DRAFT – REVISION 1

ATTACHMENT 2

2022 Wildfire Mitigation Plan Update Guidelines Template
Office of Energy Infrastructure Safety

TABLE OF CONTENTS

Introduction **5**

Overview of WMP Guideline Improvements During the 3-year Plan Cycle (2020 – 2022) ... 5

Naming Convention 6

WMP Structure 8

General Instructions 9

GENERAL GLOSSARY OF DEFINED TERMS **11**

1 PERSONS RESPONSIBLE FOR EXECUTING THE WMP **25**

1.1. Verification 29

2 ADHERENCE TO STATUTORY REQUIREMENTS **31**

3 ACTUALS AND PLANNED SPENDING FOR MITIGATION PLAN **37**

3.1. Summary of WMP initiative expenditures 38

3.2. Summary of Ratepayer Impact 40

4 LESSONS LEARNED AND RISK TRENDS **41**

4.1. Lessons Learned: how tracking metrics on the 2020 and 2021 plans informed the 2022 plan update 42

4.2. Understanding major trends impacting ignition probability and wildfire consequence 42

4.2.1. Service territory fire threat evaluation and ignition risk trends 43

4.3. Change in ignition probability drivers 45

4.4. Research proposals and findings 45

4.4.1. Research proposals 45

4.4.2. Research Findings 46

4.5. Model and metric calculation methodologies 46

4.5.1. Additional models for ignition probability, wildfire and PSPS risk 46
4.5.2. Calculation of key metrics 48
4.6. Progress reporting on key areas of improvement 50

5 INPUTS TO THE PLAN AND DIRECTIONAL VISION FOR WMP 52

5.1. Goal of Wildfire Mitigation Plan 53
5.2. The Objectives of the plan 53
5.3. Plan program targets 53
5.4. Planning for Workforce and Other Limited Resources 58
5.4.1. Target role: Vegetation inspections 58
5.4.2. Target role: Vegetation management projects 59
5.4.3. Target role: Asset Inspections 59
5.4.4. Target role: Grid hardening 59
5.4.5. Target role: Risk event inspections 59

6 PERFORMANCE METRICS AND UNDERLYING DATA 60

6.1. Recent performance on progress metrics, last 7 years 61
6.2. Recent performance on outcome metrics, annual, last 7 years 62
6.3. Description of additional metrics 63
6.4. Detailed information supporting outcome metrics 64
6.5. Mapping recent, modelled, and baseline conditions 66
6.6. Recent weather patterns, last 7 years 67
6.7. Recent and projected drivers of outages and ignition probability 67
6.8. Baseline state of equipment and wildfire and PSPS event risk reduction plans .. 69
6.8.1. Current baseline state of service territory and utility equipment 69
6.8.2. Additions, removal, and upgrade of utility equipment by end of 3-year plan term 70

7 MITIGATION INITIATIVES 73

7.1. Wildfire Mitigation Strategy 74
7.2. Wildfire Mitigation Plan implementation 76
7.3. Detailed wildfire mitigation initiatives 76
7.3.1. Financial data on mitigation initiatives 77
7.3.2. Detailed information on mitigation initiatives 77

8 PUBLIC SAFETY POWER SHUTOFFS (PSPS) 81

8.1. Directional Vision for Necessity of PSPS 82
8.2. Protocols on Public Safety Power Shut-off 84
8.3. Projected changes to PSPS impact 84
8.4. Engaging vulnerable communities 85
8.5. PSPS-specific metrics 85
8.6 Identification of frequently de-energized circuits 86

9 APPENDIX 87

9.1. Definitions of initiative activities by category 88
9.2. Citations for relevant statutes, Commission directives, proceedings and orders 102
9.3. Covered Conductor Installation Reporting 102
9.4. Undergrounding Implementation Reporting 102

INTRODUCTION

The California Public Utilities Commission (CPUC) guidance in Decision (D.)19-05-036 included substantive and procedural requirements for future Wildfire Mitigation Plans (WMP) based on lessons learned during the first WMP (2019) evaluation and established an expectation for improvement in the WMPs each year. As such, the Office of Energy Infrasture Safety (Energy Safety), formerly the CPUC's Wildfire Safety Division, has matured the guidelines and reporting requirments for each WMP and WMP Update.

Overview of WMP Guideline Improvements During the 3-year Plan Cycle (2020 – 2022)

- **2020 WMP Guideline Improvements** – The 2020 WMP submission and review process included substantial changes from earlier guidance, which streamlined the structure and consistency in data submissions, requested additional supporting data earlier in the WMP process, and utilized a more structured and consistent approach to evaluating the WMPs. The 2020 WMPs were the base year in a three-year cycle from 2020-2022.
- **2021 WMP Guideline Improvements** – The 2021 Guidelines were updated based on several guiding principles from lessons learned, comments from stakeholders, and input from the Wildfire Safety Advisory Board (WSAB) during the 2020 WMP evaluation period. This feedback informed the development of four key elements for the 2021 WMP submission and review process:

    1. Frontloaded data collection. Process revisions for this element extended the timeframe for Energy Safety and stakeholder review of relevant utility[1] data in advance of the WMP submission and review period, while also reducing the need for follow-up data requests. In addition, with these revisions, utilities submit some data through

[1] The term "utility" is used interchangeably with "electrical corporation"

Quarterly Reports prior to the development of the annual WMP.

2. Standardized templates for utility WMP submission. The 2021 Guidelines included additional templates to facilitate WMP evaluations and comparisons across utility WMPs and identify relevant supporting information. The guidelines also introduced standardization for narrative sections and additional sub-headings. A specific data schema and automated calculation checklist also now standardize Quarterly Reports.

3. Systematized qualitative evaluation. The guidelines established an assessment framework to increase objectivity, consistency and efficiency of WMP evaluations.

4. Tracked utility progress towards wildfire and Public Safety Power Shutoff (PSPS) risk reduction. The 2021 Guidelines provided instructions and guidance for the first annual WMP Updates to the initial three-year plans submitted by the Utilities' in 2020. The 2021 WMP Updates highlighted the progress each utility made since 2020.

- **2022 WMP Guideline Improvements** – In a similar spirit of continuous improvement, the 2022 WMP Update Guidelines (2022 Guidelines) include new requirements and updates based on lessons learned and comments received from various stakeholder groups (e.g., the public, utilities, WSAB, and Energy Safety staff) during the 2021 WMP evaluation period. As 2022 is the final year of the 3-year plan cycle (2020 – 2022), the 2022 Guidelines primarily correct errors, address omissions, and inconsistencies, and incorporate minor improvements to structure, process, and data reporting elements. Changes are minimal to enable comparison across 2020-2022 WMPs and are as set forth below.

Naming Convention

To improve the administrative management of WMP submissions, the electronic file names for the WMPs and associated document/data submissions must follow the standardized electronic naming convention illustrated in Table 1 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 1: Electronic File Naming Convention with Examples

Date Submitted (Year-Month-Day)	Utility Abbreviated Name	Document Year	Document Type	Revision Number
"2022-02-05"	• "PGE" (Pacific Gas & Electric Company) • "SDGE" (San Diego Gas & Electric) • "SCE" (Southern California Edison) • "BVES" (Bear Valley Electrical Services) • "LU" (Liberty Utility) • "PC" (PacifiCorp) • "HWT" (Horizon West) • "TBC" (Trans Bay Cable)	"2022"	• "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) • "QDR" (Quarterly Data Report) • "QIU" (Quarter Initiative Update)	• R0 (First Version) • R1 (Revision 1) • R2 (Revision 2)

Examples:

- **First Version of a WMP Submission:** "2022-02-05_PGE_2022_WMP-Update_R0", which refers to the PG&E 2022 WMP Update submitted on Feb 05, 2022, first version
- **Updated submission in response to Energy Safety Revision Notices:** "2022-06-05_HW_22_RNR_R1", which refers to the Horizon West Revision Notice Response submitted on June 5, 2022, revision 1
- **Maturity Model submission:** "2022-04-05_TBC_2022_Survey_R0", which refers to the Trans Bay Cable 2022 Maturity Model Survey submitted on April 5, 2022, first version
- **Quarter 2 Report data submission:** "2022-05-05_LU_2022_Q2-data_R0", which refers to the Liberty Utility 2022 Quarter 2 Report data submitted on May 5, 2022, first version

WMP Structure

The structure and organization of the 2022 WMP Updates must follow the eight sections and appendix indicated in Table 2 below.

Table 2: Structure of2022 WMP Update

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

General Instructions

The following subsection provides detailed instructions for preparing the 2022 WMP Update.

Narratives
Each section of the WMP is required to 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 facilitate communication and substantiation of concepts and strategies. Each narrative must be clear, concise, and include a high-level bulleted summary of key takeaways for the respective section (where appropriate). WMP Updates must be limited in duplication of narratives across different sections.

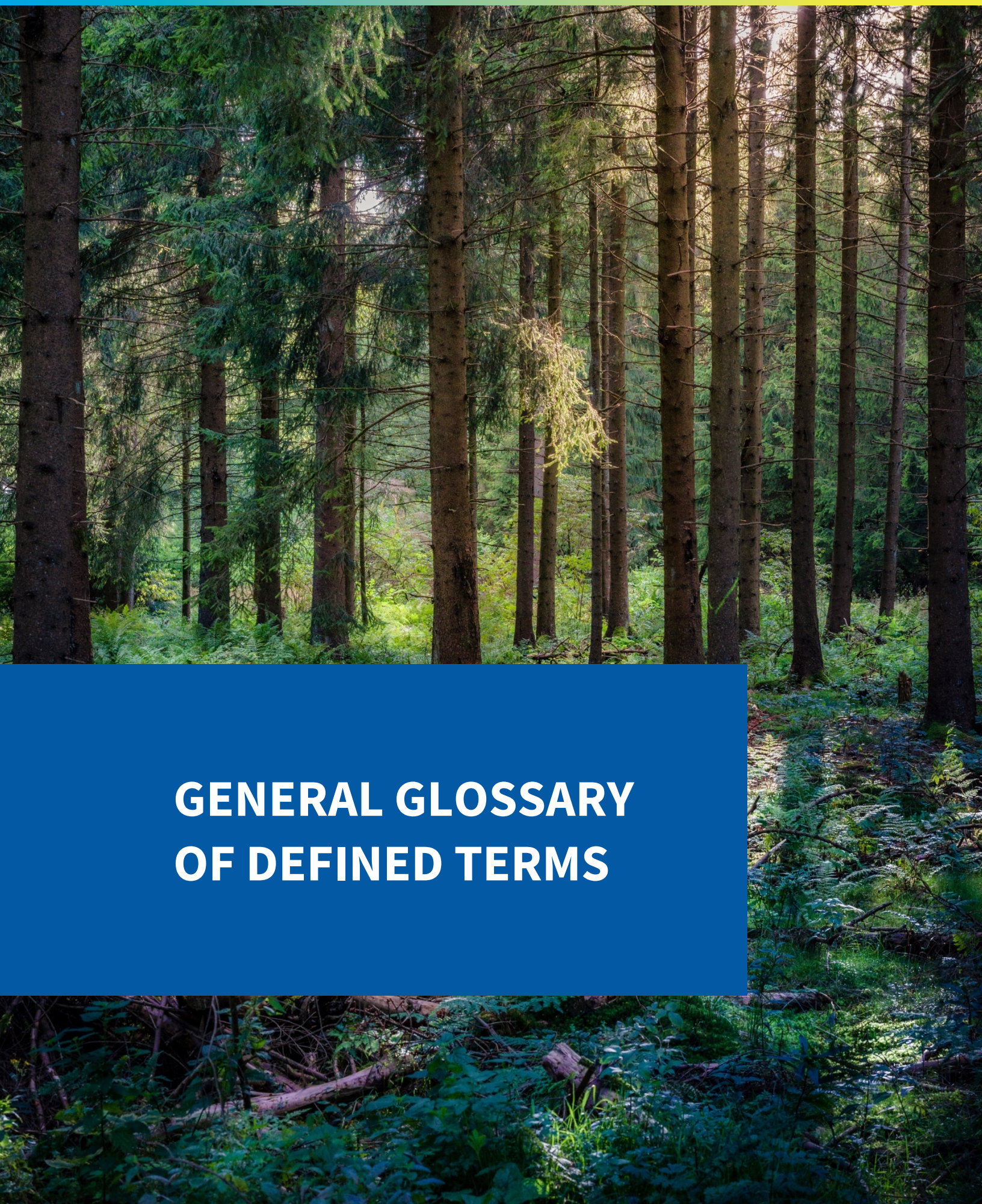
Cross-Referencing
The WMP Update must include cross-referencing and hyperlinks to minimize duplication of narratives and provide quick referencing to other relevant sections. All figures and tables must incorporate the use of captions with associated references in the main body of the WMP using hyperlinks. PDFs must incorporate the use of electronic bookmarks for all sections, main headings, and sub-headings.

Quantitative Responses
Use the template tables for reporting quantitative data according to the instructions provided in the respective sections. If a table includes comment boxes, the comment boxes may be extended as needed. Some tables, such as those in Section 3, require reporting directly in the WMP alongside the narrative content. Quarterly Data Reports (QDR) must include the required data in a separate spreadsheet document following the standard format in Attachment 3. Completely fill out the data tables including both existing and updated data. Each section must include a narrative identifying updated tables.

Protocols for Inaccessible Data/Information
If any portion of the WMP requires information that the utility cannot collect and/or is not obtainable from peer utilities, the utility 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 utility must identify these circumstances and provide a description of an alternative source of information or proxy that most closely fits the original requirement. The WMP shall clearly cite the source(s) of the data used in lieu of the required data.

For example, by the WMP submission deadline, a utility may not have a full accounting of the value of property destroyed by utility-~~ignited wildfire~~related ignitions in a given year due to ongoing investigation into the cause of one or more wildfires within its service territory. In this example, the utility is required to indicate: 1) the known sum of the value of property determined by the relevant fire Authorities Having Jurisdiction (AHJs) to have been destroyed by utility-~~ignited wildfire~~related ignitions in that year, even if this summation is incomplete, and 2) a list of the wildfires in that year, and an estimation of the value of property destroyed by each wildfire, for which utility facilities are being investigated as potential sources of ignition but for which the cause is still undetermined. The utility is required to cite all data sources used in the calculations.

Finally, the utility is required to provide a plan for improving its data collection and/or cooperation with partners for collecting the required information, including a timeline for implementation. If any of the requested information is confidential, the utility is required to submit two versions to Energy Safety – one that includes all of the requested information and a second that redacts the confidential information.



GENERAL GLOSSARY OF DEFINED TERMS

Term	Definition
10-hour dead fuel moisture content	Moisture content of small dead vegetation (e.g., grass, leaves, which burn quickly but not intensely), which can respond to changes in atmospheric moisture content within 10 hours.
Access and functional needs populations	Per Public Utilities Code (Pub. Util. Code) § 8593.3 and D.19-05-042, individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking, older adults, children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant.
Authority Having Jurisdiction	AHJ, party with assigned responsibility, depending on location and circumstance.
Asset (utility)	Electric lines, equipment, or supporting hardware.
At-risk species	Species of vegetation that have an elevated risk of (1) coming into contact with powerlines, (2) causing an outage or ignition, and/or (3) easily ignitable and within close enough proximity to potential arcing, sparks and/or other utility equipment thermal failures. “At-risk species” must be a function of species-specific characteristics including growth rate, failure rate of limbs, trunk, and/or roots (as compared to other species), height at maturity, flammability, vulnerability to disease or insects, etc.
Baseline (ignition probability, maturity)	A measure, typically of the current state, which establishes a starting point for comparison with measures from other states.
Carbon dioxide equivalent	Tons of greenhouse gases (GHG) emitted, multiplied by the global warming potential relative to carbon dioxide.
Circuit mile	The total length in miles of separate circuits regardless of the number of conductors used per circuit
Contractor	Any individual in the temporary and/or indirect employ of the utility whose limited hours and/or time-bound term of

Term	Definition
	employment are not considered as "full-time" for tax and/or any other purposes.

Critical facilities and infrastructure	For brevity in the WMP, "critical facilitates and infrastructure" may be shortened to "critical infrastructure" and/or "critical facilities" throughout the WMP. Critical facilities and infrastructure is defined in accordance with the definition adopted in D.19-05-042 and modified in D.20-05-051: those facilities and infrastructure that are essential to the public safety and that require additional assistance and advance planning to ensure resiliency during de energization events. Namely:
	• Emergency Services Sector
	  ○ Police Stations
	  ○ Fire Station
	  ○ Emergency Operations Centers
	  ○ Public safety answering points
	• Government Facilities Sector
	  ○ Schools
	  ○ Jails and prisons
	• Healthcare and Public Health Sector
	  ○ Public Health Departments
	  ○ Medical facilities, including hospitals, skilled nursing facilities, nursing homes, blood banks, health care facilities, dialysis centers and hospice facilities (excluding doctor offices and other non-essential medical facilities)
	• Energy Sector
	  ○ Public and private utility facilities vital to maintaining or restoring normal service, including, but not limited to, interconnected publicly owned utilities and electric cooperatives
	• Water and Wastewater Systems Sector
	  ○ Facilities associated with the provision of drinking water or processing of wastewater including facilities used to pump, divert, transport, store, treat and deliver water or wastewater
	• Communications Sector
	  ○ Communication carrier infrastructure including selective routers, central offices, head ends, cellular switches, remote terminals and cellular sites

Term	Definition

	• Chemical Sector
	  ○ Facilities associated with the provision of manufacturing, maintaining, or distributing hazardous materials and chemicals (including Category N-Customers as defined in D.01-06-085)
	• Transportation Sector
	  ○ Facilities associated with automobile, rail, aviation, major public transportation, and maritime transportation for civilian and military purposes

Customer hours	Total number of customers, multiplied by the average number of hours (e.g., of power outage).
Data cleaning	Calibrating raw data to remove errors (including typographical and numerical mistakes).
Dead fuel moisture content	Moisture content of dead vegetation, which responds solely to current environmental conditions and is critical in determining fire potential.
Detailed inspection	In accordance with GO 165, an inspection where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.
Enhanced inspection	Inspection whose frequency and thoroughness exceeds the requirements of the detailed inspection, particularly if driven by risk calculations.
Enterprise System	A centralized information system that ensures data may be shared throughout all functional levels and management hierarchies of an organization, as needed.
Evacuation impact	Number of people evacuated, with the duration for which they are evacuated, from homes and businesses, due to wildfires.
Evacuation zone	Areas designated by CAL FIRE and local fire agency evacuation orders, to include both “voluntary” and “mandatory” in addition to other orders such as “precautionary” and “immediate threat”.

Term	Definition
Fire Season	The time of year that wildfires are most likely to take place for a given geographic region due to historical weather conditions, vegetative characteristics and impacts of climate change. Goals and targets which have milestones related to the onset, duration, or end of "fire season" or "height of fire season" must be accompanied with calendar dates.
Frequently de-energized circuit	A circuit which has been de-energized pursuant to a de-energization event to mitigate the risk of wildfire three or more times in a calendar year.
Fuel density	Mass of fuel (vegetation) per area which could combust in a wildfire.
Fuel management	Removing, thinning, or otherwise altering vegetation to reduce the potential rate of propagation or intensity of wildfires.
Fuel moisture content	Amount of moisture in a given mass of fuel (vegetation), measured as a percentage of its dry weight.
Full-time employee	Any individual in the ongoing and/or direct employ of the utility whose hours and/or term of employment are considered as "full-time" for tax and/or any other purposes.
GO 95 nonconformance	Condition of a utility asset that does not meet standards established by General Order 95.
Greenhouse gas (GHG) emissions	Health and Safety Code 38505 identifies seven greenhouse gases that ARB is responsible to monitor and regulate in order to reduce emissions: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF3).
Grid hardening	Actions (such as equipment upgrades, maintenance, and planning for more resilient infrastructure) taken in response to the risk of undesirable events (such as outages) or undesirable conditions of the electrical system in order to reduce or mitigate those events and conditions, informed by an assessment of the relevant risk drivers or factors.

Term	Definition
Grid topology	General design of an electric grid, whether looped or radial, with consequences for reliability and ability to support de-energization (e.g., being able to deliver electricity from an additional source).
High Fire Threat District (HFTD)	Per D.17-01-009, areas of the State designated by the Office of Energy Infrastructure Safety and CAL FIRE to have elevated wildfire risk, indicating where each utility must take additional action (per GO 95, GO 165, and GO 166) to mitigate wildfire risk.
Highly rural region	In accordance with 38 CFR 17.701, "highly rural" must be defined as those areas with a population of less than 7 persons per square mile. For the purposes of the WMP, "area" must be defined as census tracts.
High Wind Warning (HWW)	Level of wind risk from weather conditions, as declared by the National Weather Service. For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings.[2]
HWW overhead (OH) Circuit Mile Day	Sum of overhead circuit miles of utility grid subject to High Wind Warnings (HWW, as defined by the National Weather Service) each day within a given time period, calculated as the number of overhead circuit miles that are under an HWW multiplied by the number of days those miles are under said HWW. For example, if 100 overhead circuit miles are under an HWW for 1 day, and 10 of those miles are under HWW for an additional day, then the total HWW OH circuit mile days would be 110.
Ignition probability	The relative possibility that an ignition will occur, probability is quantified as a number between 0% and 100% (where 0% indicates impossibility and 100% indicates certainty). The higher the probability of an event, the more certainty there is that the event will occur. (Often informally referred to as likelihood or chance).
Ignition-related deficiency	Any condition which may result in ignition or has previously resulted in ignition, even if not during the past five years.

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

Term	Definition
Impact/consequence of ignitions	The effect or outcome of a wildfire ignition upon objectives, which may be expressed by terms including, although not limited to, maintaining health and safety, ensuring reliability, and minimizing economic and/or environmental damage.
Initiative	Measure or activity proposed or in process designed to reduce the consequences and/or probability of wildfire or PSPS.
Inspection protocol	Documented procedures to be followed in order to validate that a piece of equipment is in good condition and expected to operate safely and effectively.
Invasive species	A species that is: 1) 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 (non-immediate high to low) safety and/or reliability risk.
Level 3 finding	In accordance with GO 95, an acceptable safety and/or reliability risk.
Life expectancy	Anticipated years that a piece of equipment can be expected to meet safety and performance requirements.
Limited English Proficiency (LEP)	Populations with limited English working proficiency based on the International Language Roundtable scale.
Line miles	The number of miles of transmission and/or distribution line. Differs from circuit miles because individual circuits, such as the two circuits of a double-circuit line, are not counted separately in circuit miles but are counted as separate total miles of line.
Live fuel moisture content	Moisture content within living vegetation, which can retain water longer than dead fuel.
Lost energy	Energy that would have been delivered if not for an outage.

Term	Definition
Major roads	Interstate highways, U.S. highways, state and county routes.
Match drop simulation	Wildfire simulation method that takes an arbitrary ignition and forecasts propagation and consequence/impact.
Member of the public	Any individual not employed by the utility.
Multi-attribute value function	Risk calculation methodology introduced during CPUC's S-MAP and RAMP proceedings.
Near miss	Previously used to define an event with probability of ignition. Redefined under "Risk event."
Need for PSPS	When the utility's criteria for utilizing PSPS are met.
Noncompliant clearance	Rights-of-way whose vegetation is not trimmed in accordance with the requirements of GO 95.
Outages of the type that could ignite a wildfire	Outages that, in the judgement of the utility, could have ignited a wildfire.
Outcome metrics	Measurements of the performance of the utility and its service territory in terms of both leading and lagging indicators of wildfire, PSPS, and other consequences of wildfire risk, including the potential unintended consequences of wildfire mitigation work, such as acreage burned by utility-~~ignited wildfire.~~related ignitions.
Overcapacity	When the energy transmitted by utility equipment exceeds that of its nameplate capacity.
Patrol inspection	In accordance with GO 165, a simple visual inspection of applicable utility equipment and structures that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.
Percentile conditions	Top X% of a particular set (e.g., wind speed), based on a historical data set with sufficient detail. For example, "Top 95 percentile wind speeds in the last 5 years" would refer to the 5% of avg daily wind speeds recorded by each weather station. If 1,000 weather stations recorded average daily wind speeds over 10 days, then the 95th percentile wind speed

Term	Definition
	would be the top 5% of weather station-days. In this example, there will be 10 days each with 1,000 weather station reports and a total of 10,000 weather station-days, so 50 observations will be in the top 5%. The lowest wind speed in this top 5% would be the "95th percentile wind speed".
Planned outage	Electric outage announced ahead of time by the utility.
Preventive maintenance (PM)	The practice of maintaining equipment on a regular schedule, based on risk, elapsed time, run-time meter readings, or number of operations. The intent of PM is to "prevent" maintenance problems or failures before they take place by following routine and comprehensive maintenance procedures. The goal is to achieve fewer, shorter, and more predictable outages.
Priority essential services	Critical first responders, public safety partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water utilities/agencies.
Program targets	Quantifiable measurements of activity identified in WMPs and subsequent updates used to show progress towards reaching the objectives.
Progress metrics	Measurements that track how much utility wildfire mitigation activity has changed the conditions of utility wildfire risk exposure or utility ability to manage wildfire risk exposure, in terms of leading indicators of ignition probability and wildfire consequences.
Property	Private and public property, buildings and structures, infrastructure, and other items of value that are destroyed by wildfire, including both third-party property and utility assets.
PSPS event	Defined as the time period from the first public safety partner notified of a planned public safety de-energization to the final customer re-energized.
PSPS risk	The potential for the occurrence of a PSPS event expressed in terms of a combination of various outcomes of the event and their associated probabilities.

Term	Definition
PSPS weather	Weather that exceeds a utility's risk threshold for initiating a PSPS.
Red Flag Warning (RFW)	Level of wildfire risk from weather conditions, as declared by the National Weather Service. For historical NWS data, refer to the Iowa State University Iowa archive of NWS watch / warnings.[3]
RFW OH Circuit Mile Day	Sum of overhead circuit miles of utility grid subject to Red Flag Warning each day within a given time period, calculated as the number of overhead circuit miles that are under an RFW multiplied by the number of days those miles are under said RFW. For example, if 100 overhead circuit miles are under an RFW for 1 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 event	An event with probability of ignition, including wires down, contacts with objects, line slap, events with evidence of heat generation, and other events that cause sparking or have the potential to cause ignition. The following risk events all qualify as risk events: • Ignitions • Outages not caused by vegetation • Vegetation-caused outages • Wire-down events • Faults Other risk events with potential to cause ignitions
Risk event simulation	Simulation of what the consequence would have been of an ignition had it occurred.
Risk-spend efficiency (RSE)	An estimate of the cost-effectiveness of initiatives, calculated by dividing the mitigation risk reduction benefit by the mitigation cost estimate based on the full set of risk reduction benefits estimated from the incurred costs. For ongoing initiatives, the RSE can be calculated by determining the "marginal benefit" of additional spending in the ongoing initiative. For example, the RSE of an ongoing initiative could be calculated by dividing the mitigation risk reduction benefit

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

Term	Definition
	from a 5% increase in spend by the cost associated with a 5% increase in spend.
Rule	Section of public utility code requiring a particular activity or establishing a particular threshold.
Run-to-failure	A maintenance approach that replaces equipment only when it fails.
Rural region	In accordance with GO 165, "rural" must be defined as those areas with a population of less than 1,000 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, “area” must be defined as census tracts.
Safety Hazard	A condition that poses a significant threat to human life or property.
Simulated wildfire	Propagation and impact/consequence of a wildfire ignited at a particular point ('match drop'), as simulated by fire spread software.
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 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.
System Average Interruption Duration Index (SAIDI)	System-wide total number of minutes per year of sustained outage per customer served.
Third-party contact	Contact between a piece of electrical equipment and another object, whether natural (tree branch) or human (vehicle).
Time to expected failure	Time remaining on the life expectancy of a piece of equipment.
Top 30% of proprietary fire potential index	Top 30% of FPI or equivalent scale (e.g., “Extreme” on SCE’s FPI; “extreme”, 15 or greater, on SDG&E’s FPI; and 4 or above on PG&E’s FPI).

Term	Definition
Tree with strike potential / danger tree	A tree within or adjacent to the utility right-of-way that has a structural defect or lean that makes it likely to fail in whole or in part and contact electrical equipment or facilities.[4]
Unplanned outage	Electric outage that occurs with no advance notice from the utility (e.g., blackout).
Urban region	In accordance with GO 165, "urban" must be defined as those areas with a population of more than 1,000 persons per square mile as determined by the United States Bureau of the Census.
Utility-~~ignited wildfire~~related ignitions	~~Wildfires ignited by~~Ignitions involving utility infrastructure or employees, including all ~~wildfires~~ignitions determined by AHJ investigation to originate from ~~ignition caused by~~ utility infrastructure~~. For the purposes of the WMP, "area" must be defined as census tracts~~ or employees.
Vegetation management	Trimming, removal, and other remediations of vegetation used to maintain utility ROW and reduce the risk of outages, ignitions, and other disruption and danger.
Vegetation risk index	Risk index indicating the probability of vegetation-caused outages and/or ignitions along a particular circuit, based on the vegetation species, density, height, growth rate, etc.
Weather normalization	Adjusting metrics based on relative weather risk factors or indices
Wildfire impact/ consequence	The effect or outcome of a wildfire affecting objectives, which may be expressed, by terms including, although not limited to health, safety, reliability, economic and/or environmental damage.
Wildfire risk	The potential for the occurrence of a wildfire event expressed in terms of ignition probability, wildfire impact/consequence.
Wildfire-only WMP programs	Activities, practices, and strategies that are only necessitated by wildfire risk, unrelated to or beyond that required by minimum reliability and/or safety requirements. Such programs are not indicated or in common use in areas where

[4] "Danger tree" is more specifically defined in California Code of Regulation Title 14 § 895.1

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

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1 PERSONS RESPONSIBLE FOR EXECUTING THE WMP

1. Persons Responsible for Executing the WMP

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

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

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

Executive-level owner with overall responsibility

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

Program owners specific to each section of the plan

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

Section 1: Persons responsible for executing the plan
Program owner (add additional program owners if separated by component in section)

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

Section 2: Adherence to statutory requirements
Program owner (add additional program owners if separated by component in section)

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

Section 3: Actuals and planned spending
Program owner (add additional program owners if separated by component in section)

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

Section 4: Lessons learned and risk trends
Program owner (add additional program owners if separated by component in section)

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

Section 5: Inputs to the plan and directional vision
Program owner (add additional program owners if separated by component in section)

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

Section 6: Metrics and underlying data
Program owner (add additional program owners if separated by component in section)

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

Section 7: Mitigation initiatives
Program owner (add additional program owners if separated by component in section)

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

Section 8: Public Safety Power Shutoff
Program owner (add additional program owners if separated by component in section)

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

Section 9: Appendix

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

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

1.1. Verification

Complete the following verification for the WMP submission:

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

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

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

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

_____
(Signature and Title of Corporate Officer)

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2 ADHERENCE TO STATUTORY REQUIREMENTS

2. Adherence to Statutory Requirements

Section 2 comprises a "check list" of the Pub. Util. Code § 8386 © requirements and subparts. The utility is required to both affirm that the WMP addresses each requirement AND cite the section and page number where statutory compliance is demonstrated fully. Citations are required to use cross-referencing with hyperlinks. ***Note: Energy Safety reserves the right to automatically reject a WMP that does not provide substantiation for statutory compliance or does not provide citations to appropriate sections of the WMP.***

Table 2-1 provides an exemplar for the minimum acceptable level of information and citation for the statutory check list.

Table 2-1: Illustrative checklist

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

Table 2-2 provides the full list of statutory requirements. A table similar to Table 2-2 is required with the appropriate citation for each requirement. If multiple WMP sections address a specific requirement, then references to all relevant sections with a brief indication of information provided in each section must be provided. The table must include each section reference separated by semi-colon (e.g., Section 5, pg. 30-32 (workforce); Section 7, pg. 43 (mutual assistance)) where appropriate, and associated hyperlinks to the referenced section.

Table 2-2: Statutory Compliance Matrix

Requirement	Description	WMP Section & Page Number
1	An accounting of the responsibilities of person(s) responsible for executing the plan	
2	The objectives of the plan	
3	A description of the preventive strategies and programs to be adopted by the electrical corporation to minimize the risk of its electrical lines and equipment causing catastrophic wildfires, including consideration of dynamic climate change risks	
4	A description of the metrics the electrical corporation plans to use to evaluate the plan's performance and the assumptions that underlie the use of those metrics	
5	A discussion of how the application of previously identified metrics to previous plan performances has informed the plan	
6	Protocols for disabling reclosers and de-energizing portions of the electrical distribution system that consider the associated impacts on public safety. As part of these protocols, each electrical corporation shall include protocols related to mitigating the public safety impacts of disabling reclosers and de-energizing portions of the electrical distribution system that consider the impacts on all of the aspects listed in PU Code 8386c	
7	Appropriate and feasible procedures for notifying a customer who may be impacted by the de-energizing of electrical lines, including procedures for those customers receiving a medical baseline allowance as described in paragraph (6). The procedures shall direct notification to all public safety offices, critical first responders, health care facilities, and operators of telecommunications infrastructure with premises within the footprint of potential de-energization for a given event	
8	Identification of circuits that have frequently been de-energized pursuant to a de-energization 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 de-energization of those circuits, including, but not limited to, the estimated annual decline in circuit de-energization and de-energization impact on customers, and replacing, hardening, or undergrounding any portion of the	

Requirement	Description	WMP Section & Page Number
	circuit or of upstream transmission or distribution lines	
9	Plans for vegetation management	
10	Plans for inspections of the electrical corporation's electrical infrastructure	
11	Protocols for the de-energization of the electrical corporation's transmission infrastructure, for instances when the de-energization may impact customers who, or entities that, are dependent upon the infrastructure	
12	A list that identifies, describes, and prioritizes all wildfire risks, and drivers for those risks, throughout the electrical corporation's service territory, including all relevant wildfire risk and risk mitigation information that is part of the Safety Model Assessment Proceeding and the Risk Assessment Mitigation Phase filings	
13	A description of how the plan accounts for the wildfire risk identified in the electrical corporation's Risk Assessment Mitigation Phase filing	
14	A description of the actions the electrical corporation will take to ensure its system will achieve the highest level of safety, reliability, and resiliency, and to ensure that its system is prepared for a major event, including hardening and modernizing its infrastructure with improved engineering, system design, standards, equipment, and facilities, such as undergrounding, insulation of distribution wires, and pole replacement	
15	A description of where and how the electrical corporation considered undergrounding electrical distribution lines within those areas of its service territory identified to have the highest wildfire risk in a commission fire threat map	
16	A showing that the electrical corporation has an adequately sized and trained workforce to promptly restore service after a major event, taking into account employees of other utilities pursuant to mutual aid agreements and employees of entities that have entered into contracts with the electrical corporation	
17	Identification of any geographic area in the electrical corporation's service territory that is a higher wildfire threat than is currently identified in a commission fire threat map,	

Requirement	Description	WMP Section & Page Number
	and where the commission must consider expanding the high fire threat district based on new information or changes in the environment	
18	A methodology for identifying and presenting enterprise-wide safety risk and wildfire-related risk that is consistent with the methodology used by other electrical corporations unless the commission determines otherwise	
19	A description of how the plan is consistent with the electrical corporation's disaster and emergency preparedness plan prepared pursuant to Section 768.6, including plans to restore service and community outreach	
20	A statement of how the electrical corporation will restore service after a wildfire	
21	Protocols for compliance with requirements adopted by the commission regarding activities to support customers during and after a wildfire, outage reporting, support for low-income customers, billing adjustments, deposit waivers, extended payment plans, suspension of disconnection and nonpayment fees, repair processing and timing, access to electrical corporation representatives, and emergency communications	
22	A description of the processes and procedures the electrical corporation will use to do the following: (A) Monitor and audit the implementation of the plan. (B) Identify any deficiencies in the plan or the plan's implementation and correct those deficiencies. (C) Monitor and audit the effectiveness of electrical line and equipment inspections, including inspections performed by contractors, carried out under the plan and other applicable statutes and commission rules.	

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3 ACTUALS AND PLANNED SPENDING FOR MITIGATION PLAN

3. Actuals and Planned Spending for Mitigation Plan

3.1. Summary of WMP initiative expenditures

Table 3.1-1 summarizes the projected costs (in thousands of US $) per year over the three-year WMP cycle, including actual expenditures for past years. In Table 3.1-2, break out projected costs per category of mitigations, over the three-year WMP plan cycle. In reporting "planned" expenditure, use data from the corresponding year's WMP or WMP Update (i.e., 2020 planned expenditure must use 2020 WMP data). The financials represented in the summary tables below equal the aggregate spending listed in the mitigations financial tables reported quarterly. Nothing in this document is required to be construed as a statement that costs listed are approved or deemed reasonable if the WMP is approved, denied, or otherwise acted upon.

Table 3.1-1: Summary of WMP Expenditures - Total

Year	Spend in thousands of $USD
2020 Planned	
2020 Actual	
2020 Difference	
2021 Planned	
2021 Actual	
2021 Difference	
2022 Planned	
2020-22 Planned (With 2020 and 2021 Actual)	

Table 3.1-2: Summary of WMP Expenditures by Category

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

3.2. Summary of Ratepayer Impact

For each of the years in Table 3.2-1, report the actual and projected cost increases to ratepayers due to utility-~~ignited wildfires~~related ignitions and wildfire mitigation activities engaged. For past years, account for all expenditures incurred in that year due to utility-~~ignited wildfires~~related ignitions and wildfire mitigation activities. Below the table, describe the methodology behind the calculations.

Table 3.2-1: WMP Electricity cost increase to ratepayers

Outcome metric name	**Annual performance**							Unit(s)	
	Actual					**Projected**			
	2017	2018	2019	2020	2021	2022		~~2023~~	
Increase in electric costs to ratepayer due to utility-~~ignited wildfires~~related ignitions (total)								Dollar value of average monthly rate increase attributable to utility-~~ignited wildfires~~related ignitions per year (e.g., $3/month on average across customers for utility-~~ignited wildfires~~related ignitions occurring in 20XX)	
Increase in electric costs to ratepayer due to wildfire mitigation activities (total)								Dollar value of average monthly rate increase attributable to WMPs per year	

4 LESSONS LEARNED AND RISK TRENDS

4. Lessons Learned and Risk Trends

4.1. Lessons Learned: how tracking metrics on the 2020 and 2021 plans informed the 2022 plan update

Describe how the utility's plan has evolved since the 2020 WMP and 2021 WMP Update submissions. Outline any major themes and lessons learned from the 2020 and 2021 plans, and subsequent implementation of the initiatives. In particular, focus on how utility performance against the metrics used has informed the 2022 WMP Update. Include an overview map of the utility's service territory~~, as well as~~. If any of the lessons learned are derived from data, include visual/graphical representations of ~~major lessons~~this/these lesson(s) learned ~~from 2020 and 2021 in the report~~.

4.2. Understanding major trends impacting ignition probability and wildfire consequence

Describe how the utility assesses wildfire risk in terms of ignition probability and estimated wildfire consequence, including use of Multi-Attribute Risk Score (MARS) and Multi-Attribute Value Function (MAVF) as in the Safety Model and Assessment Proceeding (S-MAP)[5] and Risk Assessment Mitigation Phase (RAMP), highlighting changes since the 2020 WMP and 2021 Update. Include description of how the utility distinguishes between these risks and the risks to safety and reliability. List and describe each "known local condition" that the utility monitors per GO 95, Rule 31.1, including how the condition is monitored and evaluated. In addition:

A. Describe how the utility monitors and accounts for the contribution of weather to ignition probability and estimated wildfire consequence in its decision-making, including describing any utility-generated Fire Potential Index or other measure (including input variables, equations, the scale or rating system, an explanation of how uncertainties are accounted for, an explanation of how this index is used to inform operational decisions, and an explanation of how trends in index ratings impact medium-term decisions such as maintenance and longer-term decisions such as capital investments, etc.).

B. Describe how the utility monitors and accounts for the contribution of fuel conditions to ignition probability and estimated wildfire consequence in its decision-making, including describing any proprietary fuel condition index (or other measures tracked), the outputs of said index or other measures, and the methodology used for projecting

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

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

4.2.1. Service territory fire threat evaluation and ignition risk trends

Present a map of the highest risk areas identified within the current High Fire Threat District (HFTD) tiers of the utility's service territory as a figure in the WMP. Discuss fire threat evaluation of the service territory to determine whether a modification to the HFTD is warranted (i.e., expansion beyond existing Tier 2 and Tier 3 areas). If the utility believes there are areas in its service territory that are not currently included in the HFTD but require prioritization for mitigation efforts, then the utility is required to provide a process outlining the formal steps necessary to have those areas considered for recognition in the CPUC-defined HFTD.[6] Include a discussion of any fire threat assessment of its service territory performed by the electrical corporation, highlighting any changes since prior WMP submissions. In the event that the utility's assessment determines the fire threat rating for any part of its service territory is insufficient (i.e., the actual fire threat is greater than what is indicated by the CPUC's Fire Threat Map and High Fire Threat District designations), the utility is required to identify those areas for potential HFTD modification, based on the new information or environmental changes, showing the differences on a map in the WMP. To the extent this identification relies upon a meteorological or climatological study, a thorough explanation and copy of the study must be included as an Appendix to the WMP.

List, describe, and map geospatially (*where geospatial mapping is applicable*) any macro trends impacting ignition probability and estimated wildfire consequence within utility service territory, highlighting any changes since the 2021 WMP Update:

1. Change in ignition probability and estimated wildfire consequence due to climate change
2. Change in ignition probability and estimated wildfire consequence due to relevant invasive species, such as bark beetles
3. Change in ignition probability and estimated wildfire consequence due to other drivers of change in fuel density and moisture

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[6] As there is no formal or standard process for modifying the HFTD maps defined by the CPUC, Utilities may utilize a similar approach adopted by SCE during the 2019 WMP review process described in D.19-05-038, p. 53. For this process, in August 2019 SCE submitted a petition to modify D.17-12-024 to recognize SCE-identified HFRA as HFTD Tier 2 areas.

4. Population changes (including Access and Functional Needs population) that could be impacted by utility ignition
5. Population changes in HFTD that could be impacted by utility ignition
6. Population changes in WUI that could be impacted by utility ignition
7. Utility infrastructure location in HFTD vs non-HFTD
8. Utility infrastructure location in urban vs rural vs highly rural areas

4.3. Change in ignition probability drivers

Based on the implementation of the above wildfire mitigation initiatives, explain how the utility sees its ignition probability drivers evolving over the 3-year term of the WMP, highlighting any changes since the 2021 WMP Update. Focus on ignition probability and estimated wildfire consequence reduction by ignition probability driver, detailed risk driver, and include a description of how the utility expects to see incidents evolve over the same period, both in total number (of occurrence of a given incident type, whether resulting in an ignition or not) and in likelihood of causing an ignition by type. Outline methodology for determining ignition probability from events, including data used to determine likelihood of ignition probability, such as past ignition events, number of risk events, and description of events (including vegetation and equipment condition).

4.4. Research proposals and findings

Report all utility-sponsored research proposals, findings from ongoing studies and findings from studies completed in 2020 and 2021 relevant to wildfire and Public Safety Power Shutoff (PSPS) mitigations.

4.4.1. Research proposals

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

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

Example table reporting data elements

Data Element	Collection period	Collection frequency	Spatial granularity	Temporal granularity	Comments
Ignitions from contact with vegetation in non-enhanced vegetation areas	2014 – 2021+ (ongoing)	Per ignition	Lat/~~lon~~long per ignition	Date, hour of ignition (estimated)	-
Ignitions from contact with vegetation in enhanced vegetation areas	2019 – 2021+ (ongoing)	Per ignition	Lat/~~lon~~long per ignition	Date, hour of ignition (estimated)	-

4.4.2. Research Findings

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

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

4.5. ~~Model~~Model and metric calculation methodologies

4.5.1. Additional models for ignition probability, wildfire and PSPS risk

Each utility is required to report details on the models and methodologies used to determine ignition probability, wildfire risk, and PSPS risk. This must include the following for each model – a list of all inputs, details of data elements used in the analysis, modeling

assumptions and methodologies, input from Subject Matter Experts (SMEs), model verification and validation (e.g., equation(s), functions, algorithms or other validation studies), model uncertainty and accuracy, output (e.g., windspeed model) and applications of model in WMP (e.g., in selection of mitigations, decision-making).

The narrative for each model must be organized using the headings described below. A concise summary of the model(s) must be provided in the main body of the WMP in this section, with additional detail provided for each model in an appendix.

1. **Purpose of model** – Brief summary of context and goals of model
2. **Relevant terms** – Definitions of relevant terms (e.g., defining "enhanced vegetation management" for a model on vegetation-related ignitions)
3. **Data elements** – Details of data elements used for analysis. Including at minimum the following:
    a. Scope and granularity (or, resolution) of data in time and location (i.e., date range, spatial granularity for each data element, see example table above).
    b. Explain the frequency of data updates.
    c. Sources of data. Explain in detail measurement approaches.
    d. Explain in detail approaches used to verify data quality.
    e. Characteristics of the data (field definitions / schema, uncertainties, acquisition frequency).
    f. Describe any processes used to modify the data (such as adjusting vegetative fuel models for wildfire spread based on prior history and vegetation growth).
4. **Modeling assumptions and limitations** – Details of each modeling assumption, its technical basis, and the resulting limitations of the model.
5. **Modeling methodology** – Details of the modeling methodology. Including at minimum the following:
    a. Model equations and functions
    b. Any additional input from Subject Matter Experts (SME) input
    c. Any statistical analysis or additional algorithms used to obtain output
    d. Details on the automation process for automated models.
6. **Model uncertainty** – Details of the uncertainty associated with the model. This must include uncertainty related to the fundamental formulation of the model as well as due to uncertainty in model input parameters.
7. **Model verification and validation –** Details of the efforts undertaken to verify and validate the model performance. Including at minimum the following:
    a. Documentation describing the verification basis of the model, demonstrating that the software is correctly solving the equations described in the technical approach.
    b. Documentation describing the validation basis of the model, demonstrating the extent to which model predictions agree with real-world observations.

8. **Modeling frequency** – Details on how often the model is run (for example, quarterly to support risk planning versus daily to support on-going risk assessments).
9. **Timeline for model development –** Model initiation and development progress over time. If updated in last WMP, provide update to changes since prior report.
10. **Application and results** – Explain where the model has been applied, how it has informed decisions, and any metrics or information on model accuracy and effectiveness collected in the prior year.
11. **Key improvements from working group** – For each model, describe changes which have been implemented as a result of wildfire risk modeling working group discussions. Provide a high-level summary of recommendations from the wildfire risk modeling working group.

4.5.2. Calculation of key metrics

Report details on the calculation of the metrics below. For each metric, a standard definition is provided with statute cited where relevant. The utility must follow the definition provided and detail the procedure they used to calculate the metric values aligned with these definitions. The utility must cite all data sources used in calculating the metrics below. In addition, the utility must include ~~maps~~GIS layers showing ~~contours/heat maps of~~ Red Flag Warning (RFW) frequency and High Wind Warning (HWW) frequency~~,~~ (use data from the previous 5 years, 2016-2021), as well as ~~maps~~GIS layers for distribution of Access Functional Need (AFN) customers, ~~wildland-urban interface (WUI),~~ and urban/rural/highly rural customers, and disadvantaged communities[7] in its service territory. ~~These maps[8] must include an overlay of the utility's transmission and distribution lines and other relevant electrical equipment (e.g., substations) within the utility's service territories.~~

1. **Red Flag Warning overhead circuit mile days** – Detail the steps to calculate the annual number of red flag warning (RFW) overhead (OH) circuit mile days. Calculate as the number of circuit miles that are under an RFW multiplied by the number of days those miles are under said RFW. Refer to the National Weather Service (NWS) Red Flag Warnings. For historical NWS RFW data, refer to the Iowa State University archive of NWS watch / warnings.[9] Detail the steps used to determine if an overhead circuit mile is under a RFW, providing an example of how the RFW OH circuit mile days are calculated for a RFW that occurred within the utility service territory over the last five years.
2. **High Wind Warning overhead circuit mile days** – Detail the steps used to calculate the annual number of High Wind Warning (HWW) overhead circuit mile days. Calculate

[7] Energy Safety recommends using CalEnviroScreen and Senate Bill 535 to identify disadvantaged communities.
~~[8] Energy Safety acknowledges potential security concerns regarding aggregating and presenting critical electrical infrastructure in map form. Utilities may provide any map required by these Guidelines as a confidential attachment.~~
[9] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml

as the number of OH circuit miles that are under an HWW multiplied by the number of days those miles are under said HWW. Refer to High Wind Warnings as issued by the National Weather Service (NWS). For historical NWS data, refer to the Iowa State University archive of NWS watch / warnings.[10] Detail the steps used to determine if an OH circuit mile is under a HWW, providing an example of how the OH HWW circuit mile days are calculated for a HWW that occurred within the utility service territory over the last five years.

3. **Access and Functional Needs population** – Detail the steps to calculate the annual number of customers that are considered part of the Access and Functional Needs (AFN) population. Defined in Government Code § 8593.3 and D.19-05-042 as individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking,[11] older adults, children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant.
4. **Wildland-Urban Interface** – Detail the steps to calculate the annual number of circuit miles and customers in wildland-urban interface (WUI) territory. WUI is defined as the area where houses exist at more than 1 housing unit per 40 acres and (1) wildland vegetation covers more than 50% of the land area (intermix WUI) or (2) wildland vegetation covers less than 50% of the land area, but a large area (over 1,235 acres) covered with more than 75% wildland vegetation is within 1.5 mi (interface WUI) (Radeloff et al, 2005).[12]
5. **Urban, rural, and highly rural** – Detail the steps for calculating the number of customers and circuit miles in utility territory that are in highly rural, rural, and urban regions for each year. Use the following definitions for classifying an area highly rural/rural/urban (also referenced in glossary):
    a. Highly rural – In accordance with 38 CFR 17.701, “highly rural” must be defined as those areas with a population of less than 7 persons per square mile as determined by the United States Bureau of the Census. For the purposes of the WMP, “area” must be defined as census tracts.
    b. Rural – In accordance with GO 165, "rural" must be defined as those areas with a population of less than 1,000 persons per square mile as determined by the

[10] https://mesonet.agron.iastate.edu/request/gis/watchwarn.phtml
[11] Guidance on calculating number of households with limited or no English proficiency can be found in D.20-04-003
[12] Paper can be found here - https://www.fs.fed.us/pnw/pubs/journals/pnw_2005_radeloff001.pdf with the latest WUI map (form 2010) found here - http://silvis.forest.wisc.edu/data/wui-change/

United States Bureau of the Census. For the purposes of the WMP, “area” must be defined as census tracts.

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

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

4.6. Progress reporting on key areas of improvement

Report progress on all key areas of improvement identified in Section 1.3 of the utility’s 2021 Action Statement. Provide a summary table of the actions taken to address these key areas and report on progress made over the year. Summarize the progress in a table using a high-level bullet point list of key actions, strategies, schedule, timeline for completion, quantifiable performance-metrics, measurable targets, etc. The table must also include a cross-referenced link to a more detailed narrative and substantiation of progress in an Appendix. The summary table must follow the format illustrated in Table 4.6-1.

Table 4.6-1: Progress on Key Areas of Improvement and Remedies, 2021

Utility-#	Issue title	Summary of Progress
e.g., SCE-21-01	e.g., RSE estimates not provided for all PSPS-related mitigation initiatives	**<u>Brief Narrative</u>** • Highlight 1 • Highlight 2 • Highlight 3 • Highlight # ***Refer to Appendix Section xxx for further details***

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5 INPUTS TO THE PLAN AND DIRECTIONAL VISION FOR WMP

5. Inputs to the Plan and Directional Vision for WMP

5.1. Goal of Wildfire Mitigation Plan

The goal of the WMPs are shared across Energy Safety and all utilities: Documented reductions in the number of ignitions caused by utility actions or equipment and minimization of the societal consequences (with specific consideration to the impact on AFN populations and marginalized communities) of both wildfires and the mitigations employed to reduce them, including PSPS.

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

5.2. The Objectives of the plan

Objectives are unique to the utility and reflect the 1, 3, and 10-year projections of progress towards WMP goals. Objectives are determined by the portfolio of mitigation strategies proposed in the WMP. The objectives of the plan must, at a minimum, be consistent with the requirements of California Pub. Util. Code §8386(a) – *Each electrical corporation shall construct, maintain, and operate its electrical lines and equipment in a manner that will minimize the risk of catastrophic wildfire posed by those electrical lines and equipment.*

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

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

5.3. Plan program targets

Program targets are quantifiable measurements of activity identified in WMPs and subsequent updates used to show progress towards reaching the objectives.

List and describe all program targets the electrical corporation uses to track utility WMP implementation and utility performance over the last five years. For all program targets, list the 2019 to 2021 performance, a numeric target value that is the projected target for end of year 2022 and 2023, units on the metrics reported, the assumptions that underlie the use of those metrics, update frequency, and how the performance reported could be validated by third parties outside each utility, such as analysts or academic researchers. Identified metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in

ignition probability or wildfire consequence) of each targeted preventive strategy and program.

Pub. Util. Code Section 8386.3(c)(5) requires a utility to notify Energy Safety "after it completes a substantial portion of the vegetation management (VM) requirements in its wildfire mitigation plan." To ensure compliance with this statue, the utility is required to populate Table 5.3-1 with VM program targets that the utility can determine when it has completed a "substantial portion"[13] and that Energy Safety can subsequently audit. Energy Safety has provided some required, standardized VM targets below. It is expected that the utilities provide additional VM targets beyond those required. The identification of other VM targets and units for those targets (e.g., for inspections, customer outreach, enhanced vegetation management, etc.) are at the discretion of the utility.

Additionally, in Table 5.3-1, utilities must populate the column "Target%/ Top-Risk%" for each 2022 performance target related to initiatives in the following categories: Grid design and system hardening; Asset management and inspections; and Vegetation management and inspections. This column allows utilities to identify the percentage of the target that will occur in the highest risk areas. For example, if a utility targets conducting 85% of its vegetation management program in the top 20% of its risk-areas, it should input "85/20" in this column. In the "Notes" column, utilities must provide definitions and sources for each of the "Top-Risk%" values provided. In the given example above, an acceptable response would be: "The top 20% of risk areas used for this target relate to the circuit segment risk rankings from [Utility Company's] Wildfire Risk Model outputs, as described in [hyperlink to Section XX] of the 2022 WMP Update."

[13] Energy Safety intends to define "substantial portion" in its forthcoming Compliance Guidelines. This definition may be included in the Final version of the 2022 WMP Update Guidelines.

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

Program target	2019		2020		2021		2022		~~2023~~	Units	~~Underlying assumptions~~	~~Update Frequency~~	Audited by Third-party ~~validation?~~ (Y/N)	Notes (including definitions and sources for Top-Risk%)	
	Target	~~Performance~~ Perf.	Target	~~Performance~~ Perf.	Target	~~Performance~~ Perf.	~~Projected~~ Target	~~Projected~~ Target%/ Top-Risk%							
Vegetation Inspections audited ~~annually~~										% of vegetation inspections audited					
Poles Brushed per PRC 4292										# of poles bushed (cleared)					
LiDAR Vegetation										# of circuit miles					

DRAFT

Program target	2019		2020		2021		2022		~~2023~~	Units	~~Underlying assumptions~~	~~Update Frequency~~	Audited by Third-party ~~validation~~? (Y/N)	Notes (including definitions and sources for Top-Risk%)	
	Target	~~Performance~~ Perf.	Target	~~Performance~~ Perf.	Target	~~Performance~~ Perf.	~~Projected~~ Target	~~Projected~~ Target%/ Top-Risk%							
Inspections – Distribution															
LiDAR Vegetation Inspections – Transmission										# of circuit miles					
Substation Vegetation										# of substations inspected					

DRAFT

Program target	2019		2020		2021		2022		~~2023~~	Units	~~Underlying assumptions~~	~~Update Frequency~~	Audited by Third-party ~~validation~~? (Y/N)	Notes (including definitions and sources for Top-Risk%)	
	Target	~~Performance~~ Perf.	Target	~~Performance~~ Perf.	Target	~~Performance~~ Perf.	~~Projected~~ Target	~~Projected~~ Target%/ Top-Risk%							
Inspections															

Add additional rows as needed.

DRAFT

5.4. Planning for Workforce and Other Limited Resources

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

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

For each of the target roles listed above:

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

5.4.1. Target role: Vegetation inspections

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

5.4.2. Target role: Vegetation management projects

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

5.4.3. Target role: Asset Inspections

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

5.4.4. Target role: Grid hardening

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

5.4.5. Target role: Risk event inspections

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

6 PERFORMANCE METRICS AND UNDERLYING DATA

6. Performance Metrics and Underlying Data

Instructions: Section to be populated from Quarterly Reports. Tables to be populated are listed below for reference.

NOTE: Report updates to projected metrics that are now actuals (e.g., projected 2021 spend will be replaced with actual unless otherwise noted). If an actual is substantially different from the projected (>10% difference), highlight the corresponding metric in light green.

6.1. Recent performance on progress metrics, last 7 years

Instructions for Table 1 of Attachment 3:

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

Table 1 of Attachment 3: Recent performance on progress metrics, last 7 years – reference only, fill out attached spreadsheet to correct prior reports

Metric type	#	Progress metric name	2015	2016	2017	2018	2019	2020	2021	Unit(s)
1. Grid condition findings from inspection - Distribution lines in HFTD	1.a.	Number of circuit miles inspected from patrol inspections in HFTD - Distribution lines								# miles
	1.b.	Number of circuit miles inspected from detailed inspections in HFTD - Distribution lines								# miles
	1.c.	Number of circuit miles inspected from other inspections in HFTD - Distribution lines								# miles
	…	…	…							…

6.2. Recent performance on outcome metrics, annual ~~and normalized for weather~~, last 7 years

Instructions for Table 2 of Attachment 3:

In the attached spreadsheet document, report performance on the following metrics within the utility's service territory over the past ~~five~~seven years as needed to correct previously reported data. Risk events and utility-related ignitions are normalized by wind warning status (RFW & HWW). Where the utility does not collect its own data on a given metric, the utility is required to work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in "Comments" column.

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

Table 2 of Attachment 3: Recent performance on outcome metrics, last 7 years– reference only, fill out attached spreadsheet to correct prior reports

Metric type	#	~~Progress~~Outcome metric name	Wind Warning Status	HFTD Tier	2015	2016	~~2017~~	~~2018~~	~~2019~~	~~2020~~	~~2021~~	~~Unit(s)~~
1. Risk Events	1.a.	Number of all events with probability of ignition, including wires down, contacts with objects, line slap, events with evidence of heat generation, and other events that cause sparking or have the potential to cause ignition	All	1			-	-			-	
	~~1.b.~~	~~Number of wires down (total)~~	RFW	1			-	-			-	
~~2. Utility inspection~~	~~2.a.~~	~~Number of Level 1 findings that could increase the probability of ignition discovered~~	HWW	1			-	-			-	

~~findings -~~ ~~Distribution~~													
	~~...~~	~~...~~		~~...~~HWW & RFW	1			-	-			~~...~~	
-	-			HWW & not RFW	1	-	-						

6.3. Description of additional metrics

Instructions for Table 3 of Attachment 3:

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

Table 3 of Attachment 3: List and description of additional metrics, last 7 years – reference only, fill out attached spreadsheet to correct prior reports

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

Note: Add more rows as needed.

6.4. Detailed information supporting outcome metrics

Enclose detailed information as requested for the metrics below.

Instructions for Table 4 of Attachment 3:
In the attached spreadsheet document, report numbers of fatalities attributed to any utility wildfire mitigation initiatives, as listed in the utility's previous or current WMP filings or otherwise, according to the type of activity in column one, and by the victim's relationship to the utility (i.e., full-time employee, contractor, of member of the general public), for each of the last five years as needed to correct previously reported data. For fatalities caused by initiatives beyond these categories, add rows to specify accordingly. The relationship to the utility statuses of full-time employee, contractor, and member of public are mutually exclusive, such that no individual can be counted in more than one category, nor can any individual fatality be attributed to more than one initiative.

Table 4 of Attachment 3: Fatalities due to utility wildfire mitigation initiatives, last 7 years – reference only, fill out attached spreadsheet to correct prior reports

Metric type	#	Progress metric name	2015	2016	2017	2018	2019	2020	2021	Unit(s)
1. Fatalities - Full-time Employee	1.a.	Fatalities due to inspection - Full-time employee								
	1.b.	Fatalities due to vegetation management - Full-time employee								
	1.c.	Fatalities due to utility fuel management - Full-time employee								
	…	…	…							…

Instructions for Table 5 of Attachment 3:

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

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

Table 5 of Attachment 3: OSHA-reportable injuries due to utility wildfire mitigation initiatives, last 7 years – reference only, fill out attached spreadsheet to correct prior reports

Metric type	#	Progress metric name	2015	2016	2017	2018	2019	2020	2021	Unit(s)
1. OSHA injuries - Full-time Employee	1.a.	OSHA injuries due to inspection - Full-time employee								
	1.b.	OSHA injuries due to vegetation management - Full-time employee								
	1.c.	OSHA injuries due to utility fuel management - Full-time employee								
	…	…	…							…

6.5. Mapping recent, modelled, and baseline conditions

The utility must provide underlying data for recent conditions (over the last five years) of the utility's service territory in a downloadable shapefile GIS format, following the spatial reporting schema[14]. All data is reported quarterly, this is a placeholder for quarterly spatial data.

[14] https://energysafety.ca.gov/wp-content/uploads/energy-safety-gis-data-reporting-standard_version2.1_09072021_final.pdf

6.6. Recent weather patterns, last 7 years

Instructions for Table 6 of Attachment 3:
In the attached spreadsheet document, report weather measurements based upon the duration and scope of NWS Red Flag Warnings, High wind warnings and upon proprietary Fire Potential Index (or other similar fire risk potential measure if used) for each year. Calculate and report 5-year historical average as needed to correct previously reported data.

Table 6 of Attachment 3: Weather patterns, last 7 years – reference only, fill out attached spreadsheet to correct prior reports

Metric type	#	Progress metric name	2015	2016	2017	2018	2019	2020	2021	Unit(s)
1. Red Flag Warning overhead Circuit Mile Days	1.a.	Red Flag Warning overhead Circuit Mile days - entire utility territory								RFW OH circuit mile days
	1.b.	Red Flag Warning overhead Circuit Mile days - HFTD Zone 1								RFW OH circuit mile days
	1.c.	Red Flag Warning overhead Circuit Mile days - HFTD Tier 2								RFW OH circuit mile days
	…	…	…							…

Note: Add additional rows as needed.

6.7. Recent and projected drivers of outages and ignition probability

Instructions for Table 7.1 and Table 7.2 of Attachment 3:
(Table 7.1) In the attached spreadsheet document, report recent drivers of outages according to whether or not risk events of that type are tracked, the number of incidents per year (e.g., all instances of animal contact regardless of whether they caused an outage, an ignition, or neither), the rate at which those incidents (e.g., object contact, equipment failure, etc.) cause an ignition in the column, and the number of ignitions that those incidents caused by category, for each of last ~~five~~seven years as needed to correct previously-reported data. Calculate and include 5-year historical averages. This requirement applies to all utilities, not only those required to submit annual ignition data. Any utility that does not have complete 2021 ignition data compiled by the

WMP deadline is required to indicate in the 2021 columns that said information is incomplete. (Table 7.2) Similar to Table 7.1, but for ignition probability by line type and HFTD status, according to if ignitions are tracked.

Table 7.1 of Attachment 3: Key recent and projected drivers of outages, last 7 years and projections – reference only, fill out attached spreadsheet to correct prior reports

					Actual number of risk events							Projected risk events			
												Q1	Q2	Q3	Q4
Risk Event category	**Cause category**	**#**	**Sub-cause category**	**Are risk events tracked?**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2022**	**2022**	**2022**
Wire down event - Distribution	1. Contact from object - Distribution	1.a.	Veg. contact-Distribution												
		1.b.	Animal contact-Distribution												
		1.c.	Balloon contact-Distribution												
…	…	…	…	…	…										

Table 7.2 of Attachment 3: Key recent and projected drivers of ignition probability by Line type and HFTD status, last 7 years and projections – reference only, fill out attached spreadsheet to correct prior reports

Metric Type	**#**	**Ignition Driver**	**Line Type**	**HFTD Tier**	**Are ignitions tracked? (Yes/No)**	Actual number of ignitions							Projected numbers of ignitions	
						2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
1. Contact from object	1.a.i	Veg. contact	Distribution	Non-HFTD										
	1.a.ii	Veg contact	Distribution	HFTD Zone 1										
	1.a.iii	Veg	Distribution	HFTD Tier 2										

		contact				
...	...	...	...		...	...

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

6.8.1. Current baseline state of service territory and utility equipment

Instructions for Table 8 of Attachment 3:
In the attached spreadsheet document, provide summary data for the current baseline state of HFTD and non-HFTD service territory in terms of circuit miles; overhead transmission lines, overhead distribution lines, substations, weather stations, and critical facilities located within the territory; and customers by type, located in urban versus rural versus highly rural areas and including the subset within the Wildland-Urban Interface (WUI) as needed to correct previously reported data.

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

Table 8 of Attachment 3: State of service territory and utility equipment – reference only, fill out attached spreadsheet to correct prior reports

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

Metric type	#	Outcome metric name	Non-HFTD **2015**	HFTD Zone 1 **2015**	HFTD Tier 2 **2015**	HFTD Tier 3 **2015**	Non-HFTD **2016**
	1.d.	Number of critical facilities in WUI					
…	…	…	…				

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

Instructions for Table 9 of Attachment 3:
In the attached spreadsheet document, input summary information of plans and actuals for additions or removals of utility equipment as needed to correct previously reported data. Report net additions using positive numbers and net removals and undergrounding using negative numbers for circuit miles and numbers of substations. Report changes planned or actualized for that year – for example, if 10 net overhead circuit miles are added in 2020, then report "10" for 2020. If 20 net overhead circuit miles are planned for addition by 2022, with 15 being added by 2021 and 5 more added by 2022, then report "15" for 2022 and "5" for 2021. Do not report cumulative change across years. In this case, do not report "20" for 2022, but instead the number planned to be added for just that year, which is "5".

Table 9 of Attachment 3: Location of actual and planned utility equipment additions or removal year over year – reference only, fill out attached spreadsheet to correct prior reports

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

Metric type	#	Outcome metric name	Non-HFTD 2020	HFTD Zone 1 2020	HFTD Tier 2 2020	HFTD Tier 3 2020	Non-HFTD 2021
	1.d.	Circuit miles of overhead distribution lines in WUI					
…	…	…	…				

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

Instructions for Table 10 of Attachment 3:
Referring to the program targets discussed above, report plans and actuals for hardening upgrades in detail in the attached spreadsheet document. Report in terms of number of circuit miles or stations to be upgraded for each year, assuming complete implementation of wildfire mitigation activities, for HFTD and non-HFTD service territory for circuit miles of overhead transmission lines, circuit miles of overhead distribution lines, circuit miles of overhead transmission lines located in Wildland-Urban Interface (WUI), circuit miles of overhead distribution lines in WUI, number of substations, number of substations in WUI, number of weather stations and number of weather stations in WUI as needed to correct previously-reported data.
If updating previously reported data, separately include a list of the hardening initiatives included in the calculations for the table.

Table 10 of Attachment 3: Location of actual and planned utility infrastructure upgrades year over year – reference only, fill out attached spreadsheet to correct prior reports

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

Metric type	#	Outcome metric name	Non-HFTD **2020**	HFTD Zone 1 **2020**	HFTD Tier 2 **2020**	HFTD Tier 3 **2020**	Non-HFTD **2021**
	1.c.	Circuit miles of overhead transmission lines planned for upgrades in WUI					
	1.d.	Circuit miles of overhead distribution lines planned for upgrades in WUI					
…	…	…	…				

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

7 MITIGATION INITIATIVES

7. Mitigation Initiatives

7.1. Wildfire Mitigation Strategy

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

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

The description of utility wildfire mitigation strategy must:

A. Discuss the utility's approach to determining how to manage wildfire risk (in terms of ignition probability and estimated wildfire consequence) as distinct from managing risks to safety and/or reliability. Describe how this determination is made both for (1) the types of activities needed and (2) the extent of those activities needed to mitigate these two different groups of risks. Describe to what degree the activities needed to manage wildfire risk may be incremental to those needed to address safety and/or reliability risks.
B. Discuss how risk modeling outcomes are used to inform decision-making processes and used to prioritize mitigation activities. Provide detailed descriptions including clear evaluation criteria[15] and visual aids (such as flow charts or decision trees). Provide an appendix (including use of relevant visual aids) with specific examples demonstrating how risk modeling outcomes are used in prioritizing circuit segments and selecting mitigation measures.
C. Include a summary of achievements of major investments and implementation of wildfire mitigation initiatives over the past year, lessons learned, changed circumstances during the 2020-2022 WMP plan cycle, and corresponding adjustment in priorities for the current year. Organize summaries of initiatives by the wildfire mitigation categories listed in Section 7.3.
D. List and describe all challenges associated with limited resources and how these challenges are expected to evolve over the next 3 years.
E. Outline how the utility expects new technologies and innovations to impact the utility's strategy and implementation approach over the next 3 years, including the utility's

[15] "Evaluation criteria" should include all points of considerations including any thresholds and weights that may affect the outcome of their decision, as well as a descriptor of how it is evaluated (i.e. given a risk score, using SME expertise to determine that score, using a formula).

program for integrating new technologies into the utility's grid. Include utility research listed above in Section 4.4.

F. Provide a ~~map~~GIS layer[16] showing ~~generalized~~ wildfire risk (e.g., MAVF~~) on transmission and distribution infrastructure using a color gradient (i.e., from red for high risk to green for lower risk).~~); data should be as granular as possible.

G. Provide ~~geospatial maps~~GIS layers[17] for ~~Grid Design and System Hardening mitigations. The map must show~~ the ~~transmission and distribution~~following grid ~~with each line distinguished by its~~hardening initiatives: covered conductor installation;[18] undergrounding of electrical lines and/or equipment; and removal of electrical lines. Features must have the following attributes: state of hardening~~ and~~, type of hardening where known (i.e~~.g~~., undergrounding~~ or~~, covered conductors~~), such~~, or removal), and expected completion date. Provide as~~:~~ much detail as possible (circuit segment, circuit-level, etc.). The layers must include the following:

~~a. Currently not hardened and no plan to harden within next 10 years~~

~~b. Currently hardened line~~

~~c.~~a. Hardening planned ~~by June 1 of current year~~for 2022

~~d.~~b. Hardening planned ~~by Sep 1 of current year~~for 2023

~~e.~~ Hardening planned ~~by next Annual WMP Update~~

~~f. Hardening planned within the next 3 years~~

~~g. Hardening planned within the next 10 years~~

c. ~~Provide geospatial maps~~ for 2024

H. Provide static (either in text or in an appendix), high-level maps of the areas where the utility will be prioritizing Grid Design and System Harding initiatives for 2022, 2023, and by 2032.

~~H.~~I. Provide a GIS layer for planned Asset Management and Inspections~~. The map must show the transmission and distribution grid with each line distinguished by the~~ in 2022. Features must include the following attributes: type, timing, and prioritization of asset inspection. Inspection types must follow the same types described in Section 7.3.4, Asset Management and Inspections, and as applicable, should not be limited to patrols and detailed inspections.

J. Provide a ~~geospatial map~~GIS layer illustrating where enhanced clearances (12 feet or more) were achieved in 2020 and 2021, and where the utility plans to achieve enhanced clearances in 2022. ~~Indicate graduated~~Feature attributes must include clearance ~~distances beyond~~distance greater than or equal to 12 feet, if such data is

[16] GIS data that has corresponding feature classes in the most current version of Energy Safety GIS Data Reporting Standard will utilize the format for submission. GIS data that does not have corresponding feature classes shall be submitted in an ESRI compliant GDB and include a data dictionary as part of the metadata.

[17] Energy Safety acknowledges potential security concerns regarding aggregating and presenting critical electrical infrastructure in map form. Utilities may provide ~~any map~~maps or GIS layers required by these Guidelines as ~~a~~ confidential ~~attachment~~attachments when necessary.

[18] For a definition of "covered conductor installation" see Section 9 of Attachment 2.

available, either in ranges or as discrete integers (e.g., 12-15 feet, 15-20 feet, etc.). OR 12, 13, 14, 15, etc.).

7.2. Wildfire Mitigation Plan implementation

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

A. Monitor and audit the implementation of the plan. Include what is being audited, who conducts the audits, what type of data is being collected, and how the data undergoes quality assurance and quality control.
B. Identify any deficiencies in the plan or the plan's implementation and correct those deficiencies.
C. Monitor and audit the effectiveness of inspections, including inspections performed by contractors, carried out under the plan and other applicable statutes and commission rules.
D. Ensure that across audits, initiatives, monitoring, and identifying deficiencies, the utility will report in a format that matches across WMPs, Quarterly Reports, Quarterly Advice Letters,[19] and annual compliance assessment.

7.3. Detailed wildfire mitigation initiatives

In this section, describe how specific wildfire and PSPS mitigation initiatives execute the strategy set out in Section 5. The initiatives are divided into 10 categories, with each providing a space for narrative descriptions of the utility's initiatives. The initiatives are organized by the following categories provided in this section:

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

It is not necessary for a utility to have every initiative listed under each category.

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

7.3.1. Financial data on mitigation initiatives

Report actual and projected WMP expenditure, as well as the risk-spend-efficiency (RSE), for each initiative by HFTD tier (territory-wide, non-HFTD, HFTD zone 1, HFTD tier 2, HFTD tier 3) in Table 12 of Attachment 3.

7.3.2. Detailed information on mitigation initiatives

Report detailed information for each initiative. For each initiative, organize details under the following headings:

1. **Risk to be mitigated** / problem to be addressed
2. **Initiative selection** ("why" engage in initiative) – include reference to and description of a risk informed analysis and/or risk model on empirical (or projected) impact of initiative in comparison to alternatives and demonstrate that outcomes of risk model are being prioritized
3. **Region prioritization** ("where" to engage initiative) – include reference to a risk informed analysis in allocation of initiative (e.g., veg clearance is done for trees tagged as "high-risk") and demonstrate that high-risk areas are being prioritized
4. **Progress on initiative** since the last WMP submission and plans, targets, and/or goals for the current year
5. **Future improvements to initiative** – include known future plans (beyond the current year) and new/novel strategies the utility may implement in the next 5 years (e.g., references to and strategies from pilot projects and research detailed in Section 4.4).

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

Risk assessment and mapping

For each item in this category, provide relevant maps within the report or appendices.

1. A summarized risk map showing the overall ignition probability and estimated wildfire consequence along electric lines and equipment
2. Climate-driven risk map and modeling based on various relevant weather scenarios
3. Ignition probability mapping showing the probability of ignition along the electric lines and equipment
4. Initiative mapping and estimation of wildfire and PSPS risk-reduction impact
5. Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment

~~6. Weather-driven risk map and modelling based on various relevant weather scenarios~~

Situational awareness and forecasting

~~7.~~6.Advanced weather monitoring and weather stations

~~8.~~7.Continuous monitoring sensors

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

Grid design and system hardening

~~13.~~12. Capacitor maintenance and replacement program
~~14.~~13. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault
~~15.~~14. Covered conductor installation
~~16.~~15. Covered conductor maintenance
~~17.~~16. Crossarm maintenance, repair, and replacement
~~18.~~17. Distribution pole replacement and reinforcement, including with composite poles
~~19.~~18. Expulsion fuse replacement
~~20.~~19. Grid topology improvements to mitigate or reduce PSPS events
~~21.~~20. Installation of system automation equipment
~~22.~~21. Maintenance, repair, and replacement of connectors, including hotline clamps
~~23.~~22. Mitigation of impact on customers and other residents affected during PSPS event
~~24.~~23. Other corrective action
~~25.~~24. Pole loading infrastructure hardening and replacement program based on pole loading assessment program
~~26.~~25. Transformer maintenance and replacement
~~27.~~26. Transmission tower maintenance and replacement
~~28.~~27. Undergrounding of electric lines and/or equipment
~~29.~~28. Updates to grid topology to minimize risk of ignition in HFTDs

Asset management and inspections

~~30.~~29. Detailed inspections of distribution electric lines and equipment
~~31.~~30. Detailed inspections of transmission electric lines and equipment
~~32.~~31. Improvement of inspections
~~33.~~32. Infrared inspections of distribution electric lines and equipment
~~34.~~33. Infrared inspections of transmission electric lines and equipment
~~35.~~34. Intrusive pole inspections
~~36.~~35. LiDAR inspections of distribution electric lines and equipment
~~37.~~36. LiDAR inspections of transmission electric lines and equipment
~~38.~~37. Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations
~~39.~~38. Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations
~~40.~~39. Patrol inspections of distribution electric lines and equipment

~~41.~~40. Patrol inspections of transmission electric lines and equipment
~~42.~~41. Pole loading assessment program to determine safety factor
~~43.~~42. Quality assurance / quality control of inspections
~~44.~~43. Substation inspections

Vegetation management and inspections

~~45.~~44. Additional efforts to manage community and environmental impacts
~~46.~~45. Detailed inspections and management practices for vegetation clearances around distribution electrical lines and equipment.
~~47.~~46. Detailed inspections and management practices for vegetation clearances around transmission electrical lines and equipment.
~~48.~~47. Emergency response vegetation management due to red flag warning or other urgent climate conditions
~~49.~~48. Fuel management (including all wood management) and reduction of "slash" from vegetation management activities
~~50.~~49. Improvement of inspections
~~51.~~50. Remote sensing inspections of vegetation around distribution electric lines and equipment
~~52.~~51. Remote sensing inspections of vegetation around transmission electric lines and equipment
~~53.~~52. Other discretionary inspection of vegetation around distribution electric lines and equipment, beyond inspections mandated by rules and regulations
~~54.~~53. Other discretionary inspection of vegetation around transmission electric lines and equipment, beyond inspections mandated by rules and regulations
~~55.~~54. Patrol inspections of vegetation around distribution electric lines and equipment
~~56.~~55. Patrol inspections of vegetation around transmission electric lines and equipment
~~57.~~56. Quality assurance / quality control of vegetation management
~~58.~~57. Recruiting and training of vegetation management personnel
~~59.~~58. Identification and remediation of "at-risk species"
~~60.~~59. Removal and remediation of trees with strike potential to electric lines and equipment
~~61.~~60. Substation inspections
~~62.~~61. Substation vegetation management
~~63.~~62. Vegetation management system
~~64.~~63. ~~Additional~~ Vegetation management ~~practices beyond regulatory requirements~~to achieve clearances around electric lines and ~~recommendations~~equipment
~~65.~~64. Vegetation management activities post-fire

Grid operations and protocols

~~66.~~65. Automatic recloser operations
~~67.~~66. Protective equipment and device settings
~~68.~~67. Crew-accompanying ignition prevention and suppression resources and services

~~69.~~68. Personnel work procedures and training in conditions of elevated fire risk
~~70.~~69. Protocols for PSPS re-energization
~~71.~~70. PSPS events and mitigation of PSPS impacts
~~72.~~71. Stationed and on-call ignition prevention and suppression resources and services

Data governance
~~73.~~72. Centralized repository for data
~~74.~~73. Collaborative research on utility ignition and/or wildfire
~~75.~~74. Documentation and disclosure of wildfire-related data and algorithms
~~76.~~75. Tracking and analysis of risk event data

Resource allocation methodology
~~77.~~76. Allocation methodology development and application
~~78.~~77. Risk reduction scenario development and analysis
~~79.~~78. Risk-spend-efficiency analysis – not to include PSPS

Emergency planning and preparedness
~~80.~~79. Adequate and trained workforce for service restoration
~~81.~~80. Community outreach, public awareness, and communications efforts
~~82.~~81. Customer support in emergencies
~~83.~~82. Disaster and emergency preparedness plan
~~84.~~83. Preparedness and planning for service restoration
~~85.~~84. Protocols in place to learn from wildfire events

Stakeholder cooperation and community engagement
~~86.~~85. Community engagement
~~87.~~86. Cooperation and best practice sharing with agencies outside CA
~~88.~~87. Cooperation with suppression agencies
~~89.~~88. Forest service and fuel reduction cooperation and joint roadmap

8 PUBLIC SAFETY POWER SHUTOFFS (PSPS)

8. Public Safety Power Shutoffs (PSPS)

8.1. Directional Vision for Necessity of PSPS

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

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

Instructions for Table 8.1-1:

Rank order, from highest (1 – greatest anticipated change in reliability or impact on ignition probability or estimated wildfire consequence over the next 10 years) to lowest (9 - minimal change or impact, next 10 years), the characteristics of PSPS events (e.g., numbers of customers affected, frequency, scope, and duration), regardless of if the change is an increase or a decrease. To the right of the ranked magnitude of impact, indicate whether the impact would be a significant increase in reliability, a moderate increase in reliability, limited or no impact, a moderate decrease in reliability, or a significant decrease in reliability. For each characteristic, include comments describing the expected change and expected impact, using quantitative estimates wherever possible.

Table 8.1-1: Anticipated characteristics of PSPS use over next 10 years

Rank order 1-9	PSPS characteristic	Significantly increase; increase; no change; decrease; significantly decrease	Comments
	Number of customers affected by PSPS events (total)		
	Number of customers affected by PSPS events (normalized by fire weather, e.g., Red Flag Warning line mile days)		

Rank order 1-9	PSPS characteristic	Significantly increase; increase; no change; decrease; significantly decrease	Comments
	Frequency of PSPS events in number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability (total)		
	Frequency of PSPS events in number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability (normalized by fire weather, e.g., Red Flag Warning line mile days)		
	Scope of PSPS events in circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization (total)		
	Scope of PSPS events in circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization (normalized by fire weather, e.g., Red Flag Warning line mile days)		
	Duration of PSPS events in customer hours (total)		
	Duration of PSPS events in customer hours (normalized by fire weather, e.g., Red Flag Warning line mile days)		
	Other (Describe) – Rank as 9 and leave other columns		

Rank order 1-9	PSPS characteristic	Significantly increase; increase; no change; decrease; significantly decrease	Comments
	blank if no other characteristics associated with PSPS		

8.2. Protocols on Public Safety Power Shut-off

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

1. Method used to evaluate the potential consequences of PSPS and wildfires. Specifically, the utility is required to discuss how the relative consequences of PSPS and wildfires are compared and evaluated. In addition, the utility must report the wildfire risk thresholds and decision-making process that determine the need for a PSPS.
2. Strategy to minimize public safety risk during high wildfire risk conditions and details of the considerations, including but not limited to a list and description of community assistance locations and services provided during a de-energization event.
3. Outline of tactical and strategic decision-making protocol for initiating a PSPS/de-energization (e.g., decision tree).
4. Strategy to provide for safe and effective re-energization of any area that is de-energized due to PSPS protocol.
5. Company standards relative to customer communications, including consideration for the need to notify priority essential services – critical first responders, public safety partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water utilities/agencies. This section, or an appendix to this section, must include a complete listing of which entities the electrical corporation considers to be priority essential services. This section must also include a description of strategy and protocols to ensure timely notifications to customers, including access and functional needs populations, in the languages prevalent within the utility's service territory.
6. Protocols for mitigating the public safety impacts of these protocols, including impacts on first responders, health care facilities, operators of telecommunications infrastructure, and water utilities/agencies.

8.3. Projected changes to PSPS impact

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

1. By June 1 of current year

2. By September 1 of current year
3. By next WMP submission

8.4. Engaging vulnerable communities

Report on the following:

1. Describe protocols for PSPS that are intended to mitigate the public safety impacts of PSPS on vulnerable, marginalized and/or at-risk communities. Describe how the utility is identifying these communities.
2. List all languages which are "prevalent" in utility's territory. A language is prevalent if it is spoken by 1,000 or more persons in the utility's territory or if it is spoken by 5% or more of the population within a "public safety answering point" in the utility territory[20] (D.20-03-004).
3. List all languages for which public outreach material is available, in written or oral form.
4. Detail the community outreach efforts for PSPS and wildfire-related outreach. Include efforts to reach all languages prevalent in utility territory.

8.5. PSPS-specific metrics

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

Instructions for PSPS table of Attachment 3:

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

Table 11 of Attachment 3: Recent use of PSPS and other PSPS metrics – reference only, fill out attached spreadsheet to correct prior reports

Metric type	#	Outcome metric name	2015	2016	2017	2018	2019	2020	2021	2022 Q1, Q2…,Q4 projected	Comments
1. Recent use of PSPS	1.a.	Frequency of PSPS events (total)									

[20] See Cal. Government Code § 53112

Metric type	#	Outcome metric name	2015	2016	2017	2018	2019	2020	2021	2022 Q1, Q2…,Q4 projected	Comments
	1.b.	Scope of PSPS events (total)									
	1.c.	Duration of PSPS events (total)									
…	…	…	…								

8.6 Identification of frequently de-energized circuits

Senate Bill 533 (2021) added an additional requirement to the WMPs. Pub. Util. Code Section 8386(c)(8) requires the "Identification of circuits that have frequently been de-energized[21] pursuant to a de-energization 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 de-energization of those circuits, including, but not limited to, the estimated annual decline in circuit de-energization and de-energization impact on customers, and replacing, hardening, or undergrounding any portion of the circuit or of upstream transmission or distribution lines." To comply with this statutory addition, utilities are required to populate Table 8.6-1 and provide a map showing the listed frequently de-energized circuits.

Table 8.6-1: Frequently de-energized circuits

ID of Circuit	County	Dates of Outages	# of Customers Affected	Measures taken, or planned to be taken, to reduce the need for, and impact of, future PSPS of circuit

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

9 APPENDIX

9. Appendix

9.1. Definitions of initiative activities by category

Table 9-1: Definitions of initiative activities by category

Category	Initiative activity	Definition
A. Risk mapping and simulation	A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment	Development and use of tools and processes to develop and update risk map and simulations and to estimate risk reduction potential of initiatives for a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.
	Climate-driven risk map and modeling based on various relevant weather scenarios	Development and use of tools and processes demonstrating medium and long-term climate trends based on the best available climate models demonstrating the most wildfire-relevant impacts (e.g., warming trends, fuel moisture trends, soil moisture trends, vegetation distribution trends). Describe how these trends are being incorporated into risk modeling or other risk-informed analyses.
	Ignition probability mapping showing the probability of ignition along the electric lines and equipment	Development and use of tools and processes to assess the risk of ignition across regions of the grid (or more granularly, e.g., circuits, spans, or assets).
	Initiative mapping and estimation of wildfire and PSPS risk-reduction impact	Development of a tool to estimate the risk reduction efficacy (for both wildfire and PSPS risk) and risk-spend efficiency of various initiatives.
	Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment	Development and use of tools and processes to assess the impact of potential ignition and risk to communities (e.g., in terms of potential fatalities, structures burned, monetary damages, area burned, impact on air quality and greenhouse gas, or GHG, reduction goals, etc.).
B. Situational awareness and forecasting	Advanced weather monitoring and weather stations	Purchase, installation, maintenance, and operation of weather stations. Collection, recording, and analysis of weather data from weather stations and from external sources.

Category	Initiative activity	Definition
	Continuous monitoring sensors	Installation, maintenance, and monitoring of sensors and sensorized equipment used to monitor the condition of electric lines and equipment.
	Fault indicators for detecting faults on electric lines and equipment	Installation and maintenance of fault indicators.
	Forecast of a fire risk index, fire potential index, or similar	Index that uses a combination of weather parameters (such as wind speed, humidity, and temperature), vegetation and/or fuel conditions, and other factors to judge current fire risk and to create a forecast indicative of fire risk. A sufficiently granular index is required to inform operational decision-making.
	Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	Personnel position within utility service territory to monitor system conditions and weather on site. Field observations is required to inform operational decisions.
	Weather forecasting and estimating impacts on electric lines and equipment	Development methodology for forecast of weather conditions relevant to utility operations, forecasting weather conditions and conducting analysis to incorporate into utility decision-making, learning and updates to reduce false positives and false negatives of forecast PSPS conditions.
C. Grid design and system hardening	Capacitor maintenance and replacement program	Remediation, adjustments, or installations of new equipment to improve or replace existing capacitor equipment.
	Circuit breaker maintenance and installation to de-energize lines upon detecting a fault	Remediation, adjustments, or installations of new equipment to improve or replace existing fast switching circuit breaker equipment to improve the ability to protect electrical circuits from damage caused by overload of electricity or short circuit.
	Covered conductor installation	Installation of covered or insulated conductors to replace standard bare or unprotected conductors (defined in accordance with GO 95 as supply conductors, including but not limited to lead wires, not enclosed in a grounded metal pole or not covered by: a “suitable protective

Category	Initiative activity	Definition
		covering" (in accordance with Rule 22.8), grounded metal conduit, or grounded metal sheath or shield). In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.
	Covered conductor maintenance	Remediation and adjustments to installed covered or insulated conductors. In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.
	Crossarm maintenance, repair, and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing

Category	Initiative activity	Definition
		crossarms, defined as horizontal support attached to poles or structures generally at right angles to the conductor supported in accordance with GO 95.
	Distribution pole replacement and reinforcement, including with composite poles	Remediation, adjustments, or installations of new equipment to improve or replace existing distribution poles (i.e., those supporting lines under 65kV), including with equipment such as composite poles manufactured with materials reduce ignition probability by increasing pole lifespan and resilience against failure from object contact and other events.
	Expulsion fuse replacement	Installations of new and CAL FIRE-approved power fuses to replace existing expulsion fuse equipment.
	Grid topology improvements to mitigate or reduce PSPS events	Plan to support and actions taken to mitigate or reduce PSPS events in terms of geographic scope and number of customers affected, such as installation and operation of electrical equipment to sectionalize or island portions of the grid, microgrids, or local generation.
	Installation of system automation equipment	Installation of electric equipment that increases the ability of the utility to automate system operation and monitoring, including equipment that can be adjusted remotely such as automatic reclosers (switching devices designed to detect and interrupt momentary faults that can reclose automatically and detect if a fault remains, remaining open if so).
	Maintenance, repair, and replacement of connectors, including hotline clamps	Remediation, adjustments, or installations of new equipment to improve or replace existing connector equipment, such as hotline clamps.
	Mitigation of impact on customers and other residents affected during PSPS event	Actions taken to improve access to electricity for customers and other residents during PSPS events, such as installation and operation of local generation equipment (at the community, household, or other level).

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

Category	Initiative activity	Definition
	Detailed inspections of transmission electric lines and equipment	Careful visual inspections of overhead electric transmission lines and equipment where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.
	Improvement of inspections	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
	Infrared inspections of distribution electric lines and equipment	Inspections of overhead electric distribution lines, equipment, and right-of-way using infrared (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.
	Infrared inspections of transmission electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using infrared (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.
	Intrusive pole inspections	In accordance with GO 165, intrusive inspections involve movement of soil, taking samples for analysis, and/or using more sophisticated diagnostic tools beyond visual inspections or instrument reading.
	LiDAR inspections of distribution electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	LiDAR inspections of transmission electric lines and equipment	Inspections of overhead electric distribution lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).

Category	Initiative activity	Definition
	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric transmission lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric distribution lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Patrol inspections of distribution electric lines and equipment	In accordance with GO 165, simple visual inspections of overhead electric distribution lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.
	Patrol inspections of transmission electric lines and equipment	Simple visual inspections of overhead electric transmission lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.
	Pole loading assessment program to determine safety factor	Calculations to determine whether a pole meets pole loading safety factor requirements of GO 95, including planning and information collection needed to support said calculations. Calculations must consider many factors including the size, location, and type of pole; types of attachments; length of conductors attached; and number and design of supporting guys, per D.15-11-021.
	Quality assurance / quality control of inspections	Establishment and function of audit process to manage and confirm work completed by employees or contractors, including packaging QA/QC information for input to decision-making

Category	Initiative activity	Definition
		and related integrated workforce management processes.
	Substation inspections	In accordance with GO 175, inspection of substations performed by qualified persons and according to the frequency established by the utility, including record-keeping.
E. Vegetation management and inspection	Additional efforts to manage community and environmental impacts	Plan and execution of strategy to mitigate negative impacts from utility vegetation management to local communities and the environment, such as coordination with communities, local governments, and agencies to plan and execute vegetation management work.
	Detailed inspections and management practices for vegetation clearances around distribution electrical lines and equipment	Careful visual inspections and maintenance of vegetation around the distribution right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded. Describe the frequency of inspection and maintenance programs.
	Detailed inspections and management practices for vegetation clearances around transmission electrical lines and equipment	Careful visual inspections and maintenance of vegetation around the transmission right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded. Describe the frequency of inspection and maintenance programs.
	Emergency response vegetation management due to red flag warning or other urgent weather conditions	Plan and execution of vegetation management activities, such as trimming or removal, executed based upon and in advance of forecast weather conditions that indicate high fire threat in terms of ignition probability and wildfire consequence.
	Fuel management and, management of all wood and “slash” from vegetation management activities	Plan and execution of fuel management activities in proximity to potential sources of ignition. This includes pole clearing per PRC 4292 and reduction or adjustment of live fuel (based on species or otherwise) and of dead fuel, including all downed wood and “slash” generated from vegetation management activities.

Category	Initiative activity	Definition
	Improvement of inspections	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
	Remote sensing inspections of vegetation around distribution electric lines and equipment	Inspections of right-of-way using remote sensing methods such as LiDAR, satellite imagery, and UAV.
	Remote sensing inspections of vegetation around transmission electric lines and equipment	Inspections of right-of-way using remote sensing methods such as LiDAR, satellite imagery, and UAV.
	Other discretionary inspections of vegetation around distribution electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Other discretionary inspections of vegetation around transmission electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Patrol inspections of vegetation around distribution electric lines and equipment	Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business.
	Patrol inspections of vegetation around transmission electric lines and equipment	Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business.
	Quality assurance / quality control of vegetation management	Establishment and function of audit process to manage and oversee the work completed by employees or contractors, including packaging QA/QC information for input to decision-making

Category	Initiative activity	Definition
		and workforce management processes. This includes identification of the percentage of vegetation inspections that are audited annually, as a program target in Table 5.3-1.
	Recruiting and training of vegetation management personnel	Programs to ensure that the utility can identify and hire qualified vegetation management personnel and to ensure that both employees and contractors tasked with vegetation management responsibilities are adequately trained to perform vegetation management work, according to the utility's wildfire mitigation plan, in addition to rules and regulations for safety. Include discussion of continuous improvement of training programs and personnel qualifications.
	Identification and remediation of “at-risk species”	Specific actions, not otherwise described in other WMP initiatives, taken to reduce the ignition probability and wildfire consequence attributable to “at-risk species”, such as trimming, removal, and replacement.
	Removal and remediation of trees with strike potential to electric lines and equipment	Actions taken to identify, remove, or otherwise remediate trees that pose a high risk of failure or fracture that could potentially strike electrical equipment.
	Substation inspection	Inspection of vegetation surrounding substations, performed by qualified persons and according to the frequency established by the utility, including record-keeping.
	Substation vegetation management	Based on location and risk to substation equipment only, actions taken to reduce the ignition probability and wildfire consequence attributable to contact from vegetation to substation equipment.
	Vegetation management enterprise system	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.

Category	Initiative activity	Definition
	~~Additional~~ Vegetation management ~~practices beyond regulatory requirements~~to achieve clearances around electric lines and ~~recommendations~~equipment	~~Identifying and discussing additional vegetation management actions (e.g., trimming and removal of vegetation) taken beyond the minimum regulatory requirements and recommendations, for example, enhanced vegetation management.~~ Actions taken to ensure that vegetation does not encroach upon the minimum clearances set forth in Table 1 of GO 95, measured between line conductors and vegetation, such as trimming adjacent or overhanging tree limbs.
	Vegetation management activities post-fire	Vegetation management (VM) activities during post-fire service restoration including, but not limited to: activities or protocols that differentiate post-fire VM from programs described in other WMP initiatives; supporting documentation for the tool and/or standard the utility uses to assesses the risk presented by vegetation post-fire; and how the utility includes fire-specific damage attributes into its assessment tool/standard.
F. Grid operations and protocols	Automatic recloser operations	Designing and executing protocols to deactivate automatic reclosers based on local conditions for ignition probability and wildfire consequence.
	Protective equipment and device settings	The utility's procedures for adjusting the sensitivity of grid elements to reduce wildfire risk, other than automatic reclosers (such as circuit breakers, switches, etc.). For example, PG&E's Fast Trip Settings.
	Crew-accompanying ignition prevention and suppression resources and services	Those firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, and water) that are deployed with construction crews and other electric workers to provide site-specific fire prevention and ignition mitigation during on-site work.
	Personnel work procedures and training in conditions of elevated fire risk	Work activity guidelines that designate what type of work can be performed during operating conditions of different levels of wildfire risk. Training for personnel on these guidelines and the procedures they prescribe, from normal

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

Category	Initiative activity	Definition
	Risk reduction scenario development and analysis	Development of modeling capabilities for different risk reduction scenarios based on wildfire mitigation initiative implementation; analysis and application to utility decision-making.
	Risk spend efficiency (RSE) analysis	Tools, procedures, and expertise to support analysis of wildfire mitigation initiative risk-spend efficiency, in terms of MAVF and/ or MARS methodologies.
I. Emergency planning and preparedness	Adequate and trained workforce for service restoration	Actions taken to identify, hire, retain, and train qualified workforce to conduct service restoration in response to emergencies, including short-term contracting strategy and implementation.
	Community outreach, public awareness, and communications efforts	Actions to identify and contact key community stakeholders; increase public awareness of emergency planning and preparedness information; and design, translate, distribute, and evaluate effectiveness of communications taken before, during, and after a wildfire, including Access and Functional Needs populations and Limited English Proficiency populations in particular.
	Customer support in emergencies	Resources dedicated to customer support during emergencies, such as website pages and other digital resources, dedicated phone lines, etc.
	Disaster and emergency preparedness plan	Development of plan to deploy resources according to prioritization methodology for disaster and emergency preparedness of utility and within utility service territory (such as considerations for critical facilities and infrastructure), including strategy for collaboration with Public Safety Partners and communities.
	Preparedness and planning for service restoration	Development of plans to prepare the utility to restore service after emergencies, such as developing employee and staff trainings, and to conduct inspections and remediation necessary

Category	Initiative activity	Definition
		to re-energize lines and restore service to customers.
	Protocols in place to learn from wildfire events	Tools and procedures to monitor effectiveness of strategy and actions taken to prepare for emergencies and of strategy and actions taken during and after emergencies, including based on an accounting of the outcomes of wildfire events.
J. Stakeholder cooperation and community engagement	Community engagement	Strategy and actions taken to identify and contact key community stakeholders; increase public awareness and support of utility wildfire mitigation activity; and design, translate, distribute, and evaluate effectiveness of related communications. Includes specific strategies and actions taken to address concerns and serve needs of Access and Functional Needs populations and Limited English Proficiency populations in particular.
	Cooperation and best practice sharing with agencies outside CA	Strategy and actions taken to engage with agencies outside of California to exchange best practices both for utility wildfire mitigation and for stakeholder cooperation to mitigate and respond to wildfires.
	Cooperation with suppression agencies	Coordination with CAL FIRE, federal fire authorities, county fire authorities, and local fire authorities to support planning and operations, including support of aerial and ground firefighting in real-time, including information-sharing, dispatch of resources, and dedicated staff.
	Forest service and fuel reduction cooperation and joint roadmap	Strategy and actions taken to engage with local, state, and federal entities responsible for or participating in forest management and fuel reduction activities; and design utility cooperation strategy and joint stakeholder roadmap (plan for coordinating stakeholder efforts for forest management and fuel reduction activities).

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

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

9.3. Covered Conductor Installation Reporting

In Section 7.3.2.3.3, Covered Conductor Installation, report on the following key information for covered conductor installation:

- Methodology for installation and implementation
- Design and design considerations (such as selection of type of covered conductor, additional hardware needed for installation, pole strengthening or replacements, etc.)
- Implementation (including timeframes, prioritization, contractor and labor needs, etc.)
- Long-term operations and considerations (including maintenance, long-term effectiveness and feasibility, effectiveness monitoring, etc.)
- Key assumptions
- Cost effectiveness evaluations (including cost breakdown per circuit mile, comparison with alternatives, etc.)
- Any other activities relevant to the covered conductor installation

This information must be derived from utility-specific programs and supplemented by the findings of the covered conductor working group.

9.4. Undergrounding Implementation Reporting

In Section 7.3.3.16 Undergrounding of electric lines and/or equipment, report on the following key information for undergrounding implementation:

- Methodology for installation and implementation
- Design and design considerations (such as permitting requirements, additional hardware needed for installation, etc.)
- Implementation (including timeframes, prioritization, contractor and labor needs, etc.)
- Long-term operations and considerations (including maintenance, long-term effectiveness and feasibility, effectiveness monitoring, etc.)

- Key assumptions
- Cost effectiveness evaluations (including cost breakdown per circuit mile, comparison with alternatives, etc.)
- Any other activities relevant to the undergrounding implementation

This information must be derived from utility-specific programs.

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