

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

WILDFIRE MITIGATION PLAN

**INDEPENDENT EVALUATION
REPORT**

May 19, 2020

DISCLAIMER

California Senate Bill 901 (SB 901) mandates that local publicly owned electric utilities or electrical cooperatives shall, before January 1, 2020, prepare a Wildfire Mitigation Plan (WMP or Plan). Additionally, publicly owned electric utilities and electrical cooperatives are required to contract with a qualified independent evaluator with experience to assess the comprehensiveness of its WMP.

The San Francisco Public Utilities Commission (SFPUC) has requested Grid Subject Matter Experts ("GridSME") to conduct a review and assessment of their WMP to ensure it meets the requirements outlined in SB 901. GridSME's review and assessment is based on SFPUC's WMP alone and evaluates only the comprehensiveness of the Plan as it is written.

The information provided in this review and report represents GridSME's 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 assessment 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.

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1.0 Executive Summary:

On September 21, 2018, California Governor Jerry Brown signed Senate Bill (SB) 901 which amended Public Utilities Code (PUC) § 8387 and states that “Each local publicly owned electric utility and electrical cooperative 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. They will prepare a wildfire mitigation plan before January 1, 2020 and contract with a qualified independent evaluator with experience in assessing the safe operation of electrical infrastructure to review and assess the comprehensiveness of its wildfire mitigation plan. The independent evaluator (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’s or electrical cooperative’s governing board”.

In accordance with PUC §§ 8387(3) and 8387(3)(c) the San Francisco Public Utilities Commission (SFPUC) presented its Wildfire Mitigation Plan (WMP or Plan) at an appropriately noticed public meeting on 12/10/2019 and received approval of the Plan from the SFPUC Commission. SFPUC subsequently contracted with Grid Subject Matter Experts (GridSME) to conduct an independent evaluation of their WMP to review and assess the comprehensiveness of their Plan as written. As of the time of this review the California Public Utilities Commission (CPUC) Wildfire Safety Advisory Board has not issued formal guidelines or requirements regarding an IE’s WMP review. Therefore, GridSME’s evaluation of the SFPUC Plan consisted of only a review of the written Plan to ensure that SFPUC’s WMP addressed each of the required elements of PUC § 8387 as it relates to publicly owned utilities (POU).

The GridSME team of IEs bring over 100 years of combined electric utility system operations experience and are qualified to review and assess the comprehensiveness of SFPUC’s WMP. Based on this high-level review GridSME has concluded that SFPUC’s WMP is comprehensive and meets the requirements of PUC § 8387.

2.0 Introduction:

Over the past several years the threat of catastrophic wildfires has significantly increased in the state of California. These fires are fueled in part by changing weather patterns such as extended drought conditions, more intense windstorms, hotter temperatures; and at-risk fuel such as dead or diseased vegetation, etc. Following a thorough investigation of these catastrophic wildfires, the fire authorities have concluded that electrical facilities were the source of ignition for some of these fires.

In order to comply with State law and the requirements of PUC § 8387, SFPUC prepared its WMP detailing fire mitigation efforts and programs 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. This report provides a high-level assessment of SFPUC efforts to comply with each of the elements of PUC § 8387 and a short description of the assessment by the IE.

3.0 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 electricity customers, and power to some residents and businesses of San Francisco through the CleanPowerSF program; however, there is only one SFPUC customer served directly from a SFPUC transmission line. Their 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.¹

Hetch Hetchy Water and Power (HHW), a division of the SFPUC, operates the Hetch Hetchy Water and Power Project. The HHW 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 all the way 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 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.

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 overhead lines (see Figure 1). The power transmission and distribution facilities are within PG&E's service territory, where PG&E is the energy provider. SFPUC 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 SFPUC-owned transmission, 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

¹ "SFPUC About Us," San Francisco Public Utilities Commission: Our Mission. See <https://www.sfwater.org/index.aspx?page=161>.

Zone, and two high fire-threat areas where there is an increased risk for utility associated wildfires.

The three areas are:

1. Tier 1, High Hazard Zone – Zones which are in direct proximity to communities, roads, and utility lines, and are 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.

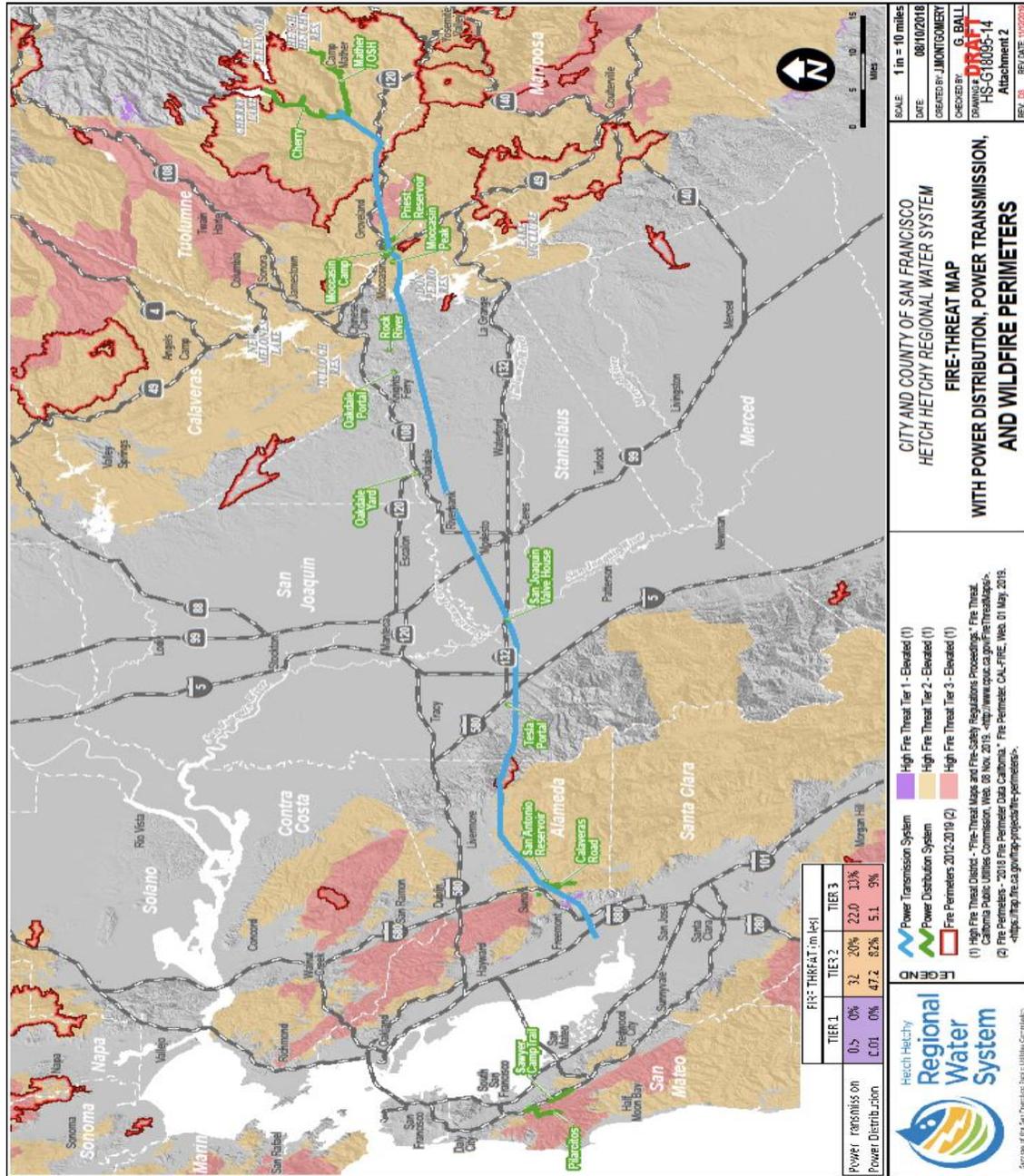


Figure 1 - SFPUC's Electric Service Territory

4.0 Independent Evaluation:

SFPUC's WMP and compliance with PUC § 8387 is built upon three primary objectives aimed at minimizing the probability that SFPUC's electrical facilities may be 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 plan performance and effectiveness.

Each of the 17 requirements (elements) of PUC § 8387 are listed separately below with a high-level narrative by the IE of the plan assessment, the comprehensiveness of the plan, and recommendations for inclusion in future Plan updates, if any.

4.1 PUC § 8387 (2)(A)

Requirement:

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

Assessment:

Section 3, Roles and Responsibilities, of SFPUC's WMP clearly defines who is responsible and/or accountable for approval, development, and implementation of this Plan. The SFPUC Commission has responsibility for Plan approval. The SFPUC Assistant General Manager of Water has overall accountability for the development and implementation of this WMP and delegates responsibilities to section leadership who have specific responsibilities for the various wildfire mitigation programs such as vegetation management, substation inspections, line inspections, line construction, etc.

4.2 PUC § 8387 (2)(B)

Requirement:

The objectives of the wildfire mitigation plan.

Assessment:

SFPUC's WMP and compliance with PUC § 8387 are built upon three primary objectives. Described in more detail in Section 2, and throughout the WMP, those three objectives are aimed at minimizing the probability that SFPUC's electrical facilities may be the origin or contributing source for the ignition of a catastrophic wildfire. They are:

1. Minimize electrical sources of ignition,
2. Maintain resiliency of the electric grid, and
3. Evaluate plan performance and effectiveness.

4.3 PUC § 8387 (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:

Section 5, Wildfire Prevention Strategies and Programs, of SFPUC's WMP, provides a comprehensive list of programs undertaken by SFPUC to minimize the probability that its electrical facilities may be the origin or contributing source for the ignition of a catastrophic wildfire. The SFPUC describes a robust vegetation management program, system hardening, transmission and distribution line inspections, substation inspections, and situational awareness tools to forecast critical fire weather conditions.

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

Although SFPUC outlines numerous grid hardening strategies for reducing the risk of its electrical lines and equipment being the source of ignition for catastrophic wildfires, GridSME recommends the following:

1. Assess the need for installing additional weather stations within their service territory to monitor weather conditions directly impacting their facilities. Today, SFPUC utilizes 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.
2. SFPUC states they will explore and develop a 10-year capital plan for system hardening projects. It is recommended that SFPUC provide a status update on this capital plan in their 2020 WMP.
3. Evaluate the operating condition criteria and, if necessary, revise to be consistent across the different SFPUC zones.

4.4 PUC § 8387 (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:

Section 6 of SFPUC's 2019 WMP lists three metrics used to monitor the effectiveness and performance of their Plan. The SFPUC anticipates there will be relatively limited data gathered through these metrics in the initial years of this WMP. However, the SFPUC will use the 2019 results of these metrics to establish the baseline to determine effectiveness of the Plan and serve as the basis for future Plan revisions and updates.

4.5 PUC § 8387 (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:

In section 6.B of the WMP, the SFPUC states that in the initial years there will be relatively limited data gathered through these metrics to measure Plan performance. SFPUC relied on personal experience of long-term employees to provide historical failure and system performance trends. As previously mentioned, SFPUC will use 2019 Plan data and metrics to establish the baseline for evaluating and measuring the effectiveness of their Plan.

4.6 PUC § 8387 (2)(F)**Requirement:**

Protocols for disabling reclosers and deenergizing 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.

Assessment:

Section 5.I fully 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. The SFPUC has only one retail customer connected directly to their facilities and that customer is located within a Tier 2 HFTD. This customer has a portable generator and experiences no adverse impacts due to a utility power interruption.

Section 5.J describes the SFPUC protocols for de-energizing transmission and/or distribution facilities for safety during critical fire weather conditions. There was one critical fire weather event in 2019 when the SFPUC de-energized circuits for public safety with no customer impacts. Lastly, the SFPUC has not identified any impacts to public safety, critical first responders, or health and communications infrastructure due to interruptions in service to SFPUC facilities.

4.7 PUC § 8387 (2)(G)**Requirement:**

Appropriate and feasible procedures for notifying a customer who may be impacted by the deenergizing 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:

Sections 5.G and 5.H describe the SFPUC procedures for communicating with stakeholders regarding potential service interruptions. The SFPUC provides retail electric service to only one customer which is located in the Stanislaus National Forest. This customer maintains a backup generator at their facility and experiences no significant operational impacts when there is an interruption in service. However, the SFPUC has met with this customer to provide them an

overview of the SFPUC operational protocols, potential impacts to them, and will communicate with this customer if an interruption in service is imminent.

The SFPUC does not provide electric service to any public safety offices, critical first responders, health care facilities, or operators of telecommunications infrastructure.

4.8 PUC § 8387 (2)(H)

Requirement:

Plans for vegetation management.

Assessment:

Described in section 5.A, SFPUC meets or exceeds the minimum industry standard vegetation management practices as required in CPUC General Order 95, NERC Standard FAC-003-4, California Public Resource Codes §§ 4292 and 4293, and their internal HHW Transmission Vegetation Management Program.

Aerial and/or ground vegetation management inspections are conducted on an annual basis. The SFPUC performs this work with three internal Registered Professional Foresters (one of which is a part-time employee). The SFPUC has two internal Vegetation Management crews made up of one supervisor, one operating engineer, two arborists, and eight laborers. Each crew has a manager.

4.9 PUC § 8387 (2)(I)

Requirement:

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

Assessment:

Section 5.B provides an overview of SFPUC's facility inspection guidelines for facilities within the SFPUC HFTD. The SFPUC owns, operates, and maintains

transmission and distribution lines, and substations, from the Sierra Nevada Mountains across the San Joaquin Valley to the South Coast Range Mountains. SFPUC meets or exceeds the minimum inspection standards defined in CPUC General Order 165 for electric distribution and transmission facilities and GO 174 for substations.

4.10 PUC § 8387 (2)(J)(i) and (ii)

Requirement:

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:

(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.

(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:

Sections 4.C and 4.D describe the risks and risk drivers associated with topographic, climatological, and operational risk factors. Although the SFPUC does not have a documented history of high fire risk incidents they have identified their primary risk drivers for a wildfire ignition from electrical facilities as (1) vegetation contact with powerlines, and (2) electrical equipment failures (e.g., non-exempt equipment). In the absence of documented historical data regarding equipment failures the SFPUC has identified the aforementioned risks based on experience of their long-term employees.

Approximately 35% of the SFPUC’s service territory is within the HFTD but poses minimal risk for 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. However, a large portion of their service territory is in the San Joaquin Valley consisting of flat terrain covered with crops that are frequently irrigated and pose no risk for a catastrophic wildfire. The climatological risk factors experienced within the SFPUC service territory are consistent with what is experienced throughout California. Those risks are associated with (1) extended drought conditions, (2) hot temperatures, (3) vegetation type and density, (4) high winds, (5) and climate change.

4.11 PUC § 8387 (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:

As described in section 4.B SFPUC agrees with the CPUC and the identified HFTD and has incorporated it into its construction, inspection, and maintenance procedures, where applicable.

SFPUC has not identified any areas of their service territory that are of higher wildfire threat than is identified in the CPUC fire threat map and makes no recommendations for expanding the HFTD within their service territory.

4.12 PUC § 8387 (2)(L)

Requirement:

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

Assessment:

Section 4.A describes the SFPUC’s enterprise wildfire risk reduction methodology. In the absence of an enterprise fire-risk mitigation program framework the SFPUC currently relies on internal personnel with extensive maintenance and operations experience to inform the company of potential safety and reliability risks. Because there are no significant impacts to SFPUC’s one customer and no impact to system reliability, the SFPUC has elected to deenergize circuit(s) during critical fire weather conditions to reduce the risk of their facilities being a source of ignition for a wildfire. Additionally, the SFPUC 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 avoid similar risks.

It is recommended that the SFPUC develop a corporate enterprise fire risk management plan to identify, prioritize and support overall risk reduction efforts.

4.13 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:

Section 5.K describes SFPUC’s procedures for restoring electrical service if a line experiences an unplanned (forced) interruption, or if the line is de-energized for safety due to critical fire weather conditions, or after a wildfire. The SFPUC has well defined standard operating procedures for safely restoring service following an interruption or other event that causes significant infrastructure damage.

4.14 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:

Section 6, Evaluating the Plan, describes the SFPUC methodology for monitoring and auditing the WMP implementation and effectiveness of the various programs. The SFPUC leadership are responsible for ensuring compliance with SFPUC's wildfire mitigation programs, and the Assistant General Manager of Water has overall accountability for the development and implementation of the Plan. All specific program responsibilities are delegated to leadership overseeing their respective departments.

Initially, the SFPUC will have limited data (metrics) to help determine plan effectiveness or identifying plan deficiencies. The metrics provided in SFPUC's 2019 WMP will serve as the baseline year to assess Plan performance and serve as the basis for plan revisions and improvements in future years.

5.0 Summary

SFPUC's goal is to comply with California SB 901, PUC § 8387, and 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.

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