hours after conditions requiring PSPS have ended to restore service to the grid.	Electrical corporation restores service to the grid within 24 hours of conditions returning below electrical corporation's PSPS threshold.	Electrical corporation restores service to the grid within 12 hours of conditions returning below electrical corporation's PSPS threshold.	Electrical corporation restores service to the grid within 4 hours of conditions returning below electrical corporation's PSPS threshold.	Electrical corporation restores service to the grid within 2 hours of conditions returning below electrical corporation's PSPS threshold.

Protocols for PSPS re-energization		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Learning and improvement	The degree to which Electrical corporation exchanges on a regular basis best practices and lessons learned with other California electrical corporations and implements information from other electrical corporations regarding PSPS re-energization.	Electrical corporation has no procedures for sharing or receiving best practices and lessons learned regarding the effective implementation PSPS with or from other California electrical corporations.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the effective implementation PSPS. Electrical corporation procedures include at least 1 of the following: 1. Actively seeking information from and providing information to other electrical corporations. 2. Has a consistent format and venue/medium through which information is exchanged. 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the effective implementation PSPS. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the effective implementation PSPS.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the effective implementation of PSPS. Electrical corporation procedures include at least 2 of the following: 1. Actively seeking information from and providing information to other electrical corporations. 2. Has a consistent format and venue/medium through which information is exchanged. 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the effective implementation PSPS. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the effective implementation PSPS.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the effective implementation of PSPS. Electrical corporation procedures include at least 3 of the following: 1. Actively seeking information from and providing information to other electrical corporations. 2. Has a consistent format and venue/medium through which information is exchanged. 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the effective implementation PSPS. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the effective implementation PSPS.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding the effective implementation of PSPS. Electrical corporation procedures include all the following: 1. Actively seeking information from and providing information to other electrical corporations. 2. Has a consistent format and venue/medium through which information is exchanged. 3. Participation in annual benchmarking exercises to identify areas of improvement regarding the effective implementation PSPS. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding the effective implementation PSPS.
Level of sophistication	The level of inspections of de-energized circuits the Electrical corporation performs prior to re-energization	Electrical corporation does not conduct adequate inspections of de-energized circuits prior to re-energization.	Electrical corporation performs adequate inspections of de-energized circuits prior to re-energization	No additional requirements beyond level 1	No additional requirements beyond level 1	No additional requirements beyond level 1

Protocols for PSPS re-energization		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
QA/QC	The amount and frequency of material regarding PSPS re-energization that is reviewed by SMEs.	Electrical corporation does not review after-event inspection procedures and causes after-event ignitions during re-energization.	Electrical corporation performs SME review of after-event inspection procedures at least once per year. Electrical corporation causes at least 1 after-event ignition during re-energization	Electrical corporation performs SME review of after-event inspection procedures at least once per year. Electrical corporation causes 0 after-event ignitions during re-energization.	No additional requirements beyond level 2	No additional requirements beyond level 2

C.5.5.5 26. Ignition prevention and suppression

Ignition prevention and suppression		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Documentation and disclosures	The electrical corporation shares internally developed and adopted ignition and suppression activities and procedures with other electrical corporations.	Electrical corporation has no procedures for sharing or receiving best practices and lessons learned regarding ignition prevention and suppression with or from other California electrical corporations.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding ignition prevention and suppression. Electrical corporation procedures include at least 1 of the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding ignition prevention and suppression. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding ignition prevention and suppression.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding ignition prevention and suppression. Electrical corporation procedures include at least 2 of the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding ignition prevention and suppression. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding ignition prevention and suppression.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding ignition prevention and suppression. Electrical corporation procedures include at least 3 of the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding ignition prevention and suppression. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding ignition prevention and suppression.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding ignition prevention and suppression. Electrical corporation procedures include all the following: 1. Actively seeking information from and providing information to other electrical corporations 2. Has a consistent format and venue/medium through which information is exchanged 3. Participation in annual benchmarking exercises to identify areas of improvement regarding ignition prevention and suppression. 4. Standard process for testing applicability of best practices and lessons learned of other electrical corporations regarding ignition prevention and suppression.

Ignition prevention and suppression		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Level of sophistication	The Electrical corporation has capabilities of controlling any ignitions on-site or provides rapid real-time reporting of ignition events.	Electrical corporation does not provide workers with communication or suppression tools to report and suppress ignitions caused by workers or in the vicinity of workers.	Electrical corporation provides communication equipment tools to immediate report ignitions caused by workers or in the vicinity of workers.	Electrical corporation provides communication equipment tools to immediate report ignitions caused by workers or in the vicinity of workers. Electrical corporation provides suppression tools to immediate suppress ignitions caused by workers or in the vicinity of workers.	Electrical corporation provides communication equipment tools that function without cell reception to immediate report ignitions caused by workers or in the vicinity of workers. Electrical corporation provides a variety of suppression tools to immediate suppress ignitions caused by workers or in the vicinity of workers.	Electrical corporation provides communication equipment tools that function without cell reception to immediate report ignitions caused by workers or in the vicinity of workers and requires contractors and subcontractors to do the same. Electrical corporation provides a variety of suppression tools to immediate suppress ignitions caused by workers or in the vicinity of workers.
Standardized processes	The Electrical corporation process for asset and vegetation management Teams is clear, explicit, and standardized on wildfire avoidance, suppression, and reporting.	Electrical corporation has no policies dictating the role of personnel in reporting and suppressing ignitions.	Electrical corporation has explicitly defined policies and procedures dictating the role of electrical corporation employees at the site of ignition.	Electrical corporation has explicitly defined policies and procedures dictating the role of electrical corporation, contractor, and subcontractor employees at the site of ignition.	No additional requirements beyond level 2	Electrical corporation has explicitly defined policies and procedures dictating the role of electrical corporation, contractor, and subcontractor employees at the site of ignition. Electrical corporation has fire suppression and safety teams on site during asset and vegetation management work in HFTD areas.

C.5.6 F. Emergency Preparedness

C.5.6.1 27. Wildfire and PSPS emergency & disaster preparedness plan

Wildfire and PSPS emergency & disaster preparedness plan		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Coordination and integration	Development and integration of wildfire- and PSPS-specific emergency and disaster preparedness plans, policies, practices, and procedures throughout the disaster life cycle (i.e., prevention, mitigation, response, and recovery) into the electrical corporation's overall Emergency and Disaster Preparedness Plan and in the equivalent plans for Public Safety Partners	The electrical corporation does not have wildfire- and PSPS-specific emergency and disaster preparedness plans, policies, practices, and procedures	The electrical corporation has wildfire- and PSPS-specific emergency and disaster preparedness plans, policies, practices and procedures for prevention, mitigation, and response in compliance with GO 166 and SEMS The electrical corporation has an all-hazards approach to its Emergency and Disaster Preparedness Plan, but does not fully integrate wildfire- and PSPS-specific features	The electrical corporation has wildfire- and PSPS-specific emergency and disaster preparedness plans, policies, practices, and procedures throughout the disaster life cycle (i.e., prevention, mitigation, response, and **recovery**) and in compliance with GO 166, SEMs **and compatible with NIMS** The electrical corporation adopts a **hazard specific** approach to Emergency and Disaster Preparedness and Planning. Wildfire- and PSPS-specific preparedness plans, policies, practices, and procedures are **fully integrated** into electrical corporation's overall emergency and disaster operations, systems, and protocols.	The electrical corporation has wildfire- and PSPS-specific emergency and disaster preparedness plans, policies, practices, and procedures throughout the disaster life cycle (i.e., prevention, mitigation, response, and **recovery**) and in compliance with GO 166, SEMs **and compatible with NIMS** The electrical corporation adopts a **hazard specific** approach to Emergency and Disaster Preparedness and Planning. Wildfire- and PSPS-specific preparedness plans, policies, practices, and procedures are **fully integrated** into the electrical corporation's overall emergency and disaster operations, systems, and protocols. The electrical corporation coordinates the integration of their wildfire- and PSPS-specific emergency and disaster preparedness plans into **50-75%** of all relevant public safety partner's emergency plans within their service territory	The electrical corporation has wildfire- and PSPS-specific emergency and disaster preparedness plans, policies, practices, and procedures throughout the disaster life cycle (i.e., prevention, mitigation, response, and **recovery**) and in compliance with GO 166, SEMs **and compatible with NIMS** The electrical corporation adopts a **hazard specific** approach to Emergency and Disaster Preparedness and Planning. Wildfire- and PSPS-specific preparedness plans, policies, practices, and procedures are **fully integrated** into the electrical corporation's overall emergency and disaster operations, systems, and protocols. The electrical corporation coordinates the integration of their wildfire- and PSPS-specific emergency and disaster preparedness plans into **75-100%** of all relevant public safety partner's emergency plans within their service territory The electrical corporation takes a primary partner role in planning, coordinating, and integrating plans across all public safety partners in their service territory including state and tribal partners

Wildfire and PSPS emergency & disaster preparedness plan		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Documentation and disclosures	Level of detail of Information documented regarding wildfire- and PSPS-specific emergency and disaster preparedness plans. Higher maturity is achieved when detailed information such as operational procedures, policies, protocols, systems used before, during and after wildfire and PSPS incidents is documented. In addition, mature systems document personnel roles and responsibilities (internal and external), training, operational and discussion-based exercises (drills, simulations, tabletop exercises), and verification of completed coordination efforts, training, exercises, and plan revisions.	The information documented regarding wildfire- and PSPS-specific emergency and preparedness plan does not meet the minimum expectations or requirements.	The information documented at minimum includes the following elements: 1. Standard wildfire- and PSPS-specific emergency operational policies, practices, and procedures before, during and after an incident 2. Physical emergency response and recovery systems used (e.g., detection & notification systems, communications systems) 3. Training/simulation exercises and programs 4. Personnel roles and responsibilities 5. Verification of coordination efforts with Public Safety Partners 6. Verification of completed training and exercises 7. Verification of updated plan 8. Gaps, limitations, and improvement areas with remedial action plans.	The information documented at minimum includes the following elements: 1. Standard wildfire- and PSPS-specific emergency operational policies, practices, and procedures before, during and after an incident 2. Physical emergency response and recovery systems used (e.g., detection & notification systems, communications systems) 3. Training/simulation exercises and programs 4. Personnel roles and responsibilities 5. Verification of coordination efforts with Public Safety Partners 6. Verification of completed training and exercises 7. Verification of updated plan 8. Gaps, limitations, and improvement areas with remedial action plans. 9. Integration of internal lessons-learned 10. Feedback from external third-party evaluation	The information documented at minimum includes the following elements: 1. Standard wildfire- and PSPS-specific emergency operational policies, practices, and procedures before, during and after an incident 2. Physical emergency response and recovery systems used (e.g., detection & notification systems, communications systems) 3. Training/simulation exercises and programs 4. Personnel roles and responsibilities 5. Verification of coordination efforts with Public Safety Partners 6. Verification of completed training and exercises 7. Verification of updated plan 8. Gaps, limitations, and improvement areas with remedial action plans. 9. Integration of internal lessons-learned 10. Feedback from external third-party evaluation 11. Actions taken to incorporate periodic external third-party feedback	The information documented at minimum includes the following elements: 1. Standard wildfire- and PSPS-specific emergency operational policies, practices, and procedures before, during and after an incident 2. Physical emergency response and recovery systems used (e.g., detection & notification systems, communications systems) 3. Training/simulation exercises and programs 4. Personnel roles and responsibilities 5. Verification of coordination efforts with Public Safety Partners 6. Verification of completed training and exercises 7. Verification of updated plan 8. Gaps, limitations, and improvement areas with remedial action plans. 9. Integration of internal lessons-learned 10. Feedback from external third-party evaluation 11. Actions taken to incorporate periodic external third-party feedback 12. Data collected from drills and after-action reports, and integrated into updated plans

<table>
<tr><th colspan="2">Wildfire and PSPS emergency & disaster preparedness plan</th><th colspan="5">Maturity Level</th></tr>
<tr><th>Scoring Philosophy</th><th>Scoring Description</th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th></tr>
<tr>
<td>Frequency</td>
<td>The frequency by which the electrical corporation evaluates, maintains, and updates its wildfire- and PSPS-specific emergency and disaster preparedness policies, practices, procedures, and protocols. This includes frequency for activities such as plan revisions, training, drills and other exercises, integration, and coordination with public safety partners.</td>
<td>The electrical corporation does not have wildfire- and PSPS-specific emergency and disaster preparedness plans, policies, practices, and procedures

Or

The electrical corporation evaluates, maintains, and updates its wildfire- and PSPS-specific emergency and disaster preparedness plans, policies, practices, and procedures at a frequency greater than 2-year intervals</td>
<td>The electrical corporation evaluates, maintains, and updates its wildfire- and PSPS-specific emergency and disaster preparedness plans, policies, practices, and procedures every 2 years

The electrical corporation performs the following activities at least once annually:
• Personnel and contractor training
• Internal discussion-based and operations-based exercises (e.g., drills, simulations, and tabletop exercises)
• Review of after-action reports (internal and external)
• Review and integration of feedback from internal discussion-based and operations-based exercises</td>
<td>The electrical corporation evaluates, maintains, and updates its wildfire- and PSPS-specific emergency and disaster preparedness plans, policies, practices, and procedures every 2 years

The electrical corporation performs the following activities at least once annually, immediately before core fire season(s):
• Personnel and contractor training
• Internal discussion-based and operations-based exercises (e.g., drills, simulations, and tabletop exercises)
• Review of after-action reports (internal and external)
• Review and integration of feedback from internal discussion-based and operations-based exercises

The electrical corporation performs the following activities at least once annually, immediately after core fire season(s):
• Review and integrate public feedback on wildfire- and PSPS-specific emergency preparedness activities (e.g., public notifications, emergency services)
• Seek feedback from public safety partners on</td>
<td>The electrical corporation evaluates, maintains, and updates its wildfire- and PSPS-specific emergency and disaster preparedness plans, policies, practices, and procedures every 2 years

The electrical corporation performs the following activities at least once annually, immediately before core fire season(s):
• Personnel and contractor training
• Internal discussion-based and operations-based exercises (e.g., drills, simulations, and tabletop exercises)
• Review of after-action reports (internal and external)
• Review and integration of feedback from internal discussion-based and operations-based exercises

The electrical corporation performs the following activities at least once annually, immediately after core fire season(s):
• Review and integrate public feedback on wildfire- and PSPS-specific emergency preparedness activities (e.g., public notifications, emergency services)
• Seek feedback from public safety partners on</td>
<td>The electrical corporation evaluates, maintains, and updates its wildfire- and PSPS-specific emergency and disaster preparedness plans, policies, practices, and procedures every 2 years

The electrical corporation performs the following activities at least once annually, immediately before core fire season(s):
• Personnel and contractor training
• Internal discussion-based and operations-based exercises (e.g., drills, simulations, and tabletop exercises)
• Review of after-action reports (internal and external)
• Review and integration of feedback from internal discussion-based and operations-based exercises

The electrical corporation performs the following activities at least once annually, immediately after core fire season(s):
• Review and integrate public feedback on wildfire- and PSPS-specific emergency preparedness activities (e.g., public notifications, emergency services)
• Seek feedback from public safety partners on preparedness plan revisions
• Reviews MOAs and MAAs with key public safety</td>
</tr>
</table>

Wildfire and PSPS emergency & disaster preparedness plan		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
				preparedness plan revisions	preparedness plan revisions • Reviews MOAs and MAAs with key public safety partners for any required updates The electrical corporation reviews and provides feedback on public safety partners' Emergency and Disaster Preparedness plans to be in-line with the electrical corporations plans **every 5 years**	partners for any required updates The electrical corporation reviews and provides feedback on public safety partners' Emergency and Disaster Preparedness plans to be in-line with the electrical corporations plans **every 2 years**
Subject matter expert (SME) evaluation /(QA/QC)	Subject Matter Expert (SME) and third-party entities evaluate wildfire- and PSPS-specific emergency operations and disaster preparedness plans.	No Subject Matter Expert (SME) and third-party entities evaluate of wildfire- and PSPS-specific emergency operations and disaster preparedness plans.	Wildfire- and PSPS-emergency operations and disaster preparedness plans are assessed through subject matter expert (SME) review at least once per year.	Wildfire- and PSPS-emergency operations and disaster preparedness plans are assessed through subject matter expert (SME) review at least once per year. External third-party evaluation of plans every 5 years 50-75% of state, county, city, and tribal public safety partners evaluate the plans once every 3 years	Wildfire emergency operations and disaster preparedness plans are assessed through subject matter expert (SME) review at least once per year **and after every catastrophic wildfire**. External third-party evaluation of plans every 5 years 50-75% of state, county, city, and tribal public safety partners evaluate the plans once **every 2 years**	Wildfire emergency operations and disaster preparedness plans are assessed through subject matter expert (SME) review at least once per year and after every catastrophic wildfire. External third-party evaluation of plans every 5 years **75-100%** of state, county, city, and tribal public safety partners evaluate the plans once **every 2 years** Electrical corporation SME partners review and evaluate plans once every 5 years

C.5.6.2 28. Collaboration and coordination with public safety partners

Collaboration and coordination with public safety partners		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Coordination and integration	Coordination of wildfire- and PSPS-specific electrical corporation emergency and disaster preparedness plans, policies, practices and procedures for response and recovery, with existing emergency and disaster preparedness practices and protocols with Public Safety Partners.	The electrical corporation does **not** have wildfire- and PSPS-specific emergency and disaster preparedness plans, policies, practices, and procedures Or Electrical corporation's wildfire- and PSPS-emergency operations and disaster preparedness plans are not coordinated with any Public Safety Partner	The electrical corporation coordinates the following aspects of their wildfire- and PSPS-emergency and disaster preparedness plans with relevant Public Safety Partners: • List of all relevant state, city, county and tribal agencies and key point(s)-of-contacts (e.g., operations, PIO, Emergency Director) with associated contact information • **50%** of relevant Public Safety Partners have provided consultation and/or verbal or written comments on electrical corporation's most recent plan • List of all relevant MOAs with all Public Safety Partners • **50%** of relevant Public Safety Partners' communication strategy (e.g., protocols, procedures, and systems) to inform public safety partners and other interconnected electrical corporation partners of wildfire, PSPS and re-energization incidents • **50%** of partner establish frequency of pre-arranged comms strategy reviews and updates	The electrical corporation coordinates the following aspects of their wildfire- and PSPS-emergency and disaster preparedness plans with relevant Public Safety Partners: • List of all relevant state, city, county and tribal agencies and key point(s)-of-contacts (e.g., operations, PIO, Emergency Director) with associated contact information • **50 - 75%** of relevant Public Safety Partners have provided consultation and/or verbal or written comments on electrical corporation's most recent plan • List of all relevant MOAs with all Public Safety Partners • **50-75%** of relevant Public Safety Partners' communication strategy (e.g., protocols, procedures, and systems) to inform public safety partners and other interconnected electrical corporation partners of wildfire, PSPS and re-energization incidents • **50-75%** of partner establish frequency of pre-arranged comms	The electrical corporation coordinates the following aspects of their wildfire- and PSPS-emergency and disaster preparedness plans with relevant Public Safety Partners: • List of all relevant state, city, county and tribal agencies and key point(s)-of-contacts (e.g., operations, PIO, Emergency Director) with associated contact information • **75 - 90%** of relevant Public Safety Partners have provided consultation and/or verbal or written comments on electrical corporation's most recent plan • List of all relevant MOAs with all Public Safety Partners • **75-90%** of relevant Public Safety Partners' communication strategy (e.g., protocols, procedures, and systems) to inform public safety partners and other interconnected electrical corporation partners of wildfire, PSPS and re-energization incidents • **75-90%** of partner establish frequency of pre-arranged comms	The electrical corporation coordinates the following aspects of their wildfire- and PSPS-emergency and disaster preparedness plans with relevant Public Safety Partners: • List of all relevant state, city, county and tribal agencies and key point(s)-of-contacts (e.g., operations, PIO, Emergency Director) with associated contact information • **99%** of relevant Public Safety Partners have provided consultation and/or verbal or written comments on electrical corporation's most recent plan • List of all relevant MOAs with all Public Safety Partners • **99%** of relevant Public Safety Partners' communication strategy (e.g., protocols, procedures, and systems) to inform public safety partners and other interconnected electrical corporation partners of wildfire, PSPS and re-energization incidents • **99%** of partner establish frequency of pre-arranged comms strategy reviews and updates

Collaboration and coordination with public safety partners		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
			Resources available for Mutual Aid Agreements	strategy reviews and updates Resources available for Mutual Aid Agreements	strategy reviews and updates Resources available for Mutual Aid Agreements	Resources available for Mutual Aid Agreements
Frequency	The frequency by which the electrical corporation evaluates, maintains, and updates its wildfire-, PSPS- and power restoration-specific interoperation communication strategies, procedures, and protocols interoperability with Public Safety Partners and other interconnected electrical corporations. This includes frequency for activities such as communication plan revisions, discussion-based and operational exercise schedules	The electrical corporation does **not coordinate** its wildfire-, PSPS- and power restoration- specific interoperation communication strategies, procedures, and protocols with Public Safety Partners and other interconnected electrical corporations Or The electrical corporation coordinates its wildfire-, PSPS and power-restoration-specific interoperation communication strategies, procedures, and protocols interoperability once every 5-years	The electrical corporation coordinates its wildfire-, PSPS and power-restoration-specific interoperation communication strategies, procedures, and protocols once **every 2 years** The electrical corporation performs the following activities at least once annually: • Identify and confirm interoperation communications protocols, practices, and procedures before, during and after an incident for all relevant Public Safety Partners and interconnected electrical corporations • Discussion-based and operations-based communications interoperability exercises (e.g., drills, simulations, and tabletop exercises) • Review of after-action reports (internal and external)	The electrical corporation coordinates its wildfire-, PSPS and power-restoration-specific interoperation communication strategies, procedures, and protocols once **every 2 years** The electrical corporation performs the following activities at least once annually, immediately before core fire season(s): • Identify and confirm interoperation communications protocols, practices, and procedures before, during and after an incident for all relevant Public Safety Partners and interconnected electrical corporations • Discussion-based and operations-based communications interoperability exercises (e.g., drills, simulations, and tabletop exercises) • Review of after-action reports (internal and external)	The electrical corporation coordinates its wildfire-, PSPS and power-restoration-specific interoperation communication strategies, procedures, and protocols once **every 2 years** The electrical corporation performs the following activities at least once annually, immediately before core fire season(s): • Identify and confirm interoperation communications protocols, practices, and procedures before, during and after an incident for all relevant Public Safety Partners and interconnected electrical corporations • Discussion-based and operations-based communications interoperability exercises (e.g., drills, simulations, and tabletop exercises) • Review of after-action reports (internal and external)	The electrical corporation coordinates its wildfire-, PSPS and power-restoration-specific interoperation communication strategies, procedures, and protocols once **a year** The electrical corporation performs the following activities at least once annually, immediately before core fire season(s): • Identify and confirm interoperation communications protocols, practices, and procedures before, during and after an incident for all relevant Public Safety Partners and interconnected electrical corporations • Discussion-based and operations-based communications interoperability exercises (e.g., drills, simulations, and tabletop exercises) • Review of after-action reports (internal and external)

Collaboration and coordination with public safety partners		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
			• Review and integration of feedback from external discussion-based and operations-based communications interoperability exercises	• Review and integration of feedback from external discussion-based and operations-based communications interoperability exercises The electrical corporation performs the following activities at least once annually, immediately after core fire season(s): • Seek feedback from public safety partners and interconnected electrical corporation partners on wildfire, PSPS and power restoration interoperation communications for timeliness, completeness, and reliability	• Review and integration of feedback from external discussion-based and operations-based communications interoperability exercises The electrical corporation performs the following activities at least once annually, immediately after core fire season(s): • Seek feedback from public safety partners and interconnected electrical corporation partners on wildfire, PSPS and power restoration interoperation communications for timeliness, completeness, and reliability • Reviews MOAs with key public safety partners and interconnected electrical corporations for any required updates	• Review and integration of feedback from external discussion-based and operations-based communications interoperability exercises The electrical corporation performs the following activities at least once annually, immediately after core fire season(s): • Seek feedback from public safety partners and interconnected electrical corporation partners on wildfire, PSPS and power restoration interoperation communications for timeliness, completeness, and reliability • Reviews MOAs with key public safety partners and interconnected electrical corporations for any required updates

C.5.6.3 29. Public emergency communication strategy

Public emergency communication strategy		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation	Levels of automation for monitoring and transmitting emergency information. This also includes frequency reporting updates based on near-real-time conditions	Emergency information monitoring and transmission are not automated.	Emergency information monitoring and transmission are partially automated (<50%). At least three (3) of the following parameters are determined and communicated automatically: 1. Detection and alarm for wildfire ignition 2. Location and extent of wildfire perimeter 3. Local wildfire settings (e.g., weather, RFW, climate data) 4. Electrical corporation emergency resources already deployed 5. Customers impacted and anticipated duration of power outages caused by wildfire and PSPS 6. Locations of support services 7. Instructions for emergency action 8. Accessibility and Translation of information into Spanish and 2-3 of the top languages in the service territory	Emergency information monitoring and transmission are partially automated (<50%). At least four (4) of the following parameters are determined and communicated automatically: 1. Detection and alarm for wildfire ignition 2. Location and extent of wildfire perimeter 3. Local wildfire settings (e.g., weather, RFW, climate data) 4. Electrical corporation emergency resources already deployed 5. Customers impacted and anticipated duration of power outages caused by wildfire and PSPS 6. Locations of support services 7. Instructions for emergency action 8. Accessibility and Translation of information into Spanish and 2-3 of the top languages in the service territory	Emergency information monitoring and transmission are mostly automated (>50%). At least five (5) of the following parameters are determined and communicated automatically: 1. Detection and alarm for wildfire ignition 2. Location and extent of wildfire perimeter 3. Local wildfire settings (e.g., weather, RFW, climate data) 4. Electrical corporation emergency resources already deployed 5. Customers impacted and anticipated duration of power outages caused by wildfire and PSPS 6. Locations of support services 7. Instructions for emergency action 8. Accessibility and Translation of information into Spanish and 2-3 of the top languages in the service territory	Emergency information monitoring and transmission are fully automated. Each of the following parameters are determined and communicated automatically: 1. Detection and alarm for wildfire ignition 2. Location and extent of wildfire perimeter 3. Local wildfire settings (e.g., weather, RFW, climate data) 4. Electrical corporation emergency resources already deployed 5. Customers impacted and anticipated duration of power outages caused by wildfire and PSPS 6. Locations of support services 7. Instructions for emergency action 8. Accessibility and Translation of information into Spanish and 2-3 of the top languages in the service territory
Coordination and integration	Coordination with public interest groups and Alerting Authority for timely, accurate, complete, and comprehensive public communication strategy(s) to inform essential customers and all community stakeholder groups of	Electrical corporation's public communication strategy for wildfires, outages due to wildfires and PSPS, and service restoration are not coordinated with any Alerting Authority or public interest groups.	The electrical corporation coordinates the following aspects of their communication strategy for wildfires, outages due to wildfires and PSPS, and service restoration with Alerting Authorities or public interest groups:	The electrical corporation coordinates the following aspects of their communication strategy for wildfires, outages due to wildfires and PSPS, and service restoration with Alerting Authorities or public interest groups:	The electrical corporation coordinates the following aspects of their communication strategy for wildfires, outages due to wildfires and PSPS, and service restoration with Alerting Authorities or public interest groups:	The electrical corporation coordinates the following aspects of their communication strategy for wildfires, outages due to wildfires and PSPS, and service restoration with Alerting Authorities or public interest groups:

Public emergency communication strategy		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
	wildfires, outages due to wildfires and PSPS, and service restoration before, during and after the incident		1. Roles and responsibilities for designing, preparing, and disseminating public communications before, during and after each incident type 2. Identification of essential customers and key community stakeholder groups across the electrical corporation's service territory 3. Understand the specific needs and communication methods required to effectively notify essential customers, medical baseline, and other key community stakeholder groups 4. Notification protocols, message objectives for each interest group 5. Available technical resources for public communication systems (e.g., radio, TV, social media) 6. Targeted messaging and diversity of communication methods per public stakeholder group and incident type. 7. Means to verify message receipt. 8. Gaps, limitations, and improvement areas with remedial action plans.	1. Roles and responsibilities for designing, preparing, and disseminating public communications before, during and after each incident type 2. **Detailed list** of essential customers and **all** key community stakeholder groups **by county/city** 3. Understand the specific needs and communication methods required to effectively notify essential customers, medical baseline and all community stakeholder groups, **with a particular focus on AFN and other vulnerable populations**. 4. **Locally relevant** notification protocols, message objectives for each interest group 5. **Locally** available technical resources for public communication systems (e.g., radio, TV, social media) 6. Targeted messaging and diversity of communication methods per public stakeholder group and incident type. 7. Assess and obtain feedback from Alerting Authorities, public interest groups, essential customers on timeliness, quality, and completeness of messaging. 8. Gaps, limitations, and improvement areas with remedial action plans.	1. Roles and responsibilities for designing, preparing, and disseminating public communications before, during and after each incident type 2. **Detailed list** of essential customers and **all** key community stakeholder groups **by county/city** 3. Understand the specific needs and communication methods required to effectively notify essential customers and all community stakeholder groups, **with a particular focus on AFN and other vulnerable populations**. 4. **Locally relevant** notification protocols, message objectives for each interest group 5. **Locally** available technical resources for public communication systems (e.g., radio, TV, social media) 6. Targeted messaging and diversity of communication methods per public stakeholder group and incident type. 7. Assess and obtain feedback from Alerting Authorities, public interest groups, essential customers on timeliness, quality, and completeness of messaging. 8. Gaps, limitations, and improvement areas with remedial action plans.	1. Roles and responsibilities for designing, preparing, and disseminating public communications before, during and after each incident type 2. **Detailed list** of essential customers and **all** key community stakeholder groups **by county/city** 3. Understand the specific needs and communication methods required to effectively notify essential customers and all community stakeholder groups, **with a particular focus on AFN and other vulnerable populations**. 4. **Locally relevant** notification protocols, message objectives for each interest group 5. **Locally** available technical resources for public communication systems (e.g., radio, TV, social media) 6. Targeted messaging and diversity of communication methods per public stakeholder group and incident type. 7. Assess and obtain feedback from Alerting Authorities, public interest groups, essential customers on timeliness, quality, and completeness of messaging. 8. Gaps, limitations, and improvement areas with remedial action plans.

Public emergency communication strategy		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
					9. Assess and verify that essential customers and community stakeholder groups not only received emergency notifications, but understood how to act	9. Assess and verify that essential customers and community stakeholder groups not only received the notifications, but understood how to act and then took appropriate action for all incident types
Documentation	Level of detail and comprehensiveness of public communication strategy to inform essential customers and all community stakeholder groups of wildfires, outages due to wildfires and PSPS, and service restoration before, during and after the incident types. Higher maturity is achieved when detailed information such as public communication strategies, policies, practices, and procedures used before, during and after wildfires, outages due to wildfires and PSPS events, and service restoration incidents are documented. In addition, mature systems identify key communication personnel (roles and responsibilities), key stakeholder groups and associated needs, methods and technologies for COMMS, messaging detail, coordination with Alerting Authorities, training, exercises, and system testing.	The information documented regarding communication strategies to inform essential customers and all community stakeholder groups of wildfires, outages due to wildfires and PSPS, and service restoration before, during and after an incident do not meet the minimum expectations or requirements.	The information documented at minimum includes the following elements: 1. Standard wildfire, outages due to wildfires and PSPS events, and service restoration operational policies, protocol, and procedures for communicating to the public before, during and after an incident 2. Physical public communication systems used (e.g., detection & notification systems, communications systems) 3. Targeted messaging and communication methods per public stakeholder group and incident type. 4. Personnel roles and responsibilities 5. Resiliency and redundancy of notification and communication systems and methods. 6. Training/simulation exercises and programs 7. Verification of coordination efforts with Public Safety Partners 8. Verification of completed training and exercises	The information documented at minimum includes the following elements: Same as Level 1, plus: 10. AFN and vulnerable population-specific communication methods and systems 11. Seek feedback from essential customers, AFN/vulnerable populations, and the general public on timeliness, accuracy, and completeness of messaging 12. Feedback from external third-party evaluation	The information documented at minimum includes the following elements: Same as Level 2, plus: 13. Actions taken to incorporate periodic external third-party feedback	The information documented at minimum includes the following elements: Same as Level 3, plus: 14. Data collected from drills and after-action reports, and integrated into updated plans

Public emergency communication strategy		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
			9. Gaps, limitations, and improvement areas with remedial action plans.			

Effectiveness	Degree to which public notifications and communication strategies, practices and protocols are not only timely, accurate and complete, but lead to increased awareness and risk-informed action during and after an emergency	Limited or poor communication before, during and after a wildfire, outages due to wildfires or PSPS, and service restoration
		
		No ability to measure effectiveness of public notification or communications during or after an emergency
			The following aspects of an electrical corporation's emergency notifications and communications to the public for wildfires, outages due to wildfires and PSPS, and service restoration are provided:
			
			1. Severe weather warnings and alerts (e.g., RFW)
			2. Location and extent of wildfire perimeter
			3. Public notification of wildfire incident immediately when there is an imminent threat to life, health, or property.
			4. Customers impacted, and anticipated duration of power outages caused by wildfire and PSPS within 4 hours of outage
			5. Public notification (i.e., warnings and alerts) of PSPS incidents no more than 2 days beforehand
			6. Locations and timing of power restoration at predefined intervals
			7. Locations in community for support services within 1 hour of wildfire detection; 2 days before PSPS incident
				The following aspects of an electrical corporation's emergency notifications and communications to the public for wildfires, outages due to wildfires and PSPS, and service restoration are provided:
				
				• Same as Level 1, plus:
				• Messaging is designed to be specific, consistent, confident, clear, and accurate per IPAWS
				• Provide redundancy and enhanced interoperability for the following:
				  ○ Loss of power
				  ○ Loss of cell towers or overloaded cell systems
				  ○ Internet outages
				  ○ Overloaded networks
				  ○ Cyber-attacks
				  ○ Ability of carriers to redistribute
				  ○ Overloaded infrastructure
				  ○ Cross-jurisdictional needs
				  ○ Availability of staffing to effectively
					The following aspects of an electrical corporation's emergency notifications and communications to the public for wildfires, outages due to wildfires and PSPS, and service restoration are provided:
					
					• Same as Level 2, plus
					• Adopting Integrated Public Warning Systems (IPAWS)
					• Applying 3-5 methods of communication:
					  ○ Telephonic alert system
					  ○ Email distribution
					  ○ Website override
					  ○ Internet-based services
					  ○ High-frequency radio
					  ○ Social media
					  ○ Opt-in features
					
					• AFN considerations (e.g., TTY/TTD, font size, color analyzer)
					• Conduct post-incident surveys and other forms of public feedback to assess timeliness, accuracy, and completeness of
						The following aspects of an electrical corporation's emergency notifications and communications to the public for wildfires, outages due to wildfires and PSPS, and service restoration are provided:
						
						• Same as Level 3, plus
						• Implement corrective plans based on public feedback survey

Public emergency communication strategy		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
			8. Instructions for emergency protective action and links to credible Public Safety Partners emergency communications and instructions (e.g., shelter-in-place, evacuation) within 30 min of wildfire detection; 2 days before PSPS incident 9. Accessibility and Translation of information into Spanish and 2-3 of the top languages in the service territory 10. Emergency notifications are limited to people at risk. 11. Delivery of warnings and alerts using various formats across multiple media platforms 12. Structure training and practice to minimize false alarms	manage and deploy systems	information of impacted populations	
Quality assurance and quality control (QA/QC)	Evaluation and verification of protocols to provide timely, accurate and complete public emergency communications for wildfires, PSPS and service restoration information to public safety partners and public interest groups	Maintenance, testing, and inspection of the physical communication-related systems that provide detection, alarm, notification, central monitoring, situational awareness, and transmission of "approved" reporting information are **never performed**.	Maintenance, testing, and inspection of the physical communication-related systems that provide detection, alarm, notification, central monitoring, situational awareness, and transmission of "approved" reporting information are performed at least **once a year**.	Maintenance, testing, and inspection of the physical communication-related systems that provide detection, alarm, notification, central monitoring, situational awareness, and transmission of "approved" reporting information are performed at least **twice a year**.	Maintenance, testing, and inspection of the physical communication-related systems that provide detection, alarm, notification, central monitoring, situational awareness, and transmission of "approved" reporting information are performed at least **monthly**.	Maintenance, testing, and inspection of the physical communication-related systems that provide detection, alarm, notification, central monitoring, situational awareness, and transmission of "approved" reporting information are performed at least **weekly**.
Spatial granularity	Granularity of reported public emergency notification and communication strategies, practices, and protocols.	Resolution of reported information, policies, practices, and protocols are evaluated and implemented at territory-wide resolution.	Resolution of reported data, practices, and protocols are evaluated and implemented at county level resolution.	Resolution of reported data, practices, and protocols are evaluated and implemented at city level resolution.	Resolution of reported data, practices, and protocols are evaluated and implemented at community level resolution.	Resolution of reported data, practices, and protocols are evaluated and implemented at neighborhood level resolution.

C.5.6.4 30. Preparedness and planning for service restoration

Preparedness and planning for service restoration		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Automation	Level of automation of safety checks.	Safety checks are not automated.	Safety checks are partially automated (<50%).	Safety checks are mostly automated (>=50%).	Safety checks are fully automated.	No additional requirements beyond level 3
Coordination and integration	Coordination and integration of re-energization and recovery plan with state/county/city agencies and interconnected power entities in the electrical corporation's service area. Mature plans are coordinated, maintained, and integrated into the emergency response and recovery plans of all relevant state, city, and county agencies, as well as associated, interconnected power entities in the electrical corporation's service area.	Electrical corporation's e-energization and recovery plan is not coordinated and integrated with any stakeholder's recovery plans.	Electrical corporation's e-energization and recovery plan is coordinated with at least 75-100% of state, county, and city agencies and all interconnected power entities in the electrical corporation's service area annually.	Electrical corporation's e-energization and recovery plan is coordinated with all state/county/city agencies and all interconnected power entities in the electrical corporation's service area annually.	Electrical corporation's e-energization and recovery plan is coordinated with all state/county/city agencies and all interconnected power entities in the electrical corporation's service area. The electrical corporation participates in drills to audit the viability and execution of plans across stakeholders annually	Electrical corporation's e-energization and recovery plan is coordinated with all state/county/city agencies and all interconnected power entities in the electrical corporation's service area. The electrical corporation participates in drills to audit the viability and execution of plans across stakeholders annually The electrical corporation takes a primary partner role in planning, coordinating, and integrating plans across stakeholders. The electrical corporation leads efforts to run annual drills.
Documentation and disclosures	Development and documentation of re-energization and recovery plan. Higher maturity is achieved when more elements are involved for decision-making during restoration and recovery plans as well as detailed explanation information is included.	The elements considered for the re-energization and recovery plan development and information documented do not meet the minimum expectations or requirements.	The elements considered for the re-energization and recovery plan development and information documented include the following: 1. Risk-informed decision-making framework 2. Detailed and actionable policies, procedures, and protocols for power restoration 3. Appropriate staffing and	The elements considered for the re-energization and recovery plan development and information documented include the following: 1. Risk-informed decision-making framework 2. Detailed and actionable policies, procedures, and protocols for power restoration 3. Appropriate staffing and	The elements considered for the re-energization and recovery plan development and information documented include the following: 1. Risk-informed decision-making framework 2. Detailed and actionable policies, procedures, and protocols for power restoration 3. Appropriate staffing and	The elements considered for the re-energization and recovery plan development and information documented include the following: 1. Risk-informed decision-making framework 2. Detailed and actionable policies, procedures, and protocols for power restoration 3. Appropriate staffing and

Preparedness and planning for service restoration		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
			contractor resources, training, and qualifications	contractor resources, training, and qualifications 4. Personnel roles and responsibilities	contractor resources, training, and qualifications 4. Personnel roles and responsibilities 5. Instructions on how to execute duties during plan 6. Feedback from external third-party evaluation	contractor resources, training, and qualifications 4. Personnel roles and responsibilities 5. Instructions on how to execute duties during plan 6. Feedback from external third-party evaluation 7. Actions taken to incorporate periodic external third-party feedback 8. Data collected from drills and after-action reports
Level of sophistication	Number of ignitions due to re-energization. Mature systems result in zero (0) ignitions due to re-energization.	Multiple ignitions due to re-energization per year.	Not more than 1 ignition due to re-energization per year.	Zero (0) ignitions due to re-energization per year.	No additional requirements beyond level 2	No additional requirements beyond level 2
Spatial granularity	Level of customization of procedures to restore service after a wildfire-related outage.	Procedures to restore service after a wildfire-related outage are customizable to territory-wide level.	Procedures to restore service after a wildfire-related outage are customizable to region level.	Procedures to restore service after a wildfire-related outage are customizable to circuit level.	Procedures to restore service after a wildfire-related outage are customizable to span level.	No additional requirements beyond level 3
Subject matter expert (SME) verification/(QA/QC)	Subject Matter Expert (SME) and third-party entities verification to evaluate re-energization and recovery plan.	No Subject matter expert (SME) verification in place to evaluate re-energization and recovery plan.	Re-energization and recovery plan is assessed through subject matter expert (SME) review at least once every 3-5 years.	Re-energization and recovery plan is assessed through subject matter expert (SME) review at least once every 2 years. State/local agencies are involved during the evaluation.	Re-energization and recovery plan is assessed through subject matter expert (SME) review at least once per year. State/local agencies are involved during the evaluation.	Re-energization and recovery plan is assessed through subject matter expert (SME) review at least two times per year. State/local agencies are involved during the evaluation.

C.5.6.5 31. Customer support in wildfire and PSPS emergencies

Customer support in wildfire and PSPS emergencies		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Comprehensiveness	Extent and accessibility of customer support in wildfire	Electrical corporation does not provide emergency support services for residential and non-residential customers during and after wildfire and PSPS incidents	Electrical corporation provides the following emergency support services for residential and non-residential customers within 4 hours of a wildfire and PSPS incidents • Outage reporting (location, expected duration and cause) • Support for low-income customers • Billing adjustments • Deposit waivers • Extended payment plans • Suspension of disconnection and nonpayment fees, • Repair processing and timing, • List and description of community assistance locations and services • Medical baseline support services • Access to electrical corporation representatives • Tracks metrics that measure customer access to information on customer service calls and web host availability	Electrical corporation provides the following emergency support services for residential and non-residential customers within 4 hours of a wildfire and PSPS incidents • Same as Level 1, plus • Call Center busies calculation is lower than Level-1 • Evaluates customer access metrics and web host availability metrics, and develops corrective action plans where deficiencies are identified	No additional requirements beyond level 2	No additional requirements beyond level 2

C.5.6.6 32. Learning after wildfires and PSPS events

Learning after wildfires and PSPS events		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Learning and continuous improvement	Processes and programs to identify lessons learned and implement correction action plans for both process and capital improvements.	Policies, practices, and procedures recorded and evaluated to identify lessons learned and implement correction action plans do not meet the minimum expectations or requirements.	At minimum the following policies, practices, and procedures are recorded and evaluated to identify lessons learned and implement corrective action plans annually: 1. Proactive diagnostic/ performance testing 2. Post-fire incident data and operations collection such as origin & cause 3. Environmental risk factors (e.g., weather conditions, vegetation conditions) 4. Staff & contractor behaviors 5. Wildfire emergency management 6. Technical systems performance (e.g., detection, alarm, notification) 7. Interactions with response and other government agencies 8. Pre-incident diagnostics, drills, training, and stress-testing	At minimum the following policies, practices, and procedures are recorded and evaluated to identify lessons learned and implement corrective action plans monthly: 1. Proactive diagnostic/ performance testing 2. Post-fire incident data and operation collection such as origin & cause 3. Environmental risk factors (e.g., weather conditions, vegetation conditions) 4. Staff & contractor behaviors 5. Wildfire emergency management 6. Technical systems performance (e.g., detection, alarm, notification) 7. Interactions with response and other government agencies 8. Pre-incident diagnostics, drills, training, and stress-testing	At minimum the following policies, practices, and procedures are recorded and evaluated to identify lessons learned and implement corrective action plans weekly: 1. Proactive diagnostic/ performance testing 2. Post-fire incident data and operations collection such as origin & cause 3. Environmental risk factors (e.g., weather conditions, vegetation conditions) 4. Staff & contractor behaviors 5. Wildfire emergency management 6. Technical systems performance (e.g., detection, alarm, notification) 7. Interactions with response and other government agencies 8. Pre-incident diagnostics, drills, training, and stress-testing	At minimum the following policies, practices, and procedures are recorded and evaluated to identify lessons learned and implement corrective action plans daily: 1. Proactive diagnostic/ performance testing 2. Post-fire incident data and operations collection such as origin & cause 3. Environmental risk factors (e.g., weather conditions, vegetation conditions) 4. Staff & contractor behaviors 5. Wildfire emergency management 6. Technical systems performance (e.g., detection, alarm, notification) 7. Interactions with response and other government agencies 8. Pre-incident diagnostics, drills, training, and stress-testing
Subject matter expert (SME) verification/(QA/QC)	"Dry runs", Subject Matter Expert (SME), and third-party entities verification to evaluate the effectiveness of updated plans.	No Subject matter expert (SME) verification in place to evaluate the effectiveness of updated plans.	Subject Matter Expert (SME) verification in place to evaluate the effectiveness of updated plans at least once per year. Feedback implementation is performed within thirty (30) days.	"Dry runs", Subject Matter Expert (SME) and third-party entities verification are in place to evaluate the effectiveness of updated plans at least once per year. Feedback implementation is performed within thirty (30) days.	"Dry runs", Subject Matter Expert (SME) and third-party entities verification are in place to evaluate the effectiveness of updated plans at least twice per year. Feedback implementation is performed within seven (7) days.	"Dry runs", Subject Matter Expert (SME) and third-party entities verification are in place to evaluate the effectiveness of updated plans at least four times per year. Feedback implementation is performed within the same day.

C.5.7 G. Community Outreach and Engagement

C.5.7.1 33. Public outreach and education awareness

Public outreach and education awareness		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Comprehensiveness	Depth, breadth, and accessibility of an electrical corporation's public outreach and education awareness program for wildfires, outages due to wildfire and PSPS events, and service restoration incidents. This includes providing multiple, targeted activities to meet the needs of the "whole" community before, during and after an incident.	Electrical corporation does not provide community outreach and education awareness program activities before, during and after wildfire and PSPS events	Electrical corporation provides the following community outreach and educational awareness program activities for wildfires and PSPS events before, during and after an incident: • Identifies and evaluates all key community stakeholder groups across the electrical corporation's service territory • For each community stakeholder group, the electrical corporation identifies specific concerns, interests, and needs for outreach and education awareness • Identify key community partnerships to collaborate and coordinate on wildfire and PSPS public education and awareness efforts • Develop and implement a diverse range of outreach and educational awareness programs targeted to address the specific needs and concerns of each community stakeholder group • Develop and implement operational strategies and resources to establish and sustain public outreach and education program activities.	Electrical corporation provides the following community outreach and educational awareness program activities for wildfires and PSPS events before, during and after an incident: • Same as Level 1, plus • Establish working relationships with a minimum of 4 community partners per county within the Electrical corporation's service territory to coordinate and collaborate on public outreach and education awareness activities. • Develop and implement a diverse range of outreach and educational awareness programs targeted to address the specific needs and concerns of each community stakeholder group, specific to each County in the Electrical corporation's service territory. • Obtain feedback from public on community outreach and educational awareness programs	Electrical corporation provides the following community outreach and educational awareness program activities for wildfires and PSPS events before, during and after an incident: • Same as Level 2, plus • Support (e.g., grants, access to electrical corporation representatives) public outreach and education awareness programs (e.g., chipper days, HIZ assessments, townhalls) managed by local community partners. • Obtain targeted feedback (e.g., host meetings, townhalls) from each community stakeholder group on public on community outreach and educational awareness programs annually.	Electrical corporation provides the following community outreach and educational awareness program activities for wildfires and PSPS events before, during and after an incident: • Same as Level 3, plus • Identify and establish working relationships with at least 1 community partner for each of the key community stakeholder groups at the County and/or City level within the Electrical corporation's territory • Coordinate, collaborate and support all community partners on their respective community outreach and educational awareness programs annually.

Public outreach and education awareness		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Spatial granularity	Level of customization of public outreach and education awareness for wildfires, outages due to wildfire or PSPS, power restoration before, during and after the incident	No public outreach and education awareness program(s) for wildfires, outages due to wildfire or PSPS events, power restoration before, during and after the incident	Public outreach and education awareness program(s) for wildfires, outages due to wildfire or PSPS events, power restoration before, during and after the incident are based on an enterprise-wide level.	Public outreach and education awareness program(s) for wildfires, outages due to wildfire or PSPS events, power restoration before, during and after the incident are based on county-wide level.	Public outreach and education awareness program(s) for wildfires, outages due to wildfire or PSPS events, power restoration before, during and after the incident are based on city-wide level.	Public outreach and education awareness program(s) for wildfires, outages due to wildfire or PSPS events, power restoration before, during and after the incident are based on community-level (e.g., a grouping of neighborhoods or sub-area of a city/town/unincorporated lands with common living characteristics as defined locally).

C.5.7.2 34. Public engagement in electrical corporation wildfire mitigation planning

Public engagement in electrical corporation wildfire mitigation planning		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Comprehensiveness	Depth, breadth, and accessibility of an electrical corporation's wildfire mitigation planning process to customers and the general public. This includes providing a range of participatory activities for essential customers, medical baseline, the general public, and other civil society groups to engage and have a voice throughout the wildfire mitigation planning process.	Electrical corporation does not provide public engagement or participatory activities in its wildfire mitigation planning.	Electrical corporation provides public engagement activities as part of its wildfire mitigation planning process, which informs Energy Safety's annual WMP/WMP Update submission and evaluation process in accordance with Public Electrical corporations Code section 8386 and all Energy Safety reporting requirements. •	Electrical corporation provides the following public engagement activities, in addition to statutory requirements, as part of its wildfire mitigation planning process: • Develop and implement structured programs that give citizens and representative public interest groups accessible means and methods to provide feedback. • Establishing several participatory activities for representative community interest groups and civil society groups in its wildfire mitigation planning process. • Establish working groups or other advisory panels represented by community interest groups that the electrical corporation consults to better integrate community needs into its wildfire mitigation planning • Provide engagement and participation throughout its wildfire mitigation planning. • Identify public interest group's role & responsibilities.	Electrical corporation provides the following public engagement activities, in addition to statutory requirements, as part of its wildfire mitigation planning process: • Same as Level 2, plus • Develop and implement public engagement activities at the **county-level**	Electrical corporation provides the following public engagement activities, in addition to statutory requirements, as part of its wildfire mitigation planning process: • Same as Level 2, plus • Develop and implement public engagement activities at the **community-level**

Public engagement in electrical corporation wildfire mitigation planning		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Frequency	Number of occurrences the Electrical corporation seeks public engagement, feedback, and participation in its wildfire mitigation planning process	No public engagement or participatory activities in its wildfire mitigation planning process. Or Electrical corporation seeks public engagement, feedback, and participation in its wildfire mitigation planning process less than once per year	Electrical corporation seeks public engagement, feedback and participation in its wildfire mitigation planning process at least once a year as part of its base WMP or WMP Update submission to Energy Safety	Electrical corporation seeks public engagement, feedback and participation in the development and decision-making process of its WMP at least once a year and after every major wildfire or PSPS event, in addition to the formal submission and evaluation process for Energy Safety	No additional requirements beyond level 2	No additional requirements beyond level 2
Spatial granularity	Level of customization of public engagement activities as part of an electrical corporation's wildfire mitigation planning process	No public engagement or participatory activities in the electrical corporation's wildfire mitigation planning process	Public engagement or participatory activities in f the electrical corporation's wildfire mitigation planning process are based on statutory minimums (i.e., as part of the annual WMP submission and evaluation process)	Public engagement or participatory activities in the electrical corporation's wildfire mitigation planning process are based on an enterprise-wide level.	Public engagement or participatory activities in the electrical corporation's wildfire mitigation planning process are based on a county-wide level.	Public engagement or participatory activities in the electrical corporation's wildfire mitigation planning process are based on a community-wide level.

C.5.7.3 35. Engagement with AFN and socially vulnerable populations

Engagement with AFN and socially vulnerable populations		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Comprehensiveness	Depth and breadth of an electrical corporation's engagement (i.e., outreach, education, and support) program with AFN, medical baseline and socially vulnerable populations throughout their service territory. This includes providing multiple, targeted activities to meet the specific needs of AFN, medical baseline and socially vulnerable populations before, during and after wildfires and outages due to wildfires or PSPS events.	Electrical corporation does not have a specific and targeted engagement program for AFN, medical baseline and socially vulnerable populations throughout its territory	Electrical corporation provides the following engagement activities for AFN, medical baseline, and socially vulnerable populations for wildfires and PSPS events before, during and after an event: • Identifies and evaluates all AFN, medical baseline and socially vulnerable stakeholder groups across the electrical corporation's service territory. • Understands extent, size, and distribution of AFN, medical baseline, and socially vulnerable populations • For each vulnerable group, the electrical corporation identifies specific concerns, interests, and needs before, during and after a wildfire or PSPS event • Develop and implement a diverse range of outreach, educational, engagement and support programs targeted and specific to the needs and concerns of each vulnerable group • Develop and implement operational strategies and resources to establish and sustain AFN, medical baseline, and socially vulnerable group activities	Electrical corporation provides the following engagement activities for AFN, medical baseline, and socially vulnerable populations for wildfires and PSPS events before, during and after an event: • Same as Level 1, plus • Understands extent, size, and distribution of AFN, medical baseline, and socially vulnerable populations by county. • Establish working relationships with a minimum of 4 community partners per county within the Electrical corporation's service territory to coordinate and collaborate on engagement activities for AFN, medical baseline and socially vulnerable populations • Develop and implement a diverse range of outreach, educational, engagement and support programs targeted and specific to the needs and concerns of each vulnerable group at the county-level. • Obtain feedback from each vulnerable population and/or representatives of AFN, medical baseline and socially vulnerable populations on accessibility and effectiveness of engagement activities	Electrical corporation provides the following engagement activities for AFN, medical baseline, and socially vulnerable populations for wildfires and PSPS events before, during and after an event: • Same as Level 2, plus • Support (e.g., grants, access to electrical corporation representatives) of AFN, medical baseline and socially vulnerable populations engagement activities and programs managed by local community partners. • Obtain targeted feedback (e.g., host meetings) from AFN, medical baseline and socially vulnerable populations on accessibility and effectiveness of engagement activities annually and after major events.	Electrical corporation provides the following engagement activities for AFN, medical baseline, and socially vulnerable populations for wildfires and PSPS events before, during and after an event: • Same as Level 3, plus • Identify and establish working relationships with at least 1 community partner for each of the key AFN, medical baseline and socially vulnerable groups at the County and/or City level within the Electrical corporation's territory • Coordinate, collaborate and support all community partners on their respective vulnerable populations outreach, educational and support programs annually.

Effectiveness	Degree to which electrical corporation's engagement (i.e., outreach, education, and support) program with AFN, medical baseline and socially vulnerable populations are not only timely, accurate and complete, but lead to increased awareness and risk-informed action during and after an emergency	Electrical corporation does not have a specific and targeted engagement program for AFN, medical baseline, and socially vulnerable populations throughout its territory Or No ability to measure effectiveness of engagement (i.e., outreach, education, and support) program with AFN, medical baseline and socially vulnerable populations during or after an emergency	At a minimum, the electrical corporation: • Seeks feedback from AFN, medical baseline, and socially vulnerable populations and/or representatives of such groups on accessibility and effectiveness of engagement activities annually • Has demonstrated that its engagement (i.e., outreach, education, and support) has reach at least **50-75%** of the AFN, medical baseline and socially vulnerable populations before, during and after a wildfire and/or PSPS event in its service territory • Has demonstrated that its support services before and during a PSPS event has reached at least **90%** of medical baseline customers.	At a minimum, the electrical corporation: • Same as Level 1, plus • Updates program and activities based on feedback from AFN, medical baseline, and socially vulnerable populations and/or representatives of such groups on accessibility and effectiveness of engagement activities annually • Has demonstrated that its engagement (i.e., outreach, education, and support) has reach at least **75-90%** of the AFN, medical baseline, and socially vulnerable populations before, during and after a wildfire and/or PSPS event in its service territory • Prior to and during PSPS outages, provides back-up power (e.g., generators) to **95%** of medical baseline customers who are at an elevated risk due to lack of power.	At a minimum, the electrical corporation: • Same as Level 2, plus • Updates program and activities based on feedback from AFN, medical baseline, and socially vulnerable populations and/or representatives of such groups on accessibility and effectiveness of engagement activities annually and **after every major event** • Has demonstrated that its engagement (i.e., outreach, education, and support) has reach at least **90-95%** of the AFN, medical baseline and socially vulnerable populations before, during and after a wildfire and/or PSPS event in its service territory • Prior to and during PSPS outages, provides back-up power (e.g., generators) to **99%** of medical baseline customers who are at an elevated risk due to lack of power.	At a minimum, the electrical corporation: • Same as Level 3, plus • Has demonstrated that its engagement (i.e., outreach, education, and support) has reach at least **99%** of the AFN, medical baseline, and socially vulnerable populations before, during and after a wildfire and/or PSPS event in its service territory

Engagement with AFN and socially vulnerable populations		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Spatial granularity	Level of customization of engagement (i.e., outreach, education, and support) program with AFN, medical baseline and socially vulnerable populations	No engagement (i.e., outreach, education, and support) program with AFN, medical baseline and socially vulnerable populations	Engagement (i.e., outreach, education, and support) program with AFN, medical baseline and socially vulnerable populations are based on statutory minimums	Engagement (i.e., outreach, education, and support) program with AFN, medical baseline and socially vulnerable populations are based on an enterprise-wide level.	Engagement (i.e., outreach, education, and support) program with AFN, medical baseline, and socially vulnerable populations are based on a county-wide level.	Engagement (i.e., outreach, education, and support) program with AFN. medical baseline and socially vulnerable populations are based on a community-wide level.

C.5.7.4 36. Collaboration on local wildfire mitigation planning

Collaboration on local wildfire mitigation planning		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Comprehensiveness	Depth and breadth an electrical corporation's collaboration efforts in local wildfire mitigation planning with community partners. This includes community wildfire protection plans, safety elements in general plans, chipper program, local multi-hazard mitigation planning, etc.	Electrical corporation does not collaborate on local wildfire mitigation planning with community partners	Electrical corporation provides the following collaborative efforts in local wildfire mitigation planning: • Identifies relevant county, city, tribal and civil society groups conducting wildfire mitigation planning across the electrical corporation's service territory • For each entity, electrical corporation identifies local wildfire mitigation planning programs, activities and/or documents and level of collaboration, and date of collaboration to which the electrical corporation has contributed. • Identify key community partnerships to collaborate and coordinate on wildfire and PSPS mitigation planning efforts. • Develop and implement sustainable operational strategies to provide necessary resources to support and collaborate on local wildfire mitigation planning efforts.	Electrical corporation provides the following collaborative efforts in local wildfire mitigation planning: • Same as Level 1, plus • Establishes working relationships with a minimum of 4 community partners per county within the Electrical corporation's service territory • Provide feedback and input on a minimum of 4 local wildfire mitigation planning activities (e.g., CWPPs, safety elements in general plans, local hazard mitigation plans) per county. • The frequency of these efforts should be based on the update cycle of the respective planning effort (e.g., every 5 years for a CWPP)	Electrical corporation provides the following collaborative efforts in local wildfire mitigation planning: • Same as Level 2, plus • Take an active and proactive role in supporting local wildfire mitigation planning managed by local community partners. • Establish working relationships and provide support for 75% of all community partners conducting local wildfire mitigation planning in the electrical corporation's service territory	Electrical corporation provides the following collaborative efforts in local wildfire mitigation planning: • Same as Level 3, plus • Establish working relationships and provide support for 90% of all community partners conducting local wildfire mitigation planning in the electrical corporation's service territory

Collaboration on local wildfire mitigation planning		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Frequency	Number of occurrences the Electrical corporation collaborates on local wildfire mitigation planning with community partners	Electrical corporation does not collaborate on local wildfire mitigation planning with community partners	Electrical corporation collaborates on local wildfire mitigation planning with community partners **once every 5 years** or as often as the local planning effort is updated	Electrical corporation collaborates on local wildfire mitigation planning with community partners **once every 2-4 years** or as often as the local planning effort is updated	Electrical corporation collaborates on local wildfire mitigation planning with community partners **annually** or as often as the local planning effort is updated	Electrical corporation collaborates on local wildfire mitigation planning with community partners **more than once a year** or has often as the local planning effort is updated

C.5.7.5 37. Cooperation and best practice sharing with other electrical corporations

Cooperation and best practice sharing with other electrical corporations		Maturity Level				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Comprehensiveness	Extent of cooperation and best practices which are shared with other electrical corporations.	Electrical corporation does not cooperate or share best practices with other electrical corporations or electrical corporations.	Electrical corporation cooperates or participates in best practice sharing through **2 of** the following activities: 1. Benchmarking risk and risk component calculations. 2. Benchmarking risk event data and corrective actions with other electrical corporations. 3. Benchmark weather forecasts with those of other electrical corporations and government agencies. 4. Benchmark near-real-time data collected for wildfire monitoring of other electrical corporations and government agencies. 5. Compare asset inspection, maintenance and repair procedures, training, and lessons learned with other electrical corporations. 6. Compare vegetation inspection, management, treatment procedures, training, and lessons learned with other electrical corporations. 7. Compare grid operations procedures for minimizing ignition and PSPS risk factors with other electrical corporations. 8. Compare processes and protocols for learning following wildfire and PSPS events electrical corporations.	Electrical corporation cooperates or participates in best practice sharing through **4 of** the following activities: 1. Benchmarking risk and risk component calculations. 2. Benchmarking risk event data and corrective actions with other electrical corporations. 3. Benchmark weather forecasts with those of other electrical corporations and government agencies. 4. Benchmark near-real-time data collected for wildfire monitoring of other electrical corporations and government agencies. 5. Compare asset inspection, maintenance and repair procedures, training, and lessons learned with other electrical corporations. 6. Compare vegetation inspection, management, treatment procedures, training, and lessons learned with other electrical corporations. 7. Compare grid operations procedures for minimizing ignition and PSPS risk factors with other electrical corporations. 8. Compare processes and protocols for learning following wildfire and PSPS events electrical corporations.	Electrical corporation cooperates or participates in best practice sharing through **6 of** the following activities: 1. Benchmarking risk and risk component calculations. 2. Benchmarking risk event data and corrective actions with other electrical corporations. 3. Benchmark weather forecasts with those of other electrical corporations and government agencies. 4. Benchmark near-real-time data collected for wildfire monitoring of other electrical corporations and government agencies. 5. Compare asset inspection, maintenance and repair procedures, training, and lessons learned with other electrical corporations. 6. Compare vegetation inspection, management, treatment procedures, training, and lessons learned with other electrical corporations. 7. Compare grid operations procedures for minimizing ignition and PSPS risk factors with other electrical corporations. 8. Compare processes and protocols for learning following wildfire and PSPS events electrical corporations.	Electrical corporation cooperates or participates in best practice sharing through **all** the following activities: 1. Benchmarking risk and risk component calculations. 2. Benchmarking risk event data and corrective actions with other electrical corporations. 3. Benchmark weather forecasts with those of other electrical corporations and government agencies. 4. Benchmark near-real-time data collected for wildfire monitoring of other electrical corporations and government agencies. 5. Compare asset inspection, maintenance and repair procedures, training, and lessons learned with other electrical corporations. 6. Compare vegetation inspection, management, treatment procedures, training, and lessons learned with other electrical corporations. 7. Compare grid operations procedures for minimizing ignition and PSPS risk factors with other electrical corporations. 8. Compare processes and protocols for learning following wildfire and PSPS events electrical corporations.

Cooperation and best practice sharing with other electrical corporations		**Maturity Level**				
Scoring Philosophy	**Scoring Description**	**0**	**1**	**2**	**3**	**4**
Frequency	Frequency at which the electrical corporation cooperates or shares best practices with other electrical corporations.	Electrical corporation does not cooperate or share information with other electrical corporations at least once per year	Electrical corporation cooperates or shares information with other electrical corporations at least once per year.	Electrical corporation cooperates or shares information with other electrical corporations at least once per quarter.	Electrical corporation cooperates or shares information with other electrical corporations at least once per month.	No additional requirements beyond level 3
Standardized processes	The methods used to share best practices with other electrical corporations	Electrical corporation has no procedures for sharing or receiving best practices and lessons learned regarding ignition prevention and suppression with or from other California electrical corporations.	Electrical corporation has standard procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding ignition prevention and suppression.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding ignition prevention and suppression. Electrical corporation seeks out information from and provides information to other electrical corporations. Electrical corporation has a consistent format and venue/medium through which information is exchanged	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding ignition prevention and suppression. Electrical corporation seeks out information from and provides information to other electrical corporations. Electrical corporation has a consistent format and venue/medium through which information is exchanged Participate in task groups focused on sharing lessons learned and improving best practices.	Electrical corporation has procedures for exchanging best practices and lessons learned with other California electrical corporations and implementing information from other electrical corporations regarding ignition prevention and suppression. Electrical corporation seeks out information from and provides information to other electrical corporations. Electrical corporation has a consistent format and venue/medium through which information is exchanged Participate in task groups focused on sharing lessons learned and improving best practices. Electrical corporation has standard process for testing applicability of best practices and lessons learned of other electrical corporations.

Attachment 2 - Draft 2023-2025 WMP Process and Evaluation Guidelines

OFFICE OF ENERGY INFRASTRUCTURE SAFETY

2023-2025 WILDFIRE MITIGATION PLAN PROCESS AND EVALUATION GUIDELINES

DRAFT

[September 19, 2022]

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OFFICE OF ENERGY INFRASTRUCTURE SAFETY

1 Introduction

This document establishes guidelines[1] outlining the process for disposition of Wildfire Mitigation Plans (WMPs) and details the public participation process and submission requirements. These guidelines will remain in effect for the 2023-2025 WMP three-year cycle. Energy Safety will release an updated schedule each year and may amend these guidelines as necessary according to the procedures in Government Code section 15475.6. These guidelines do not address the substantive content of the WMPs. For substantive content requirements, refer to the 2023-2025 WMP Technical Guidelines.

2 The Three-Year WMP Process

Each electrical corporation is required to annually prepare and submit a WMP to Energy Safety for review and approval. The plan must cover at least a three-year period.[2] Energy Safety has discretion to establish a submission schedule. It may also elect to allow annual submissions to be updates to the last approved comprehensive WMP provided that a comprehensive WMP is submitted once every three years.[3,4] In 2023, Energy Safety is requiring each electrical corporation to submit a comprehensive WMP covering 2023-2025. This will be known as the "Base WMP." Non-Base submissions will be known as "WMP Updates."

2.1Base WMP

For the Base WMP, electrical corporations must submit comprehensive WMPs covering the 2023-2025 plan period pursuant to the 2023-2025 WMP Technical Guidelines.

2.2WMP Updates

If Energy Safety determines that the electrical corporation need only file an Update to its Base WMP, the electrical corporation must submit information pursuant to future WMP Update

[1] Gov. Code, § 15475.6.

[2] Pub. Util. Code, § 8386(b).

[3] *Id.*

[4] Energy Safety intends that a Base WMP be submitted to cover a three-year period and subsequent filings within the three-year plan cycle be WMP Updates. The 2023 schedule reflects this intention; however, Energy Safety reserves the right to require Base WMP submissions in any year.

Guidelines. Updates are intended to report progress and changes to the Base WMP. Updates are not intended to include major changes to strategic direction unless based on a new understanding of risk. Energy Safety may, at its discretion, require electrical corporations to provide updates on specific initiatives or topic areas in WMP Updates. See Section 13 for more information on WMP Updates.

2.3 The Year-Ahead Process

To date, electrical corporations have submitted WMPs in the year in which mitigations occur. For example, electrical corporations submitted the 2020 WMP in February 2020 with final dispositions in May of that year.

Moving forward, electrical corporations must submit plans for the year following the year of submission. For example, in 2024, electrical corporations will submit a WMP Update for 2025. To facilitate this shift, in 2023, electrical corporations must submit a Base WMP that covers 2023-2025. The plan must include detailed targets, projections, etc.. Energy Safety will evaluate and approve or deny the utilities' WMPs for both 2023 and 2024 in 2023. A timeline is provided below in Table 1.

Table 1: Timeline for the Year-Ahead Process

Year Submitted	Years Covered	Base/Update
2023	2023-2025	Base Plan
2024	2025	Update

3 Maturity Survey

As part of the WMP evaluation process, Energy Safety develops a Maturity Model to measure each electrical corporation's current and projected maturity over the three-year plan period. To measure maturity, Energy Safety (or its contractor) will issue an electronic Maturity Survey to each electrical corporation along with instructions on how to complete the Maturity Survey. Each electrical corporation must submit a complete set of survey responses by the designated deadline.

3.1 Extension Requsts

If an electrical corporation seeks a longer response period to complete the Maturity Survey than the response period provided by Energy Safety, the electrical corporation must request an extension by sending an extension request to safetypolicy@energysafety.ca.gov.

a. An extension request must include:
    i. A strong showing of the specific reason for the delay; and
    ii. A proposed date of response in lieu of the original deadline.
b. Any extension request must be received by Energy Safety by 5PM on the business day two-days prior to the date the Maturity Survey response is due.
c. Upon receipt of an extension request, Energy Safety will evaluate the request and issue a determination.

4 Energy Safety Evaluation Process

This section sets forth the steps to the WMP evaluation process.

4.1 Completeness Check/Pre-Submission

Energy Safety will first assess each electrical corporation's WMP for completeness based on the statutory requirements and adherence to the relevant year WMP Guidelines. The completeness check occurs through a pre-submission process and is a precursor to and separate from the statutory WMP review process.[5]

WMP approval is contingent upon complete and adequate filings. The objective of the completeness check is to ensure that electrical corporations' WMP submissions are complete prior to commencing evaluation. The completeness check is not a substantive review of WMP content; a substantive review occurs during the WMP evaluation process.

Energy Safety will notify each electrical corporation if its WMP satisfies the initial completeness check. If a WMP does not satisfy the initial completeness check, Energy Safety will notify the electrical corporation as to the missing or incomplete information (i.e., incomplete, not fully referenced, or unsubstantiated statutory compliance checklist). For an efficient and streamlined WMP review process, WMP submissions at a minimum must satisfy Public Utilities Code section 8386(c) statutory requirements and demonstrate this via the requisite checklist in the 2023-2025 WMP Technical Guidelines. Once deemed complete, an

[5] See Pub. Util. Code, § 8389.3(a)

electrical corporation may not change or update its WMP prior to submission. An electrical corporation must submit any changes to its WMP submission through the errata process set forth in Section 4.3

4.1.1 Completeness Check Process

The completeness check consists of four steps:

1. Energy Safety uses the Statutory Checklist in the WMP Technical Guidelines to confirm that information is reported for each Public Utilities Code Section 8386(c) requirement and appropriately cross-references the relevant section(s)/sub-section(s) of the WMP. If information is not reported for a requirement, Energy Safety marks this element incomplete.
2. Energy Safety confirms the electrical corporation has provided a narrative for each section and sub-section in the WMP. If the WMP contains a blank section or the detail is insufficient, Energy Safety marks this element incomplete.
3. Energy Safety confirms narrative tables are filled out in the WMP. Narrative tables are the required tables found within the body of the WMP as required by the WMP Technical Guidelines. If any fields are blank, Energy Safety marks this element incomplete.
4. Energy Safety confirms completeness of each electrical corporation's spatial and non-spatial data, submitted separately from its WMP and according to the Energy Safety Data Guidelines. If an electrical corporation's spatial submission contains any blank fields or layers, Energy Safety will note the spatial database and blank fields and layers.

Energy Safety will not accept public comments on the completeness check process.

4.2WMP Submissions

Following completeness checks/pre-submissions, electrical corporations must submit WMPs according to the schedule set forth by Energy Safety.[6] The statutory evaluation period commences upon submission of the WMP.[7]

[6] See Section 10 for additional information regarding the WMP submission schedule.

[7] *Id.*

4.2.1 Incomplete WMPs

If after conclusion of the completeness check/pre-submission phase an electrical corporation submits an incomplete WMP, Energy Safety in its sole discretion may direct an electrical corporation to remedy its incomplete WMP through a data request or Energy Safety may deny the electrical corporation's WMP without further notice.

For guidance regarding data requests, please see Sections 7 and 8.

4.3 Errata

An Erratum is a correction of published text and does not include revisions required by Energy Safety as part of the Revision Notice process.

Electrical corporations may submit errata as follows:

1. After the submission deadline, **substantive errata** for WMPs will only be accepted within 10 business days after the submission deadline unless permission is granted through written request to the Deputy Director.
    - **Substantive errata** are corrections to targets, calculations, initiatives, etc., that materially impact Energy Safety's evaluation of the WMP.
2. **Nonsubstantive errata** for WMPs will only be accepted within 30 business days after the submission deadline.
    - **Nonsubstantive errata** are minor corrections to fix typographical errors or to improve clarity.

Classification of errata as substantive or nonsubstantive is solely within the discretion of Energy Safety.

Energy Safety may request an electrical corporation submit errata based upon information learned through the data request process at any point during the evaluation process.

4.4 Revision Notice

Public Utilities Code section 8386.3(a) states, "[b]efore approval, the division may require modifications of the plan." Energy Safety effectuates this provision by issuing a Revision Notice. The purpose of a Revision Notice is to ensure the electrical corporation addresses critical issues prior to completion of Energy Safety's evaluation.

4.4.1 Examples Warranting a Revision Notice

Examples of when Energy Safety may choose to issue a Revision Notice include, but are not limited to, the following and shall be designated as critical issues:

- The electrical corporation failed to incorporate the Areas of Continued Improvement detailed in the prior year's decision,
- The electrical corporation did not provide sufficient[8] information for evaluation,
- The electrical corporation made a significant shift in its wildfire mitigation strategy without sufficient substantiation,
- The electrical corporation's submission does not meet evaluation criteria listed in Section 5.1, including ineffective or infeasible mitigations, and
- The electrical corporation did not provide sufficient information for an element of the WMP that is critical to life-safety or property.

4.4.2 Revision Notice Process

The Revision Notice process is set forth as follows:

1. Energy Safety determines an electrical corporation's WMP contain critical issue(s) and warrants a Revision Notice.
2. Energy Safety issues a Revision Notice to the electrical corporation. The Revision Notice will contain a list of critical issues the electrical corporation must address in its Revision Notice Response and the due date(s) by which the electrical corporation must respond. Energy Safety may revise any prior WMP schedule or set forth additional WMP schedules for the electrical corporation's response(s), comments, and decision issuance in the Revision Notice.
3. By the provided due date(s), the electrical corporation must resubmit its entire WMP or sections therein, as directed within the Revision Notice, as well as provide written responses to each issue delineated in the Revision Notice (Revision Notice Response). Energy Safety will not accept any updates or errata to Revision Notice Response after the due date(s).
4. Once an electrical corporation has resubmitted its WMP or sections therein and provided its Revision Notice Response, Energy Safety will consider the electrical corporation's Revision Notice Response, revised WMP, public comments, responses to data requests, and the totality of the information before it to date and issue a determination on the electrical corporation's WMP.

[8] Different from the completeness check, in this case, the information presented lacks sufficient detail or information for Energy Safety to conduct its evaluation.

If an electrical corporation fails to provide a Revision Notice Response or resubmit its WMP or sections as required in the Revision Notice, Energy Safety may deny the electrical corporation's WMP without further notice.

4.5 Workshops

Energy Safety in its sole discretion may hold one or more public workshops to discuss part or all of an electrical corporation's WMP or Revision Notice Response. Energy Safety will issue notice of workshops according to the process set forth in Section 6.4 Notice of Workshops.

4.6 Comments On WMP and Revison Notices

Once an electrical corporation has submitted its WMP, it is available for public comment. Opening Comments (initial public comments) must be filed according to the schedule set forth by Energy Safety and according to the process set forth in Section 6. Opening Comments must focus on information contained in the WMP or Revision Notice Response.

Electrical corporations as well as members of the public may file Reply Comments to Opening Comments on their WMP. Reply Comments will be accepted according to the schedule set forth by Energy Safety. The subject of Reply Comments is limited to issues raised in Opening Comments. While Energy Safety will not respond to public comments (Opening and Reply Comments) directly, it will consider those comments during its evaluation of the WMPs.

When a public comment is received, it becomes public record and will be made available to the public on the Energy Safety docket. Energy Safety will post the public comments as received without redaction of personal information.

4.7 Draft Decision and Public Comment

Upon completion of its review, Energy Safety determines whether each electrical corporation's WMP should be:

- Approved (approval may include a requirement that the electrical corporation demonstrate continued growth in its subsequent WMP, known as an Area for Continued Improvement), or
- Denied (the electrical corporation does not have an approved WMP and must reapply for approval in the subsequent year).

To reach its decision, Energy Safety assesses each element of the WMP against statutory requirements and guidelines and may seek additional information through meetings with electrical corporations and data requests.[9] After this assessment and consideration of comments on the posted WMP, Energy Safety determines if each element of the WMP has been satisfactorily addressed according to the evaluation criteria set forth in Section 5, below.

Energy Safety's approval of a WMP does not mean that the electrical corporation has reached the highest levels of maturity or has reduced its ignition risk to zero. Rather, approval means the electrical corporation has satisfied the evaluation criteria and substantiated its mitigation strategy such that implementation of the plan is appropriate.

When Energy Safety approves a Base WMP or WMP Update, it does so with an aim of continued improvement. Therefore, in its final decision, Energy Safety may list "Areas for Continued Improvement," which are areas where the electrical corporation must continue to mature in its capabilities. Areas for Continued Improvement identified during an evaluation **must** be addressed in the next WMP. Failure to show maturation in these areas may result in a Revision Notice or Denial. Areas for Continued Improvement that require more than one year to complete will have a custom deadline identified by Energy Safety.

Energy Safety's draft decision on a submitted WMP will be posted on Energy Safety's docket for public comment.

Electrical corporations and members of the public may submit Opening Comments on a draft decision within 20 days of a draft decision being posted to the docket according to the process set forth in Section 6. Reply Comments are limited to issues brought up in Opening Comments. Reply Comments will be accepted for 10 days after the close of the Opening Comment period. While Energy Safety will not respond to public comments directly, it will consider those comments before issuing a final decision. When a comment is received, it becomes public record and will be made available to the public on the Energy Safety docket. Energy Safety will post the comments as received without redaction of personal information.

4.8 Final Decision

Upon completion of its review of public comments, Energy Safety will issue a final decision. Energy Safety submits final decisions for each electrical corporation to the California Public Utilities Commission for ratification pursuant to Public Utilities Code section 8386.3(a).

[9] See Sections 6 and 7.

5 WMP Evaluation Criteria

5.1 Evaluation Criteria

Energy Safety evaluates WMP according to the following criteria:

- **Completeness**: The electrical corporation comprehensively responds to the statutory requirements contained in Public Utilities Code section 8386(c) and Energy Safety's Guidelines.
- **Technical and programmatic feasibility and effectiveness**: The proposed initiatives are technically feasible and effective in addressing the risks that exist in the electrical corporation's service territory. The proposed initiatives are programmatically feasible for the specific electrical corporation given its maturity and progress to date.
- **Resource use efficiency**: The proposed initiatives are an efficient use of electrical corporation resources and focus on achieving the greatest risk reduction at the lowest cost.
- **Demonstrated year-over-year progress**: The electrical corporation demonstrates sufficient progress on objectives and program targets reported in its previous plan.
- **Forward-looking growth**: The electrical corporation demonstrates a clear action plan to continue reducing utility-related ignitions and the scale, scope, and frequency of Public Safety Power Shutoff (PSPS) events. In addition, the electrical corporation focuses sufficiently on long-term strategies to build the overall maturity of its wildfire mitigation capabilities while reducing reliance on shorter-term strategies such as PSPS and enhanced vegetation management.
- **Progress metrics**: The electrical corporation tracks the degree to which its wildfire mitigation activity has changed the conditions of its wildfire risk exposure in terms of drivers of ignition probability.
- **Outcome metrics**: The electrical corporation uses outcome metrics to measure its performance and outcomes in its service territory in terms of both leading and lagging indicators of wildfire risk, PSPS risk, and other direct and indirect consequences of wildfire and PSPS, including the potential unintended consequences of wildfire mitigation work.
- **Program targets**: The electrical corporation uses targets to track its progress toward specific objectives for its wildfire mitigation activities. Program targets track the electrical corporation's pace of activity completion as laid out in the WMP but do not track the efficacy of its activities. The primary use of these program targets is to track electrical corporation progress with its WMP.

5.2 Evaluation Inputs

To assess a WMP, Energy Safety may rely upon the following:

- An electrical corporation's WMP submissions, including errata,
- Input from the California Department of Forestry and Fire Protection (CAL FIRE),
- Public and stakeholder comments,
- An electrical corporation's response to the Utility Wildfire Mitigation Maturity Survey (Maturity Survey),
- An electrical corporation's data submissions,
- An electrical corporation's responses to data requests, and
- Any other information Energy Safety may require for the evaluation of an electrical corporation's WMP submissions.

5.3 Approval or Denial of a WMP

Energy Safety may issue a draft decision denying the WMP if the WMP is not satisfactory or is insufficient as to the details of each section or sub-section of the WMP. A WMP is considered "satisfactory" if the WMP meets statutory and guideline requirements, including the evaluation criteria set forth in Section 5.1, with sufficient substantiation and shows an acceptable level of continued improvement over the prior WMP.

6 Public Participation/Feedback on WMPs

6.1 Docket Access

Unless otherwise specified herein, Energy Safety posts all documents received and issued to the docket. Persons who are not already subscribed to Energy Safety's WMP service list and wish to receive service of the WMPs and comments on the WMPs may enroll by visiting https://listservice.cnra.ca.gov/scripts/wa.exe?A0=OEIS_WMPS&X=P274FFFAAFB0F2A86FA. Additional information on Energy Safety's service lists and detailed instructions for signing up can be found at https://energysafety.ca.gov/events-and-meetings/how-to-participate-in-public-events/.

6.2 Public Comments

Any person or entity may submit Opening and Reply Comments on WMPs and draft decisions in accordance with the schedule issued by Energy Safety. Opening Comments must focus on information contained in the WMP, Revision Notice, or draft decision. The subject of Reply Comments is limited to issues raised in Opening Comments.

6.3 Submitting Comments

Public comment must conform to the following requirements:

- Whenever possible, comments must be submitted to the proper docket on Energy Safety's e-filing system.[10] For WMP related matters, comments must be submitted to the appropriate year's WMP docket (e.g., #2023-2025-WMPs).
- Comments on an electrical corporation's WMP shall be named according to the naming convention set forth in Section 10.6. However, comments shall include the organization or person's name followed by "Opening Comments" or "Reply Comments" and then the relevant abbreviations set forth in Table 2 in Section 10.6. For example:
    - Comments on Pacific Gas and Electric Company's (PG&E) 2023_2025 WMP Submission: "2023_04_10_ORGNAME[11]_OpeningComments_PGE_2023_2025WMP_R0," which refers to Organization's comments submitted on April 10, 2023, on PG&E's 2023-2025 Base Year WMP, first version.
- Opening Comments must focus on the content of the WMP, Revision Notice or draft decision. Opening Comments on draft decisions shall be limited to 15 pages.
- Reply Comments are limited to issues raised in Opening Comments. New information not directly related to issues presented in Opening Comments will not be considered. Reply Comments shall be limited to 5 pages.
- Comments must be accessible. It is the policy of the State of California that electronic information be accessible to people with disabilities. Each person who submits information through the Office's e-filing system must ensure that the information complies with the accessibility requirements set forth in Government Code section 7405. Energy Safety will not accept any information submitted through the e-filing system that does not comply with these requirements.
- The submission process for confidential information is set forth in section 29200 of Title 14 of the California Code of Regulations.

[10] Members of the public and other interested parties are also encouraged to utilize the e-filing system. Energy Safety will accept mailed or in person submissions at, 715 P Street, 20th Floor, Sacramento, California 95814.

[11] For comments submitted by an individual, please use the individual's last name in place of the organization name.

6.4 Notice of Workshops

Energy Safety may at its discretion hold one or more public workshops during the WMP evaluation phase to discuss all or part of an electrical corporation's WMP submission. Notice of workshops will be posted to the relevant year's WMP docket and on Energy Safety's website, www.energysafety.ca.gov. Energy Safety will issue written notice of the workshop at least 10-days prior to the workshop. Workshop notices will include information on the workshop topic, date, location, format, etc.

7 Data Requests from Energy Safety

Energy Safety may obtain any document, data, or information from any electrical corporation that is relevant to any docket matter via a data request.

The following applies to data requests:

2. Data requests from Energy Safety staff to the electrical corporations may come from safetypolicy@energysafety.ca.gov or from individual Energy Safety staff e-mail addresses. All responses to Energy Safety data requests must be submitted to the 2023-2025 WMP Data Requests docket (#2023-2025-WMP-DRs).
3. Electrical corporations must respond to all data requests within 3 business days of the request unless a different response period is provided by Energy Safety.
    a. Energy Safety will endeavor to limit the 3-business-day response requirement to the WMP review period unless an expedited response time is otherwise required by Energy Safety.
    b. The WMP review period for Energy Safety begins on the date an electrical corporation submits its WMP for the completeness check (pre-submission) and runs throughout the entire WMP evaluation period until issuance of a final decision for each electrical corporation.
4. Energy Safety-issued WMP-related data requests occurring outside of the WMP review period shall be subject to a 10-business day response period unless a different response period is provided by Energy Safety.
5. Extension Requests
    a. If an electrical corporation seeks a longer response period than as provided in this section or as provided by Energy Safety, the electrical corporations must request an extension by sending an extension request to safetypolicy@energysafety.ca.gov.
    b. An extension request must include:
        i. The data request or portion of the data request requiring an extension;
        ii. A strong showing of the specific reason for the delay; and

iii. A proposed date of response in lieu of the original deadline.

c. Any extension request must be received by Energy Safety by 5PM on the business day prior to the date the response to a date request is due.

d. Upon receipt of an extension request, Energy Safety will evaluate the request and issue a determination.

8 Data Requests from Stakeholders

A stakeholder, as defined in Section 8.1, may obtain through a data request to electrical corporations, documents, data, or other information for purpose of providing public Opening and Reply Comments on any WMP docket matter that seeks public comments.

Prior to issuing a data request, a person or entity must seek and obtain a stakeholder designation pursuant to Section 8.1. A person or entity may submit public comments without a stakeholder designation.

8.1Stakeholder Designation

Any person or entity must submit a request for and receive designation as a stakeholder to send stakeholder data requests to electrical corporations as related to public comments for WMP evaluation. An initial request for designation as a stakeholder can be submitted any time prior to the WMP submission but must be submitted to the relevant year's WMP docket no later than 5-days following submission of an electrical corporation's WMP.

A request for designation as a stakeholder must include:

1. The docket matter (Docket #) the person or entity intends to participate in (e.g., #2023-2025-WMPs),
2. The position and interest of the person in the WMP docket matter,
3. Disclosure of the persons or entities on whose behalf the person may be seeking the designation, if any,
4. The electrical corporations for which the person or entity seeks stakeholder status. This may include a request for all electrical corporations,
5. The name, mailing address, e-mail address, and telephone number of the person or entity designee.

A request for designation as a stakeholder will be considered approved five (5) days after submission without any further correspondence from Energy Safety unless the person or entity seeking the designation is otherwise notified by Energy Safety during that time. Once granted stakeholder designation, a person or entity shall retain the stakeholder designation for subsequent WMP years unless that stakeholder fails to submit comments or otherwise actively participate in the WMP evaluation process for two years. After two years of nonparticipation, stakeholder designation is automatically withdrawn, and the person or entity must resubmit for stakeholder status in future WMP years.

Energy Safety may grant late requests for stakeholder designation only on a showing of good cause by the interested person or entity. No person or entity who becomes a stakeholder is permitted to reopen data requests dealt with in the relevant WMP docket matter prior to the time when such person became a stakeholder.

8.2 Stakeholder Data Request Process

The following applies to stakeholder data requests:

1. Electrical corporations must respond to all data requests within 3 business days of the request, unless a different response period is mutually agreed upon by the stakeholder making the data request and the electrical corporation.
    a. The 3-business-day response requirement is only in effect during the WMP review period.
    b. The stakeholder WMP review period begins on the date of submission of an electrical corporation's WMP (not its pre-submission) and runs throughout the entire WMP evaluation period until issuance of a Final Decision for each electrical corporation.
2. Stakeholder WMP-related data requests occurring outside of the WMP review period shall be subject to a 10-business day response period, unless a different response period is mutually agreed upon by the stakeholder making the data request and the electrical corporation.
3. Extension Requests
    a. Prior to seeking an extension from Energy Safety to respond to a data request, an electrical corporation must first make a good-faith effort to ask the stakeholder making the request to agree to the extension.
    b. If an electrical corporation cannot reach an agreement with the stakeholder requesting the data for a longer response period, the electrical corporation must request an extension by sending an extension request to safetypolicy@energysafety.ca.gov.
    c. An extension request must include:
        i. A showing of a good-faith effort by the electrical corporation to ask the stakeholder to agree to the extension and the result of such effort,
        ii. The data request or portion of the data request requiring an extension,
        iii. A strong showing of the specific reason for the delay, and
        iv. A proposed date of response in lieu of the original deadline.

d. Any extension request must be received by Energy Safety by 5PM prior to the date response(s) to a data request is due. If the day before falls on a weekend or holiday; the request must be submitted on the last business day prior to the data request due date.

e. Upon receipt of an extension request, Energy Safety will evaluate the request and issue a determination.

8.3 Stakeholder Data Request Minimum Criteria

Stakeholder data requests must adhere to the following:

1. Data requests must seek documents, data, or information relevant to the pending docket matter and be designed to facilitate the stakeholder's ability to make an informed public comment,
2. Stakeholders submitting data requests must consider the volume and nature of the data being requested when negotiating response deadlines outside of those set forth in Section 8.2,
3. Stakeholders must avoid extensive and comprehensive data requests in the 6 weeks before the electrical corporation must submit its WMP if the data could reasonably be requested outside of that timeframe.
4. Stakeholders submitting data requests must not submit requests where such information is otherwise available, namely:
   a. Contained in the electrical corporations' WMP filings,
   b. Previously requested by Energy Safety, or
   c. Previously requested by other stakeholders.

Stakeholders may view prior data requests and responses in each electrical corporation's Data Request Log, available on an electrical corporation's website. See Section 9.2, Data Request Log.

8.4 Request to Compel or Limit Stakeholder Data Requests

Stakeholders and electrical corporations must endeavor to resolve all data request disputes amongst themselves. For data request disputes that cannot be resolved, parties to the dispute may seek relief in accordance with the process below:

1. Prior to filing a request to compel or limit data requests, the parties to the dispute must have previously met and conferred in a good faith effort to informally resolve the dispute.

2. The party seeking to compel or to limit data requests bears the burden of proving the reasons why Energy Safety should compel or limit the data request.
3. A request to compel or limit a data request must include:
    a. Facts showing a good-faith attempt at an informal resolution of the data request dispute presented by the request,
    b. The data request or portion of the data request at issue,
    c. Basis to compel or limit the data request, and
    d. A proposed order that clearly indicates the relief requested.
4. A response to a request to compel or limit a data request must be submitted within 3 days of the date that the request was submitted to Energy Safety.
5. Energy Safety will take requests to compel or limit a data request under consideration and will issue a determination on a request to compel or limit a data request after the request and response(s) have been submitted.

All filings for a request to compel or limit data requests must be submitted to Energy Safety at safetypolicy@energysafety.ca.gov and served to all parties to the dispute.

9 Document Maintenance

9.1 Document Postings

Each electrical corporation must post its WMP and all documents referenced in its WMP on a WMP-specific website in an easy-to-follow format. This will be in addition to the posting of WMPs on Energy Safety's website. Electrical corporations must include the website address in a cover letter to their WMP submission.

9.2 Data Request Log

Each electrical corporation must post a WMP Data Request Log according to the guidance set forth below. The WMP Data Request Log must be posted and maintained beginning with pre-submission of the WMP for a completeness check and ending upon issuance of a draft decision.

1. Each electrical corporation must update its WMP Data Request Log and post all data requests and responses issued to date by Thursday at 5 pm Pacific time.
2. The website or portion of webpage pertaining to data requests must be titled "YEAR Wildfire Mitigation Plan Data Requests."
3. The Data Request Log must be in the form of a searchable online table that contains all data requests, responses for each data request received, and links to relevant documents.

4. The Data Request Log must indicate:
    a. The attachment number of any additional attachments related to the data request,
    b. The relevant sections of the WMP, and
    c. A thematic category and subcategory of the data request.

See Appendix A for the Data Request Log template.

10 Electrical Corporation WMP Submission Information

Each electrical corporation must submit its WMP and all supporting documents to the appropriate year's WMP docket. In addition, each electrical corporation must mail 5 hard copies, including appendices, of the WMP to:

Office of Energy Infrastructure Safety

Attn: Deputy Director

715 P Street, 20th Floor

Sacramento, CA 95814

10.1 Confidentiality

The submission process for confidential information is set forth in section 29200 of Title 14 of the California Code of Regulations.

10.2 Single Point of Contact

Each electrical corporation must send to safetypolicy@energysafety.ca.gov the name of its single point of contact for all data requests and WMP matters for Energy Safety staff use no later than the date of its pre-submission.

10.3 Format

Every document submitted to Energy Safety must comply with the formatting requirements below.

1. Electronically filed documents shall be word searchable and accessible as prescribed in Section 10.4 of these Guidelines.
2. Paper documents shall be:

a. Typewritten or otherwise mechanically printed;
b. On paper 11 inches long and 8 ½ inches wide;
c. Printed on both sides of the page if feasible; and
d. Bound securely.

3. Both electronic and paper documents shall;
   a. Be in a clear, easily readable font of at least 11 points;
   b. Have consecutively numbered pages; and
   c. Included the following information on the first page:
      i. Name of the docket;
      ii. Number of the docket; and
      iii. Title of the document.
4. For electronic documents, signatures may be electronic.[12]

10.4 Accessibility

It is the policy of the State of California that electronic information be accessible to people with disabilities. Each person who submits information through the Office's e-filing system must ensure that the information complies with the accessibility requirements set forth in Government Code section 7405. The Office will not accept any information submitted through the e-filing system that does not comply with these requirements.[13]

10.5 Pre-submissions

Each electrical corporation must submit a WMP pre-submission according to the schedule set forth by Energy Safety. Pre-submissions are to be complete WMPs submitted to Energy Safety for a completeness check as set forth in Section 4.1.

Each electrical corporation must submit its WMP pre-submission to the relevant year's WMP docket.

[12] Gov. Code, § 16.5.

[13] References to laws and regulations related to digital accessibility are available are available at, https://dor.ca.gov/Home/DisabilityLawsandRegulations. Resources on constructing accessible electronic contents are available at, https://dor.ca.gov/Home/ConstructingAccessibleElectronicContent.

10.6 Naming Convention

Electronic file names for the WMPs and associated document/data submissions must follow the standardized electronic naming convention illustrated in Table 2 below. The electronic file name(s) must include, in order, the naming convention identified in each column (without quotation marks), with an underscore between the character string of each column. See examples below.

Table 2: Electronic File Naming Convention with Examples

Date Submitted (Year-Month-Day)	Electrical Corporation Abbreviated Name	Document Year	Document Type	Revision Number
“2023-02-05”	• “PGE” (Pacific Gas and Electric Company) • “SDGE” (San Diego Gas and Electric) • “SCE” (Southern California Edison) • “BVES” (Bear Valley Electrical Services) • “LU” (Liberty Utilities) • “PC” (PacifiCorp) • “HWT” (Horizon West Transmission) • “TBC” (Trans Bay Cable) • “LSPGC” (LS Power Grid California)	“2023”	• “WMP-Pre (Wildfire Mitigation Plan Pre-Submission for Completeness Check) • “WMP” (Wildfire Mitigation Plan) • “WMP-Update” (Wildfire Mitigation Plan Update) • “Survey” (Maturity Model Survey) • “Metrics” (Performance Metrics Data) • “RNR” (Revision Notice Response) • “DSSR” (Data Schema Status Report) • “COR” (Change Order Report) • “PR” (Progress Report)	• R0 (First Version) • R1 (Revision 1) • R2 (Revision 2)

			• "QDR" (Quarterly Data Report)	

Examples:

- First Version of a WMP Submission: "2023-02-05_PGE_2023_WMP _R0", which refers to the PG&E 2023 WMP submitted on Feb 05, 2023, first version
- Updated submission in response to Energy Safety Revision Notices: "2023-06-05_HW_23_RNR_R1", which refers to the Horizon West Revision Notice Response submitted on June 5, 2023, revision 1
- Maturity Model submission: "2023-04-05_TBC_2023_Survey_R0", which refers to the Trans Bay Cable 2023 Maturity Model Survey submitted on April 5, 2023, first version

10.7 Service and Publications of WMPs

The electrical corporations must submit their 2023-2025 Base WMPs to the 2023-2025 Wildfire Mitigation Plan docket (#2023-2025-WMPs). Energy Safety will publish all WMPs on its website as required by Public Utilities Code section 8386(d). The electrical corporations must concurrently serve WMPs on the Department of Forestry and Fire Protection at CALFIREUtilityFireMitigationUnit@fire.ca.gov.

10.8 WMP Data Submissions

Data previously submitted with the WMP, excluding WMP targets as set forth in 2023-2025 WMP Technical Guidelines, will now be collected via Quarterly Data Reports (QDR). No separate data will be submitted along with the WMPs. Evaluation of an electrical corporation's WMP[14] and its compliance with the WMP[15] will include QDR submissions. Energy Safety will rely upon the most recently submitted QDR when evaluating a WMP.

Requirements for QDR submissions will be available in the Energy Safety Data Guidelines.

11 Schedule

Pursuant to Public Utilities Code section 8385.3(a), Energy Safety "shall approve or deny each wildfire mitigation plan and update…within three months of its submission, unless the

[14] See Pub. Util. Code, § 8386.3(a).

[15] See Pub. Util. Code, §§ 8386.3(c) & 8389(g); see also Gov. Code, §§ 15475.1 & 15475.2.

division makes a written determination, which shall include reasons supporting the determination, that the three-month deadline cannot be met."

Energy Safety will release a schedule each year prior to the pre-submission deadline. Energy Safety may update the schedule as needed during the evaluation process via written notice to the docket. Should Energy Safety exercise its right to extend the three-month deadline, Energy Safety will issue notice and rationale for its extension, concurrent with issuance of a determination or included in notice of a schedule or schedule update.

Any deadline that falls on a weekend or holiday shall be moved to the following business day. A document will be accepted by Energy Safety as of the date of the document's receipt. The exception is, documents submitted after 5:00p.m. on a business day, or at any time on a Saturday, Sunday, or holiday shall be deemed filed the next business day.

12 Change Order Requests

After approval of an electrical corporation's WMP, the electrical corporation may seek to change approved mitigation initiatives as it gains experience and assesses outcomes. The following section outlines the process for an electrical corporation to request Energy Safety's approval of significant changes related to its WMP mitigation initiatives.

Electrical corporations are required to request approval of changes to their mitigation initiatives if the changes substantially alter the course of their WMP or potentially reduce asset or community protections from wildfire or Public Safety Power Shutoff (PSPS) risk. Specific criteria for Change Order Requests are described in Section 11.2.

12.1 Purpose of a Change Order Request

The purpose of the Change Order Request is to allow the electrical corporation to request approval for a change or update to its approved WMP prior to submission of a subsequent WMP based on an updated understanding of risk.

Energy Safety evaluates Change Order Requests to ensure that electrical corporations continue to follow a risk-based approach to mitigation of wildfire and PSPS risk. Energy Safety will issue a decision on each Change Order Request as set forth in Section 12.4.

12.2 Criteria for a Change Order Request

An electrical corporation must request approval from Energy Safety if it is making any significant change to a mitigation initiative described in its WMP as soon as practicable after the WMP is approved and the electrical corporation determines a change is warranted. To be considered "significant" the change must meet the criteria set out in both A and B below.

A. Type of Initiative

The proposed change is to a mitigation initiative in one or more of the following categories:

1. Risk Methodology and Assessment
2. Grid Design, Operation, and Maintenance, including asset inspections and maintenance
3. Vegetation Management and Inspections
4. Public Safety Power Shutoff (PSPS)

B. Change in Risk

The change results in any of the following:

1. An increase or decrease of more than 25% of an initiative's risk reduction value based on an updated understanding of risk.
2. The change represents a significant shift in either the strategic direction or purpose of an initiative (e.g., introducing a novel risk model that significantly alters the risk profile of the electrical corporation's circuits).

If an electrical corporation is unsure whether a proposed change meets these criteria, it is encouraged to submit an advance inquiry to Energy Safety on the matter via email at safetypolicy@energysafety.ca.gov.

The following are not permissible through the Change Order Request process:

- Changes to approach or targets because full implementation may not be feasible.
- Changes to approach or targets because the electrical corporation expects to exceed its targets. Energy Safety will evaluate an electrical corporation's failure to meet a target (or its overshoot of a target) from the approved WMP as part of Energy Safety's compliance program. Electrical corporations should include details about their progress against their targets in their Quarterly Data Reports.
- Electrical corporations should also not request approval for a fundamental change in strategy, as such a change may be too substantive for the change order process.

12.3 Submission of Change Order Requests & Stakeholder Comments

Electrical corporations should endeavor to submit Change Order Requests as soon as practicable after they determine a change is warranted. Multiple submissions are permissible. However, electrical corporations must submit change order requests related to their approved WMP no later than 5P.M. on November 1st of the year in which the changes are being requested.[16]

Change order requests must be submitted to Energy Safety's e-filing system in the associated year's docket. Electrical corporations must concurrently send all change order requests to the Department of Forestry and Fire Protection at CALFIREUtilityFireMitigationUnit@fire.ca.gov. Change order requests should be titled following the naming conventions set forth in Section 10.6.

12.3.1 Requirements for Change Order Request Submissions

Requests for changes that meet the criteria described in Section 12.2 must include the following:

A. A brief description of the proposed change including:

   1. The title of the initiative for which the proposed change request is being submitted,
   2. The page number(s) in the WMP or WMP Update where that initiative is described, and
   3. Whether the proposed change is a change to an approach, a target, or both.

B. The planned expenditure for that initiative according to the WMP including:

   1. The percent of planned expenditure already spent,
   2. The planned expenditure for the remainder of the current WMP cycle, and
   3. If the expenditure amount is being redeployed, the amount being redeployed:
      a. From what budget, and
      b. To what budget.

C. The type of change proposed; changes may include:

   1. Increase in scale,
   2. Decrease in scale,
   3. Change in prioritization,

[16] Energy Safety may update this deadline as needed via written notice to the docket. For changes to 2023 WMPs, the deadline is November 1, 2023. For changes to 2024 WMPs, the deadline is November 1 2024, and so on.

4. Change in timing, or
5. Change in the nature of the work.

D. Description of the expected outcome from the change within the current WMP cycle, including any reduction to:

1. Wildfire risk (including ignition and consequence risk), and
2. PSPS risk.

12.3.2 Stakeholder Comments

Electrical corporations, stakeholders and members of the public may comment on Change Order Requests within 20 days of the date the electrical corporation submits a Change Order Request to Energy Safety's docket according to the process set forth in Section 6.2. The three-day deadline for Energy Safety and stakeholder data requests during their respective WMP review periods also applies during review of Change Order Requests and shall cover the period from the date the change order is submitted to the date of Energy Safety's decision on the change order.

Electrical corporations, stakeholders and members of the public must submit comments to the appropriate WMP docket according to the naming conventions set forth in Section 10.5.

12.4 Change Order Request Evaluation

Energy Safety will evaluate Change Order Requests and approve or deny the request based on the criteria in Table 3 below.

Table 3: Criteria for Approval and Denial of Change Order Requests

Decision	Rationale	Impact
Approved	Proposed change responds to updated understanding of risk and is likely to reduce wildfire or PSPS risk.	Electrical corporation must reflect change in all subsequent reports or WMP submissions to Energy Safety.
Rejected	Proposed change is not likely to reduce wildfire or PSPS risk over existing approved mitigation initiative;	Targets/approaches remain the same as proposed in approved WMP/Update.

	OR Proposed change does not respond to updated risk assessment and/or only responds to underperformance or overperformance for reasons unrelated to the risk assessment; OR Proposed change is too substantive for the change order process.	

Electrical corporations must not include revisions to targets or approaches in any submission to Energy Safety, including Quarterly Data Reports, until the change is approved. Upon approval, the electrical corporation may amend any previous submissions via submission of an amended submission to the relevant docket.

13 WMP Updates

Energy Safety will issue separate guidelines for WMP Updates. The anticipated allowable revisions for WMP Updates may include:[17]

1. Progress on Areas for Continued Improvement from previous decisions(s),
2. Updates resulting from approved Change Order Requests,
3. Mid-year and end-of-year targets for the year covered in the WMP Update (i.e., in 2024, electrical corporations will provide/update applicable mid-year and end-of-year targets for 2025),
4. Updates based on lessons learned during the previous year, and
5. Updates based on significant changes to risk models, as set forth in Section 13.1, below.

[17] A final list will be issued in forthcoming WMP Update Guidelines.

13.1 Risk Models and Workplans

Energy Safety recognizes that development of models is not a static process. However, to ensure continuity of workplans and avoid projects being continuously reprioritized, throughout the three-year WMP cycle, electrical corporations must implement planned projects as determined by the output of the risk-model used in the Base WMP, as set forth below:

1. Electrical corporations may update their risk-models throughout the three-year WMP cycle based on new learnings.
2. In WMP Updates, electrical corporations must report on key risk-model outputs (e.g. top riskiest circuits) from both the Base WMP version of the model and any updated version.
3. If changes to the risk-model result in substantial changes to risk-prioritization such that an electrical corporation believes that project workplans must be altered to significantly reduce risk, the electrical corporation must include justification for the changes to the model resulting in the reprioritization and provide detail changes to project plans, including stranded projects, as part of the WMP Update.

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Appendix A: Data Request Log Template

Count	Party Name	DR Set #	Data Request	Question No.	Question ID	Question	Responses	Requestor	Date Rec'd	Final Due Date	Date Sent	Links	Number of Atchs	NDA required	WMP Section	Category	Subcategory