BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Investigation pursuant to Senate Bill 380 to determine the feasibility of minimizing or eliminating the use of the Aliso Canyon natural gas storage facility located in the County of Los Angeles while still maintaining energy and electric reliability for the region.	Investigation 17-02-002 (Filed February 9, 2017)

COMMENTS OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

The California Independent System Operator Corporation (CAISO) appreciates this opportunity to provide comments on California Public Utilities Commission's (Commission) September 13, 2018 Scenarios Framework (Scenarios Framework) developed by Energy Division staff. The Scenarios Framework will inform Investigation (I.) 17-02-002, which will determine whether use of the Aliso Canyon natural gas storage facility (Aliso) can be minimized or eliminated while maintaining energy and electric reliability in the region.

I. Introduction

The CAISO appreciates Energy Division staff's efforts in preparing and updating the Scenarios Framework. The Scenarios Framework outlines the scope of the Commission's proposed Aliso-related studies. The Commission plans to conduct three types of studies in the course of this investigation: (1) a hydraulic modeling analysis, (2) a production cost modeling analysis, and (3) an economic modeling analysis. The CAISO agrees with this general framework and appreciates the inclusion of the CAISO power flow modeling in this version of the Scenarios Framework to inform both the hydraulic and production cost modeling. While this inclusion to the CAISO's power flow modeling will provide critical information regarding the levels of local gas generation necessary to reliably operate the electric grid, the CAISO continues to advocate additional improvements as discussed in more detail below.[1]

[1] The CAISO previously raised these issue in comments filed June 28, 2018.

II. Discussion

A. The Commission Should Study Multiple Unplanned Gas Transmission and Storage Outages.

The Scenarios Framework states that "pipeline and storage outages can significantly impact the ability of the natural gas system to serve load on peak days."[2] The Scenarios Framework goes on to state that for the Reliability Assessment portion of the hydraulic modeling, the "gas pipeline system [will] be subject to a single plausible unplanned outage (pipeline or storage) that results in the maximum loss of aggregate gas send out."[3] However, the CAISO notes that there are currently multiple main gas transmission outages that affect gas delivery into the southern California area.[4] Based on current conditions, the CAISO recommends that the Commission incorporate multiple gas transmission and/or storage field outages in the hydraulic model as part of the study process. The CAISO understands that the Commission has directed Southern California Gas Company (SoCalGas) to determine plausible unplanned outage events based on review of historical outages for gas transmission system in the area, but suggests that the Commission specify that multiple gas outage events should be studied in the hydraulic modeling.

B. The Commission Should Consider Electric Reliability Based on Multiple Perspectives.

The CAISO recommends the Commission also review electric reliability from a "top-down" perspective in addition to the Commission-recommended "bottom-up" process. The "top-down" approach would use the Commission's production cost modeling and hydraulic modeling initially[5] to provide the CAISO information regarding the level of gas that would be available for electric generation for both the 1-in-10 Peak and the 1-in-35 Extreme Peak conditions. The CAISO could then use the available gas information to determine whether the level would be sufficient to meet minimum electric generation requirements in the area as determined from the

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[2] Scenarios Framework, p. 16.
[3] *Id.*
[4] CPUC's Draft 2018 Summer Supplemental Report, PUC Code Section 715 - Aliso Canyon Working Gas Inventory, Production Capacity, Injection Capacity, and Well Availability for Reliability, June 18, 2018. (http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/News_Room/Draft715Report_Summer2018.pdf).
[5] The top-down process would rely on the Commission's determination of the level of gas that would be available for electric generation as residual resource after gas is committed to core and other non-core non-electric loads based on application of the CPUC's Reliability Standard for the gas system.

power flow study.

In addition, the CAISO recommends that the Commission consider western region impacts that were identified in the Western Electricity Coordinating Council's recent Western Interconnection Gas-Electric Interface Study (WECC Study).[6] The WECC Study concluded that "the potential closure of Aliso Canyon creates region-wide reliability issues centered around the markets concentrated in Southern California and Phoenix; disruption scenarios revolving around a [Desert Southwest] pipeline rupture or Permian/San Juan Basin supply freeze-offs routinely result in unserved energy and/or unmet spinning reserves." The Commission should consider the WECC Study and regional reliability considerations in its determinations regarding whether and how to reduce reliance on the Aliso Canyon facility.

C. The Commission's Production Cost Modeling Should Consider Multiple Reliability Objectives.

The Scenarios Framework suggests that the production cost modeling will establish a desired reliability level based on a loss of load expectation (LOLE) analysis. The LOLE analysis focuses on reviewing the expected number of loss of load events over a 10-year horizon. The CAISO is concerned about whether the production cost model can be used to meet both a specific LOLE metric and specific generation dispatch levels needed to meet local reliability requirements. The CAISO's primary concern is that the production cost run may meet LOLE metrics for system wide reliability, but would not be able to commit minimum generation needed for local capacity requirements. The CAISO suggests that the generation needed to maintain local capacity requirements be represented in the production cost modeling though a nomogram or a similar modeling mechanism that maintains a minimum amount of local gas-fired electric generation during peak load hours. The Power Flow Model from both the CAISO and LADWP would identify the minimum local generation requirements for the Local Capacity Area Resource Requirements. The Production Cost Model will economically dispatch units to meet the electric demand requirement, with a check to make sure that the local generation dispatch determined by the Production Cost Model meet the minimum generation requirements determined from the Power Flow Model.

The Scenarios Framework references the minimum NERC reliability standards to be

[6] Accessible at: https://www.wecc.biz/Administrative/WECC Gas Study Public Presentation.pdf.

utilized for the assessment of noncore electric gas load needs.[7] Specifically, the Scenarios Framework states that "[f]or the peak (1-in-10) day, hourly load profiles will be computed based on the economically optimal production of electricity with no gas supply constraints and meeting minimum NERC reliability standards (Unconstrained Gas Scenario)."[8] The CAISO agrees that NERC reliability standards should be maintained in the modeling, but also notes that NERC reliability standards are only one of the reliability standards used for assessing reliability for the electric power system. The CAISO's FERC-approved tariff also requires the maintenance of Local Capacity Area Resource Requirements[9] using the Local Capacity Technical Study Criteria.[10] The CAISO suggests that the Scenarios Framework specifically referenced Local Capacity Area Resource Requirements in addition to NERC Reliability Standards.

The CAISO also recommends that the Commission include information regarding Expected Unserved Energy (EUE) in addition to the Loss of Load Expectation (LOLE). LOLE information provides the expected accumulated amount of time (expressed in hours or days) during which a shortage of power is experienced, while EUE provides the expected amount of energy not supplied due to generation shortage from potential gas curtailments. This information can be used to estimate the potential number of electric customers that would be impacted from gas curtailments to non-core electric generation loads.

D. The Commission's Hydraulic Modeling Should Consider All Generating Plants Connected to SoCalGas' system.

As the CAISO previously noted in this proceeding, the availability of Aliso Canyon affects the entire Southern California electric system, including electric generation facilities outside of the Western Los Angeles Basin. In the Scenarios Framework, the Commission notes as follows:

> The Aliso storage field primarily interacts with electricity generating plants in the Western Los Angeles Basin, both in the CAISO balancing authority and the LADWP balancing authority area. Curtailment or closure of the Aliso storage field will affect the plants' ramping ability, ability to start up on short notice, and other operating parameters, which in turn may affect electric system costs and reliability. In addition, under the 1-in-35 (extreme peak) design standard adopted

[7] Scenarios Framework, p. 13
[8] Id.
[9] CAISO Tariff Section 40.3 (http://www.caiso.com/Documents/Section40_ResourceAdequacyDemonstration_SCs_CAISOBAA_asof_May1_2018.pdf)
[10] CAISO Tariff Section 40.3.1.1

in SoCalGas Tariff Rule 23, complete curtailment of a larger group of electric generators may be required to protect core customer gas supply.

Although Aliso Canyon interacts directly with generating plants in the Western Los Angeles Basin, the hydraulic model needs to be studied with SoCalGas' entire Southern California system modeled, as the gas system also interacts with San Diego Gas & Electric Company gas system in the south. In addition, the CAISO evaluates the local capacity needs for electric generation in the combined Los Angeles Basin and the overall San Diego-Imperial Valley local capacity areas, as the electric systems in these areas have significant interaction with each other, particularly after the retirement of the San Onofre Nuclear Generating Station. Based on the interactive nature of the Southern California grid, the hydraulic modeling should be modified to specifically study all of the gas-fired electric generation connected to the SoCalGas system.

E. More Granular Modeling is Necessary to Study Post-Contingency Ramping Needs.

Local electric generation needs are determined based on power flow modeling analysis that considers the impact of specified transmission or generation contingency events. To determine whether the local area can adequately withstand such contingency events, local generation must respond within thirty minutes after the studied contingency. Local gas-fired generation may be dispatched to quickly ramp up generation to address the contingency. The proposed hydraulic and production cost modeling will provide hourly granularity, which may miss potential ramping issues that occur on a post-electric contingency basis. To accurately capture post-contingency ramping needs, the Commission should conduct more granular analysis in its hydraulic and production cost modeling. The CAISO recommends conducting these analyses with thirty-minute intervals (rather than hourly), as the step-size suggested for the production cost model.

F. Historical Electric Pricing Information May Have Limited Value in Determining Future Dispatch and Pricing.

The Scenarios Framework suggests that the economic modeling should use the CAISO OASIS pricing information to evaluate the potential correlation between daily natural gas price differences and the daily congestion rent revenue component of energy prices in Southern

California and Northern California.[11] Part 3 (The Impact of Tighter Gas Supply in SoCal Gas System on Power Gas Generation in the CAISO Territory) will assess the effect of storage availability on customers of electric generation by analyzing the impacts of gas curtailment on hourly energy prices and implied market heat rate.[12] The CAISO's view is that using the historical data in the analysis may not provide forward looking information for future system conditions but does not object to reviewing the historical data to determine if there is a potential cause and effect between gas curtailment and generation dispatch and power prices. However, the CAISO is concerned there is limited utility in using the results of historical events to determine the potential effects in the future as well as the degree of linearity of the comparison.

III. Conclusion

The CAISO appreciates this opportunity to comment on the Scenarios Framework and looks forward to cooperating with the Commission going forward in this proceeding.

Respectfully submitted,

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[11] Scenarios Framework, p. 42.
[12] Scenarios Framework, p. 39.