

**SAN FRANCISCO PUBLIC
UTILITIES COMMISSION
(SFPUC)**

**2023 WILDFIRE MITIGATION
PLAN**

**INDEPENDENT EVALUATION
REPORT**

June 1, 2023

DISCLAIMER

California Public Utilities Code (PUC) § 8387 mandates that local publicly owned electric utilities or electrical cooperatives (herein POU) shall prepare a Wildfire Mitigation Plan (WMP or Plan). Additionally, POUs are required to contract with a qualified independent evaluator (IE) with experience in assessing the safe operation of electrical infrastructure to review and assess the comprehensiveness of its WMP.

The San Francisco Public Utilities Commission (SFPUC or Commission) has requested Grid Subject Matter Experts (“GridSME”) to conduct a review of the SFPUC 2023 WMP and provide an independent evaluation report to ensure it meets the requirements of PUC § 8387. GridSME’s IE review and assessment is based only on SFPUC’s 2023 WMP and evaluates only the comprehensiveness of the Plan as it is written.

The information provided in this report represents GridSME’s IE analysis based only on the information available at the time the review was conducted. GridSME is not responsible for the success or failure of SFPUC’s projects nor any potential ignition resulting therefrom. GridSME makes no representations or warranties expressed or implied regarding the reliability or thoroughness of SFPUC’s WMP. Recipients of the IE report assume all liabilities incurred by themselves, or third parties, resulting from their reliance on the report, or the data, information, and/or assessment contained therein.

Table of Contents

1.0	Statutory Requirements of the Wildfire Mitigation Plan.....	4
2.0	Independent Evaluator Qualifications	5
4.0	Introduction:	6
5.0	SFPUC Company Overview:.....	7
6.0	Independent Evaluation:.....	11
6.1	PUC § 8387(b)(2)(A).....	11
6.2	PUC § 8387 (b)(2)(B).....	13
6.3	PUC § 8387 (b)(2)(C).....	13
6.4	PUC § 8387 (b)(2)(D)	17
6.5	PUC § 8387 (b)(2)(E).....	18
6.6	PUC § 8387(b)(2)(F)	18
6.7	PUC § 8387(b)(2)(G)	20
6.8	PUC § 8387(b)(2)(H)	21
6.10	PUC § 8387 (b)(2)(J)(i) and (ii)	24
6.11	PUC § 8387 (b)(2)(K).....	25
6.12	PUC § 8387 (2)(L)	26
6.13	PUC § 8387 (2)(M)	27
6.14	PUC § 8387 (2)(N) (i), (ii) and (iii)	28
7.0	Summary	30

1.0 Statutory Requirements of the Wildfire Mitigation Plan

California Public Utilities Code (PUC) § 8387 requires “Each local publicly owned electric utility and electrical cooperative (herein a POU) shall construct, maintain, and operate its electrical lines and equipment in a manner that will minimize the risk of wildfire posed by those electrical lines and equipment”.

PUC § 8387 requires that after January 1, 2020, “publicly owned electric utility and electrical cooperatives shall prepare a wildfire mitigation plan (WMP or Plan) annually and shall submit the plan to the California Wildfire Safety Advisory Board (WSAB) on or before July 1 of that calendar year. Each POU shall update its plan annually and submit the update to the WSAB by July 1 of each year. At least once every three years, the submission shall be a comprehensive revision of the plan.

Prior California legislation, codified in PUC § 8387, established the WSAB. The WSAB consists of an appointed seven-member panel that serves in an advisory role within the California Office of Energy Infrastructure Safety (OEIS)¹. PUC § 326.2(C) requires the WSAB to “Review and provide comments and advisory opinions to each local publicly owned electric utility and electrical cooperative regarding the content and sufficiency of its wildfire mitigation plan and recommendations on how to mitigate wildfire risk”.

PUC § 8387(3)(c) requires that each POU “shall contract with a qualified independent evaluator (IE) with experience in assessing the safe operation of electrical infrastructure to review and assess the comprehensiveness of

¹ <https://energysafety.ca.gov/what-we-do/wildfire-safety-advisory-board/>

its wildfire mitigation plan. The IE shall issue a report that shall be made available on the internet website of the local publicly owned electric utility or electrical cooperative and shall present the report at a public meeting of the local publicly owned electric utility or electrical cooperative's governing board".

The SFPUC has, each year, complied with its statutory obligation and timely filed its 2020, 2021, and 2022 WMPs, and now files its 2023 WMP to the WSAB.

2.0 Independent Evaluator Qualifications

In accordance with PUC § 8387(3)(c) the SFPUC, a publicly owned utility (POU), engaged the services of GridSME to conduct an independent evaluation of their 2023 WMP to review and assess the comprehensiveness of their Plan as written. GridSME is a company of about 100 power industry professionals who offer its clients a diverse range of solutions in areas such as engineering, interconnection, compliance, cybersecurity, and operations to help guide them throughout their projects' entire lifecycle. The GridSME team brings over 100 years of combined electric utility system operations experience and is qualified to review and assess the comprehensiveness of SFPUC's 2023 WMP. The GridSME project team leader is a former investor-owned utility executive with 40 years of experience in electric system operations and had a significant role in developing and executing wildfire mitigation programs at the utility from 2008 until his retirement in 2017. In 2019/2020 the GridSME team provided WMP IE services for five different POU's for the first submittals of the POU WMPs.

3.0 Independent Evaluation Methodology

GridSME’s review and evaluation of the SFPUC 2023 Plan consisted of reviewing the written Plan and providing comments and recommendations for SFPUC’s consideration prior to finalizing the 2023 Plan. GridSME’s final review and evaluation of SFPUC’s 2023 WMP assesses the Plan’s comprehensiveness to ensure it satisfies each of the required 17 elements of PUC § 8387 and considers the guidance and recommendations issued by the WSAB in previous advisory opinions. Per the WSAB Guidance Advisory Opinion for the 2023 WMP of POUs², they state their reviews are performed in the context of the following elements:

A	Staff responsibilities	G	Community notification	L	Identify enterprise-wide risk
B	General objectives	H	Vegetation management	M	Restoration of service
C	Program descriptions	I	Infrastructure inspections	N(i)	Monitoring & auditing of WMPs
D	Evaluation metrics	J(i)	Grid design, construction & operation risks	N(ii)	Identifying and correcting deficiencies
E	Lessons learned, metrics application	J(ii)	Vegetation, topographic, & climate risks	N(iii)	Monitoring asset inspections
F	Protocols for reclosers, de-energization, and PSPS mitigation	K	Identification and expansion of higher wildfire threat areas		

Figure 1 / WSAB List of Statutory Responsibilities

4.0 Introduction:

Over the past several years the threat of catastrophic wildfires has significantly increased, not only in the state of California, but the entire western United States. These fires are fueled in part by changing

² <https://energysafety.ca.gov/wp-content/uploads/wsab-wmp-pou-guidance-advisory-opinion-adopted.pdf>

weather patterns that have contributed to extended drought conditions, hotter temperatures, and more intense conditions, which could result in a catastrophic wildfire. Although there are many different sources of ignition for wildland fires these types of weather events increase the threat to utility infrastructure which could result in a risk event (fault) and could lead to an ignition of a fire. Origin and Cause investigations by fire authorities have concluded that utility electrical infrastructure has previously been the origin or contributing source for the ignition of a fire. SFPUC's 2023 WMP details the wildfire mitigation programs and initiatives undertaken by the company to construct, maintain, and operate its electrical lines and equipment in a manner that will minimize the risk of wildfire posed by those electrical lines and equipment.

5.0 SFPUC Company Overview:

The SFPUC is a department of the City and County of San Francisco (CCSF). The SFPUC provides retail drinking water and wastewater services to the City of San Francisco, wholesale water to three Bay Area counties, green hydroelectric and solar power to Hetch Hetchy electric customers, and power to some residents and businesses of San Francisco through the CleanPowerSF program. The SFPUC's mission is to provide their customers with high quality, efficient, and reliable water, power, and sewer services in a manner that is inclusive of environmental and community interests, and that sustains the resources entrusted to their care.³

³ "SFPUC About Us," San Francisco Public Utilities Commission: Our Mission. See <https://www.sfwater.org/index.aspx?page=161>.

The SFPUC is comprised of six business functions, or enterprises, including the Water Enterprise (see WMP Figure 3). The Water Enterprise is comprised of six divisions, including Hetch Hetchy Water (HHW), Water Supply & Treatment (WST), and Natural Resources and Lands Management (NRLM). Each division is overseen by an Assistant General Manager who has responsibilities for managing and maintaining the electrical assets within their area of responsibility and as described in this Plan.

The HHW department has responsibility for the development, execution, and oversight of the SFPUC WMP, with support from NLRM and WST. In 2022 the SFPUC established the Wildfire Mitigation and Recovery Analyst (WMRA) position, reporting under the HHW division, and was given responsibility for direct oversight of the SFPUC WMP.

Hetch Hetchy Water and Power (HHWP) operates the HHWP Project. The HHWP operates and maintains a system of assets including water storage and conveyance systems, power generation facilities, power transmission and distribution systems, roads, bridges, and other ancillary facilities. The assets making up these systems start at the Hetch Hetchy Reservoir located in Yosemite National Park and span to the communities of Sunol and Newark in Alameda County, including the counties of Tuolumne, Stanislaus, San Joaquin, and San Mateo. HHW produces hydroelectric generation and transmits the power over the SFPUC-owned and operated transmission and distribution lines to the California electric grid. Additionally, Water Supply & Treatment (WST), a division of the SFPUC, operates and maintains overhead distribution lines in Alameda and San Mateo counties.

The SFPUC owns, maintains, and operates approximately 163 miles of 230 and 115 kV transmission lines, and distributes electricity at 22 and 2.4 kV

through approximately 58 miles of overhead distribution lines (see Figure 2). The power transmission and distribution facilities are within PG&E's service territory, where PG&E is the energy provider. SFPUC's transmission facilities are designed to carry energy from SFPUC-owned hydroelectric plants to the grid. SFPUC distribution facilities are designed to take energy from either the SFPUC-owned transmission system or from the grid to power SFPUC Water Enterprise operations. Approximately 54 miles of SFPUC's transmission facilities and 52.3 miles of distribution facilities are located within the CPUC-designated High Fire Threat District (HFTD) Tier 2 or Tier 3. The HFTD is comprised of a High Hazard Zone and two high fire-threat areas where there is an increased risk for utility-associated wildfires.

The three fire-threat areas are:

1. Tier 1, High Hazard Zone – Is in direct proximity to communities, roads, and utility lines, and is a direct threat to public safety.
2. Tier 2 fire-threat area - Depicts areas where there is an elevated risk (including likelihood and potential impacts on people and property) from utility-associated wildfires.
3. Tier 3 fire-threat area - Depicts areas where there is an extreme risk (including likelihood and potential impacts on people and property) from utility-associated wildfires.

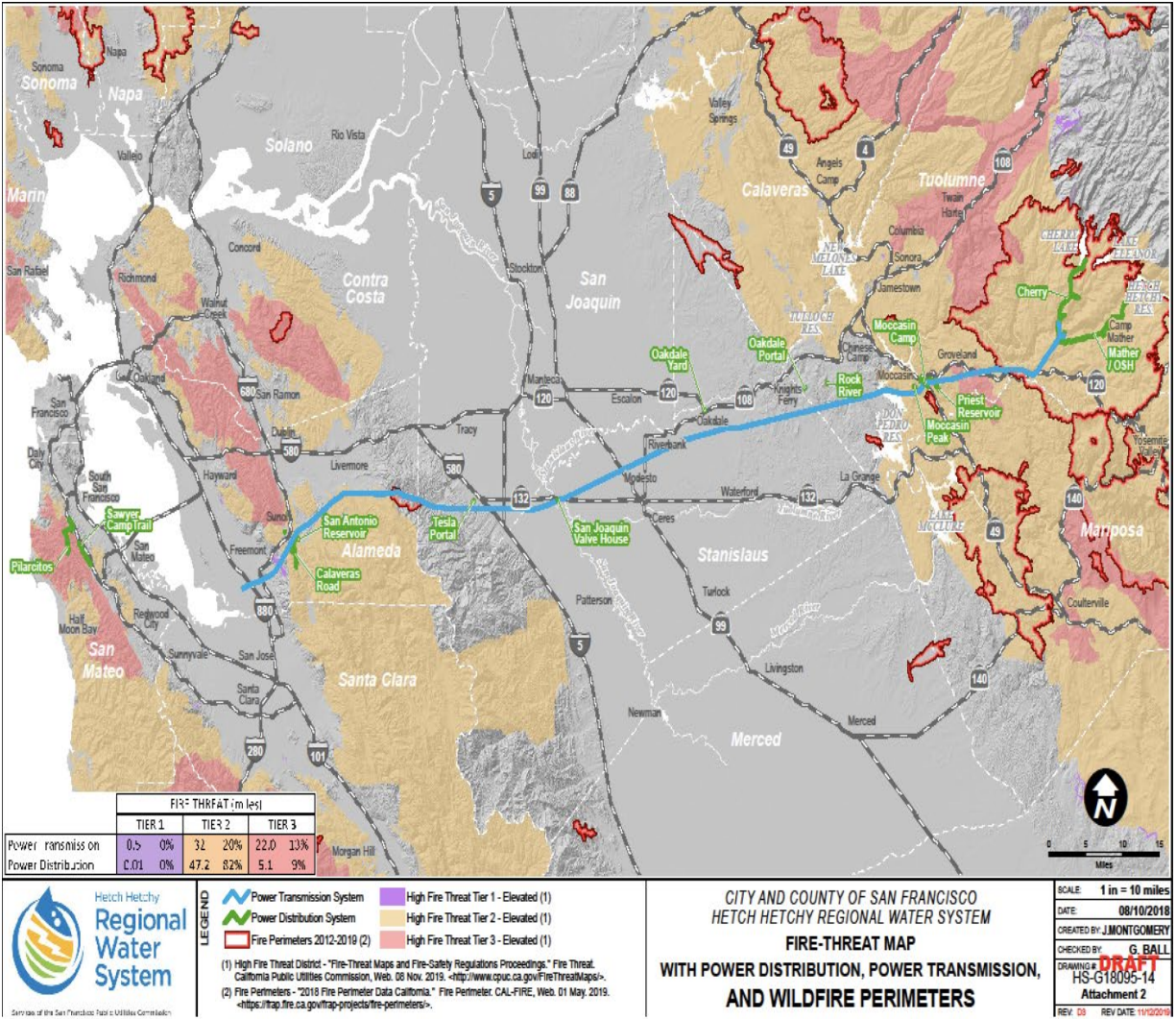


Figure 2 - SFPUC's Electric Service Territory

6.0 Independent Evaluation:

The SFPUC conducted a comprehensive review of its WMP and submits its 2023-2025 WMP as required by statute. The SFPUC's 2023 WMP builds upon the successes and learnings from the 2020-2022 WMP to maintain compliance with the seventeen (17) elements required in PUC § 8387. The SFPUC additionally considered recommendations and advisory opinions provided by the WSAB and recommendations by the IE for inclusion in the 2023 WMP.

The SFPUC WMP is built upon three primary objectives aimed at minimizing the risk of SFPUC's electrical facilities being the origin or contributing source for the ignition of a catastrophic wildfire. They are:

1. Minimize electrical sources of ignition,
2. Improve resiliency of the electric grid, and
3. Evaluate the Plan's performance and effectiveness.

Each of the 17 requirements (elements) of PUC § 8387 is listed separately below followed by comments/recommendations provided by the IE.

For the IE evaluation of the SFPUC 2023, WMP GridSME's primary point of contact was the WMRA in the HHWP division. The IE noted that wildfire mitigation programs and initiatives are well-defined in the WMP for the HHWP division.

6.1 PUC § 8387(b)(2)(A)

Requirement:

An accounting of the responsibilities of persons responsible for executing the plan.

Assessment:

WMP Section 5.1, POU Org Chart and Specific Responsibilities, describe personnel who are responsible and/or accountable for the development, approval, and implementation of this Plan. The Commission has responsibility for Plan approval. The SFPUC Assistant General Manager of Water Enterprise has overall accountability for the development and implementation of this WMP and delegates responsibilities to division leadership (HHWP, NLRM, and WST) who have specific responsibilities for the various wildfire mitigation programs such as vegetation management, substation inspections, line inspections, line construction, etc.

During the 2020-2022 WMP cycle, the SFPUC assigned a Wildfire Mitigation & Recovery Analyst (WMRA) position to oversee the overall development and maintenance of the SFPUC WMP. The WMRA is the lead of an internal SFPUC team that has responsibility for reviewing the ongoing status of the SFPUC wildfire mitigation programs and monitoring the effectiveness of their Plan. This team, with representation from HHWP, NLRM, and WST, meets monthly, or as required. The WMRA is also the primary SFPUC liaison with the CMUA for all wildfire mitigation discussions, including participating in the six CMUA WMP working groups.

Comments / Recommendations:

The SFPUC organization chart and the Roles and Responsibilities table are well-defined. The IE commends the SFPUC for establishing the Wildfire Mitigation & Recovery Analyst (WMRA) position to oversee the overall development and maintenance of the SFPUC WMP.

6.2 PUC § 8387 (b)(2)(B)

Requirement:

The objectives of the wildfire mitigation plan.

Assessment:

Section 4.0, Objectives of the Wildfire Mitigation Plan, describe the three primary objectives of the SFPUC WMP. All wildfire mitigation programs and initiatives described in the SFPUC 2023 WMP are designed to minimize the risk of SFPUC electrical assets being the origin or contributing source for the ignition of a catastrophic wildfire. The three primary objectives are:

1. Minimizing sources of ignition,
2. Improve grid reliability and resiliency, and
3. Measuring Plan effectiveness.

Comments / Recommendations:

The SFPUC continues to develop and mature its wildfire mitigation programs and initiatives to meet and improve on its three primary objectives. The 2023-2025 WMP continues to build upon the successes and learnings of the 2020, 2021, and 2022 WMPs. The various mitigation programs listed in the WMP are well-defined and demonstrate how the SFPUC continues to focus on wildfire risk reduction initiatives.

6.3 PUC § 8387 (b)(2)(C)

Requirement:

A description of the preventative strategies and programs to be adopted by the local publicly owned electric utility or electrical cooperative to minimize the risk of its electrical lines and equipment causing catastrophic wildfires, including consideration of dynamic climate change risks.

Assessment:

WMP Section 7, Wildfire Preventative Strategies, provides a comprehensive list of programs undertaken by SFPUC to minimize the risk of SFPUC electrical facilities being the origin or contributing source for the ignition of a catastrophic wildfire. The SFPUC describes a robust vegetation management program, system hardening projects, transmission and distribution line inspections, substation inspections, and situational awareness tools to forecast critical fire weather conditions.

In 2022, the SFPUC's most significant advancement in understanding and evaluating wildfire risk within their areas of operation was to procure Technosylva's Wildfire Analyst^{TM4} application. Technosylva is a leading provider of "advanced GIS-enabled software solutions for wildfire protection planning and operational response, as well as firefighter and public safety". Technosylva supports CAL FIRE, the CPUC, and all of California's investor-owned utilities. It is believed the SFPUC is the first POU, nationwide, to procure and operationalize the use of this state-of-the-art risk modeling software. The Wildfire AnalystTM performs risk analysis on each SFPUC asset and produces a Fire Potential Index (FPI) rating for that asset. Additionally, the Wildfire AnalystTM produces four different consequence risk metrics if an ignition were to occur at a specific asset. The risk metrics are (1) Fire Size Potential, (2) Population Impacted, (3) Buildings Threatened, and (4) Estimated Number of Buildings Destroyed. This tool, in conjunction with existing critical fire weather monitoring tools, is now used to support the SFPUC field operation's daily work schedules and

⁴ <https://technosylva.com/products/wildfire-analyst/>

informs personnel of risk areas and if any operating restrictions should be implemented.

Additionally, the SFPUC must be commended on their communication and collaboration with external partners and neighboring utilities. These partners include Cal Fire, the US Forest Service, the Bureau of Land Management, the National Weather Service, the National Oceanic and Atmospheric Administration, PG&E, and other local, regional, state, and federal agencies.

The SFPUC continues to monitor the work of the SFPUC Climate Change Collaboration and Coordination Committee (C5). The C5 primary objective(s) is to develop, coordinate, and communicate a comprehensive and consistent approach to mitigating and adapting to climate change. The SFPUC looks to leverage the work of the C5 to identify potential risks to SFPUC electrical assets and develop mitigation plans.

Comments / Recommendations:

1. IE comment: In 2019/2020 GridSME was retained by SFPUC as their IE and recommended the SFPUC assess the need for installing additional weather stations within their service territory to monitor weather conditions directly impacting their facilities. In 2020, the SFPUC utilized the National Weather Service weather reports for real-time and forecasted weather information, however, these forecasts may not be specific to areas where the SFPUC has facilities that could be at risk.

During the 2020-2022 WMP cycle, with the procurement of Technosylva's Wildfire Analyst™ application, SFPUC now has access to over 300 weather stations in close proximity to SFPUC assets. Many of

these weather stations are owned and operated by PG&E. Additionally the Wildfire Analyst™ provides a 100-hour weather forecast and fire potential index for enhanced situational awareness.

2. IE comment: During the 2020-2022 WMP cycle the SFPUC included Section 3.4, Wildfire Mitigation Funding, which provides a snapshot of the Hetch Hetchy Ten-Year Capital Plan and describes a number of transmission line and substation capital improvement projects.
3. In 2019/2020 the IE recommended the SFPUC evaluate the operating condition criteria, and if necessary, revise them to be consistent across the different SFPUC zones.
 - a. IE comment: The 2023 SFPUC WMP describes the SFPUC plans to leverage the functionality of the Wildfire Analyst™ application to provide a more granular fire potential index rating and real-time weather information for different SFPUC operational zones. The IE recommends the SFPUC consider adopting the use of the four operating conditions (Normal, Elevated, Extreme, and Red Flag Warning) recommended by the WSAB in their Advisory Opinion for the POU 2023 WMP.

The Wildfire Analyst™ will produce a daily Fire Potential Index rating for the different SFPUC zones. SFPUC leadership state that in 2023 the HHWP division will conduct a pilot project to formalize the operating condition criteria and operationalize it for use throughout the SFPUC. Upon successful completion of the HHWP pilot project the Wildfire Analyst™ will be deployed for use

by NLRM and WST.

4. For the 2023-2025 WMP cycle, the IE recommends the SFPUC provide an update regarding projects, mentioned in the 2020-2022 WMPs, to remove overhead lines in the High Fire Threat District.

6.4 PUC § 8387 (b)(2)(D)

Requirement:

A description of the metrics the local publicly owned electric utility or electrical cooperative plans to use to evaluate the wildfire mitigation plan's performance and the assumptions that underlie the use of those metrics.

Assessment:

WMP Section 10, Evaluation of the Plan, lists four performance metrics and three outcome metrics used to monitor the performance and effectiveness of the SFPUC Plan. The SFPUC utilizes Maximo (IBM™) as its enterprise computerized maintenance management system (CMMS) for managing its programmatic maintenance and repair programs. Preventative maintenance work orders for detailed transmission and distribution line inspections and substation inspections are managed through Maximo.

Comments / Recommendations:

The SFPUC has done a good job of defining specific metrics to evaluate the performance of their WMP. The 2023 WMP metrics build upon the metrics listed in the 2020-2022 WMP cycle.

No additional recommendations.

6.5 PUC § 8387 (b)(2)(E)

Requirement:

A discussion of how the application of previously identified metrics to previous wildfire mitigation plan performances has informed the wildfire mitigation plan.

Assessment:

WMP Section 10.2, Impact of Metrics on the Plan, describes two specific incidents which occurred during the 2020-2022 WMP cycle, which resulted in an ignition attributed to SFPUC assets. Both incidents were the result of a tree failure contacting and downing SFPUC distribution lines. Upon investigation to identify the root cause of the tree failure the SFPUC determined other trees could fail with potentially similar results. The SFPUC took immediate action and removed identified trees to mitigate the risk of future similar tree failures near SFPUC electrical assets.

Comments / Recommendations:

The 2023 WMP metrics build upon the metrics listed in the 2020-2022 WMP cycle. The IE recommends the SFPUC continue to explore what other metrics should be tracked to inform them of WMP progress or areas needing improvement.

6.6 PUC § 8387(b)(2)(F)

Requirement:

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 health and communication infrastructure.

Assessment:

WMP Section 7.8, Recloser Policy, describes SFPUC's protocols for disabling line reclosers on all of their transmission and distribution circuits when the Stanislaus National Forest changes the fire danger condition from Low to Moderate. This section also describes the line restoration procedures following an unplanned interruption while the reclosing function is disabled.

WMP Section 7.10, Public Safety Power Shutoff / De-energization, describes the SFPUC protocols for de-energizing transmission or distribution lines for public safety during critical fire weather conditions. In 2021 the SFPUC de-energized one line segment seven different times as shown in SFPUC WMP Table 10.

The SFPUC retail customers connected directly to their facilities located within a Tier 2 HFTD have a portable generator and experience no adverse impacts due to a utility power interruption. All other SFPUC-owned and operated critical load has backup generation and does not experience any operational impacts.

WMP Section 5.2, Coordination with Critical Infrastructure Providers, has identified one privately owned and operated cellular site supplied by the SFPUC line. During a de-energization event impacting the cellular site, the SFPUC will communicate with the customer. The site is equipped with a backup generator and does not experience any downtime during a utility power interruption.

Comments / Recommendations:

The IE recommends the SFPUC leverage the fire potential index and other fire consequence risk models of the Wildfire Analyst™ to refine the criteria or triggers for disabling reclosers and de-energizing overhead line(s).

The SFPUC leadership reports that, in 2023, the HHWP division will be conducting a pilot project on operationalizing the Wildfire Analyst™. Upon successful completion of the HHWP pilot project the Wildfire Analyst™ will be deployed for use by NLRM and WST.

6.7 PUC § 8387(b)(2)(G)

Requirement:

Appropriate and feasible procedures for notifying a customer who may be impacted by the de-energizing of electrical lines. The procedures shall direct notification to all public safety offices, critical first responders, health care facilities, and operators of telecommunications infrastructure with premises within the footprint of potential de-energization for a given event.

Assessment:

WMP Section 8.5 Customer Communications, describes the SFPUC procedure for communicating with stakeholders regarding potential service interruptions. The SFPUC provides retail electric service to a lodging facility which is located in the Stanislaus National Forest. This customer maintains a backup generator at their facility and experiences no operational impacts when there is an interruption in service. The SFPUC meets with this customer to provide them an overview of the SFPUC operational protocols,

and potential impacts to them and will communicate with this customer if a service interruption is imminent.

See WMP section 4.6 for communication protocols with communication provider(s). The SFPUC has identified one wireless antenna supplied from their lines, however, the site has a backup generator and experiences no interruption in service during an SFPUC line outage.

The SFPUC does not provide electric service to any public safety offices, critical first responders, or healthcare facilities.

Comments / Recommendations:

The IE recommends the SFPUC conduct a more detailed audit to confirm there is no other commercial load supplied by the SFPUC assets.

6.8 PUC § 8387(b)(2)(H)

Requirement:

Plans for vegetation management.

Assessment:

WMP Section 7.3, Vegetation Management, describes in detail the SFPUC vegetation management (VM) inspection and maintenance programs, including substations, to meet or exceed the minimum industry standard VM practices as required by CPUC General Order 95, NERC Standard FAC-003-4, California Public Resource Codes §§ 4292 and 4293, and the California Power Line Fire Prevention Field Guide. The SFPUC also maintains very detailed internal company procedures and guidelines for VM programs. They are (1) Hetch Hetchy Water and Power (HHW) Transmission Vegetation Management Program, (2) HHW 115kV Transmission Vegetation

Management Plan, (3) Right of Way Integrated Vegetation Management (IVM) Policy, and (4) HHW Power Distribution Vegetation Management Plan.

The use of herbicides on SFPUC property and ROW is strictly controlled by the City and County of San Francisco and San Francisco's Integrated Pest Management Ordinance (Chapter 3 of the San Francisco Environment Code).

During the 2020-2022 WMP cycle, the SFPUC hired a Right of Way (ROW) Manager, with VM experience at a California investor-owned utility. The ROW Manager has responsibility for overseeing all VM programs and VM crews. VM crews perform work with registered professional foresters, and arborists with the following certifications, International Society of Arboriculture (ISA) Certified Arborist, ISA Certified Utility Arborist, and ISA Tree Risk Assessment Qualified (TRAQ).

Additionally, during the 2020-2022 WMP cycle the SFPUC built a “Vegetation Inspection Dashboard” (Figure 3) to track the percentage of inspections completed during the year. This dashboard is accessible to leadership to continuously track the progress of the VM program.

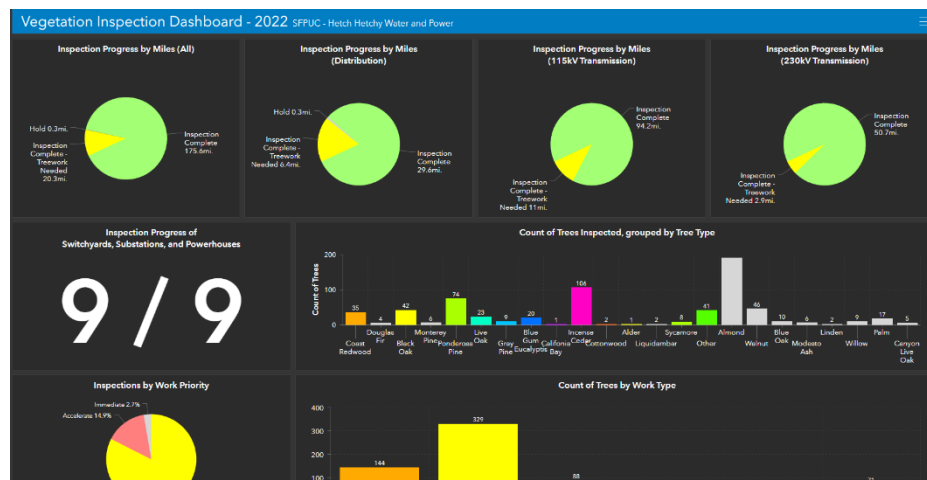


Figure 3 / Vegetation Inspection Dashboard

Comments / Recommendations:

The IE commends the SFPUC for the level of detail provided in outlining the VM programs.

For the 2023-2025 WMP cycle, the IE recommends the SFPUC consider adding the number of scheduled inspections to the vegetation inspection dashboard.

6.9 PUC § 8387 (b)(2)(I)**Requirement:**

Plans for inspections of the local publicly owned electric utility's or electrical cooperative's electrical infrastructure.

Assessment:

WMP Section 7.4, Asset Inspections, provides an overview of the SFPUC's transmission and distribution line inspection requirements for facilities within the SFPUC HFTD, including substations, switchyards, and powerhouses. The SFPUC owns, operates, and maintains transmission and distribution lines, and substations, from the Sierra Nevada Mountains across the San Joaquin Valley and west to the South Coast Range Mountains. The SFPUC meets or exceeds the minimum inspection requirements defined in CPUC General Order 95 and 165 for electric distribution and transmission facilities, GO 174 for substations, and PRC § 4291 for defensible space requirements as they apply to substations, switchyards, and powerhouses.

Comments / Recommendations:

The IE commends the SFPUC for the level of detail provided in outlining the asset inspection programs.

No additional recommendations.

6.10 PUC § 8387 (b)(2)(J)(i) and (ii)

Requirement:

(b)(2)(J) A list that identifies, describes, and prioritizes all wildfire risks, and drivers for those risks, throughout the local publicly owned electric utility's or electrical cooperative's service territory. The list shall include, but not be limited, to both of the following:

(b)(2)(J)(i) Risks and risk drivers associated with design, construction, operation, and maintenance of the local publicly owned electric utility's or electrical cooperative's equipment and facilities.

(b)(2)(J)(ii) Particular risks and risk drivers associated with topographic and climatological risk factors throughout the different parts of the local publicly owned electric utility's or electrical cooperative's service territory.

Assessment:

WMP Section 6, Wildfire Risks and Risk Drivers describes the risks and risk drivers associated with topographic, climatological, design, construction, operation, and maintenance risk factors associated with SFPUC electrical assets within the HFTD.

Although the SFPUC does not have a documented history of fire risk incidents caused by failure of their electrical assets they have identified vegetation contact as a risk driver for a possible wildfire ignition from electrical facilities. In the absence of substantial documented historical data regarding equipment failures, the SFPUC has identified a number of potential risks based on the experience of their long-term employees and has

instituted various risk reduction programs as described in Section 6.3 of the WMP.

Approximately 35% of the SFPUC's service territory is within the HFTD, and per SFPUC assessment, poses minimal risk for the ignition of a catastrophic wildfire. SFPUC topographic risks are located on the west side of the Sierra Nevada Mountain range and the South Coast Mountain range. Some of these mountain areas could have dense vegetation and steep terrain. A large portion of the SFPUC service area is in the San Joaquin Valley consisting of flat terrain covered with frequently irrigated crops that pose no risk for a catastrophic wildfire. The climatological risk factors experienced within the SFPUC area of operation are consistent with what is experienced throughout California. Those risks are associated with (1) extended drought conditions, (2) lack of early fall rains, (3) hot temperatures, (4) high winds, (5) steep terrain, and (6) vegetation type and density.

Comments / Recommendations:

The IE recommends that the HHWP, NLRM, and WST Divisions leverage its newly acquired risk modeling tool, Wildfire Analyst™, to identify areas of higher risk and inform the prioritization of risk reduction programs in those areas.

6.11 PUC § 8387 (b)(2)(K)

Requirement:

Identification of any geographic area in the local publicly owned electric utility's or electrical cooperative's service territory that is a higher wildfire threat than is identified in a commission fire threat map, and identification of where the commission should expand a high fire threat district based on new information or changes to the environment.

Assessment:

WMP Section 6.4.1, Changes to the CPUC Fire Threat Map, states the SFPUC's agreement with the existing CPUC HFTD boundaries and makes no recommendation for expanding or minimizing the current HFTD boundaries.

Comments / Recommendations:

No further comments or recommendations.

6.12 PUC § 8387 (2)(L)

Requirement:

A methodology for identifying and presenting enterprise-wide safety risk and wildfire-related risk.

Assessment:

WMP Section 6.1, Enterprise-Wide Safety Risks, describes the SFPUC's enterprise wildfire risk reduction methodology. As the SFPUC continues to build out its enterprise fire-risk mitigation program framework, it will continue to rely on the institutional knowledge of its employees with extensive maintenance and operations experience to inform the company of potential safety and reliability risks. The SFPUC, for the foreseeable future, will continue to de-energize circuit(s) as needed during critical fire weather conditions to reduce the risk of their facilities being the origin or contributing source for the ignition of a wildfire. The SFPUC also closely monitors wildfire incidents impacting other utilities to gain knowledge of trends throughout the industry and how grid improvements/upgrades can be applied at the SFPUC to reduce the risk of similar occurrences.

Comments / Recommendations:

The SFPUC continues to build a database to record risk events that will inform risk trends and areas of improvement. The IE recommends the SFPUC leverage this information to develop more risk-informed wildfire mitigation programs and initiatives and prioritize those programs to the areas of highest risk for wildfire.

The IE recommends the SFPUC (HHWP, NLRM, WST) utilize the Wildfire Analyst™ risk modeling tool to provide a more risk-informed analysis of areas near SFPUC assets that could be of higher risk for a catastrophic wildfire than previously identified. The IE also recommends the SFPUC provide an update in their 2024 WMP.

The IE also recommends the SFPUC (HHWP, NLRM, WST) develop a corporate enterprise fire risk management plan to identify, prioritize and support overall risk reduction efforts.

6.13 PUC § 8387 (2)(M)**Requirement:**

A statement of how the local publicly owned electric utility or electrical cooperative will restore service after a wildfire.

Assessment:

WMP Section 9, Restoration of Service, describes SFPUC's procedures for restoring electrical service following a de-energization event or if a line experiences an unplanned (forced) interruption for any reason, including a wildfire. The SFPUC has well-defined standard operating procedures for

safely restoring service following an interruption or other events that might cause significant infrastructure damage.

For restoration of service after a wildfire, the SFPUC states “Following a wildfire, the SFPUC will restore service when it is safe for staff to access the damaged area(s). The SFPUC will not access burn areas until the agency having jurisdiction (i.e., CAL FIRE, USFS, local fire agency) grants permission to enter the burn area to conduct a damage assessment. Following a full damage assessment (patrol), if required, the SFPUC will perform repairs, and restoration will proceed following established priority and restoration procedures”.

Comments / Recommendations:

The SFPUC follows utility best practices for service restoration. No further comments or recommendations.

6.14 PUC § 8387 (2)(N) (i), (ii) and (iii)

Requirement:

A description of the processes and procedures the local publicly owned electric utility or electrical cooperative shall use to do all of the following:

(2)(N)(i) Monitor and audit the implementation of the wildfire mitigation plan.

(2)(N)(ii) Identify any deficiencies in the wildfire mitigation plan or its implementation and correct those deficiencies.

2(N)(iii) Monitor and audit the effectiveness of electrical line and equipment inspections, including inspections performed by contractors, that are carried out under the plan, other applicable statutes, or commission rules.

Assessment:

WMP Section 9, Evaluating Performance of the Plan, describes in detail the methodology employed by the SFPUC for monitoring and auditing the WMP implementation, and monitoring the effectiveness of the various mitigation programs described in their WMP. The SFPUC leadership is responsible for ensuring compliance with SFPUC’s wildfire mitigation programs outlined in their WMP, and the Assistant General Manager of Water has overall accountability for the development and implementation of the Plan. All specific wildfire mitigation program responsibilities are delegated to leadership in HHWP, NLRM, and WST overseeing their respective divisions.

The three metrics listed in the SFPUC 2019 WMP served as the baseline year metrics to assess the Plan performance. The SFPUC has added additional metrics to monitor the WMP performance. The SFPUC has also adopted the WSAB recommendation to list separate metrics by category of Outcome Metrics and Performance Metrics.

The SFPUC power grid is very reliable and does not experience a high number of risk events, which contributes to the limited amount of data available for the Outcome Metrics.

During the 2020-2022 WMP cycle, the HHWP division built tools to monitor and document the relevant data to track the effectiveness of the programs they describe in their WMP. One example is the Vegetation Inspection Dashboard as previously shown in Figure 3 which tracks the daily progress of vegetation management work.

For the 2023-2025 WMP cycle, the IE recommends the Vegetation Inspections Dashboard include data from NLRM and WST.

During the 2020-2022 WMP cycle, the SFPUC assigned a Wildfire Mitigation & Recovery Analyst (WMRA) position dedicated to overseeing the overall development and maintenance of the SFPUC WMP. The WMRA is the lead of an internal SFPUC team responsible for reviewing and monitoring the progress of the SFPUC wildfire mitigation programs and monitoring the effectiveness of their Plan. This team, with representation from HHWP, NLRM, and WST, meets monthly, or as required. The WMRA is also the primary SFPUC liaison with the CMUA for all wildfire mitigation discussions.

Comments / Recommendations:

1. The SFPUC reports total completed outcome metrics for vegetation and asset inspections. The IE recommends the SFPUC also provide the number of inspections scheduled to the metric table to show the number completed versus the number scheduled.
2. The SFPUC must be commended on continuing to look for opportunities to reduce the risk of their assets being the origin or contributing source for the ignition of fire by documenting relevant data to better inform the effectiveness of their wildfire mitigation initiatives.

7.0 Summary

SFPUC's primary goal is to construct, maintain, and operate its electrical lines and equipment in a manner that will minimize the risk of wildfire posed by those electrical lines and equipment, and maintain compliance with PUC § 8387.

Following this independent evaluation of the SFPUC's 2023 WMP, GridSME concludes the Plan is comprehensive and meets the requirements of PUC § 8387.