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# ATTACHMENT 1

## (WMP Guidelines)

## **Wildfire Mitigation Plan (WMP) Guidelines**

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## I. WMP submission and review process and timeline

The California Public Utilities Commission (henceforth the CPUC or the Commission) Guidance Decision (D.19-05-036) included substantive and procedural requirements for future plans based on lessons learned during the first WMP proceeding and established an expectation for improvement in the WMPs each year.

The experience of the 2019 WMP submission and review process points towards the benefit of greater structure and consistency in data, receiving supporting data earlier in the WMP process, and utilizing a structured and consistent approach to evaluate utility wildfire mitigation. Several guiding principles based on lessons learned inform the WMP Guidelines for 2020: frontloading the WMP review cycle where possible, standardizing information collection, and establishing a baseline of risk exposure and maturity for each utility.

Accordingly, the WSD will adopt four key elements of the 2020 WMP submission and review process:

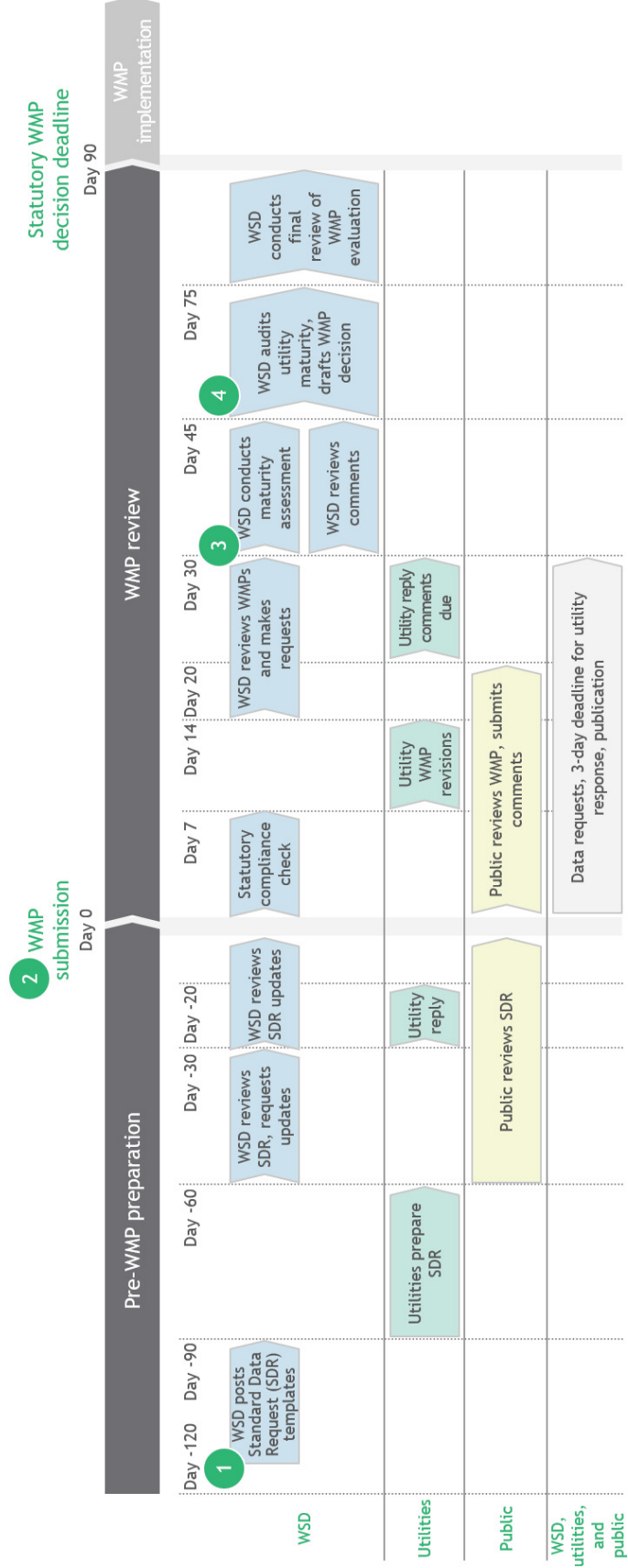
- 1. Frontload data collection.** This will extend the timeframe for WSD and party review of relevant utility data in advance of the WMP submission and review period, in addition to reducing the need for follow-up data requests.
- 2. Standardize templates for utility WMP submission.** Templates help WSD staff more easily uncover relevant supporting information and facilitate comparison across utilities.
- 3. Systematize qualitative evaluation using the utility wildfire mitigation maturity assessment.** An assessment framework increases the objectivity of review and allows WSD staff to more efficiently conduct a thorough review.
- 4. Use audit to validate wildfire mitigation maturity model assessment.** Audits can help the WSD ensure accuracy and consistency of the utility wildfire mitigation maturity assessments.

**Timeline to accommodate process updates**

Where feasible, the WMP submission and review timeline will be updated to accommodate these process updates, as below. The 2020 WMP cycle cannot accommodate the full 120-day pre-WMP preparation phase. Therefore, CPUC staff shall engage with utilities to begin working on understanding methodology and data that supports WMPs ahead of the 2020 filing. In future years, a fuller 120 day pre-WMP preparation phase will be used.

Figure 1 outlines the future view of the WMP submission and review timeline. Each number in Figure 1 represents the implementation of one of the four key elements above.

**Figure 1: Descriptive view of future WMP submission and review timeline**



## II. Wildfire Mitigation Plan Guidelines

### Structure

The WMP itself is composed of five sections and their corresponding templates:

1. Persons responsible for executing the plan,
2. Metrics and underlying data,
3. Baseline ignition probability and wildfire risk exposure,
4. Inputs to the plan, including current and directional vision for wildfire risk exposure,
5. Wildfire mitigation activity for each year of the 3-year WMP term, including expected outcomes of the 3-year plan.

An additional section 6 in the document provides a location for utilities to attach the GIS files required to support the information reported.

Instructions for filling out the WMP are given with each section of the WMP. Sections of this document contain a portion for the utility to provide a narrative response. This narrative response may include quantitative and qualitative explanations, as well as supporting documentation including relevant maps, spreadsheets, photographs, and other relevant information. Many sections also instruct the utility to provide a separate quantitative-focused response in the tables, where cells must be filled out by utilities according to the instructions provided in each section. Some tables include comment boxes. Utilities may extend the size of comment boxes as needed to provide an adequate description for each aspect of the WMP.

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

Where the information in question is not collected by any stakeholder and cannot be collected by the utility, the utility shall indicate this in the comments and include a description of the most similar data point(s) that the utility and/or other stakeholders do track that most closely fits the requirement.

For example, by the WMP deadline, the utility may not have a full accounting of the value of property destroyed by utility-ignited wildfire in a given year due to ongoing investigation into the cause of one or more wildfires within its service territory. In this example, the utility shall indicate 1) the known sum of the value of property determined by fire AHJs to have been destroyed by utility-ignited wildfire in that year, albeit incomplete, and 2) a list of the wildfires in that year for which utility facilities are being investigated as a potential source of ignition but for which the cause is still undetermined and an estimation of value of property destroyed by each. Finally, the utility shall describe its plan to improve its data collection and/or cooperation with partners with the goal of collecting the required information, including the timeline to implementation.

In the event that any of the requested information is confidential, the utility shall provide 2 versions, 1 which includes all of the information and a second that does not include the confidential information.

Clarification of normalization calculation: For those metrics and other figures that are likely to vary year-to-year based on the prevalence of fire-weather conditions, instructions are included to report said metric or figure both 1) as a total for the year and 2) normalized by Red Flag Warning (RFW) circuit mile

days. The denominator “RFW circuit mile days” is intended to capture the duration and scope of the fire weather that year and is calculated as the number of circuit miles that were under a RFW multiplied by the number of days those miles were under said RFW. For example, if 100 circuit miles were under a RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW circuit mile days would be 110.

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## 0 Glossary of defined terms

Term	Definition
<b>10-hour dead fuel moisture content</b>	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.
<b>Access and functional needs populations</b>	Per Government Code § 8593.3 and D.19-05-042, individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking, older adults, children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant.
<b>Authority Having Jurisdiction</b>	AHJ, party with assigned responsibility, depending on location and circumstance.
<b>Asset (utility)</b>	Electric lines, equipment, or supporting hardware.
<b>At-risk species</b>	Species of vegetation that are particularly likely to contact power lines in the event of high winds and/or ignite if they catch a spark.
<b>Baseline (ignition probability, maturity)</b>	A measure, typically of the current state, to establish a starting point for comparison.
<b>Carbon dioxide equivalent</b>	Tons of greenhouse gases (GHG) emitted, multiplied by the global warming potential relative to carbon dioxide.
<b>Contractor</b>	Any individual in the temporary and/or indirect employ of the utility whose limited hours and/or time-bound term of employment are not considered as “full-time” for tax and/or any other purposes.
<b>Critical facilities and infrastructure</b>	In accordance with the interim definition adopted in D.19-05-042, 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 stations, emergency operations centers), government facilities sector (schools, jails, 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), 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), and chemical sector (facilities associated with the provision of manufacturing, maintaining, or distributing hazardous materials and chemicals).
<b>Customer hours</b>	Total number of customers, multiplied by the average number of hours (e.g. of power outage).
<b>Data cleaning</b>	Calibrating raw data to remove errors (including typographical and numerical mistakes).
<b>Dead fuel moisture content</b>	Moisture content of dead vegetation, which responds solely to current environmental conditions and is critical in determining fire potential.
<b>Detailed inspection</b>	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.

<b>Enhanced inspection</b>	Inspection whose frequency and thoroughness exceeds the requirements of the detailed inspection, particularly if driven by risk calculations.
<b>Evacuation impact</b>	Number of people evacuated, with the duration for which they are evacuated, from homes and businesses, due to wildfires.
<b>Evacuation zone</b>	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”.
<b>Fuel density</b>	Mass of fuel (vegetation) per area which could combust in a wildfire.
<b>Fuel management</b>	Removing or thinning vegetation to reduce the potential rate of propagation or intensity of wildfires.
<b>Fuel moisture content</b>	Amount of moisture in a given mass of fuel (vegetation), measured as a percentage of its dry weight.
<b>Full-time employee</b>	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.
<b>GO 95 nonconformance</b>	Condition of a utility asset that does not meet standards established by General Order 95.
<b>Greenhouse gas (GHG) emissions</b>	Health and Safety Code 38505 identifies seven greenhouse gases that ARB is responsible to monitor and regulate in order to reduce emissions: carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O), sulfur hexafluoride (SF <sub>6</sub> ), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF <sub>3</sub> ).
<b>Grid hardening</b>	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.
<b>Grid topology</b>	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).
<b>High Fire Threat District (HFTD)</b>	Per D.17-01-009, areas of the State designated by the CPUC and CAL FIRE to have elevated wildfire risk, indicating where utilities must take additional action (per GO 95, GO 165, and GO 166) to mitigate wildfire risk.
<b>Highly rural region</b>	In accordance with 38 CFR 17.701, “highly rural” shall be defined as those areas with a population of less than 7 persons per square mile.
<b>Ignition probability</b>	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).
<b>Ignition-related deficiency</b>	Any condition which may result in ignition or has previously resulted in ignition, even if not during the past five years.
<b>Impact/consequence of ignitions</b>	The effect or outcome of a wildfire ignition, affecting objectives, which may be expressed by terms including, although not limited to health, safety, reliability, economic and/or environmental damage.
<b>Initiative</b>	Measure or activity proposed or in process designed to reduce the consequences and/or probability of wildfire or PSPS.
<b>Inspection protocol</b>	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.
<b>Invasive species</b>	Non-native species whose proliferation increases the risk of wildfires.
<b>Level 1 finding</b>	In accordance with GO 95, an immediate safety and/or reliability risk with high probability for significant impact.

<b>Level 2 finding</b>	In accordance with GO 95, a variable (non-immediate high to low) safety and/or reliability risk.
<b>Level 3 finding</b>	In accordance with GO 95, an acceptable safety and/or reliability risk.
<b>Life expectancy</b>	Anticipated years that a piece of equipment can be expected to meet safety and performance requirements.
<b>Limited English Proficiency (LEP)</b>	Populations with limited English working proficiency based on the International Language Roundtable scale.
<b>Live fuel moisture content</b>	Moisture content within living vegetation, which can retain water longer than dead fuel.
<b>Lost energy</b>	Energy that would have been delivered were it not for an outage.
<b>Major roads</b>	Interstate highways, U.S. highways, state and county routes.
<b>Match drop simulation</b>	Wildfire simulation method that takes an arbitrary ignition and forecasts propagation and consequence/impact.
<b>Member of the public</b>	Any individual not employed by the utility.
<b>Multi-attribute value function</b>	Risk calculation methodology introduced during CPUC's S-MAP and RAMP proceedings.
<b>Near miss</b>	An event with significant probability of ignition, including wires down, contacts with objects, line slap, events with evidence of significant heat generation, and other events that cause sparking or have the potential to cause ignition.
<b>Near-miss simulation</b>	Simulation of what the consequence would have been of an ignition had it occurred.
<b>Need for PSPS</b>	When utilities' criteria for utilizing PSPS are met.
<b>Noncompliant clearance</b>	Rights-of-way whose vegetation is not trimmed in accordance with the requirements of GO 95.
<b>Outages of the type that could ignite a wildfire</b>	Outages that, in the judgement of the utility, could have ignited a wildfire.
<b>Outcome metrics</b>	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.
<b>Overcapacity</b>	When the energy transmitted by utility equipment exceeds that of its nameplate capacity.
<b>Patrol inspection</b>	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.
<b>Percentile conditions</b>	Top X% of a particular set (e.g. wind speed), based on a historical data set with sufficient detail.
<b>Planned outage</b>	Electric outage announced ahead of time by the utility.
<b>Preventive maintenance (PM)</b>	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.
<b>Priority essential services</b>	Critical first responders, public safety partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water utilities/agencies.
<b>Program targets</b>	Measurements of activity identified in WMPs and subsequent annual updates, in terms of volume or scope of work, such as number trees trimmed or miles of power lines hardened.

<b>Progress metrics</b>	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.
<b>Property</b>	Private and public property, buildings and structures, infrastructure, and other items of value that were destroyed by wildfire, including both third-party property and utility assets.
<b>PSPS risk</b>	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.
<b>PSPS weather</b>	Weather that exceeds a utility's risk threshold for initiating a PSPS.
<b>Red Flag Warning</b>	RFW, level of wildfire risk from weather as declared by the National Weather Service.
<b>RFW Circuit Mile Day</b>	Sum of miles of utility grid subject to Red Flag Warning each day. For example, if 100 circuit miles were under a RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW circuit mile days would be 110.
<b>Risk-spend efficiency</b>	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.
<b>Rule</b>	Section of public utility code requiring a particular activity or establishing a particular threshold.
<b>Run-to-failure</b>	A maintenance approach that replaces equipment only when it fails.
<b>Rural region</b>	In accordance with GO 165, "rural" shall be defined as those areas with a population of less than 1,000 persons per square mile as determined by the United States Bureau of the Census.
<b>Safety Hazard</b>	A condition that poses a significant threat to human life or property.
<b>Simulated wildfire</b>	Propagation and impact/consequence of a wildfire ignited at a particular point ('match drop'), as simulated by fire spread software.
<b>Span</b>	The space between adjacent supporting poles or structures on a circuit consisting of electric line and equipment. "Span level" refers to asset-scale granularity.
<b>System Average Interruption Duration Index (SAIDI)</b>	System-wide total number of minutes per year of sustained outage per customer served.
<b>Third-party contact</b>	Contact between a piece of electrical equipment and another object, whether natural (tree branch) or human (vehicle).
<b>Time to expected failure</b>	Time remaining on the life expectancy of a piece of equipment.
<b>Top 30% of proprietary fire potential index</b>	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).
<b>Trees with strike potential / hazard trees</b>	Trees that could either 'fall in' to a power line, or have branches detach and 'fly in' to contact a power line in high-wind conditions.
<b>Unplanned outage</b>	Electric outage that occurs with no advance notice from the utility (e.g. blackout).
<b>Urban region</b>	In accordance with GO 165, "urban" shall be defined as those areas with a population of more than 1,000 persons per square mile as determined by the United States Bureau of the Census.
<b>Utility-ignited wildfire</b>	Wildfires ignited by utility infrastructure or employees, including all wildfires determined by AHJ investigation to originate from ignition caused by utility infrastructure.
<b>Vegetation management</b>	Trimming and clearance of trees, branches, and other vegetation that poses the risk of contact with electric equipment.
<b>Vegetation risk index</b>	Risk index indicating the probability of vegetation-related outages along a particular circuit, based on the vegetation species, density, height, and growth rate.

<b>Weather normalization</b>	Adjusting metrics based on relative weather risk, with RFW circuit mile days as the normalization factor.
<b>Wildfire impact/ consequence</b>	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.
<b>Wildfire risk</b>	The potential for the occurrence of a wildfire event expressed in terms of a combination of various outcomes of the wildfire and their associated probabilities.
<b>Wildfire-only WMP programs</b>	Activities, practices, and strategies that are only necessitated by wildfire risk, unrelated to or beyond that required by minimum reliability and/or safety requirements. Such programs are not indicated or in common use in areas where wildfire risk is minimal (e.g., territory with no vegetation or fuel) or under conditions where wildfires are unlikely to ignite or spread (e.g., when rain is falling).
<b>Wildland urban interface (WUI)</b>	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.
<b>Wire down</b>	Instance where an electric transmission or distribution conductor is broken and falls from its intended position to rest on the ground or a foreign object.

## **1 Persons responsible for executing the WMP**

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

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

Ensure that the plan components described in (2) include an accounting for each of the WMP sections and subsections.

**1.1 Verification**

Complete the following verification for the WMP submission:

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

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

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

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

\_\_\_\_\_  
(Signature and Title of Corporate Officer)



## **2 Metrics and underlying data**

Instructions: Report performance on the following progress and outcome metrics within the utility's service territory over the past five years. Where a utility does not collect its own data for a given metric, that utility shall work with the relevant sources to collect the information for its service territory, and clearly identify the owner and dataset used to provide the response in "Comments" column.

Progress metrics, listed below, track how much utility wildfire mitigation activity has managed to change the conditions of utility wildfire risk exposure in terms of drivers of ignition probability.

Outcome metrics measure the performance of a utility and its service territory in terms of both leading and lagging indicators of wildfire risk, PSPS risk, and other direct and indirect consequences of wildfire and PSPS, including the potential unintended consequences of wildfire mitigation work.

In the 2019 WMPs, utilities proposed sets of "program targets" that enable tracking implementation of proposed wildfire mitigation activities against the scope of those activities as laid out in the WMPs but do not track the efficacy of those activities. Utilities shall continue to report program targets, however, the primary use of these will be to gauge follow-through on WMPs while recognizing that some WMP initiatives should be adjusted after plan submittal based on new information and lessons learned.

### **2.1 Lessons learned: how tracking metrics on the 2019 plan has informed the 2020 plan**

Describe how the utility's plan has evolved since the 2019 WMP submission. Outline any major themes and lessons learned from the 2019 plan and subsequent implementation of the initiatives. In particular, focus on how utility performance against the metrics used has informed the utility's 2020 WMP.

**2.2 Recent performance on progress metrics, last 5 years**

**Instructions for Table 1:**

Report performance on the following metrics within the utility’s service territory over the past five years. Where the utility does not collect its own data on a given metric, the utility shall work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in the “Comments” column.

**Table 1: Recent performance on progress metrics, last 5 years**

#	Progress metric name	Annual performance					Unit(s)	Comments
		2015	2016	2017	2018	2019		
1	Grid condition findings from inspection						Number of Level 1, 2, and 3 findings per mile of circuit in HFTD, and per total miles of circuit for each of the following inspection types: 1. Patrol inspections 2. Detailed inspections 3. Other inspection types	
2	Vegetation clearance findings from inspection						Percentage of right-of-way with noncompliant clearance based on applicable rules and regulations at the time of inspection, as a percentage of all right-of-way inspected	
3	Extent of grid modularization						Number of sectionalizing devices per circuit mile plus number of automated grid control equipment in: 1. HFTD 2. Non-HFTD	
4	Data collection and reporting						Percent of data requested in SDR and WMP collected in initial submission	

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

**Instructions for Table 2:**

Report performance on the following metrics within the utility’s service territory over the past five years. Where the utility does not collect its own data on a given metric, the utility shall work with the relevant state agencies to collect the relevant information for its service territory, and clearly identify the owner and dataset used to provide the response in “Comments” column.

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

**Table 2: Recent performance on outcome metrics, last 5 years**

Metric type	#	Outcome metric name	Annual performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
1. Near misses	1.a.	Number of all events (such as unplanned outages, faults, conventional blown fuses, etc.) that could result in ignition, by type according to utility-provided list (total)						Number per year	
	1.b.	Number of all events (such as unplanned outages, faults, conventional blown fuses, etc.) that could result in ignition, by type according to utility-provided list (normalized)						Number per RFW circuit mile day per year	
	1.c.	Number of wires down (total)						Number of wires down per year	
	1.d.	Number of wires down (normalized)						Number per RFW circuit mile day per year	
2. Utility inspection findings	2.a.	Number of Level 1 findings that could increase the probability of ignition discovered per circuit mile inspected						Average number of Level 1 findings that could increase the probability of ignition discovered by all inspections per circuit mile per year	

Metric type	#	Outcome metric name	Annual performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
	2.b.	Number of Level 2 findings that could increase the probability of ignition discovered per circuit mile inspected						Average number of Level 2 findings that could increase the probability of ignition discovered by all inspections per circuit mile per year	
	2.c.	Number of Level 3 findings that could increase the probability of ignition discovered per circuit mile inspected						Average number of Level 3 findings that could increase the probability of ignition discovered by all inspections per circuit mile per year	
3. Customer hours of PSPS and other outages	3.a.	Customer hours of planned outages including PSPS (total)						Total customer hours of planned outages per year	
	3.b.	Customer hours of planned outages including PSPS (normalized)						Total customer hours of planned outages per RFW circuit mile day per year	
	3.c.	Customer hours of unplanned outages, not including PSPS (total)						Total customer hours of unplanned outages per year	
	3.d.	Customer hours of unplanned outages, not including PSPS (normalized)						Total customer hours of unplanned outages per RFW circuit mile day per year	
	3.e.	Increase in System Average Interruption Duration Index (SAIDI)						Change in minutes compared to the previous year	
4. Utility ignited wildfire fatalities	4.a.	Fatalities due to utility-ignited wildfire (total)						Number of fatalities per year	
	4.b.	Fatalities due to utility-ignited wildfire (normalized)						Number of fatalities per RFW circuit mile day per year	
5. Accidental deaths resulting from utility wildfire mitigation initiatives	5.a.	Deaths due to utility wildfire mitigation activities (total)						Number of fatalities per year	

Metric type	#	Outcome metric name	Annual performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
6. OSHA-reportable injuries from utility wildfire mitigation initiatives	6.a.	OSHA-reportable injuries due to utility wildfire mitigation activities (total)						Number of OSHA-reportable injuries per year	
	6.b.	OSHA-reportable injuries due to utility wildfire mitigation activities (normalized)						Number of OSHA-reportable injuries per year per 1000 line miles of grid	
7. Value of assets destroyed by utility-ignited wildfire, listed by asset type	7.a.	Value of assets destroyed by utility-ignited wildfire (total)						Dollars of damage or destruction per year	
	7.b.	Value of assets destroyed by utility-ignited wildfire (normalized)						Dollars of damage or destruction per RFW circuit mile day per year	
8. Structures damaged or destroyed by utility-ignited wildfire	8.a.	Number of structures destroyed by utility-ignited wildfire (total)						Number of structures destroyed per year	
	8.b.	Number of structures destroyed by utility-ignited wildfire (normalized)						Number of structures destroyed per RFW circuit mile day per year	
9. Acreage burned by utility-ignited wildfire	9.a.	Acreage burned by utility-ignited wildfire (total)						Acres burned per year	
	9.b.	Acreage burned by utility-ignited wildfire (normalized)						Acres burned per RFW circuit mile day per year	
10. Number of utility wildfire ignitions	10.a.	Number of ignitions (total) according to existing ignition data reporting requirement						Number per year	
	10.b.	Number of ignitions (normalized)						Number per RFW circuit mile day per year	
	10.c.	Number of ignitions in HFTD (subtotal)						Number in HFTD per year	
	10.c.i.	Number of ignitions in HFTD Zone 1						Number in HFTD Zone 1 per year	
	10.c.ii.	Number of ignitions in HFTD Tier 2						Number in HFTD Tier 2 per year	
	10.c.iii.	Number of ignitions in HFTD Tier 3						Number in HFTD Tier 3 per year	

Metric type	#	Outcome metric name	Annual performance				Unit(s)	Comments
			2015	2016	2017	2018		
	10.d.	Number of ignitions in HFTD (subtotal, normalized)					Number in HFTD per RFW circuit mile day per year	
	10.d.i.	Number of ignitions in HFTD Zone 1 (normalized)					Number in HFTD Zone 1 per RFW circuit mile day per year	
	10.d.ii.	Number of ignitions in HFTD Tier 2 (normalized)					Number in HFTD Tier 2 per RFW circuit mile day per year	
	10.d.iii.	Number of ignitions in HFTD Tier 3 (normalized)					Number in HFTD Tier 3 per RFW circuit mile day per year	
	10.e.	Number of ignitions in non-HFTD (subtotal)					Number in non-HFTD per year	
	10.f.	Number of ignitions in non-HFTD (normalized)					Number in non-HFTD per RFW circuit mile day per year	
11. Critical infrastructure impacted	11.a.	Critical infrastructure impacted by PSPS					Number of critical infrastructure (in accordance with D.19-05-042) locations impacted per hour multiplied by hours offline per year	
	11.b.	Critical infrastructure impacted by PSPS (normalized)					Number of critical infrastructure (in accordance with D.19-05-042) locations impacted per hour multiplied by hours offline per RFW circuit mile day per year	

**2.4 Description of additional metrics**

**Instructions for Table 3:**

In addition to the metrics specified above, list and describe all other metrics the utility uses to evaluate wildfire mitigation performance, the utility’s performance on those metrics over the last five years, the units reported, the assumptions that underlie the use of those metrics, and how the performance reported could be validated by third parties outside the utility, such as analysts or academic researchers. Identified

metrics must be of enough detail and scope to effectively inform the performance (i.e., reduction in ignition probability or wildfire consequence) of each preventive strategy and program.

**Table 3: List and description of additional metrics, last 5 years**

Metric	Performance					Units	Underlying assumptions	Third-party validation
	2015	2016	2017	2018	2019			

Note: Add more rows as needed.

**2.5 Description of program targets**

**Instructions for Table 4:**

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

Each program target shall be associated with a percent completeness and based upon the contents of the WMP.

**Table 4: List and description of program targets, last 5 years**

Program target	2019 performance	Units	Underlying assumptions	Third-party validation

Note: Add more rows as needed.

**2.6 Detailed information supporting outcome metrics**

**Instructions for Table 5:**

Enclose detailed information as requested for the metrics below. Report numbers of accidental deaths attributed to any utility wildfire mitigation activities, as listed in the utility’s 2019 WMP filing or otherwise, according to the type of activity in column one, and by the relationship to the utility, for each of the last five years. For fatalities caused by activities 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 activity.

Report subtotals calculated for each row and column.

**Table 5: Accidental deaths due to utility wildfire mitigation initiatives, last 5 years**

Activity	Victim														Total					
	Full-time employee					Contractor					Member of public									
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018		2019				
Year																				
Inspection																				
Vegetation management																				
Utility fuel management																				
Grid hardening																				





Note: Add more rows as needed.

**Instructions for Table 7:**

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

**Table 7: Methodology for potential impact of ignitions**

List of all data inputs used in impact simulation	Sources of data inputs	Data selection and treatment methodologies	Assumptions, including SME input	Equation(s), functions, or other algorithms used to obtain output	Output type(s), e.g., wind speed model	Comments

Note: Add more rows as needed.

**2.7 Mapping recent, modelled, and baseline conditions**

**Instructions for Table 8:**

Report underlying data for recent conditions (over the last five years) of the utility service territory in a downloadable shapefile GIS format, to include the following layers of data plotted on the utility service territory map as specified below, at a minimum. Provide information for each year; calculate and provide a five-year average. Name and attach files according to the table below.

**Table 8: Map file requirements for recent and modelled conditions of utility service territory, last 5 years**

Layer name	Measurements	Units	Attachment location
Recent weather patterns	Average annual number of Red Flag Warning days per square mile across service territory	Area, days, square mile resolution	6.1
	Average 95 <sup>th</sup> and 99 <sup>th</sup> percentile wind speed and prevailing direction (actual)	Area, miles per hour, at a square mile resolution or better, noting where measurements are actual or interpolated	
Recent drivers of ignition probability	Date of recent ignitions categorized by ignition probability driver	Point, GPS coordinate, days, square mile resolution	6.2
Recent use of PSPS	Duration of PSPS events and area of the grid affected in customer hours per year	Area, customer hours, square mile resolution	6.3

**Instructions for Table 9:**

Report underlying data for baseline conditions (projected for 2020) of the utility service territory in a downloadable shapefile GIS format and database, to include the following layers of data plotted on the utility service territory map as specified below, at a minimum. Report more granular resolutions where available (e.g., asset-level instead of by circuit mile).

**Table 9: Map file requirements for baseline condition of utility service territory projected for 2020**

Layer name	Measurements / variables	Units	Appendix location
Current baseline state of service territory and utility equipment	Non-HFTD vs HFTD (Zone 1, Tier 2, Tier 3) regions of utility service territory	Area, square mile resolution per type	6.4
	Urban vs. rural vs. highly rural regions of utility service territory	Area, square mile resolution per type	
	WUI regions of utility service territory	Area, square mile resolution	
	Number and location of critical facilities	Point, GPS coordinate	
	Number and location of customers	Area, number of people, square mile resolution	
	Number and location of customers belonging to access and functional needs populations	Area, number of people, square mile resolution	
	Overhead transmission lines	Line, quarter mile resolution	
	Overhead distribution lines	Line, quarter mile resolution	
	Location of substations	Point, GPS coordinate	
	Location of weather stations	Point, GPS coordinate	
	All utility assets by asset type, model, age, specifications, and condition	Point, GPS coordinate	
Location of planned utility equipment additions or removal	Non-HFTD vs HFTD (Zone 1, Tier 2, Tier 3) regions of utility service territory	Line, quarter mile resolution	6.5
	Urban vs. rural vs. highly rural regions of utility service territory	Line, quarter mile resolution	
	WUI regions of utility service territory	Line, quarter mile resolution	
	Circuit miles of overhead transmission lines	Line, quarter mile resolution	
	Circuit miles of overhead distribution lines	Line, quarter mile resolution	
Planned 2020 WMP initiative activity per year	Location of substations	Point, GPS coordinate	7.6
	Location of 2020 WMP initiative activity for each activity as planned to be completed by the end of each year of the plan term	Line, quarter mile resolution	

### 3 Baseline ignition probability and wildfire risk exposure

#### 3.1 Recent weather patterns, last 5 years

##### Instructions for Table 10:

Report weather measurements based upon the duration and scope of NWS Red Flag Warnings and upon proprietary Fire Potential Index (or other similar fire risk potential measure) for each year. Calculate and report 5-year historical average. Ensure underlying data is provided per Section 2.7.

**Table 10: Weather patterns, last 5 years**

Weather measurement	2015	2016	2017	2018	2019	5-year historical average	Unit(s)
Red Flag Warning days							RFW circuit mile days per year
Days rated at the top 30% of proprietary fire potential index or similar fire risk index measure							Circuit mile days where proprietary measure rated above top 30% threshold <sup>1</sup> per year
95 <sup>th</sup> percentile wind conditions							Circuit mile days with wind gusts over 95 <sup>th</sup> percentile historical (meaning the prior 10 years, 2005-2014) conditions per year
99 <sup>th</sup> percentile wind conditions							Circuit mile days with wind gusts over 99 <sup>th</sup> percentile historical (meaning the prior 10 years, 2005-2014) conditions per year
Other							

Note: Add additional rows as needed.

<sup>1</sup> Threshold here defined as 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).

### **3.2 Recent drivers of ignition probability, last 5 years**

#### **Instructions for Table 11:**

Report recent drivers of ignition probability according to whether or not near misses of that type are tracked, the number of incidents per year (e.g., all instances of animal contact regardless of whether they caused an outage, an ignition, or neither), the rate at which those incidents (e.g., object contact, equipment failure, etc.) cause an ignition in the column, and the number of ignitions that those incidents caused by category, for each of last five years.

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 2019 ignition data compiled by the WMP deadline shall indicate in the 2019 columns that said information is incomplete. List additional drivers tracked in the “other” row and add additional rows as needed. Ensure underlying data is provided per Section 2.7.

**Table 11: Key recent drivers of ignition probability, last 5 years**

Incident type by ignition probability driver	Near misses tracked (y/n)?						Number of incidents per year						Average percentage probability of ignition per incident						Number of ignitions per year from this driver						
	Average	2019	2018	2017	2016	2015	Average	2019	2018	2017	2016	2015	Average	2019	2018	2017	2016	2015	Average	2019	2018	2017	2016	2015	
Contact from object																									
All types of object contact																									
Animal contact																									
Balloon contact																									
Veg. contact																									
Vehicle contact																									
All types of equipment / facility failure																									
Capacitor bank failure																									
Conductor failure—all																									



**Table 12: Recent use of PSPS, last 5 years**

PSPS characteristic	2015	2016	2017	2018	2019	Unit(s)
Frequency of PSPS events (total)						Number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability, per year
Frequency of PSPS events (normalized)						Number of instances where utility operating protocol requires de-energization of a circuit or portion thereof in order to reduce ignition probability, per RFW circuit mile day per year
Scope of PSPS events (total)						Circuit-events, measured in number of events multiplied by number of circuits de-energized per year
Scope of PSPS events (normalized)						Circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization per RFW circuit mile day per year
Duration of PSPS events (total)						Customer hours per year
Duration of PSPS events (normalized)						Customer hours per RFW circuit mile day per year
Other						

Note: Add additional rows as needed.



**3.4 Baseline state of equipment and wildfire and PSPS event risk reduction plans**

**3.4.1 Current baseline state of service territory and utility equipment**

**Instructions for Table 13:**

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, 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).

The totals of the cells for each category of information (e.g., “circuit miles” or “circuit miles in WUI”) would be equal to the overall service territory total (e.g., 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). Ensure underlying data is provided per Section 2.7.

**Table 13: Current baseline state of service territory and utility equipment**

Land use	Characteristic tracked	In non-HFTD	In HFTD Zone 1	In HFTD Tier 2	In HFTD Tier 3
In urban areas	Circuit miles				
	Circuit miles in WUI				
	Number of critical facilities				
	Number of critical facilities in WUI				
	Number of customers				
	Number of customers in WUI				
	Number of customers belonging to access and functional needs populations				
	Number of customers belonging to access and functional needs populations in WUI				

Land use	Characteristic tracked	In non-HFTD	In HFTD Zone 1	In HFTD Tier 2	In HFTD Tier 3
In rural areas	Circuit miles of overhead transmission lines				
	Circuit miles of overhead transmission lines in WUI				
	Circuit miles of overhead distribution lines				
	Circuit miles of overhead distribution lines in WUI				
	Number of substations				
	Number of substations in WUI				
	Circuit miles				
	Circuit miles in WUI				
	Number of critical facilities				
	Number of critical facilities in WUI				
	Number of customers				
	Number of customers in WUI				
	Number of customers belonging to access and functional needs populations				
	Number of customers belonging to access and functional needs populations in WUI				
Circuit miles of overhead transmission lines					
Circuit miles of overhead transmission lines in WUI					

Land use	Characteristic tracked	In non-HFTD	In HFTD Zone 1	In HFTD Tier 2	In HFTD Tier 3
	Circuit miles of overhead distribution lines				
	Circuit miles of overhead distribution lines in WUI				
	Number of substations				
	Number of substations in WUI				
In highly rural areas	Circuit miles				
	Circuit miles in WUI				
	Number of critical facilities				
	Number of critical facilities in WUI				
	Number of customers				
	Number of customers in WUI				
	Number of customers belonging to access and functional needs populations				
	Number of customers belonging to access and functional needs populations in WUI				
	Circuit miles of overhead transmission lines				
	Circuit miles of overhead transmission lines in WUI				
	Circuit miles of overhead distribution lines				
	Circuit miles of overhead distribution lines in WUI				

Land use	Characteristic tracked	In non-HFTD	In HFTD Zone 1	In HFTD Tier 2	In HFTD Tier 3
	Number of substations				
	Number of substations in WUI				

**Instructions for Table 14:**

Input summary data on number of utility weather stations located in utility service territory by type.

**Table 14: Summary data on weather station count**

Weather station count type	Current count	Unit(s)
Number of weather stations (total)		Total number located in service territory and operated by utility
Number of weather stations (normalized)		Total number located in service territory and operated by utility, divided by total number of circuit miles in utility service territory
Number of weather stations in non-HFTD (total)		Total number located in non-HFTD service territory and operated by utility
Number of weather stations in non-HFTD (normalized)		Total number located in non-HFTD service territory and operated by utility, divided by total number of circuit miles in non-HFTD service territory
Number of weather stations in HFTD Zone 1 (total)		Total number located in HFTD Zone 1 service territory and operated by utility
Number of weather stations in HFTD Zone 1 (normalized)		Total number located in HFTD Zone 1 service territory and operated by utility, divided by total number of circuit miles in HFTD Zone 1 service territory
Number of weather stations in HFTD Tier 2 (total)		Total number located in HFTD Tier 2 service territory and operated by utility
Number of weather stations in HFTD Tier 2 (normalized)		Total number located in HFTD Tier 2 service territory and operated by utility, divided by total number of circuit miles in HFTD Tier 2 service territory
Number of weather stations in HFTD Tier 3 (total)		Total number located in HFTD Tier 3 service territory and operated by utility
Number of weather stations in HFTD Tier 3 (normalized)		Total number located in HFTD Tier 3 service territory and operated by utility, divided by total number of circuit miles in HFTD Tier 3 service territory

**Instructions for Table 15:**

Input summary data on number of utility fault indicators located in utility service territory by type.

**Table 15: Summary data on fault indicator count**

Fault indicator count type	Current count	Unit(s)
Number of fault indicators (total)		Total number located in service territory and operated by utility
Number of fault indicators (normalized)		Total number located in service territory and operated by utility, divided by total number of circuit miles in utility service territory
Number of fault indicators in non-HFTD (total)		Total number located in non-HFTD service territory and operated by utility
Number of fault indicators in non-HFTD (normalized)		Total number located in non-HFTD service territory and operated by utility, divided by total number of circuit miles in non-HFTD service territory
Number of fault indicators in HFTD Zone 1 (total)		Total number located in HFTD Zone 1 service territory and operated by utility
Number of fault indicators in HFTD Zone 1 (normalized)		Total number located in HFTD Zone 1 service territory and operated by utility, divided by total number of circuit miles in HFTD Zone 1 service territory
Number of fault indicators in HFTD Tier 2 (total)		Total number located in HFTD Tier 2 service territory and operated by utility
Number of fault indicators in HFTD Tier 2 (normalized)		Total number located in HFTD Tier 2 service territory and operated by utility, divided by total number of circuit miles in HFTD Tier 2 service territory
Number of fault indicators in HFTD Tier 3 (total)		Total number located in HFTD Tier 3 service territory and operated by utility
Number of fault indicators in HFTD Tier 3 (normalized)		Total number located in HFTD Tier 3 service territory and operated by utility, divided by total number of circuit miles in HFTD Tier 3 service territory

**3.4.2 Planned additions, removal, and upgrade of utility equipment by end of 3-year plan term**

**Instructions for Table 16:**

Input summary information for the planned additions or removal of utility equipment to be completed by the end of the 3-year plan term in 2022. Report net additions using positive numbers and net removals and undergrounding using negative numbers for circuit miles and numbers of substations.

**Table 16: Location of planned utility equipment additions or removal by end of 3-year plan term**

Land use	Characteristic tracked	Changes by end-2022		
		In non-HFTD	In HFTD Zone 1	In HFTD Tier 2 In HFTD Tier 3
In urban areas	Circuit miles of overhead transmission lines			
	Circuit miles of overhead distribution lines			
	Circuit miles of overhead transmission lines in WUI			
	Circuit miles of overhead distribution lines in WUI			
	Number of substations			
	Number of substations in WUI			
	Number of weather stations			
	Number of weather stations in WUI			
In rural areas	Circuit miles of overhead transmission lines			
	Circuit miles of overhead distribution lines			
	Circuit miles of overhead transmission lines in WUI			

	Circuit miles of overhead distribution lines in WUI						
	Number of substations						
	Number of substations in WUI						
	Number of weather stations						
	Number of weather stations in WUI						
In highly rural areas	Circuit miles of overhead transmission lines						
	Circuit miles of overhead distribution lines						
	Circuit miles of overhead transmission lines in WUI						
	Circuit miles of overhead distribution lines in WUI						
	Number of substations						
	Number of substations in WUI						
	Number of weather stations						
	Number of weather stations in WUI						

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

**Instructions for Table 17:**

Referring to the program targets discussed above, report plan for hardening upgrades in detail below. Report plan in terms of number of circuit miles or substations to be upgraded for each year, assuming complete implementation of wildfire mitigation activities, for HFTD and non-HFTD service territory for circuit miles of transmission lines, circuit miles of transmission lines located in Wildland-Urban Interface (WUI), circuit miles of distribution lines, circuit miles of distribution lines in WUI, number of substations, and number of substations in the WUI.

Include a list of the hardening initiatives included in the calculations for the below table.



**Table 17: Location of planned utility infrastructure upgrades**

Land use	Characteristic tracked	In non-HFTD			In HFTD Zone 1			In HFTD Tier 2			In HFTD Tier 3		
		2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022
Total circuit miles planned for hardening each year, all types and locations													
Total number of substations planned for hardening each year, all locations													
In urban areas	Circuit miles planned for grid hardening of overhead transmission lines												
	Circuit miles of overhead transmission lines in WUI to harden												
	Circuit miles of overhead distribution lines to harden												
	Circuit miles of overhead distribution lines in WUI to harden												
	Circuit miles of overhead transmission lines in WUI to harden												
	Number of substations to harden												
	Number of substations in WUI to harden												
In rural areas	Circuit miles of overhead transmission lines to harden												
	Circuit miles of overhead transmission lines in WUI to harden												
	Circuit miles of overhead distribution lines to harden												
	Circuit miles of overhead distribution lines in WUI to harden												
	Circuit miles of overhead transmission lines in WUI to harden												
	Number of substations to harden												
	Number of substations in WUI to harden												
In highly rural areas	Circuit miles of overhead transmission lines to harden												
	Circuit miles of overhead transmission lines in WUI to harden												
	Circuit miles of overhead distribution lines to harden												
	Circuit miles of overhead distribution lines in WUI to harden												
	Circuit miles of overhead distribution lines to harden												
	Circuit miles of overhead distribution lines in WUI to harden												
	Number of substations to harden												
	Number of substations in WUI to harden												

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

**3.4.3 Status quo ignition probability drivers by service territory**

**Instructions for Table 18:**

Report 5-year historical average drivers of ignition probability according to:

- the average number of incidents per year
- the likelihood of ignition per incident, meaning, the rate at which those incidents (e.g., object contact, equipment failure, etc.) would be expected to cause an ignition (e.g., if 50% of vegetation contacts result in ignition, then the value for the “Likelihood of ignition per incident” column would be “50%” in that row); and
- the 5-year historical average of the number of ignitions from this driver by location in non-HFTD, HFTD Zone 1, HFTD Tier 2, and HFTD Tier 3. List additional risk drivers tracked in the “other” row and additional rows as needed. If changes would be expected for plan years 2 and 3, describe.

**Table 18: Key drivers of ignition probability**

Ignition probability drivers	Number of incidents per year (according to 5-year historical average)	Average likelihood of ignition per incident	Ignitions from this driver (according to 5-year historical average)							
			Total	In non-HFTD	In HFTD Zone 1	In HFTD Tier 2	In HFTD Tier 3			
Contact from object All types of object contact Animal contact Balloon contact Vegetation contact Vehicle contact										
All types of equipment / facility failure Capacitor bank failure										



## **4 Inputs to the plan and directional vision for wildfire risk exposure**

### **4.1 The objectives of the plan**

The objectives of the plan shall, at a minimum, be consistent with the requirements of California Public Utilities Code §8386(a). Describe utility WMP objectives, categorized by each of the following timeframes:

1. Before the upcoming wildfire season, as defined by the California Department of Forestry and Fire Protection (CAL FIRE),
2. Before the next annual update,
3. Within the next 3 years, and
4. Within the next 10 years.

### **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) and Risk Assessment Mitigation Phase (RAMP). Include description of how the utility distinguishes between these risks and the risks to safety and reliability. List and describe each “known local condition” that the utility monitors per GO 95, Rule 31.1, including how the condition is monitored and evaluated. In addition:

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

**4.2.1 Service territory fire-threat evaluation and ignition risk trends**

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

**Instructions for Table 19:**

In the “Rank” column, numerically rank the trends anticipated to exhibit the greatest change and have the greatest impact on ignition probability and estimated wildfire consequence (be it to increase or decrease ignition probability and estimated wildfire consequence) in ten years. Rank in order from 1 to 8, where 1 represents the greatest anticipated change or impact on ignition probability and estimated wildfire consequence and 8 is the least anticipated change or impact.

In the “Comments” column, provide a narrative to describe the expected change and expected impact on the utility’s network, including whether the trend is expected to significantly increase risk, moderately increase risk, have limited or no impact, moderately decrease risk, or significantly decrease risk. Use quantitative estimates wherever possible. Also outline any programs being implemented to specifically address this trend.

**Table 19: Macro trends impacting ignition probability and/or wildfire consequence**

Rank	Macro trends impacting utility ignited ignition probability and estimated wildfire consequence by year 10	Comments
	Change in ignition probability and estimated wildfire consequence due to climate change	
	Change in ignition probability and estimated wildfire consequence due to relevant invasive species, such as bark beetles	
	Change in ignition probability and estimated wildfire consequence due to other drivers of change in fuel density and moisture	
	Population changes (including Access and Functional Needs population) that could be impacted by utility ignition	
	Population changes in HFTD that could be impacted by utility ignition	

	Population changes in WUI that could be impacted by utility ignition	
	Utility infrastructure location in HFTD vs non-HFTD	
	Utility infrastructure location in urban vs rural vs highly rural areas	<sup>2</sup>

List and describe any additional macro trends impacting ignition probability and estimated wildfire consequence within utility service territory, including trends within the control of the utility, trends within the utility’s ability to influence, and externalities (i.e., trends beyond the utility’s control, such as population changes within the utility’s territory).

List and describe all relevant drivers of ignition probability and estimated wildfire consequences and the mitigations that are identified in the Risk Assessment Mitigation Phase (RAMP) and not included in the above, including how these are expected to evolve. Rank these drivers from highest to lowest risk and describe how they are expected to evolve.

**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. 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 a near miss or in an ignition) 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 near misses, and description of events (including vegetation and equipment condition).

**4.4 Directional vision for necessity of PSPS**

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

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<sup>2</sup> Comment on difference in approach to serving customers in urban versus rural versus highly rural areas.

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

**Instructions for Table 20:**

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

**Table 20: Anticipated characteristics of PSPS use over next 10 years**

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

	number of circuits targeted for de-energization (normalized by fire weather, e.g., Red Flag Warning line mile days)		
	Duration of PPS events in customer hours (total)		
	Duration of PPS events in customer hours (normalized by fire weather, e.g., Red Flag Warning line mile days)		
	Other		



## **5 Wildfire mitigation strategy and programs for 2019 and for each year of the 3-year WMP term**

### **5.1 Wildfire mitigation strategy**

Describe organization-wide wildfire mitigation strategy and goals for each of the following time periods:

1. Before the upcoming wildfire season, as defined by the California Department of Forestry and Fire Protection (CAL FIRE),
2. Before the next annual update,
3. Within the next 3 years, and
4. Within the next 10 years.

The description of utility wildfire mitigation strategy shall:

- A. Discuss the utility's approach to determining how to manage wildfire risk (in terms of ignition probability and estimated wildfire consequence) as distinct from managing risks to safety and/or reliability. Describe how this determination is made both for (1) the types of activities needed and (2) the extent of those activities needed to mitigate these two different groups of risks. Describe to what degree the activities needed to manage wildfire risk may be incremental to those needed to address safety and/or reliability risks.
- B. Include a summary of what major investments and implementation of wildfire mitigation initiatives achieved over the past year, any lessons learned, any changed circumstances for the 2020 WMP term (i.e., 2020-2022), and any corresponding adjustment in priorities for the upcoming plan term. Organize summaries of initiatives by the wildfire mitigation categories listed in Section 5.3.
- C. List and describe all challenges associated with limited resources and how these challenges are expected to evolve over the next 3 years.
- D. Outline how the utility expects new technologies and innovations to impact the utility's strategy and implementation approach over the next 3 years, including the utility's program for integrating new technologies into the utility's grid.

### **5.2 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. For all data that is used to drive wildfire-related decisions, including grid operations, capital allocation, community engagement, and other areas, provide a thorough description of the utility's data architecture and flows. List and describe 1) all dashboards and reports directly or indirectly related to ignition probability and estimated wildfire consequences and reduction, and 2) all available GIS data and products. For each, include metadata and a data dictionary that defines all information about the data. For each, also describe how the utility collects

data, including a list of all wildfire-related data elements, where it is stored, how it is accessed, and by whom. Explain processes for QA/QC, cleaning and analyzing, normalizing, and utilizing data to drive internal decisions. Include list of internal data standards and cross-reference for they datasets or map products to which the standards apply.

### **5.3 Detailed wildfire mitigation programs**

In this section, describe how the utility's specific programs and initiatives plan to execute the strategy set out in Section 5.1. The specific programs and initiatives are divided into 10 categories, with each providing a space for a narrative description of the utility's initiatives and a summary table for numeric input in the subsequent tables in this section. The initiatives are organized by the following categories provided in this section:

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

To the extent applicable and relevant, if an electric utility has completed a Safety Model and Assessment Proceeding (S-MAP) and Risk Assessment Mitigation Phase (RAMP) as part of its General Rate Case that identifies safety models or programs the electrical corporation has implemented to mitigate ignition probability and estimated wildfire consequence, then the models or programs identified pursuant to this section must comport with those identified in the S-MAP proceeding. Describe any differences with S-MAP and RAMP and provide rationale.

**Instructions for Table 21 through Table 30:**

List and summarize each initiative using the tables below for each corresponding category. Provide a separate line item for each initiative within each category. Use the initiative rows provided for these initiatives undertaken by the utility and create new rows for initiatives only when absolutely necessary. Where the utility plans to conduct additional activities that cannot be categorized into the initiatives below, add a corresponding row to the table in the relevant category and add details on each activity to complete the row according to instructions before.

For each wildfire mitigation activity, report information on:

1. total per-initiative spend in dollars (\$);
2. line miles to be treated (as applicable)<sup>3</sup> in miles (mi);
3. spend per treated line mile (or, where initiative is not implemented on a per-line-mile basis, per total line miles of the system);
4. ignition probability drivers targeted (from the list of ignition probability drivers indicated in utility SDR Table 24 Key drivers of ignition probability, or other as needed);
5. risk reduction of the activity according to utility multi-attribute value function (MAVF); and
6. risk-spend efficiency in dollars per unit of risk reduction; and
7. other risk drivers addressed.

For the quantitative characteristics of the activities, six values shall be reported for each activity. These include numbers for the plan for 2019, actual activity spending and other calculations for the activity as actually implemented in 2019, the plan for year 1 of this WMP, estimates for years 2 and 3 of this WMP, and a subtotal for the 3-year WMP term (“2020-2022 plan total”).

For each activity, also:

1. identify whether the program/strategy is existing or new;
2. if existing, identify the proceeding where the program/strategy costs have been subjected to Commission review;
3. if new, identify any memorandum account where related costs are being tracked and provide an explanation of how double tracking is prevented in the comments;

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<sup>3</sup> Where a given activity does not take place in geographic distribution across the service territory (e.g., personnel work procedures and training in conditions of elevated fire risk), input “N/A” in the corresponding cell.

4. indicate whether the program/strategy is implemented in compliance with existing regulations or exceeds current regulatory requirements;
5. if a program/strategy is identified as meeting a current regulatory requirement, cite the associated order, rule, or code;
6. include comments as needed to clarify or explain the data provided.

**5.3.1 Risk assessment and mapping**

**Description of programs to reduce ignition probability and wildfire consequence**

For each of the below initiatives, provide a detailed description and approximate timeline of each, whether already implemented or planned, to minimize the risk of its equipment or facilities causing wildfires. Include a description for the utility’s programs, the utility’s rationale behind each of the elements of this program, the utility’s prioritization approach/methodology to determine spending and deployment of human and other resources, how the utility will conduct audits or other quality checks on each program, how the utility plans to demonstrate over time whether each component is effective and, if not, how the utility plans to evolve each component to ensure effective spend of ratepayer funds.

Include descriptions across each of the following initiatives. Input the following initiative names into a spreadsheet formatted according to the template below and input information for each cell in the row.

1. A summarized risk map showing the overall ignition probability and estimated wildfire consequence along electric lines and equipment
2. Climate-driven risk map and modelling based on various relevant weather scenarios
3. Ignition probability mapping showing the probability of ignition along the electric lines and equipment
4. Initiative mapping and estimation of wildfire and PSPS risk-reduction impact
5. Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment
6. Weather-driven risk map and modelling based on various relevant weather scenarios
7. Other / not listed [only if an initiative cannot feasibly be classified within those listed above]

**Table 21: Risk assessment and mapping**

Initiative activity	Year	Total per-initiative spend	Line miles to be treated	Spend/ treated line mile	Ignition probability drivers targeted	Risk reduction	Risk-spend efficiency	Other risk drivers addressed	Existing/ new	Existing: What proceeding has reviewed program	If new: Memorandum account	In / exceeding compliance with regulations	Cite associated rule	Comments
***[EXAMPLE]*** A summarized risk map showing the overall ignition probability and estimated wildfire consequence along electric lines and equipment	2019 plan													
	2019 actual													
	2020													
	2021													
	2022													
	2020-2022 plan total													

For each of the above initiatives, describe the utility's current program and provide an explanation of how the utility expects to evolve the utility's program over each of the following time periods:

1. Before the upcoming wildfire season,
2. Before the next annual update,
3. Within the next 3 years, and
4. Within the next 10 years.

**5.3.2 Situational awareness and forecasting**

**Description of programs to reduce ignition probability and wildfire consequence**

For each of the below initiatives, provide a detailed description and approximate timeline of each, whether already implemented or planned, to minimize the risk of its equipment or facilities causing wildfires. Include a description of the utility’s initiatives, the utility’s rationale behind each of the elements of the initiatives, the utility’s prioritization approach/methodology to determine spending and deployment of human and other resources, how the utility will conduct audits or other quality checks on each initiative, how the utility plans to demonstrate over time whether each component of the initiatives is effective and, if not, how the utility plans to evolve each component to ensure effective spend of ratepayer funds.

Include descriptions across each of the following initiatives. Input the following initiative names into a spreadsheet formatted according to the template below and input information for each cell in the row.

1. Advanced weather monitoring and weather stations
2. Continuous monitoring sensors
3. Fault indicators for detecting faults on electric lines and equipment
4. Forecast of a fire risk index, fire potential index, or similar
5. Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions
6. Weather forecasting and estimating impacts on electric lines and equipment
7. Other / not listed [only if an initiative cannot feasibly be classified within those listed above]

**Table 22: Situational awareness and forecasting**

Initiative activity	Year	Total per-initiative spend	Line miles to be treated	Spend/ treated line mile	Ignition probability drivers targeted	Risk reduction	Risk-spend efficiency	Other risk drivers addressed	Existing/ new	Existing: What proceeding has reviewed program	If new: Memorandum account	In / exceeding compliance with regulations	Cite associated rule	Comments
***[EXAMPLE]*** Advanced weather monitoring and weather stations	2019 plan													
	2019 actual													
	2020													
	2021													
	2022													
	2020-2022 plan total													

For each of the above initiatives, describe the utility's current program and provide an explanation of how the utility expects to evolve the utility's program over each of the following time periods:

1. Before the upcoming wildfire season,
2. Before the next annual update,
3. Within the next 3 years, and
4. Within the next 10 years.



### 5.3.3 Grid design and system hardening

Describe utility approach to the following categories of maintenance of transmission lines, distribution lines, and equipment, respectively:

1. Routine maintenance programs and protocols (i.e., covering general maintenance approach and programmatic structure),
2. Non-routine maintenance, further delineated into:
  - a. Emergency response maintenance/repair, and
  - b. Inspection response maintenance/repair.

Discuss proactive replacement programs versus run-to-failure models for each group, including:

1. Whether there are specific line elements or equipment that are prioritized for preventive maintenance or replacement,
2. How those programs are established,
3. What data or information is utilized to make those determinations, and
4. What level of subjectivity is implemented in making those determinations

#### **Description of programs to reduce ignition probability and wildfire consequence**

For each of the below initiatives, provide a detailed description and approximate timeline of each, whether already implemented or planned, to minimize the risk of its equipment or facilities causing wildfires. Include a description of the utility's initiatives, the utility's rationale behind each of the elements of the initiatives, the utility's prioritization approach/methodology to determine spending and deployment of human and other resources, how the utility will conduct audits or other quality checks on each initiative, how the utility plans to demonstrate over time whether each component of the initiatives is effective and, if not, how the utility plans to evolve each component to ensure effective spend of ratepayer funds.

Include descriptions across each of the following initiatives. Input the following initiative names into a spreadsheet formatted according to the template below and input information for each cell in the row.

1. Capacitor maintenance and replacement program
2. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault
3. Covered conductor installation
4. Covered conductor maintenance
5. Crossarm maintenance, repair, and replacement
6. Distribution pole replacement and reinforcement, including with composite poles
7. Expulsion fuse replacement
8. Grid topology improvements to mitigate or reduce PSPS events
9. Installation of system automation equipment
10. Maintenance, repair, and replacement of connectors, including hotline clamps

11. Mitigation of impact on customers and other residents affected during PSPS event
12. Other corrective action
13. Pole loading infrastructure hardening and replacement program based on pole loading assessment program
14. Transformers maintenance and replacement
15. Transmission tower maintenance and replacement
16. Undergrounding of electric lines and/or equipment
17. Updates to grid topology to minimize risk of ignition in HFTDs
18. Other / not listed [only if an initiative cannot feasibly be classified within those listed above]

**Table 23: Grid design and system hardening**

Initiative activity	Year	Total per-initiative spend	Line miles to be treated	Spend/ treated line mile	Ignition probability drivers targeted	Risk reduction	Risk-spend efficiency	Other risk drivers addressed	Existing/ new	Existing: What proceeding has reviewed program	If new: Memorandum account	In / exceeding compliance with regulations	Cite associated rule	Comments
***[EXAMPLE]*** Capacitor maintenance and replacement program	2019 plan													
	2019 actual													
	2020													
	2021													
	2022													
	2020-2022 plan total													

For each of the above initiatives, describe the utility’s current program and provide an explanation of how the utility expects to evolve the utility’s program over each of the following time periods:

1. Before the upcoming wildfire season,
2. Before the next annual update,
3. Within the next 3 years, and
4. Within the next 10 years.

### 5.3.4 Asset management and inspections

Explain the rationale for any utility ignition probability-specific inspections (e.g., “enhanced inspections”) within the HFTD as deemed necessary over and above the standard inspections. This shall include information about how (i.e., criteria, protocols, etc.) the electrical corporation determines additional inspections are necessary.

Describe the utility’s maintenance protocols relating to maintenance of any electric lines or equipment that could, directly or indirectly, relate to wildfire ignition. Include in the description the threshold by which the utility makes decisions of whether to (1) repair, or (2) replace electric lines and equipment. Describe all electric lines and equipment that the utility “runs-to-failure”, those that the utility maintains on a risk-based maintenance plan, and those that are managed by other approaches; describe each approach. Explain the maintenance program that the utility follows and rationale for all lines and equipment.

#### **Description of programs to reduce ignition probability and wildfire consequence**

For each of the below initiatives, provide a detailed description and approximate timeline of each, whether already implemented or planned, to minimize the risk of its equipment or facilities causing wildfires. Include a description for the utility’s programs, the utility’s rationale behind each of the elements of this program, the utility’s prioritization approach/methodology to determine spending and deployment of human and other resources, how the utility will conduct audits or other quality checks on each program, how the utility plans to demonstrate over time whether each component is effective and, if not, how the utility plans to evolve each component to ensure effective spend of ratepayer funds.

Include descriptions across each of the following initiatives. Input the following initiative names into a spreadsheet formatted according to the template below and input information for each cell in the row.

1. Detailed inspections of distribution electric lines and equipment
2. Detailed inspections of transmission electric lines and equipment
3. Improvement of inspections
4. Infrared inspections of distribution electric lines and equipment
5. Infrared inspections of transmission electric lines and equipment
6. Intrusive pole inspections
7. LiDAR inspections of distribution electric lines and equipment
8. LiDAR inspections of transmission electric lines and equipment
9. Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations
10. Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations
11. Patrol inspections of distribution electric lines and equipment
12. Patrol inspections of transmission electric lines and equipment
13. Pole loading assessment program to determine safety factor
14. Quality assurance / quality control of inspections
15. Substation inspections

16. Other / not listed [only if an initiative cannot feasibly be classified within those listed above]

**Table 24: Asset management and inspections**

Initiative activity	Year	Total per-initiative spend	Line miles to be treated	Spend/ treated line mile	Ignition probability drivers targeted	Risk reduction	Risk-spend efficiency	Other risk drivers addressed	Existing/ new	Existing: What proceeding has reviewed program	If new: Memorandum account	In / exceeding compliance with regulations	Cite associated rule	Comments
***[EXAMPLE]*** Detailed inspections of distribution electric lines and equipment	2019 plan													
	2019 actual													
	2020													
	2021													
	2022													
	2020-2022 plan total													

For each of the above initiatives, describe the utility’s current program and provide an explanation of how the utility expects to evolve the utility’s program over each of the following time periods:

1. Before the upcoming wildfire season,
2. Before the next annual update,
3. Within the next 3 years, and
4. Within the next 10 years.

### 5.3.5 Vegetation management and inspections

Explain the rationale for any utility ignition probability-specific inspections (e.g., “enhanced inspections”) within the HFTD as deemed necessary over and above the standard inspections. This shall include information about how (i.e., criteria, protocols, etc.) the electrical corporation determines additional inspections are necessary.

Describe the utility’s vegetation treatment protocols relating to treatment of any vegetation that could pose a grow-in or fall-in risk to utility equipment. Include in the description the threshold by which the utility makes decisions of whether to (1) treat, or (2) remove vegetation.

Discuss the overall objectives, strategies, and tactics of the electrical corporation for vegetation management. In the discussion,

1. Address how the electrical corporation has collaborated with local land managers to leverage opportunities for fuel treatment activities and fire break creation, and compliance with other local, state, and federal forestry and timber regulations.
2. Discuss how the electrical corporation identifies and determines which vegetation is at risk of ignition from utility electric lines and equipment.
3. Describe how (i.e., criteria, data, protocols, studies, etc.) the utility made the determination to trim any vegetation beyond required clearances in GO 95.
4. Describe utility plan to mitigate identified trees with strike potential, including information about how (i.e., criteria, protocols, data, statutes, etc.) the electrical corporation identifies and defines “hazard trees” and “trees with strike potential” based on height and feasible path to strike powerlines or equipment. Describe utility plan to identify reliability/at-risk tree species to trim or remove, where feasible, per location-specific criteria.
5. Include a discussion of how the utility’s overall vegetation management initiatives address risks that may arise from trimming or removing trees, including but not limited to erosion, wind, flooding, etc.

#### **Description of programs to reduce ignition probability and wildfire consequence**

For each of the below initiatives, provide a detailed description and approximate timeline of each, whether already implemented or planned, to minimize the risk of its equipment or facilities causing wildfires. Include a description of the utility’s initiatives, the utility’s rationale behind each of the elements of the initiatives, the utility’s prioritization approach/methodology to determine spending and deployment of human and other resources, how the utility will conduct audits or other quality checks on each initiative, how the utility plans to demonstrate over time whether each component of the initiatives is effective and, if not, how the utility plans to evolve each component to ensure effective spend of ratepayer funds.

Include descriptions across each of the following initiatives. Input the following initiative names into a spreadsheet formatted according to the template below and input information for each cell in the row.

1. Additional efforts to manage community and environmental impacts
2. Detailed inspections of vegetation around distribution electric lines and equipment

3. Detailed inspections of vegetation around transmission electric lines and equipment
4. Emergency response vegetation management due to red flag warning or other urgent conditions
5. Fuel management and reduction of “slash” from vegetation management activities
6. Improvement of inspections
7. LiDAR inspections of vegetation around distribution electric lines and equipment
8. LiDAR inspections of vegetation around transmission electric lines and equipment
9. Other discretionary inspection of vegetation around distribution electric lines and equipment, beyond inspections mandated by rules and regulations
10. Other discretionary inspection of vegetation around transmission electric lines and equipment, beyond inspections mandated by rules and regulations
11. Patrol inspections of vegetation around distribution electric lines and equipment
12. Patrol inspections of vegetation around transmission electric lines and equipment
13. Quality assurance / quality control of inspections
14. Recruiting and training of vegetation management personnel
15. Remediation of at-risk species
16. Removal and remediation of trees with strike potential to electric lines and equipment
17. Substation inspections
18. Substation vegetation management
19. Vegetation inventory system
20. Vegetation management to achieve clearances around electric lines and equipment
21. Other / not listed [only if an initiative cannot feasibly be classified within those listed above]

**Table 25: Vegetation management and inspections**

Initiative activity	Year	Total per-initiative spend	Line miles to be treated	Spend/ treated line mile	Ignition probability drivers targeted	Risk reduction	Risk-spend efficiency	Other risk drivers addressed	Existing/ new	Existing: What proceeding has reviewed program	If new: Memorandum account	In / exceeding compliance with regulations	Cite associated rule	Comments
***[EXAMPLE]* ** Additional efforts to manage	2019 plan													
	2019 actual													
	2020													

community and environmental impacts	2021																			
	2022																			
	2020-2022 plan total																			

For each of the above initiatives, describe the utility's current program and provide an explanation of how the utility expects to evolve the utility's program over each of the following time periods:

1. Before the upcoming wildfire season,
2. Before the next annual update,
3. Within the next 3 years, and
4. Within the next 10 years.

**5.3.6 Grid operations and protocols**

**Description of programs to reduce ignition probability and wildfire consequence**

For each of the below initiatives, provide a detailed description and approximate timeline of each, whether already implemented or planned, to minimize the risk of its equipment or facilities causing wildfires. Include a description of the utility’s initiatives, the utility’s rationale behind each of the elements of the initiatives, the utility’s prioritization approach/methodology to determine spending and deployment of human and other resources, how the utility will conduct audits or other quality checks on each initiative, how the utility plans to demonstrate over time whether each component of the initiatives is effective and, if not, how the utility plans to evolve each component to ensure effective spend of ratepayer funds.

Include descriptions across each of the following initiatives. Input the following initiative names into a spreadsheet formatted according to the template below and input information for each cell in the row.

1. Automatic recloser operations
2. Crew-accompanying ignition prevention and suppression resources and services
3. Personnel work procedures and training in conditions of elevated fire risk
4. Protocols for PSPS re-energization
5. PSPS events and mitigation of PSPS impacts
6. Stationed and on-call ignition prevention and suppression resources and services
7. Other / not listed [only if an initiative cannot feasibly be classified within those listed above]

**Table 26: Grid operations and protocols**

Initiative activity	Year	Total per-initiative spend	Line miles to be treated	Spend/ treated line mile	Ignition probability drivers targeted	Risk reduction	Risk-spend efficiency	Other risk drivers addressed	Existing/ new	Existing: What proceeding has reviewed program	If new: Memorandum account	In / exceeding compliance with regulations	Cite associated rule	Comments
**[EXAMPLE] *** Automatic recloser operations	2019 plan													
	2019 actual													
	2020													
	2021													
	2022													
	2020-2022													





### 5.3.7 Data governance

#### Description of programs to reduce ignition probability and wildfire consequence

For each of the below initiatives, provide a detailed description and approximate timeline of each, whether already implemented or planned, to minimize the risk of its equipment or facilities causing wildfires. Include a description of the utility's initiatives, the utility's rationale behind each of the elements of the initiatives, the utility's prioritization approach/methodology to determine spending and deployment of human and other resources, how the utility will conduct audits or other quality checks on each initiative, how the utility plans to demonstrate over time whether each component of the initiatives is effective and, if not, how the utility plans to evolve each component to ensure effective spend of ratepayer funds.

Include descriptions across each of the following initiatives. Input the following initiative names into a spreadsheet formatted according to the template below and input information for each cell in the row.

1. Centralized repository for data
2. Collaborative research on utility ignition and/or wildfire
3. Documentation and disclosure of wildfire-related data and algorithms
4. Tracking and analysis of near miss data
5. Other / not listed [only if an initiative cannot feasibly be classified within those listed above]

The list provided is non-exhaustive and utilities shall add additional initiatives to this table as their individual programs are designed and structured. Do not create a new initiative if the utility's initiatives can be classified under a provided initiative.

**Table 27: Data governance**

Initiative activity	Year	Total per-initiative spend	Line miles to be treated	Spend/ treated line mile	Ignition probability drivers targeted	Risk reduction	Risk-spend efficiency	Other risk drivers addressed	Existing/ new	Existing: What proceeding has reviewed program	If new: Memorandum account	In / exceeding compliance with regulations	Cite associated rule	Comments
***[EXAMPLE]* ** Centralized repository for data	2019 plan													
	2019 actual													
	2020													
	2021													
	2022													
	2020-2022 plan													
	total													

For each of the above initiatives, describe the utility's current program and provide an explanation of how the utility expects to evolve the utility's program over each of the following time periods:

1. Before the upcoming wildfire season,
2. Before the next annual update,
3. Within the next 3 years, and
4. Within the next 10 years.

### **5.3.8 Resource allocation methodology**

#### **Description of programs to reduce ignition probability and wildfire consequence**

For each of the below initiatives, provide a detailed description and approximate timeline of each, whether already implemented or planned, to minimize the risk of its equipment or facilities causing wildfires. Include a description of the utility's initiatives, the utility's rationale behind each of the elements of the initiatives, the utility's prioritization approach/methodology to determine spending and deployment of human and other resources, how the utility will conduct audits or other quality checks on each initiative, how the utility plans to demonstrate over time whether each component of the initiatives is effective and, if not, how the utility plans to evolve each component to ensure effective spend of ratepayer funds.

Include descriptions across each of the following resource allocation methodology and sensitivities initiatives, including a description of the data flow into the calculations involved in each. Input the following initiative names into a spreadsheet formatted according to the template below and input information for each cell in the row.

1. Allocation methodology development and application
2. Risk reduction scenario development and analysis
3. Risk spend efficiency analysis
4. Other / not listed [only if an initiative cannot feasibly be classified within those listed above]

For each of the below initiatives, describe the utility's current program and provide an explanation of how the utility expects to evolve the utility's program over each of the following time periods:

1. Before the upcoming wildfire season
2. Before the next annual update
3. Within the next 3 years
4. Within the next 10 years

The list provided is non-exhaustive and utilities shall add additional initiatives to this table as their individual programs are designed and structured. Do not create a new initiative if the utility's initiatives can be classified under a provided initiative. Where the columns listed do not apply or cannot be meaningfully calculated for a given resource allocation methodology and sensitivities initiative, "N/A" may be logged in the corresponding cell.

**Table 28: Resource allocation methodology**

Initiative activity	Year	Total per-initiative spend	Line miles to be treated	Spend/ treated line mile	Ignition probability drivers targeted	Risk reduction	Risk-spend efficiency	Other risk drivers addressed	Existing/ new	Existing: What proceeding has reviewed program	If new: Memorandum account	In / exceeding compliance with regulations	Cite associated rule	Comments	
***[EXAMPLE]*** Allocation methodology development and application	2019 plan														
	2019 actual														
	2020														
	2021														
	2022														
	2020-2022 plan														
	total														

For each of the above initiatives, describe the utility’s current program and provide an explanation of how the utility expects to evolve the utility’s program over each of the following time periods:

1. Before the upcoming wildfire season,
2. Before the next annual update,
3. Within the next 3 years, and
4. Within the next 10 years.

### 5.3.9 Emergency planning and preparedness

Include a general description of the overall emergency preparedness and response plan, and detail:

1. A description of how plan is consistent with disaster and emergency preparedness plan prepared pursuant to Public Utilities Code Section 768.6, including:
  - a. Plans to prepare for and restore service, including workforce mobilization (including mutual aid and contractors) and repositioning equipment and employees
  - b. Emergency communications, including community outreach, public awareness, and communications efforts before, during, and after a wildfire in English, Spanish, and the top three primary languages used in California other than English or Spanish, as determined by United States Census data
  - c. Showing that the utility has an adequate and trained workforce to promptly restore service after a major event, taking into account mutual aid and contractors
2. Customer support in emergencies, including protocols for compliance with requirements adopted by the CPUC regarding activities to support customers during and after a wildfire, including:
  - a. Outage reporting
  - b. Support for low income customers
  - c. Billing adjustments
  - d. Deposit waivers
  - e. Extended payment plans
  - f. Suspension of disconnection and nonpayment fees
  - g. Repair processing and timing
  - h. Access to utility representatives
3. Coordination with Public Safety Partners, such as stationing utility personnel in county Emergency Operations Centers

Describe utility efforts to identify which additional languages are in use within the utility's service territory, including plan to identify and mitigate language access challenges.

#### **Description of programs to reduce ignition probability and wildfire consequence**

For each of the below initiatives, provide a detailed description and approximate timeline of each, whether already implemented or planned, to minimize the risk of its equipment or facilities causing wildfires. Include a description of the utility's initiatives, the utility's rationale behind each of the elements of the initiatives, the utility's prioritization approach/methodology to determine spending and deployment of human and other resources, how the utility will conduct audits or other quality checks on each initiative, how the utility plans to demonstrate over time whether

each component of the initiatives is effective and, if not, how the utility plans to evolve each component to ensure effective spend of ratepayer funds.

Include descriptions across each of the following initiatives. Input the following initiative names into a spreadsheet formatted according to the template below and input information for each cell in the row.

1. Adequate and trained workforce for service restoration
2. Community outreach, public awareness, and communications efforts
3. Customer support in emergencies
4. Disaster and emergency preparedness plan
5. Preparedness and planning for service restoration
6. Protocols in place to learn from wildfire events
7. Other / not listed [only if an initiative cannot feasibly be classified within those listed above]

The list provided is non-exhaustive and utilities shall add additional initiatives to this table as their individual programs are designed and structured. Do not create a new initiative if the utility's initiatives can be classified under a provided initiative.

**Table 29: Emergency planning and preparedness**

Initiative activity	Year	Total per-initiative spend	Line miles to be treated	Spend/ treated line mile	Ignition probability drivers targeted	Risk reduction	Risk-spend efficiency	Other risk drivers addressed	Existing/ new	Existing: What proceeding has reviewed program	If new: Memorandum account	In / exceeding compliance with regulations	Cite associated rule	Comments
***[EXAMPLE]*** Adequate and trained workforce for service restoration	2019 plan													
	2019 actual													
	2020													
	2021													
	2022													
	2020-2022 plan													
	total													

For each of the above initiatives, describe the utility's current program and provide an explanation of how the utility expects to evolve the utility's program over each of the following time periods:

1. Before the upcoming wildfire season,

2. Before the next annual update,
3. Within the next 3 years, and
4. Within the next 10 years.



### **5.3.10 Stakeholder cooperation and community engagement**

#### **Description of programs to reduce ignition probability and wildfire consequence**

For each of the below initiatives, provide a detailed description and approximate timeline of each, whether already implemented or planned, to minimize the risk of its equipment or facilities causing wildfires. Include a description of the utility's initiatives, the utility's rationale behind each of the elements of the initiatives, the utility's prioritization approach/methodology to determine spending and deployment of human and other resources, how the utility will conduct audits or other quality checks on each initiative, how the utility plans to demonstrate over time whether each component of the initiatives is effective and, if not, how the utility plans to evolve each component to ensure effective spend of ratepayer funds.

Include descriptions across each of the following initiatives. Input the following initiative names into a spreadsheet formatted according to the template below and input information for each cell in the row.

1. Community engagement
2. Cooperation and best practice sharing with agencies outside CA
3. Cooperation with suppression agencies
4. Forest service and fuel reduction cooperation and joint roadmap
5. Other / not listed [only if an initiative cannot feasibly be classified within those listed above]

The list provided is non-exhaustive and utilities shall add additional initiatives to this table as their individual programs are designed and structured. Do not create a new initiative if the utility's initiatives can be classified under a provided initiative.

**Table 30: Stakeholder cooperation and community engagement**

Initiative activity	Year	Total per-initiative spend	Line miles to be treated	Spend/ treated line mile	Ignition probability drivers targeted	Risk reduction	Risk-spend efficiency	Other risk drivers addressed	Existing/ new	Existing: What proceeding has reviewed program	If new: Memorandum account	In / exceeding compliance with regulations	Cite associated rule	Comments
***[EXAMPLE]* ** Community engagement	2019 plan													
	2019 actual													
	2020													
	2021													
	2022													
	2020-2022 plan													
	total													

For each of the above initiatives, describe the utility's current program and provide an explanation of how the utility expects to evolve the utility's program over each of the following time periods:

1. Before the upcoming wildfire season,
2. Before the next annual update,
3. Within the next 3 years, and
4. Within the next 10 years.

**5.3.11 Definitions of initiatives by category**

Category	Initiative	Definition
<b>A. Risk mapping and simulation</b>	A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment	Development and use of tools and processes to develop and update risk map and simulations and to estimate risk reduction potential of initiatives for a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.
	Climate-driven risk map and modelling based on various relevant weather scenarios	Development and use of tools and processes to estimate incremental risk of foreseeable climate scenarios, such as drought, across a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.
	Ignition probability mapping showing the probability of ignition along the electric lines and equipment	Development and use of tools and processes to assess the risk of ignition across regions of the grid (or more granularly, e.g., circuits, spans, or assets).
	Initiative mapping and estimation of wildfire and PSPS risk-reduction impact	Development of a tool to estimate the risk reduction efficacy (for both wildfire and PSPS risk) and risk-spend efficiency of various initiatives.
	Match drop simulations showing the potential wildfire consequence of ignitions that 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>B. Situational awareness and forecasting</b>	Advanced weather monitoring and weather stations	Purchase, installation, maintenance, and operation of weather stations. Collection, recording, and analysis of weather data from weather stations and from external sources.
	Continuous monitoring sensors	Installation, maintenance, and monitoring of sensors and sensorized equipment used to monitor the condition of electric lines and equipment.
	Fault indicators for detecting faults on electric lines and equipment	Installation and maintenance of fault indicators.
	Forecast of a fire risk index, fire potential index, or similar	Index that uses a combination of weather parameters (such as wind speed, humidity, and temperature), vegetation and/or fuel conditions, and other factors to judge current fire risk and to create a forecast indicative of fire risk. A sufficiently granular index shall inform operational decision-making.
	Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	Personnel position within utility service territory to monitor system conditions and weather on site. Field observations shall inform operational decisions.

	<p>Weather forecasting and estimating impacts on electric lines and equipment</p>	<p>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.</p>
<p><b>C. Grid design and system hardening</b></p>	<p>Capacitor maintenance and replacement program</p>	<p>Remediation, adjustments, or installations of new equipment to improve or replace existing capacitor equipment.</p>
	<p>Circuit breaker maintenance and installation to de-energize lines upon detecting a fault</p>	<p>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.</p>
	<p>Covered conductor installation</p>	<p>Installation of covered or insulated conductors to replace standard bare or unprotected conductors (defined in accordance with GO 95 as supply conductors, including but not limited to lead wires, not enclosed in a grounded metal pole or not covered by: a “suitable protective covering” (in accordance with Rule 22.8 ), grounded metal conduit, or grounded metal sheath or shield). In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.</p>
	<p>Covered conductor maintenance</p>	<p>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.</p>
	<p>Crossarm maintenance, repair, and replacement</p>	<p>Remediation, adjustments, or installations of new equipment to improve or replace existing crossarms, defined as horizontal support attached to poles or structures generally at right angles to the conductor supported in accordance with GO 95.</p>

<p>Distribution pole replacement and reinforcement, including with composite poles</p>	<p>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.</p>
<p>Expulsion fuse replacement</p>	<p>Installations of new and CAL FIRE-approved power fuses to replace existing expulsion fuse equipment.</p>
<p>Grid topology improvements to mitigate or reduce PSPS events</p>	<p>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.</p>
<p>Installation of system automation equipment</p>	<p>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).</p>
<p>Maintenance, repair, and replacement of connectors, including hotline clamps</p>	<p>Remediation, adjustments, or installations of new equipment to improve or replace existing connector equipment, such as hotline clamps.</p>
<p>Mitigation of impact on customers and other residents affected during PSPS event</p>	<p>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).</p>
<p>Other corrective action</p>	<p>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.</p>
<p>Pole loading infrastructure hardening and replacement program based on pole loading assessment program</p>	<p>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.</p>
<p>Transformers maintenance and replacement</p>	<p>Remediation, adjustments, or installations of new equipment to improve or replace existing transformer equipment.</p>
<p>Transmission tower maintenance and replacement</p>	<p>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).</p>
<p>Undergrounding of electric lines and/or equipment</p>	<p>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).</p>

	<p>Updates to grid topology to minimize risk of ignition in HFTDs</p>	<p>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.</p>
<p><b>D. Asset management and inspections</b></p>	<p>Detailed inspections of distribution electric lines and equipment</p>	<p>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.</p>
	<p>Detailed inspections of transmission electric lines and equipment</p>	<p>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.</p>
	<p>Improvement of inspections</p>	<p>Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.</p>
	<p>Infrared inspections of distribution electric lines and equipment</p>	<p>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.</p>
	<p>Infrared inspections of transmission electric lines and equipment</p>	<p>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.</p>
	<p>Intrusive pole inspections</p>	<p>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.</p>
	<p>LiDAR inspections of distribution electric lines and equipment</p>	<p>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).</p>
	<p>LiDAR inspections of transmission electric lines and equipment</p>	<p>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).</p>
	<p>Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations</p>	<p>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.</p>
	<p>Other discretionary inspection of transmission electric lines and</p>	<p>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</p>

<p>equipment, beyond inspections mandated by rules and regulations</p> <p>Patrol inspections of distribution electric lines and equipment</p> <p>Patrol inspections of transmission electric lines and equipment</p> <p>Pole loading assessment program to determine safety factor</p> <p>Quality assurance / quality control of inspections</p> <p>Substation inspections</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>Calculations to determine whether a pole meets pole loading safety factor requirements of GO 95, including planning and information collection needed to support said calculations. Calculations shall consider many factors including the size, location, and type of pole; types of attachments; length of conductors attached; and number and design of supporting guys, per D.15-11-021.</p> <p>Establishment and function of audit process to manage and confirm work completed by employees or subcontractors, including packaging QA/QC information for input to decision-making and related integrated workforce management processes.</p> <p>In accordance with GO 175, inspection of substations performed by qualified persons and according to the frequency established by the utility, including record-keeping.</p>
<p>Additional efforts to manage community and environmental impacts</p>	<p>Plan and execution of strategy to mitigate negative impacts from utility vegetation management to local communities and the environment, such as coordination with communities to plan and execute vegetation management work or promotion of fire-resistant planting practices</p>
<p>Detailed inspections of vegetation around distribution electric lines and equipment</p>	<p>Careful visual inspections of vegetation around the right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded.</p>
<p>Detailed inspections of vegetation around transmission electric lines and equipment</p>	<p>Careful visual inspections of vegetation around the right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded.</p>
<p>Emergency response vegetation management due to red flag warning or other urgent conditions</p>	<p>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.</p>
<p>Fuel management and reduction of "slash" from vegetation management activities</p>	<p>Plan and execution of fuel management activities that reduce the availability of fuel in proximity to potential sources of ignition, including both reduction or adjustment of live fuel (in terms of species or otherwise) and of dead fuel, including "slash" from vegetation</p>
<p><b>E. Vegetation management and inspection</b></p>	



		management activities that produce vegetation material such as branch trimmings and felled trees.
Improvement of inspections		Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
LiDAR inspections of vegetation around distribution electric lines and equipment		Inspections of right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
LiDAR inspections of vegetation around transmission electric lines and equipment		Inspections of right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
Other discretionary inspections of vegetation around distribution electric lines and equipment		Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
Other discretionary inspections of vegetation around transmission electric lines and equipment		Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
Patrol inspections of vegetation around distribution electric lines and equipment		Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business.
Patrol inspections of vegetation around transmission electric lines and equipment		Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business.
Quality assurance / quality control of vegetation inspections		Establishment and function of audit process to manage and confirm work completed by employees or subcontractors, including packaging QA/QC information for input to decision-making and related integrated workforce management processes.
Recruiting and training of vegetation management personnel		Programs to ensure that the utility is able to identify and hire qualified vegetation management personnel and to ensure that both full-time employees and contractors tasked with vegetation management responsibilities are adequately trained to perform vegetation management work, according to the utility's wildfire mitigation plan, in addition to rules and regulations for safety.
Remediation of at-risk species		Actions taken to reduce the ignition probability and wildfire consequence attributable to at-risk vegetation species, such as trimming, removal, and replacement.
Removal and remediation of trees with strike potential to electric lines and equipment		Actions taken to remove or otherwise remediate trees that could potentially strike electrical equipment, if adverse events such as failure at the ground-level of the tree or branch breakout within the canopy of the tree, occur.
Substation inspection		Inspection of vegetation surrounding substations, performed by qualified persons and according to the frequency established by the utility, including record-keeping.



Substation vegetation management	Based on location and risk to substation equipment only, actions taken to reduce the ignition probability and wildfire consequence attributable to contact from vegetation to substation equipment.
Vegetation inventory system	Inputs, operation, and support for centralized inventory of vegetation clearances updated based upon inspection results, including (1) inventory of species, (2) forecasting of growth, (3) forecasting of when growth threatens minimum right-of-way clearances (“grow-in” risk) or creates fall-in/fly-in risk.
Vegetation management to achieve clearances around electric lines and equipment	Actions taken to ensure that vegetation does not encroach upon the minimum clearances set forth in Table 1 of GO 95, measured between line conductors and vegetation, such as trimming adjacent or overhanging tree limbs.
Automatic recloser operations	Designing and executing protocols to deactivate automatic reclosers based on local conditions for ignition probability and wildfire consequence.
Crew-accompanying ignition prevention and suppression resources and services	Those firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, and water) that are deployed with construction crews and other electric workers to provide site-specific fire prevention and ignition mitigation during on-site work
Personnel work procedures and training in conditions of elevated fire risk	Work activity guidelines that designate what type of work can be performed during operating conditions of different levels of wildfire risk. Training for personnel on these guidelines and the procedures they prescribe, from normal operating procedures to increased mitigation measures to constraints on work performed.
Protocols for PSPS re-energization	Designing and executing procedures that accelerate the restoration of electric service in areas that were de-energized, while maintaining safety and reliability standards.
PSPS events and mitigation of PSPS impacts	Designing, executing, and improving upon protocols to conduct PSPS events, including development of advanced methodologies to determine when to use PSPS, and to mitigate the impact of PSPS events on affected customers and local residents.
Stationed and on-call ignition prevention and suppression resources and services	Firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, firefighting foam, chemical extinguishing agent, and water) stationed at utility facilities and/or standing by to respond to calls for fire suppression assistance.
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.
<b>F. Grid operations and protocols</b>	
<b>G. Data governance</b>	

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

**5.4 Methodology for enterprise-wide safety risk and wildfire-related risk assessment**

Describe methodology for identifying and evaluating enterprise wide safety risk and wildfire related risk, and how that methodology is consistent with the methodology used by other electric utilities or electrical corporations. If the risk identification and evaluation methodology is different, the utility shall explain why in this section.

**5.5 Planning for workforce and other limited resources**

Include a showing that the utility 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 utility.

**5.6 Expected outcomes of 3-year plan**

**5.6.1 Planned utility infrastructure construction and upgrades**

Explain how the utility expects the geographic location of transmission and distribution lines to shift over the three-year plan period and discuss its impact on 1) the utility’s risk exposure and 2) the utility’s wildfire mitigation strategy. Outline portions of grid within HFTD that are highest cost to serve, by highlighting circuits or portions of circuits that exceed \$0.5M per customer in capital cost required to harden. Provide justification for the level of hardening required and why the lowest cost path to harden this equipment exceeds \$0.5M per customer, including by describing the various alternatives that were considered to reduce ignition probability and estimated wildfire consequence. For each of these sections of the grid, outline any analysis that was conducted around islanding, serving with microgrids, or providing backup generation, all to reduce the impact of PSPS events and reduce ignition probability and estimated wildfire consequence at the lowest possible cost.

Discuss how the utility wildfire mitigation strategy influenced its plan for infrastructure construction (in terms of additions or removal of overhead lines, including undergrounding of overhead lines) as detailed in Section 3.4.2. Discuss how the utility wildfire mitigation strategy influenced its plan for upgrades to overhead lines and substations as detailed in the Section 3.4.2.

**Instructions for Table 31:**

Assume weather patterns for each year are as consistent with the 5-year historical average and that wildfire mitigation initiatives are implemented according to plan. Report change in drivers of ignition probability based on WMP implementation according to whether or not near misses of that type are tracked, the number of incidents anticipated 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.) are anticipated to cause an ignition in the column, and the number of ignitions that those incidents are anticipated to cause by category. List additional risk drivers tracked in the “other” row and additional rows as needed.

**Table 31: Change in drivers of ignition probability taking into account planned initiatives, for each year of plan**

Incident type by ignition probability driver	Detailed risk driver	Are near misses tracked?	Number of incidents per year			Average percentage likelihood of ignition per incident			Number of ignitions per year					
			2020	2021	2022	2020	2021	2022	2020	2021	2022			
Contact from object	All types of object contact													
	Animal contact													
	Balloon contact													
	Vegetation contact													
	Vehicle contact													



## **6 Utility GIS attachments**

- 6.1 Recent weather patterns**
- 6.2 Recent drivers of ignition probability**
- 6.3 Recent use of PSPS**
- 6.4 Current baseline state of service territory and utility equipment**
- 6.5 Location of planned utility equipment additions or removal**
- 6.6 Planned 2020 WMP initiative activity by end-2022**

### III. Cross reference §8386(c) to 2020 WMP Guidelines

#### Summary

The Wildfire Mitigation Plan (WMP) Guidelines outline the data and narrative that utilities are expected to include in their WMPs for the 2020 WMP process. This builds upon the template used in the 2019 WMP process and incorporates lessons learned.

#### Changes relative to 2019 guidelines

The 2020 WMP Guidelines seek to build upon the 2019 WMP template by adding requirements to report additional information on utility wildfire risk exposure and wildfire mitigation outcomes performance and by incorporating templates into the guidelines where possible to standardize reporting of data and other information.

The goal of the 2020 WMP Guidelines is to collect detailed information about:

1. Utilities’ wildfire mitigation performance according to metrics and underlying data,
2. Utilities’ baseline ignition probability and wildfire risk exposure,
3. Inputs to utilities’ plans, including current and directional vision for wildfire risk exposure,
4. Wildfire mitigation activity for each year of the 3-year WMP term, including expected outcomes of the 3-year plan.

The annual updates can then focus on any adjustments to (1) and (2) and reporting on actual outcomes for (3).

See Table 1 below for a mapping of the required WMP sections from California Public Utilities Code §8386(c) to the 2019 WMPs and the 2020 WMP Guidelines.

**Table 1: Mapping of WMP requirements to 2020 Guidelines**

Code Reference §8386(c)	2019 WMP section	Section of 2020 WMP Guidelines
(1) An accounting of the responsibilities of persons responsible for executing the plan.	VI. Performance Metrics and Monitoring A. Accounting of responsibilities	1 Persons responsible for executing the WMP
(2) The objectives of the plan.	I. Objectives consistent with §8386(a) A. Categorized by following timeframes: A. Before upcoming wildfire season B. Before next Plan filing C. Within next 5 years	4.1 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	II. Description of preventive strategies and programs B. Categorized by following timeframes:	5.1 Wildfire mitigation strategy



<p>electrical lines and equipment causing catastrophic wildfires, including consideration of dynamic climate change risks.</p>	<p>A. Before upcoming wildfire season B. Before next Plan filing C. Within next 5 years</p>	<p>2.4 Description of metrics</p>
<p>(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.</p>	<p>(Section VI) B. Description of metrics and assumptions</p>	<p>2.1 Lessons learned: how tracking metrics on the 2019 plan has informed the 2020 plan</p>
<p>(5) A discussion of how the application of previously identified metrics to previous plan performances has informed the plan.</p>	<p>(Section VI) C. Discussion on how previous metrics performance has informed current plan</p>	<p>5.3.6 Grid operations and protocols 5.3.9 Emergency planning and preparedness 5.3.10 Stakeholder cooperation and community engagement</p>
<p>(6) Protocols for disabling reclosers and de-energizing portions of the electrical distribution system that consider the associated impacts on public safety, as well as protocols related to mitigating the public safety impacts of those protocols, including impacts on critical first responders and on health and communication infrastructure.</p>	<p>IV. Wildfire Prevention Strategies and Programs D. Operational practices</p>	<p>5.6.2 Protocols on Public Safety Power Shut-off 5.3.6 Grid operations and protocols 5.3.9 Emergency planning and preparedness 5.3.10 Stakeholder cooperation and community engagement</p>
<p>(7) Appropriate and feasible procedures for notifying a customer who may be impacted by the de-energizing of electrical lines. The procedures shall consider the need to notify, as a priority, critical first responders, health care facilities, and operators of telecommunications infrastructure.</p>	<p>(Section IV) I. De-energization protocol</p>	<p>5.3.5 Vegetation management and inspections 5.3.4 Asset management and inspections</p>
<p>(8) Plans for vegetation management.</p>	<p>(Section IV) G. Vegetation management plan</p>	<p>4.4 Directional vision for future ignition probability drivers</p>
<p>(9) Plans for inspections of the electrical corporation's electrical infrastructure.</p>	<p>(Section IV) E. Inspection and maintenance plans</p>	<p>5.3.5 Vegetation management and inspections 5.3.4 Asset management and inspections</p>
<p>(10) 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 Safety Model Assessment Proceeding and Risk Assessment Mitigation Phase filings. The list shall include, but not be limited to, both of the following: (A) Risks and risk drivers associated with design, construction, operations, and maintenance of the electrical corporation's equipment and facilities. (B) Particular risks and risk drivers associated with topographic and climatological risk factors throughout the different parts of the electrical corporation's service territory.</p>	<p>(Section III) B. Wildfire risks and drivers list C. Listed in the following categories: 1. Design and Construction 2. Inspection and Maintenance 3. Operational Practices 4. Situational/Conditional Awareness 5. Response and Recovery</p>	<p>5.3.5 Vegetation management and inspections 5.3.4 Asset management and inspections 4.4 Directional vision for future ignition probability drivers</p>



<p>(11) A description of how the plan accounts for the wildfire risk identified in the electrical corporation's Risk Assessment Mitigation Phase filing.</p> <p>(12) 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.</p>	<p>(Section II) C. Description of how plan accounts for wildfire risk identified in RAMP</p> <p>IV. Wildfire Prevention Strategies and Programs D. Operational practices E. Inspection and maintenance plans F. System hardening to achieve highest level of safety, reliability, and resiliency G. Vegetation management plan H. Situational awareness protocols and determination of local conditions I. De-energization protocol J. Alternative technologies K. Post-incident recovery, restoration, and remediation activities</p>	<p>5.3 Detailed wildfire mitigation programs</p> <p>5.3.3 Grid design and system hardening</p>
<p>(13) A showing that the utility has an adequate 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 utility.</p>	<p>(Section V) 3. Workforce adequacy showing</p>	<p>5.5 Planning for workforce and other limited resources</p>
<p>(14) Identification of any geographic area in the electrical corporation's service territory that is a higher wildfire threat than is currently identified in a CPUC fire threat map, and where the CPUC may consider expanding the high fire threat district based on new information or changes in the environment.</p>	<p>(Section III) D. Service territory fire-threat evaluation</p>	<p>4.2.1 Service territory fire-threat evaluation</p>
<p>(15) 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.</p>	<p>III. Risk Analysis and Risk Drivers A. Safety and wildfire risk identification and assessment methodology</p>	<p>5.4 Methodology for enterprise-wide safety risk and wildfire-related risk</p>
<p>(16) 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 both of the following: (A) Plans to prepare for, and to restore service after, a wildfire, including workforce mobilization and prepositioning equipment and employees. (B) Plans for community outreach and public awareness before, during, and after a wildfire, including language notification in English,</p>	<p>V. Emergency Preparedness and Response A. General description of overall plan B. Description of consistency with emergency preparedness and response plan 1. Service restoration plan 2. Emergency communications</p>	<p>5.3.9 Emergency planning and preparedness</p>

<p>Spanish, and the top three primary languages used in the state other than English or Spanish, as determined by the Commission based on the United States Census data.</p>		
<p>(17) A statement of how the electrical corporation will restore service after a wildfire.</p> <p>(18) 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 utility representatives, and emergency communications.</p>	<p>(Section V) 1. Service restoration plan</p> <p>(Section V) C. Customer support in emergencies 1.1.1. Protocols for compliance with CPUC requirements</p>	<p>5.3.9 Emergency planning and preparedness</p> <p>5.3.9 Emergency planning and preparedness</p>
<p>(19) A description of the processes and procedures the electrical corporation will use to do all of 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.</p>	<p>(Section VI) D. Processes and procedures for: 1. Plan monitoring and auditing 2. Identifying and correcting Plan deficiencies 3. Monitoring and auditing effectiveness of equipment and line inspections</p>	<p>5.2 Wildfire Mitigation Plan implementation</p>
<p>(20) Any other information that the Commission may require.</p>	<p>VII. Any other information the CPUC may require A. Cost information</p>	<p>5.3 Detailed wildfire mitigation programs</p>