FILED
12/16/19
11:53 AM

ATTACHMENT 5

(Supplemental Data Request)

WMP Supplemental Data Request (SDR)

Background and Instructions

Scope: The information sought in this Supplemental Data Request (SDR) as relates to "utility ignitions" and "utility-ignited wildfire," includes all ignitions reportable to the CPUC per D.14-02-015 and all wildfires that are determined, by the fire authority having jurisdiction (AHJ), to be caused by utility infrastructure or equipment, regardless of the utilities' agreement with said findings. This focus reflects the Wildfire Safety Division's (WSD) perspective on wildfire risk as a product of ignition probability and wildfire consequence. Utilities play the core role of preventing potential wildfire ignitions from their grid, and also have an important role in limiting the consequences of those ignitions.

Should any portion of the SDR 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. 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.

Detailed instructions for how to complete each portion of the template for the SDR are as included in the document itself.

Formatting: Provide responses to prompts in SDR guidelines in Word and PDF format, enclosing all completed tables in spreadsheets in Excel format or in database format. Use additional space, rows, and pages as needed to answer questions completely. Where the number of additional rows needed to report complete information exceeds 15 rows, provide spreadsheet or database in attachment. Provide other file types as needed for data, including shapefiles and images, as applicable. Submit all files containing text or numbers in a format that can be searched and copy-pasted.

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0 Glossary of defined terms

Term	Definition
10-hour dead fuel moisture content	Moisture content of small dead vegetation (e.g. grass, leaves, which burn quickly but not intensely), which can respond to changes in atmospheric moisture content within 10 hours.
Access and functional needs populations	Per Government Code § 8593.3 and D.19-05-042, individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking, older adults, children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant.
Authority Having Jurisdiction	AHJ, party with assigned responsibility, depending on location and circumstance.
Asset (utility)	Electric lines, equipment, or supporting hardware.
At-risk species	Species of vegetation that are particularly likely to contact power lines in the event of high winds and/or ignite if they catch a spark.
Baseline (ignition probability, maturity)	A measure, typically of the current state, to establish a starting point for comparison.
Carbon dioxide equivalent	Tons of greenhouse gases (GHG) emitted, multiplied by the global warming potential relative to carbon dioxide.
Contractor	Any individual in the temporary and/or indirect employ of the utility whose limited hours and/or time-bound term of employment are not considered as “full-time” for tax and/or any other purposes.
Critical facilities and infrastructure	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).
Customer hours	Total number of customers, multiplied by the average number of hours (e.g. of power outage).
Data cleaning	Calibrating raw data to remove errors (including typographical and numerical mistakes).
Dead fuel moisture content	Moisture content of dead vegetation, which responds solely to current environmental conditions and is critical in determining fire potential.
Detailed inspection	In accordance with GO 165, an inspection where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.

Enhanced inspection	Inspection whose frequency and thoroughness exceeds the requirements of the detailed inspection, particularly if driven by risk calculations.
Evacuation impact	Number of people evacuated, with the duration for which they are evacuated, from homes and businesses, due to wildfires.
Evacuation zone	Areas designated by CAL FIRE and local fire agency evacuation orders, to include both "voluntary" and "mandatory" in addition to other orders such as "precautionary" and "immediate threat".
Fuel density	Mass of fuel (vegetation) per area which could combust in a wildfire.
Fuel management	Removing or thinning vegetation to reduce the potential rate of propagation or intensity of wildfires.
Fuel moisture content	Amount of moisture in a given mass of fuel (vegetation), measured as a percentage of its dry weight.
Full-time employee	Any individual in the ongoing and/or direct employ of the utility whose hours and/or term of employment are considered as "full-time" for tax and/or any other purposes.
Greenhouse gas (GHG) emissions	Health and Safety Code 38505 identifies seven greenhouse gases that ARB is responsible to monitor and regulate in order to reduce emissions: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF3).
GO 95 nonconformance	Condition of a utility asset that does not meet standards established by General Order 95.
Grid hardening	Actions (such as equipment upgrades, maintenance, and planning for more resilient infrastructure) taken in response to the risk of undesirable events (such as outages) or undesirable conditions of the electrical system in order to reduce or mitigate those events and conditions, informed by an assessment of the relevant risk drivers or factors.
Grid topology	General design of an electric grid, whether looped or radial, with consequences for reliability and ability to support de-energization (e.g., being able to deliver electricity from an additional source).
High Fire Threat District	Per D.17-01-009, areas of the State designated by the CPUC and CAL FIRE to have elevated wildfire risk, indicating where utilities must take additional action (per GO 95, GO 165, and GO 166) to mitigate wildfire risk.
Highly rural region	In accordance with 38 CFR 17.701, "highly rural" shall be defined as those areas with a population of less than 7 persons per square mile.
Ignition probability	The relative possibility that an ignition will occur, probability is quantified as a number between 0% and 100% (where 0% indicates impossibility and 100% indicates certainty). The higher the probability of an event, the more certainty there is that the event will occur. (Often informally referred to as likelihood or chance).
Ignition-related deficiency	Any condition which may result in ignition or has previously resulted in ignition, even if not during the past five years.
Impact of ignitions	The effect or outcome of a wildfire ignition, affecting objectives, which may be expressed by terms including, although not limited to health, safety, reliability, economic and/or environmental damage.
Initiative	Measure or activity proposed or in process designed to reduce the consequences and/or probability of wildfire or PSPS.
Inspection protocol	Documented procedures to be followed in order to validate that a piece of equipment is in good condition and expected to operate safely and effectively.
Invasive species	Non-native species whose proliferation increases the risk of wildfires.
Level 1 finding	In accordance with GO 95, an immediate safety and/or reliability risk with high probability for significant impact.

Level 2 finding	In accordance with GO 95, a variable (non-immediate high to low) safety and/or reliability risk.
Level 3 finding	In accordance with GO 95, an acceptable safety and/or reliability risk.
Life expectancy	Anticipated years that a piece of equipment can be expected to meet safety and performance requirements.
Limited English Proficiency (LEP)	Populations with limited English working proficiency based on the International Language Roundtable scale.
Live fuel moisture content	Moisture content within living vegetation, which can retain water longer than dead fuel.
Lost energy	Energy that would have been delivered were it not for an outage.
Major roads	Interstate highways, U.S. highways, state and county routes.
Match drop simulation	Wildfire simulation method that takes an arbitrary ignition and forecasts propagation and impact.
Member of the public	Any individual not employed by the utility.
Multi-attribute value function	Risk calculation methodology introduced during CPUC's S-MAP and RAMP proceedings.
Near miss	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.
Near-miss simulation	Simulation of what the consequence would have been of an ignition had it occurred.
Need for PSPS	When utilities' criteria for utilizing PSPS are met.
Noncompliant clearance	Rights-of-way whose vegetation is not trimmed in accordance with the requirements of GO 95.
Outages of the type that could ignite a wildfire	Outages that, in the judgement of the utility, could have ignited a wildfire.
Outcome metrics	Measurements of the performance of the utility and its service territory in terms of both leading and lagging indicators of wildfire, PSPS, and other consequences of wildfire risk, including the potential unintended consequences of wildfire mitigation work, such as acreage burned by utility-ignited wildfire.
Overcapacity	When the energy transmitted by utility equipment exceeds that of its nameplate capacity.
Patrol inspection	In accordance with GO 165, a simple visual inspection of applicable utility equipment and structures that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.
Percentile conditions	Top X% of a particular set (e.g. wind speed), based on a historical data set with sufficient detail.
Planned outage	Electric outage announced ahead of time by the utility.
Preventive maintenance (PM)	The practice of maintaining equipment on a regular schedule, based on risk, elapsed time, run-time meter readings, or number of operations. The intent of PM is to “prevent” maintenance problems or failures before they take place by following routine and comprehensive maintenance procedures. The goal is to achieve fewer, shorter, and more predictable outages.
Priority essential services	Critical first responders, public safety partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water utilities/agencies.
Program targets	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.

Progress metrics	Measurements that track how much utility wildfire mitigation activity has changed the conditions of utility wildfire risk exposure or utility ability to manage wildfire risk exposure, in terms of leading indicators of ignition probability and wildfire consequences.
Property	Private and public property, buildings and structures, infrastructure, and other items of value that were destroyed by wildfire, including both third-party property and utility assets.
PSPS risk	The potential for the occurrence of a PSPS event expressed in terms of a combination of various outcomes of the event and their associated probabilities.
PSPS weather	Weather that exceeds a utility's risk threshold for initiating a PSPS.
Red Flag Warning	RFW, level of wildfire risk from weather as declared by the National Weather Service.
RFW Circuit Mile Day	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).
Risk-spend efficiency	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.
Rule	Section of public utility code requiring a particular activity or establishing a particular threshold.
Run-to-failure	A maintenance approach that replaces equipment only when it fails.
Rural region	In accordance with GO 165, "rural" shall be defined as those areas with a population of less than 1,000 persons per square mile as determined by the United States Bureau of the Census.
Safety Hazard	A condition that poses a significant threat to human life or property.
Simulated wildfire	Propagation and impact of a wildfire ignited at a particular point ('match drop'), as simulated by fire spread software.
Span	The space between adjacent supporting poles or structures on a circuit consisting of electric line and equipment. "Span level" refers to asset-scale granularity.
System Average Interruption Duration Index (SAIDI)	System-wide total number of minutes per year of sustained outage per customer served.
Third-party contact	Contact between a piece of electrical equipment and another object, whether natural (tree branch) or human (vehicle).
Time to expected failure	Time remaining on the life expectancy of a piece of equipment.
Top 30% of proprietary fire potential index	Top 30% of FPI or equivalent scale (e.g., “Extreme” on SCE’s FPI; “extreme”, 15 or greater, on SDG&E’s FPI; and 4 or above on PG&E’s FPI).
Trees with strike potential / hazard trees	Trees that could either 'fall in' to a power line, or have branches detach and 'fly in' to contact a power line in high-wind conditions.
Unplanned outage	Electric outage that occurs with no advance notice from the utility (e.g. blackout).
Urban region	In accordance with GO 165, "urban" shall be defined as those areas with a population of more than 1,000 persons per square mile as determined by the United States Bureau of the Census.
Utility-ignited wildfire	Wildfires ignited by utility infrastructure or employees, including all wildfires determined by AHJ investigation to originate from ignition caused by utility infrastructure.
Vegetation risk index	Risk index indicating the probability of vegetation-related outages along a particular circuit, based on the vegetation species, density, height, and growth rate.
Vegetation management	Trimming and clearance of trees, branches, and other vegetation that poses the risk of contact with electric equipment.

Weather normalization	Adjusting metrics based on relative weather risk, with RFW circuit mile days as the normalization factor
Wildfire consequence	The effect or outcome of a wildfire affecting objectives, which may be expressed, by terms including, although not limited to health, safety, reliability, economic and/or environmental damage.
Wildfire risk	The potential for the occurrence of a wildfire event expressed in terms of a combination of various outcomes of the wildfire and their associated probabilities.
Wildfire-only WMP programs	Activities, practices, and strategies that are only necessitated by wildfire risk, unrelated to or beyond that required by minimum reliability and/or safety requirements. Such programs are not indicated or in common use in areas where wildfire risk is minimal (e.g., territory with no vegetation or fuel) or under conditions where wildfires are unlikely to ignite or spread (e.g., when rain is falling).
Wildland urban interface (WUI)	A geographical area identified by the state as a "Fire Hazard Severity Zone", or other areas designated by the enforcing agency to be a significant risk from wildfires, established pursuant to Title 24, Part 2, Chapter 7A.
Wire down	Instance where an electric transmission or distribution conductor is broken and falls from its intended position to rest on the ground or a foreign object.

1 Recent wildfire mitigation performance 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.

1.1 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	Extreme weather prediction accuracy						Percentage of total PSPS predictions that are false positives (where the utility's situational awareness indicates that the upcoming risk level will exceed the threshold for PSPS, but it eventually does not do so) or false negatives (where the utility's situational awareness indicates that the	

#	Progress metric name	Annual performance					Unit(s)	Comments
		2015	2016	2017	2018	2019		
							upcoming risk level will *not* exceed the threshold for PSPS, but it eventually *does* do so) 2 days before a potential PSPS event	
2	Equipment operating load above nameplate capacity						Number of circuit hours operated above nameplate capacity in HFTD areas Average % above nameplate capacity when equipment operated above nameplate capacity in HFTD areas	
3	Risk-spend efficiency of resources deployed towards wildfire mitigation efforts						Dollars per incremental life saved Dollars invested per estimated dollars of rebuilt structures avoided Dollars per customer hour of PSPS avoided	
4	Extent of hardening across grid						Percent of all grid assets in HFTD areas using proven and demonstrated wildfire-resistant equipment	
5	Community engagement activity and effectiveness						Percent of residents made aware of PSPS and emergency response procedures in advance of events, according to post-event surveys Percent of residents agreeing to participate in utility wildfire risk-reduction activities (e.g., allowing access to property for utility hazard tree remediation)	
6	Emergency planning and preparedness						Number of emergency response deficiencies reported by Cal OES, suppression agencies, and other emergency response personnel when plans tested or activated	

1.2 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.

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. Risk spend efficiency of WMP programs	1.a.	Average risk spend efficiency of all WMP programs being undertaken by utility						Incremental cost per grid-wide 1% reduction in utility ignition risk in HFTD areas	
	1.b.	Average risk spend efficiency of wildfire-only WMP programs being undertaken by utility						Incremental cost per grid-wide 1% reduction in utility ignition risk in HFTD areas	
2. Customer hours of PSPS based on stress test conditions	2.a.	Percent of customers experiencing PSPS given 95th percentile fire weather conditions along entire grid using utility PSPS decision protocols						Percent of all customers	
	2.b.	Percent of customers experiencing PSPS given 99th percentile fire weather conditions along entire grid using utility PSPS decision protocols						Percent of all customers	
	3.a.	Increase in electric costs to ratepayer due to wildfires (total)						Dollar value rates increase attributable to wildfires per year	

Metric type	#	Outcome metric name	Annual performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
3. Electricity cost to ratepayers	3.b.	Increase in electric costs to ratepayer due to wildfires (normalized)						Dollar value rates increase attributable to wildfires per RFW circuit mile per year	
	3.c.	Increase in electric costs to ratepayer due to wildfire mitigation activities (total)						Dollar value rates increase attributable to WMPs per year	
4. Actual renewable energy procurement	4.a.	Electricity procured from renewable sources						Percentage of total electricity procured per year	
5. Impact of utility ignitions based on ignition simulation	5.a.	Potential impact of ignitions (total)						Number of people residing in evacuation zones of wildfires simulated for each ignition per year, based on in-house or contractors' fire spread models	
	5.b.	Potential impact of ignitions (normalized)						Number of people residing in evacuation zones of wildfires simulated for each ignition per RFW circuit mile day per year	
	5.c.	Potential impact of ignitions in HFTD (subtotal)						Number of people residing in evacuation zones of wildfires simulated for each ignition in HFTD per year	
	5.c.i.	Potential impact of ignitions in HFTD Zone 1						Number of people residing in evacuation zones of wildfires simulated for each ignition in HFTD Zone 1 per year	
	5.c.ii.	Potential impact of ignitions in HFTD Tier 2						Number of people residing in evacuation zones of wildfires simulated for each ignition in HFTD Tier 2 per year	
	5.c.iii.	Potential impact of ignitions in HFTD Tier 3						Number of people residing in evacuation zones of wildfires	

Metric type	#	Outcome metric name	Annual performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
								simulated for each ignition in HFTD Tier 3 per year	
	5.d.	Potential impact of ignitions in HFTD (subtotal, normalized)						Number of people residing in evacuation zones of wildfires simulated for each ignition in HFTD per RFW circuit mile day per year	
	5.d.i.	Potential impact of ignitions in HFTD Zone 1 (normalized)						Number of people residing in evacuation zones of wildfires simulated for each ignition in HFTD Zone 1 per RFW circuit mile day per year	
	5.d.ii.	Potential impact of ignitions in HFTD Tier 2 (normalized)						Number of people residing in evacuation zones of wildfires simulated for each ignition in HFTD Tier 2 per RFW circuit mile day per year	
	5.d.iii.	Potential impact of ignitions in HFTD Tier 3 (normalized)						Number of people residing in evacuation zones of wildfires simulated for each ignition in HFTD Tier 3 per RFW circuit mile day per year	
	5.e.	Potential impact of ignitions in non-HFTD (subtotal)						Number of people residing in evacuation zones of wildfires simulated for each ignition in non-HFTD per year	
	5.f.	Potential impact of ignitions in non-HFTD (normalized)						Number of people residing in evacuation zones of wildfires simulated for each ignition in non-HFTD per RFW circuit mile day per year	

Metric type	#	Outcome metric name	Annual performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
6. Public impacted by utility-ignited wildfire evacuation	6.a.	Number of people residing in evacuation zone of utility-ignited wildfire (total)						Number of people in evacuation zones of utility ignited wildfire	
	6.b.	Number of people residing in evacuation zone of utility-ignited wildfire (normalized)						Number of people per RFW circuit mile day per year	
	6.c.	Impact of evacuations for utility-ignited wildfire (total)						Person-hours per year	
	6.d.	Impact of evacuations for utility-ignited wildfire (normalized)						Person-hours per RFW circuit mile day per year	
7. Estimated GHG emissions from utility-ignited wildfire	7.a.	GHG emissions from utility-ignited wildfires (total)						Estimated tons of carbon dioxide equivalent emitted per year	
	7.b.	GHG emissions from utility-ignited wildfires (normalized)						Estimated tons of carbon dioxide equivalent emitted per RFW circuit mile day per year	
8. Transportation impacted by PSPS	8.a.	Critical transportation infrastructure impacted due to PSPS						Driver and rider-hours lost (in ridership per hour multiplied by incremental increase in commute time by hours closed) per year	
	8.b.	Major roads impacted due to PSPS (normalized)						Driver and rider-hours lost (in ridership per hour multiplied by incremental increase in commute time by hours closed) per RFW circuit mile day per year	

1.3 Detailed information supporting outcome metrics

Instructions for

Table 3**:**

Enclose detailed information as requested for the metrics above. For utility-ignited wildfires over each of the past 5 years, report annual totals for the number of days an evacuation order was in effect in the utility's service territory, the number of people residing in evacuation zones, and the reported actual evacuation numbers of people evacuated during the period of evacuation.

Table 3: Annual evacuations for utility-ignited wildfire, last 5 years

Year	Total days evacuation order in effect	Number of people residing in evacuation zones	Evacuation actuals (total number of people)
2015			
2016			
2017			
2018			
2019			

Instructions for Table 4:
Use spreadsheet or database format to report 1) list of all occurred events per type listed as an "incident type", including those added by the utility in Section 1.6, and 2) wires down events, both over the last five years. Include as attachments to the SDR, Attachment 4.1 and Attachment 4.2, respectively.

Each attachment must include the column groups and columns listed in the following table at a minimum. Each logged event must be reported in an individual row, with data for that event reported according to each of the columns listed in the table below.

Table 4: Spreadsheet columns for lists of events, last 5 years

Column groups	Columns
Identifying information	Type of event
	Date
	Time
Location information	Latitude
	Longitude
	Circuit name
	Land use (rural / urban)
	Enhanced inspections and maintenance conducted according to 2019 WMP at location prior to event (Yes / No)
	Enhanced vegetation management conducted according to 2019 WMP at location prior to event (Yes / No)
Utility facility information	Type of equipment involved
	Facility identification
	Voltage
	Age of involved equipment
	Overhead or underground
	Covered conductor or other
	Other companies' equipment involved (or N/A)
Situational awareness information	Local temperature at time of event
	Local wind speed at time of event
	Nearest weather station by weather station ID
	Last inspection data of involved equipment
	Time-to-expected failure of involved equipment on date of incident (in number of days until the involved equipment was expected to fail)
	Overcapacity history of involved equipment (percent of time equipment operated over nameplate capacity)

Instructions for Table 5:

Use spreadsheet or database format to report the following information for each circuit ID. For each of the columns listed below, with the exception of "service territory location," report information for each circuit ID separately for years 2015, 2016, 2017, 2018, and 2019; calculate a 5-year historical average and include it in a sixth sub-column.

Each attachment must include information on each circuit reported in an individual row for each circuit ID reported by the column groups and columns listed in the following table at a minimum, with six sub-columns to report information on each of the five years and the historical average. See Table 6 for an example for the column group for "fire weather". Include as attachment to the SDR, Attachment 4.3.

Table 5: Spreadsheet columns for information reported by circuit, last 5 years and historical average

Column groups	Columns
Service territory location	HFTD rating (i.e., whether the circuit is in non-HFTD, HFTD Zone 1, HFTD Tier 2, or HFTD Tier 3)
Fire weather, last 5 years and historical average	Number of Red Flag Warning days
	Average annual proprietary fire potential index or similar fire risk index measure
	Annual maximum value reached in utility's proprietary fire potential index or similar fire risk index measure (i.e., the highest FPI that circuit experienced in a given year)
Number and impact of PSPS de-energizations, last 5 years and historical average	Number of PSPS de-energizations
	Number of customers located on de-energized circuit
	Number of affected customers on other circuits
	Customer hours of PSPS (i.e., the number of customers affected times the number of hours they were affected by PSPS)
	Customer hours of PSPS per RFW circuit mile day
Recent overcapacity, last 5 years and historical average	Hours operated above nameplate capacity
	Average load as a percent of nameplate capacity for the hours operated above nameplate capacity
Extreme weather near circuit	95th percentile wind conditions (average of all weather stations within 10 miles of a circuit)
	99th percentile wind conditions (average of all weather stations within 10 miles of a circuit)

Table 6: EXAMPLE - Fire weather over the last 5 years, by circuit ID

	Fire weather																	
Circuit ID	Number of Red Flag Warnings						Average annual proprietary fire potential index						Highest proprietary fire potential index of the year					
	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average

1.4 Mapping recent, modelled, and baseline conditions

Instructions for Table 7:
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 7: 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 fire risk ratings equal to the top 30% of proprietary fire potential index or similar fire risk index measure	Area, days, square mile resolution	3.1
	Difference between forecast and actual wind when either is projected to be or is at 95th percentile wind conditions	Area, miles per hour, at a square mile resolution or better, noting where measurements are actual or interpolated	
Recent fuel measurements	Average distribution and mass of fuel	Area, tons per square mile, square mile resolution, one layer for each month	3.2
	Average distribution and mass of fuel below 62% live fuel moisture content each month	Area, tons per square mile, square mile resolution, one layer for each month	

	Average distribution and mass of fuel below 5% live fuel moisture content	Area, tons per square mile, square mile resolution, one layer for each month	
Potential impact of ignitions	Date of recent ignitions and potential impact measured in number of people in evacuation zone of modeled fire spread	Point, GPS coordinate, days, number of people, square mile resolution	3.3
Implemented 2019 WMP initiative activity	Location of completed 2019 WMP initiative activity for each activity	Line, quarter mile resolution, one layer per initiative	3.4

Instructions for Table 8:
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 8: Map file requirements for baseline condition of utility service territory projected for 2020

Layer name	Measurements / variables	Units	Appendix location
Current baseline risk maps	Ignition probability per year given 5-year historical average conditions	Line, quarter mile resolution	3.5
	Wildfire consequence to communities	Area, number of people affected, square mile resolution	
Result of stress test as defined in Section 2	Duration of PSPS events and area of the grid affected in customer hours per year	Area, customer hours, square mile resolution	3.6
	Number of ignitions and near misses	Line, circuit mile resolution	

1.5 Recent fuel measurements, last 5 years

Instructions for Table 9:
Report fuel measurements for live and dead fuel in terms of moisture content and density, in the units tracked by the utility and/or other source of fuel measurements. Specify said units in the “Unit(s)” column, and report source of information in the “Comments” row. List additional fuel information tracked in the “other” row and in additional rows as needed. Calculate and report 5-year historical average. Ensure underlying data is provided per Section 1.4.

Table 9: Fuel density and moisture, last 5 years

Fuel measurement	2015	2016	2017	2018	2019	5-year historical average	Unit(s)	Comments
Live fuel moisture content								
Dead fuel moisture content								
Live fuel density								
Dead fuel density								
Other								

Note: Add additional rows as needed.

1.6 Directional vision for future probability drivers

Instructions for Table 10:

Rank order the detailed ignition probability drivers anticipated to undergo 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) over the next ten years, in order from 1 to 15, where 1 means greatest anticipated change or impact and 15 means minimal change or impact on ignition probability and estimated wildfire consequence. In the columns titled “Change in risk impact by end-2022” and “Change in risk impact by year 10”, indicate whether the impact is to significantly increase risk, moderately increase risk, have limited or no impact, moderately decrease risk, or significantly decrease risk by the end of the 3-year WMP term, assuming no implementation of WMP initiatives, and over the longer term. For each, include comments describing expected change and expected impact, using quantitative estimates wherever possible.

Table 10: Directional vision for evolution of risk drivers

Rank order 1-15	Incident type by ignition probability driver	Detailed risk driver	Change in risk impact by end-2022	Change in risk impact by year 10	Comments
	Contact from object	All types of object contact			
		Animal contact			
		Balloon contact			
		Vegetation contact			

		Vehicle contact			
	Equipment / facility failure	All types			
		Capacitor bank failure			
		Conductor failure—all			
		Conductor failure—wires down			
		Fuse failure—all			
		Fuse failure—conventional blown fuse			
		Lightning arrestor failure			
		Switch failure			
		Transformer failure			
	Wire-to-wire contact / contamination				
	Other				

2 Stress tests for PSPS, ignitions, and near misses

2.1 Pre-WMP stress test: Modelled need for PSPS if no additional wildfire mitigation activities implemented

Instructions for Table 11:
Calculate and indicate number of RFW circuit mile days under stress test weather conditions, defined as weather conditions reported for each circuit in the service territory that year that repeat the 5-year historical average of the 95th and 99th percentile wind conditions for that circuit over 2015-2019, including an assumption that a state-wide RFW was in effect each day. Use existing PSPS protocols to determine use of PSPS necessary under such stress test weather conditions:

1. the 5-year historical average of the 95th percentile wind conditions for that circuit over 2015-2019, with a Red Flag Warning in effect each day
2. the 5-year historical average of the 99th percentile wind conditions for that circuit over 2015-2019, with a Red Flag Warning in effect each day

Need for PSPS shall be reported in terms of the number and duration of PSPS events needed each year and normalized across stress test weather conditions (by dividing by the number of RFW circuit mile days). List additional PSPS characteristics tracked in the "other" row and additional rows as needed.

These estimates shall assume no additional wildfire mitigation implementation (i.e., continued business as usual in terms of safety and reliability activities, for example, but without the addition of wildfire-specific measures outlined in the WMP). Ensure underlying data is provided per Section 1.4.

Table 11: Stress test estimate of PSPS required to manage wildfire ignition probability of current baseline system

PSPS characteristic	95th percentile wind conditions	99th percentile wind conditions	Unit(s)
Frequency of PSPS events (total)			Number of instances where utility operating protocol requires de-energization of a circuit or portion thereof in order to reduce ignition probability, per year
Scope of PSPS events (total)			Circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization per year
Duration of PSPS events (total)			Customer hours per year
Other			

2.2 Stress test: Modelled ignitions and near misses assuming 95th and 99th percentile conditions over the 3-year plan term

Instructions for Table 12:

Report modelled number of ignitions and near-misses for the entire service territory, by applying the following stress test assumptions for the weather conditions reported for each circuit in the service territory:

1. the 5-year historical average of the 95th percentile wind conditions for that circuit over 2015-2019, with a Red Flag Warning in effect each day
2. the 5-year historical average of the 99th percentile wind conditions for that circuit over 2015-2019, with a Red Flag Warning in effect each day

Assume no use of PSPS, but take into account implementation of other planned wildfire mitigation initiatives as planned each year and the granularity with which the utility monitors wind conditions. In the "Comments" column, include any other supporting information as needed to clarify the data provided in the below table, such as a description of the calculation or of subject matter expert input.

Table 12: Stress test modelled ignitions and near misses assuming 95th and 99th percentile conditions over the 3-year plan term

Stress test output	95th Observed	95th Expectation			99th Observed	99th Expectation			Unit(s)	Comments
	2019	2020	2021	2022	2019	2020	2021	2022		
Number of ignitions (total)									Number of ignitions	
Number of near misses (total)									Number of near misses	

2.3 Stress test: Modelled use of PSPS assuming 95th and 99th percentile conditions over the 3-year plan term

Instructions for Table 13:

Report modelled use of PSPS for the entire service territory, by applying the following stress test assumptions for the weather conditions reported for each circuit in the service territory:

1. the 5-year historical average of the 95th percentile wind conditions for that circuit over 2015-2019, with a Red Flag Warning in effect each day
2. the 5-year historical average of the 99th percentile wind conditions for that circuit over 2015-2019, with a Red Flag Warning in effect each day

Use existing PSPS methodology and the granularity with which the utility monitors wind conditions, assuming implementation of all planned wildfire mitigation initiatives as planned each year. Also list additional PSPS characteristics tracked in the "other" row and additional rows as needed. In the "Comments" column, include any other supporting information as needed to clarify the data provided in the below table, such as a description of the calculation or of subject matter expert input.

Table 13: Stress test modelled use of PSPS assuming 95th and 99th percentile conditions over the 3-year plan term

PSPS characteristics	95th Observed	95th Expectation			99th Observed	99th Expectation			Unit(s)	Comments
	2019	2020	2021	2022	2019	2020	2021	2022		
Frequency of PSPS events (total)									Number of instances where utility operating protocol requires de-energization of a circuit	

									or portion thereof in order to reduce ignition probability, per year	
Scope of PSPS events (total)									Circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization per year	
Duration of PSPS events (total)									Customer hours per year	
Other										

3 Utility GIS attachments

3.1 Recent weather patterns

3.2 Recent fuel measurements

3.3 Potential impact of ignitions

3.4 Implemented 2019 WMP initiative activity

3.5 Current baseline risk maps

3.6 Result of stress tests as defined in Section 2

4 Other attachments required by utilities

4.1 List of events, last 5 years

4.2 List of wires down, last 5 years

4.3 Detailed information reported by weather station or circuit ID