September 11, 2019

Sent via U.S. Mail and email to CGrandJury@sftc.org

The Honorable Garrett L. Wong
Presiding Judge
Superior Court of California, County of San Francisco
400 McAllister Street, Room 008
San Francisco, CA 94102-4512

Dear Judge Wong:

In accordance with Penal Code Sections 933 and 933.05, and pursuant to the request of Mr. Rasha Harvey, Foreperson of the City and County of San Francisco 2018-19 Civil Grand Jury, attached please find the response of the San Francisco Public Utilities Commission to the 2018-2019 Civil Grand Jury Report, Act Now Before It Is Too Late: Aggressively Expand and Enhance Our High-Pressure Emergency Firefighting Water System. At its regularly scheduled public meeting of September 10, 2019, the Commission voted to approve the attached responses by Resolution No. 19-0178.

The response of the General Manager of the San Francisco Public Utilities Commission is being sent under separate cover.

The Commission would like to thank the members of the 2018-2019 Civil Grand Jury for their service and their interest in our vital water infrastructure that supports firefighting in all communities in San Francisco.

Sincerely,

Ann Moller Caen
President
San Francisco Public Utilities Commission

cc: Harlan Kelly, SFPUC General Manager
     Mayor London Breed
RESOLUTION NO. 19-0178

WHEREAS, On July 17, 2019, the 2018-2019 Civil Grand Jury released a report entitled, “Act Now Before It Is Too Late: Aggressively Expand and Enhance Our High-Pressure Emergency Firefighting Water System,” a copy of which is on file with the Commission Secretary and has been provided to this Commission for review; and

WHEREAS, The Civil Grand Jury requires written responses from this Commission to the Report’s Findings Nos. 1, 2, 4, 5, 6, 8, 9, 10, 11, 12, and 13, and Recommendations Nos. 1, 2, 6, 7, 9, and 10; and

WHEREAS, California Penal Code §933(c) requires such written responses be submitted to the Presiding Judge no later than September 15, 2019; and

WHEREAS, Attached hereto are the Commission’s responses to the above stated Findings and Recommendations in the 2018-19 Civil Grand Jury Report; now, therefore be it

RESOLVED, That this Commission hereby approves the Commission’s responses, attached hereto, to the relevant findings and recommendations of the July 17, 2019 Civil Grand Jury Report entitled, “Act Now Before It Is Too Late: Aggressively Expand and Enhance Our High-Pressure Emergency Firefighting Water System” and authorizes and directs the Commission President to submit the response to the Presiding Judge of the Civil Grand Jury by September 15, 2019, as required by California Penal Code §933(c).

I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of September 10, 2019.

[Signature]
Secretary, Public Utilities Commission
<table>
<thead>
<tr>
<th>Report Title (Publication Date)</th>
<th>Finding (text may be duplicated due to spanning and multiple respondent effects)</th>
<th>Respondent Assigned by CGI</th>
<th>Finding Response (Agreed/Disagreed)</th>
<th>Finding Response Text</th>
<th>Recommendation (text may be duplicated due to spanning and multiple respondent effects)</th>
<th>Respondent Assigned by CGI</th>
<th>Recommendation Response (Implementation)</th>
<th>Recommendation Response Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Act Now Before It's Too Late: Aggressively Expand and Enhance Our High-Pressure Emergency Firefighting Water System</td>
<td>Fires resulting from an earthquake represent a significant risk of widespread damage and potential loss of life in San Francisco.</td>
<td>President, San Francisco Public Utilities Commission</td>
<td>Agree with the Finding</td>
<td>Fires resulting from an earthquake represent a significant risk of widespread damage and potential loss of life in San Francisco.</td>
<td>By no later than December 31, 2020, the Mayor, the SFPU, the SRTD, and the Office of Resilience and Capital Planning should jointly present to the Board of Supervisors a detailed plan to ensure the City is well prepared to fight fires in all parts of San Francisco in the event of a 10.0-magnitude (7.8) earthquake.</td>
<td>President, San Francisco Public Utilities Commission</td>
<td>Will be implemented</td>
<td>Pursuant to San Francisco's resilience and emergency preparedness plan, the City will design, plan, and build infrastructure initiatives that will help meet the City's goals of reducing the risks associated with a major earthquake. The plan discussed in Recommendation R1 will be acknowledged in the Capital Plan, and the City will continue to analyze priority projects and programs and re-prioritize investments as necessary.</td>
</tr>
</tbody>
</table>
The municipal water supply system (MWSS) is highly vulnerable to damage from an earthquake and is not a reliable source for water supply for firefighting after a major earthquake.

Disagree, partially

The MWSS has been significantly upgraded in the last 15 years through the Basin Supply Improvement Program (WSIP) initiated by the SFPUC. The goal of WSIP was to reduce vulnerability of the water system to damage from earthquakes and increase overall water system reliability. There were 26 in-city projects within the $4.8 billion-dollar program. The WSIP was the largest capital program ever undertaken by San Francisco and one of the largest water infrastructure programs in the nation. Additionally, it is one of the only comprehensive and strategic infrastructure programs targeted specifically at improving water system’s seismic reliability and resilience. Additionally, it is unique because the WSIP utilized a 7.8 magnitude earthquake as its seismic level of Service.

Agree with the finding

The SFPUC, SFRD, and San Francisco Public Works (SFpw) are committed to increasing the protection throughout San Francisco. Since the passage of the first Earthquake Safety and Emergency Response Bond in 2010, the three agencies have been implementing projects to improve the MWSS’ seismic reliability and range of coverage. Enhancing the MWSS’ range of coverage to all areas of the City would require the allocation of funds to do so. The three agencies will continue to develop and implement projects utilizing new and proven technologies that improve upon the original system design. There have been many advancements in earthquake resistant pipeline design and materials, hydrants, and seismic valves since the early 1900s, and the City intends to use the best possible technology available to meet the performance standards of the SFIO.

Disagree, partially

The plan discussed in Recommendation R1 should include a detailed proposal, including financing sources, for the installation within 15 years of high-pressure, multi-sourced, automatically self-energized emergency water system for those parts of the City that don’t currently have one, i.e., by no later than June 30, 2024.

Recommend further analysis

The City's high-pressure emergency water supply system, known as the Auxiliary Water Supply System (AWSS), does not cover large parts of Supervisorial Districts 1, 4, 7, and 11, roughly one-third of the City's developed area. As a result, these districts are not adequately protected from fires after a major earthquake.

Agree with the finding

The plan discussed in Recommendation R1 will be acknowledged in the Capital Plan, and related analysis, will be done on the capital plan timeline. The capital planning process gathers, documents, and balances planned funding for needs across the public infrastructure portfolio and across San Francisco's resilience challenges. The Capital Plan has longstanding funding principles to guide the prioritization of public infrastructure investments. These investments are tiered: (1) address legal and/or regulatory mandates; (2) ensure public safety and enhance resilience; (3) preserve assets and promote sustainability; (4) advance planned and programmatic needs; and (5) promote economic development. In the next 10 Year Capital Plan and those that follow, the City will continue to analyze priority projects and programs and identify sources to advance those priorities. Committing to adequately fund a single program out of context and without regard for the trade-offs of that commitment would be cut-of-step with the City’s longstanding and highly regarded capital planning process and likely create significant vulnerabilities elsewhere in the portfolio.

Will be implemented

The computation of sources for specific uses on specific timelines for San Francisco's public infrastructure is the work of the 10-Year Capital Plan. The plan discussed in Recommendation R1 will be acknowledged in the Capital Plan, and related analysis, will be done on the capital plan timeline. The capital planning process gathers, documents, and balances planned funding for needs across the public infrastructure portfolio and across San Francisco's resilience challenges. The Capital Plan has longstanding funding principles to guide the prioritization of public infrastructure investments. These investments are tiered: (1) address legal and/or regulatory mandates; (2) ensure public safety and enhance resilience; (3) preserve assets and promote sustainability; (4) advance planned and programmatic needs; and (5) promote economic development. In the next 10 Year Capital Plan and those that follow, the City will continue to analyze priority projects and programs and identify sources to advance those priorities. Committing to adequately fund a single program out of context and without regard for the trade-offs of that commitment would be cut-of-step with the City’s longstanding and highly regarded capital planning process and likely create significant vulnerabilities elsewhere in the portfolio.
A high-pressure, multi-sourced, seismically safe emergency firefighting water supply will be costly but is essential to protect the City.

President, San Francisco Public Utilities Commission September 15, 2019

Agree with the finding

As the City considers what is essential to protect San Francisco, it is important to acknowledge our multiple, complex resilience challenges. These challenges are documented in the Resilient SF strategy (2016) and underlie the strategy's efforts of our capital investments as represented in the 10-Year Capital Plan (last updated 2019). These challenges are: Earthquakes, Sea Level Rise/Climate Change, Aging Infrastructure, Affordability, and Social Equity. All of these challenges represent meaningful threats to San Franciscans, their property, and their ability to make a life in the city. In making decisions about priority investments, San Francisco must keep an eye on all of these challenges, identify the areas of greatest need across them, and make progress on all fronts simultaneously. The City has taken significant steps since 2010 to ensure that the City has a high-pressure, multi-sourced, seismically safe EFWS. Since the passage of the first Earthquake Safety and Emergency Response Bond (in 2010), SFPUC, SFFD, SF Public Works have been implementing projects to improve the system's seismic reliability and range of coverage. The three agencies will continue to implement projects utilizing new and proven technologies that improve upon the original system design.

By no later than December 31, 2020, the Mayor, President, San Francisco Public Utilities Commission September 15, 2019

We will be implemented

Announcing that San Francisco has the infrastructure and resources to be well prepared to fight fires in all parts of San Francisco is something that will be a focus of the next 10-Year Capital Plan. Per Administrative Code 3.20, that Plan must be submitted to the Mayor and Board no later than March 1 of each odd-numbered year for approval no later than May 1. The requested presentation would be delivered as part of that Plan’s submission to enable holistic planning across San Francisco’s resilience challenges. Updates available on this timeline would be included. The City cannot discuss the project and timeline until the ESER 2020 plan passes. For this reason, the City will sync this recommendation with the Capital Plan, and push back the timeline to December 31, 2021.

President, San Francisco Public Utilities Commission September 15, 2019

Agree with the finding

As the City considers what is essential to protect San Francisco, it is important to acknowledge our multiple, complex resilience challenges. These challenges are documented in the Resilient SF strategy (2016) and underlie the strategy's efforts of our capital investments as represented in the 10-Year Capital Plan (last updated 2019). These challenges are: Earthquakes, Sea Level Rise/Climate Change, Aging Infrastructure, Affordability, and Social Equity. All of these challenges represent meaningful threats to San Franciscans, their property, and their ability to make a life in the city. In making decisions about priority investments, San Francisco must keep an eye on all of these challenges, identify the areas of greatest need across them, and make progress on all fronts simultaneously. The City has taken significant steps since 2010 to ensure that the City has a high-pressure, multi-sourced, seismically safe EFWS. Since the passage of the first Earthquake Safety and Emergency Response Bond (in 2010), SFPUC, SFFD, SF Public Works have been implementing projects to improve the system's seismic reliability and range of coverage. The three agencies will continue to implement projects utilizing new and proven technologies that improve upon the original system design.

The plan discussed in Recommendation R1 should include a detailed proposal, including financing sources, for the installation within 15 years of a high-pressure, multi-sourced, seismically safe emergency water system for those parts of the City that don’t currently have one, i.e., by no later than June 30, 2034.

President, San Francisco Public Utilities Commission September 15, 2019

Require further analysis

The commitment of resources for specific uses on specific timelines for San Francisco’s public infrastructure is the work of the 10-Year Capital Plan. The plan discussed in Recommendation 1 will be acknowledged in the Capital Plan, but based on analysis, will be done on the capital plan timeline. The capital planning process gathers, documents, and balances planned funding needs for across the public infrastructure portfolio and across San Francisco’s resilience challenges. The Capital Plan has longstanding funding principles to guide the prioritization of public infrastructure investments. These investments are aligned: (1) address legal and/or regulatory mandates; (2) ensure public safety and enhance resilience; (3) preserve assets and promote sustainability; (4) advance planned and programmatic needs; and (5) promote economic development. In the next 10-Year Capital Plan and those that follow, the City will continue to analyze priority programs and projects and identify sources to advance those priorities. Committing to entirely funding a single program out of context and without regard for the trade-offs of that commitment would be out of step with the City’s longstanding and highly regarded capital planning process and likely create significant vulnerabilities elsewhere in the portfolio.

If no later than December 31, 2020, the Mayor, President, San Francisco Public Utilities Commission September 15, 2019

By no later than December 31, 2020, the Mayor, SF Public Utilities Commission, the SFFD, and the Office of Resilience and Capital Planning should jointly present to the Board of Supervisors a detailed plan to ensure the City is well prepared to fight fires in all parts of San Francisco in the event of a 1000-magnitude 7.8 earthquake.

President, San Francisco Public Utilities Commission September 15, 2019

Agree with the finding

Unless the City increases funding levels, it will be several decades (i.e., after the ISGS predicts one or more major earthquakes will occur) before the southern parts of the City have a high-pressure, multi-sourced, seismically safe emergency firefighting water supply.

President, San Francisco Public Utilities Commission September 15, 2019

Agree, wholly

Discussions about programming and funding levels of future bond and other complimentary sources that could support the expansion of the EFWS have yet to be made.
Unless the City increases funding levels, it will be several decades (i.e., after the USGS predicts one or more major earthquakes will occur) before the southern parts of the City have a high-pressure, multi-sourced, seismically safe emergency firefighting water supply. Current plans to extend protections to the western part of the City do not include any high-pressure, multi-sourced, seismically safe emergency water system for those parts of the City that don’t currently have one, i.e., by no later than June 30, 2021. San Francisco is unique in that there are 11 in-city reservoirs, with a total water capacity of approximately 1,000,000,000 gallons. Additionally, Lake Merced, also located within City Limits, has an additional approximately 1,000,000,000 gallons. The potable EFWS system for the Westside of San Francisco that is being developed and analyzed would provide that the new EFWS pipeline in the Sunset and Richmond Districts could be supplied from four sources of water at two locations. The first two water sources could be supplied to the EFWS pipeline via a 30,000 gallon per minute pump station in the vicinity of Lake Merced. The two sources being studied for this pump station are Lake Merced, which has a water supply of approximately one billion gallons, and a 60” seismically resilient SFPUC Hetch Hetchy Regional Water System pipeline. The proposed potable EFWS also is analyzing the inclusion of a 60” seismically resilient SFPUC Hetch Hetchy Regional Water System pipeline.

While it is true that the SFPUC and SFFD are studying four potential water pressure water sources north of Golden Gate Park, which are not located north of Golden Gate Park, which by no means would reduce the proposed system’s resiliency, reliability, performance, or ability to provide abundant high-pressure water for the suppression to the Richmond District after a seismic event. San Francisco is unique in that there are 11 in-city reservoirs, with a total water capacity of approximately 413,000,000 gallons. Additionally, Lake Merced, also located within City Limits, has an additional approximately 1,000,000,000 gallons. The potable EFWS system for the Westside of San Francisco that is being developed and analyzed would provide that the new EFWS pipeline in the Sunset and Richmond Districts could be supplied from four sources of water at two locations. The first two water sources could be supplied to the EFWS pipeline via a 30,000 gallon per minute pump station in the vicinity of Lake Merced. The two sources being studied for this pump station are Lake Merced, which has a water supply of approximately one billion gallons, and a 60” seismically resilient SFPUC Hetch Hetchy Regional Water System pipeline. The proposed potable EFWS also is analyzing the inclusion of a 60” seismically resilient SFPUC Hetch Hetchy Regional Water System pipeline.

While it is true that the SFPUC and SFFD are studying four potential water pressure water sources north of Golden Gate Park, which are not located north of Golden Gate Park, which by no means would reduce the proposed system’s resiliency, reliability, performance, or ability to provide abundant high-pressure water for the suppression to the Richmond District after a seismic event. San Francisco is unique in that there are 11 in-city reservoirs, with a total water capacity of approximately 413,000,000 gallons. Additionally, Lake Merced, also located within City Limits, has an additional approximately 1,000,000,000 gallons. The potable EFWS system for the Westside of San Francisco that is being developed and analyzed would provide that the new EFWS pipeline in the Sunset and Richmond Districts could be supplied from four sources of water at two locations. The first two water sources could be supplied to the EFWS pipeline via a 30,000 gallon per minute pump station in the vicinity of Lake Merced. The two sources being studied for this pump station are Lake Merced, which has a water supply of approximately one billion gallons, and a 60” seismically resilient SFPUC Hetch Hetchy Regional Water System pipeline. The proposed potable EFWS also is analyzing the inclusion of a 60” seismically resilient SFPUC Hetch Hetchy Regional Water System pipeline.

While it is true that the SFPUC and SFFD are studying four potential water pressure water sources north of Golden Gate Park, which are not located north of Golden Gate Park, which by no means would reduce the proposed system’s resiliency, reliability, performance, or ability to provide abundant high-pressure water for the suppression to the Richmond District after a seismic event. San Francisco is unique in that there are 11 in-city reservoirs, with a total water capacity of approximately 413,000,000 gallons. Additionally, Lake Merced, also located within City Limits, has an additional approximately 1,000,000,000 gallons. The potable EFWS system for the Westside of San Francisco that is being developed and analyzed would provide that the new EFWS pipeline in the Sunset and Richmond Districts could be supplied from four sources of water at two locations. The first two water sources could be supplied to the EFWS pipeline via a 30,000 gallon per minute pump station in the vicinity of Lake Merced. The two sources being studied for this pump station are Lake Merced, which has a water supply of approximately one billion gallons, and a 60” seismically resilient SFPUC Hetch Hetchy Regional Water System pipeline. The proposed potable EFWS also is analyzing the inclusion of a 60” seismically resilient SFPUC Hetch Hetchy Regional Water System pipeline.

Recommendation 1 will be acknowledged in the Capital Plan, timeline. The capital planning process gathers, documents, and balances planned funding for needs across the public infrastructure portfolio and across San Francisco’s resilience challenges. The Capital Plan has longstanding funding principles to guide the prioritization of public infrastructure investments. Those investments are tiered: (1) address legal and regulatory mandates; (2) ensure public safety and enhance resiliency; (3) preserve assets and promote sustainability; (4) advance planned and programmatic needs; and (5) promote economic development. In the next 10-Year Capital Plan and those that follow, the City will continue to analyze priority projects and programs and identify sources to advance those priorities. Committing to entirely funding a single program out of context and without regard for the trade-offs of that commitment would be out of step with the City’s longstanding and highly regarded capital planning process and likely create significant vulnerabilities elsewhere in the portfolio.

The SFPUC, the SFFD and the SF Department of the Environment should study adding salt-water pump stations to improve the redundancy of water sources, especially on the west side. Findings and recommendations from this study should be presented to the Board of Supervisors by no later than June 30, 2021.

The plan discussed in Recommendation 1 would include a detailed proposal, including financing sources, for the installation within 15 years of high-pressure, multi-sourced, seismically safe emergency water system for those parts of the City that don’t currently have one, i.e., by no later than June 30, 2024.

Recommendation 1 will be acknowledged in the Capital Plan, timeline. The capital planning process gathers, documents, and balances planned funding for needs across the public infrastructure portfolio and across San Francisco’s resilience challenges. The Capital Plan has longstanding funding principles to guide the prioritization of public infrastructure investments. Those investments are tiered: (1) address legal and regulatory mandates; (2) ensure public safety and enhance resiliency; (3) preserve assets and promote sustainability; (4) advance planned and programmatic needs; and (5) promote economic development. In the next 10-Year Capital Plan and those that follow, the City will continue to analyze priority projects and programs and identify sources to advance those priorities. Committing to entirely funding a single program out of context and without regard for the trade-offs of that commitment would be out of step with the City’s longstanding and highly regarded capital planning process and likely create significant vulnerabilities elsewhere in the portfolio.

Will be implemented by SFPPC and SFHFD will complete this study by June 30, 2021.
Act Now Before It Is Too Late: Aggressively Expand and Enhance Our High-Pressure Emergency Firefighting Water System [July 17, 2019]

**F10** The "reliability scores" being used by the SFPUC impart an overly optimistic impression of the protection provided. 

President, San Francisco Public Utilities Commission September 15, 2019

Disagree, partially

Fire Response Areas (FRAs) were utilized by SFPUC and SFFD in the planning study CS-199. This study divided the City into areas based on those defined by the SFFD for initial alarm response and were called Fire Response Areas (FRAs). Probable fire demands were developed for each FRA using 1000 sets of fire demands generated by Charles Scawthorn, PhD using a Monte Carlo analysis of fire ignitions and fire growth using the ground motions from the design earthquake (7.8 magnitude). The fire ignitions were generated using methods similar to those used for the Community Action Plan for Seismic Safety (CAPSS) study (ATC 2010). The fire ignitions subsequently were used to develop water demands for each FRA that were aggregated into the likely fire demands for each FRA. The water supplies for each FRA were developed using the reliability modeling tool GRAFITE, developed at Cornell University by Professor Thomas D. O’Rourke. GRAFITE performs internal Monte-Carlo analysis to damage pipes in the system for multiple scenarios. The water supplies developed by GRAFITE were aggregated into the likely fire water supplies for each FRA. It should be noted that the likely water supplies for each FRA assumed no water from the City’s municipal water system (MWSS), which is quite conservative and highly unlikely even after a seismic event. The reliability score for each FRA is calculated using the sum of all water supplies for each FRA and dividing it by the FRA water demand. The reliability scores do estimate how much EFWS water will be available for firefighting demands in a given FRA. The reliability scores are not meant to represent an estimate of the fire protection for a given house, block, or blocks. Rather it is a measure of the EFWS capacity and demand. The SFPUC recognizes the need to analyze potential EFWS demands on a more detailed level, and the agency began the process of doing so.

Act Now Before It Is Too Late: Aggressively Expand and Enhance Our High-Pressure Emergency Firefighting Water System [July 17, 2019]

**F11** The City does not have a timeline to fund and complete development of a high-pressure, multi-sourced, seismically safe emergency water supply for all parts of the City, including poor neighborhoods that historically have not been as well protected as the downtown business district and many richer neighborhoods.

President, San Francisco Public Utilities Commission September 15, 2019

Disagree, partially

The EFWS was built after the 1906 earthquake, and its location, primarily in the northeast portion of San Francisco, corresponds to the location of the majority of the city’s population at that time. Since 2010, the SFPUC, SFFD, and Public Works have made critical improvements to the existing EFWS system. Expanding the EFWS prior to ensuring that the existing EFWS is resilient and reliable would have contradicted best engineering practices. The SFPUC and SFFD are developing plans that would implement a resilient, robust, and redundant potable EFWS for the Westside of San Francisco. The potable EFWS that is being developed and analyzed would propose: the best method for bringing a robust and resilient high-pressure firefighting water system to the Western neighborhoods in San Francisco that is capable of providing water to the SFFD firefighters at the high pressure needed for firefighters to combat large fires after a seismic event, and is likely to include over 14 miles of new EFWS pipelines and potentially two new pump stations likely to be supplied by four water sources. The SFPUC and SFFD’s potable EFWS is being designed in a manner that allows for agility and the flexibility to add new technologies and water sources, and in a manner that allows the piping network to be extended in the future to serve additional areas.

The SFPUC should (a) continue its efforts to complete a more detailed analysis of emergency firefighting water needs (including above-the-median needs) by neighborhood, and not just by FRA, and (b) present a completed analysis to the Board of Supervisors by no later than June 30, 2021.

Disagree, partially

SFPUC and SFFD will complete this analysis by June 30, 2021.

**F12** The City does not have a timeline to fund and complete development of a high-pressure, multi-sourced, seismically safe emergency water supply for all parts of the City, including poor neighborhoods that historically have not been as well protected as the downtown business district and many richer neighborhoods.

President, San Francisco Public Utilities Commission September 15, 2019

Disagree, partially

The EFWS was built after the 1906 earthquake, and its location, primarily in the northeast portion of San Francisco, corresponds to the location of the majority of the city’s population at that time. Since 2010, the SFPUC, SFFD, and Public Works have made critical improvements to the existing EFWS system. Expanding the EFWS prior to ensuring that the existing EFWS is resilient and reliable would have contradicted best engineering practices. The SFPUC and SFFD are developing plans that would implement a resilient, robust, and redundant potable EFWS for the Westside of San Francisco. The potable EFWS that is being developed and analyzed would propose: the best method for bringing a robust and resilient high-pressure firefighting water system to the Western neighborhoods in San Francisco that is capable of providing water to the SFFD firefighters at the high pressure needed for firefighters to combat large fires after a seismic event, and is likely to include over 14 miles of new EFWS pipelines and potentially two new pump stations likely to be supplied by four water sources. The SFPUC and SFFD’s potable EFWS is being designed in a manner that allows for agility and the flexibility to add new technologies and water sources, and in a manner that allows the piping network to be extended in the future to serve additional areas.
Since taking over maintenance responsibilities, SFPUC has completed significant maintenance activities. For example, on a monthly basis, staff from the SFPUC test both Pump Station #1 and Pump Station #2. There are 6 maintenance recommendations provided in the CS-199 study as shown below in Table 7-1 from CS-199. The SFPUC has developed several of the routine maintenance plans recommended in the report or has determined the recommended maintenance practice is not necessary (i.e. flushing of a non-potable water system).

Maintenance Recommendations, CS. 199 Task 11 TM:

Maintenance Recommendation 1: Confirm that all AWSS assets are entered into CDD’s asset management system and PM’s are established
SFPUC Response: All AWSS asset locations are entered into CDD’s Maximo and GIS databases. PM’s are established for regular maintenance.

Maintenance Recommendation 2: Perform regular maintenance and testing
SFPUC Response: According to SFPUC Maximo maintenance/testing records, regular maintenance and testing is performed in accordance with maintenance plans.

Maintenance Recommendation 3: Check, flush and repair all suction connections regularly
SFPUC Response: All suction connections were assessed 4-5 years ago. Some were cleaned as needed at that time. A high-pressure jetting machine was recently purchased, and personnel is being trained on its use.

Maintenance Recommendation 4: Establish pipeline flushing program for AWSS
SFPUC Response: Non-potable fire-fighting water systems are not typically flushed as part of regular flushing maintenance program. However, flushing naturally occurs when the AWSS is utilized approximately 20 times per year.

Maintenance Recommendation 5: Establish leak detection program and a pipeline leak database to monitor potential hot spots
SFPUC Response: SFPUC maintenance activities have helped reduced EFWS leakage by over 500,000 gallons per day, improving system performance while reducing water waste. A condition assessment project was implemented using Smart Ball technology. In addition, the system water supply sources are regularly monitored for water levels/filling requirements which will indicate potential leaks in the pipeline system.

Maintenance Recommendation 6: Establish a cistern inspection, filling and testing program
SFPUC Response: A cistern inspection and testing program has been developed for implementation in 2019. In addition, a filling procedure has been established with SFFD.

As part of the AWSS Critical Valve Exercise Program, CDD has identified 66 AWSS valves as “critical” (66 of 1,685 valves, or approximately 4 percent) based on the following criteria for operational importance:

- Tank bypass valves
- Tank supply valve from higher pressure to lower pressure tank supply source
- Closed control valves to isolate piping within an infirman area
- Distribution system divide gate valve, manual operation

By no later than December 31, 2020 the SFPUC, with the advice and subject to the approval of the SFFD, should (a) implement “best practices” for the maintenance of AWSS assets, and (b) redefine which AWSS valves in the system are “critical” and, therefore, require more attention and priority in the SFPUC’s maintenance plans.

As part of the AWSS Critical Valve Exercise Program, CDD has identified 66 AWSS valves as “critical” (66 of 1,685 valves, or approximately 4 percent). Critical valves for AWSS were defined based on the following criteria for operational importance:

- Tank bypass valves
- Tank supply valve from higher pressure to lower pressure tank supply source
- Closed control valves to isolate piping within an infirman area
- Distribution system divide gate valve, manual operation

Act Now Before It Is Too Late: Aggressively Expand and Enhance Our High-Pressure Emergency Firefighting Water System [July 17, 2019]
Critical Valves:
These EFWS critical valves are broken down by type below. All 66 of the AWSS critical valves were exercised in 2018-2019 and will be exercised every year.

<table>
<thead>
<tr>
<th>Valve Type</th>
<th>(# of Critical Valves per type)</th>
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<tbody>
<tr>
<td>Ashbury Tank By-Pass Valves</td>
<td>(10)</td>
</tr>
<tr>
<td>Ashbury Tank Supply Valve #1 [Ashbury to Jones]</td>
<td>(1)</td>
</tr>
<tr>
<td>Ashbury Tank Supply Valve #2 [Ashbury to Jones]</td>
<td>(1)</td>
</tr>
<tr>
<td>Close Control Gate Valve</td>
<td>(15)</td>
</tr>
<tr>
<td>Division Gate Valve</td>
<td>(14)</td>
</tr>
<tr>
<td>Jones Street Tank By-Pass Valves</td>
<td>(10)</td>
</tr>
<tr>
<td>Motorized Division Gate Valve or Motorized Line Gate Valve</td>
<td>(6)</td>
</tr>
<tr>
<td>Open Control Gate Valve [Infirm Area]</td>
<td>(6)</td>
</tr>
<tr>
<td>Twin Peaks East Reservoir Lead Valve [Supply, TP to Ashbury]</td>
<td>(1)</td>
</tr>
<tr>
<td>Twin Peaks Reservoir Balancing Valve</td>
<td>(1)</td>
</tr>
<tr>
<td>Twin Peaks West Reservoir Lead Valve [Supply, TP to Ashbury]</td>
<td>(1)</td>
</tr>
<tr>
<td>Total AWSS Critical Valves</td>
<td>(66)</td>
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</tbody>
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Act Now Before It Is Too Late:
Aggressively Expand and Enhance Our High-Pressure Emergency Firefighting Water System

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
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<tbody>
<tr>
<td>July 17, 2019</td>
<td>In the 2015 MOU between the SFFD and the SFPUC, the two agencies agreed to conduct joint AWSS trainings annually, but there is no formal protocol outlining specific joint AWSS exercises or drills using hypothetical disaster scenarios, such as a major earthquake.</td>
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<tr>
<td>September 15, 2019</td>
<td>President, San Francisco Public Utilities Commission</td>
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respond to a hypothetical earthquake event (determine ICS, formulate specific objectives, and document findings). It is anticipated that this tabletop exercise will be repeated at least every other year, and that a larger scale simulation of post-earthquake response will be conducted within the next two years for SFFD and SFPUC joint-exercise.

In February 2018 the SFPUC and SFFD staff convened to review the SFPUC’s Division Emergency Operations Plan (DEOP), the CDD’s Emergency Action Plan (EAP), and the CDD’s Emergency Response Plan (ERP). The ERP overview focused on the Incident Command structure specific to CDD staff responsibilities, communication methods, critical facilities and assets, first responders for each facility (PWS and AWSS) and updated “critical facilities map” for all major pressure zones.