March 20, 2014

California Energy Commission's Drought Hydropower Questions
Responses from the San Francisco Public Utilities Commission
Submitted to: 14-HYDRO-01

Question 1: Please provide your POU's current estimate of total electric firm energy requirements in GWh for 2014.

The SFPUC generates hydroelectric energy from the Hetch Hetchy system to serve its municipal, retail and wholesale customers. The SFPUC's forecast of its calendar year 2014 retail and Class 1 wholesale sales to Modesto and Turlock Irrigation Districts[1] is 1,139 gigawatt-hours (GWh).[2]

Question 2: Please provide your POU's average annual hydroelectric energy procurement in GWh since 1970. Please differentiate between generated and purchased hydro energy supplies, and specify the timeframe over which these averages were determined if fewer years than from 1970 were used.

The SFPUC's principal source of hydroelectric supply is generated from the Hetch Hetchy system. Hydroelectric generation from the Hetch Hetchy system has averaged 1,587 GWh over the 1970-2013 period. Since 2005, the SFPUC has made a small amount of annual purchases of hydroelectric supply, approximately 10 GWh, from the Western Area Power Administration for service to Treasure Island.

Question 3: Please provide your POU's lowest hydroelectric energy procurement in GWh during the same time period used in Question 2, and identify the year in which this occurred. Please provide figures for both POU-owned/controlled hydroelectric generation and hydroelectric energy supply contracts.

As noted in response to Question 2 above, aside from the approximately 10 GWh per year from WAPA, the SFPUC does not make additional specified purchases

[1] While SFPUC's wholesale sales to MID and TID are not firm energy requirements, the SFPUC has certain obligations under the Raker Act to make some of its Hetch Hetchy hydroelectric generation available to MID and TID prior to other sales.
[2] Source: SFPUC's FY 2013-2014 and 2014-2015 budget forecast.

of hydroelectric generation. The SFPUC generates its hydroelectric supply from the Hetch Hetchy system.

The five lowest generating years for the Hetch Hetchy system over the 1970-2013 timeframe are listed in the table below. The year with the lowest hydroelectric generation was 1977, when the Hetch Hetchy system generated 826.6 GWh. The fifth lowest generation year over the 1970-2013 period occurred in 2012.

Year	Generation (MWh)	Generation (GWh)
1977	826,597	826.6
1992	912,948	912.9
1976	1,028,774	1,028.8
1988	1,087,724	1,087.8
2012	1,123,328	1,123.3

Question 4: Please provide your POU's most recent estimate of 2014 hydroelectric energy procurement (generation and purchases), both in GWh and as a percentage of this year's firm energy requirement.

As noted in response to Question 2 above, aside from the approximately 10 GWh per year from WAPA, the SFPUC does not make additional specified purchases of hydroelectric generation. The SFPUC generates its hydroelectric supply from the Hetch Hetchy system.

As of March 2014, the SFPUC was forecasting hydroelectric generation from the Hetch Hetchy system to be approximately **1,302 GWh** for calendar year 2014. The SFPUC's forecasted 2014 municipal, retail and Class 1 wholesale sales to the MID and TID represent approximately 87% of this figure.

Question 5: Does your POU expect that low hydro conditions (or the drought more generally) will raise any system or local reliability concerns? Please explain.

At this time we do not expect that low hydro conditions in 2014 will have a negative effect on system or local electric reliability. As noted above, the SFPUC is currently forecasting sufficient hydroelectric generation to cover its 2014 retail sales forecast. To the extent the SFPUC cannot generate sufficient energy to

meet its firm energy obligations from the Hetch Hetchy system it will purchase power from the market.

Question 6: Under what circumstances would the effects of the drought create severe or critical operational concerns?

The SFPUC's estimate of 1,302 GWh of production from the Hetch Hetchy system for calendar year 2014 assumes there will be additional rainfall in the spring. If that rainfall does not materialize, generation from the Hetch Hetchy system will be less than 1,302 GWh in 2014. Additionally, if the SFPUC is required to draw from its emergency water supplies, Hetch Hetchy system power production will be further reduced and require the SFPUC to make additional market purchases to satisfy its municipal and retail load obligations.

Question 7: At what value of annual hydro generation this year (in GWh) would the effects of drought result in significant or substantial financial concerns? Please estimate additional costs your POU may incur because of low hydro conditions. Please provide the assumptions used.

The SFPUC Power Enterprise's financial outlook is tied to the amount of Hetch Hetchy hydroelectric generation that is available as it the main source of electric energy supply for the City and County of San Francisco. A prolonged drought can have significant financial effects on the SFPUC by reducing energy sales and requiring the SFPUC to make additional purchases to serve its municipal and retail loads.

The SFPUC sets its power budget based on its forecast of average year Hetch Hetchy generation, retail and wholesale sales, and wholesale purchases. The budgeted value for Hetch Hetchy generation is approximately 1,600 GWh per year. If the drought results in reducing generation from the Hetch Hetchy system to approximately 1,100 to 1,200 GWh, the SFPUC will incur significant financial impacts.

If the drought reduces Hetch Hetchy generation to these levels, the SFPUC will sell less power and be required to make more purchases, i.e. reducing revenues and increases expenses. If reduced sales and increased purchases result in the depletion of the SFPUC's risk management fund, the SFPUC will be required to draw from its reserves, which will require budget cuts.

If the drought results in reducing Hetch Hetchy generation to the 1,100 to 1,200 GWh level, the SFPUC's electric revenues would be reduced by approximately $15 million or about 13% of its budgeted electric revenues. Under these circumstances the SFPUC will likely not realize its reserve requirements and will face operating and capital budget cuts, particularly if it cannot increase its rates.

Question 8: Please estimate any additional procurement of GHG allowances, in metric tons, that your POU expects will be necessary because of low hydro conditions. Please provide the assumptions used.

The SFPUC does not own any fossil-fueled generation that might need to run more often (and hence use GHG allowances) as a result of the drought. If needed, the SFPUC purchases in-state energy on the WSPP market, the price of which includes any allowance costs incurred by the seller.

Question 9: Does your POU expect that low hydro conditions (or the drought more generally) will have any other local impacts beyond local reliability? If so, are efforts underway to address these impacts?

Low hydro conditions as described herein will have local financial impacts on San Francisco. To the extent the SFPUC's cost of electric service increases, it may have to raise electric rates to entities providing essential municipal services (e.g., hospitals, public schools, libraries, etc.), which will reduce funding available from those entities to provide local programs and services.

Question 10: Will water curtailments this year, such as by SWRCB, affect your POU's hydroelectric energy procurement or dispatch (either utility-controlled hydro generation or purchases)? If so, to what extent will these supply resources be affected in terms of GWh, and over what timeframe(s)?

It is unclear how the SWRCB curtailments may impact the SFPUC diversions from the Tuolumne River. The SFPUC has pre-1914 water rights on the Tuolumne River. Assuming the priority water rights system is followed, the SWRCB curtailments should not impact the SFPUC diversions.

Question 11: Energy Commission staff would like to know about any potential drought related issues that will or could affect system and/or local reliability. For example, are there known or potential issues with water allocations or supplies to thermal plants (e.g., power plant cooling)? This is an open-ended question and we hope that your POU can, to the extent possible, provide us with information regarding your POU's overall assessment regarding how drought conditions may affect reliability in your local communities.

> We have no additional information about the impacts to local reliability than what has already been provided above.