Memorandum

To: ISO Board of Governors

From: Keith Casey, Vice President, Market & Infrastructure Development

Date: July 19, 2017

Re: **Decision on Aliso Canyon gas-electric coordination phase 3 proposal**

This memorandum requires Board action.

EXECUTIVE SUMMARY

As detailed in Management's May and September 2016 memorandums to the Board of Governors, the Aliso Canyon natural gas storage facility in southern California had a large natural gas leak that significantly affected many of the people that live and work in the area as well as the gas balancing tools available to gas system operators. Although the leak has been repaired, use of the storage facility continues to be restricted, greatly limiting the flexibility of the Southern California Gas Company and San Diego Gas and Electric Company systems to serve gas-fired electrical generators in the area. The storage facility is a significant part of the gas system serving customers in the Los Angeles Basin and San Diego, including gas-fired electric generation.

In September 2016, the Board approved extending a coordinated set of operational and market measures to address the continued risks to electrical reliability posed by the continued restrictions on the Aliso Canyon facility. The Board approved these measures that were later approved by the Federal Energy Regulatory Commission to be effective through November 30, 2017.

The loss of the Aliso Canyon storage facility is expected to continue to stress the gas system in southern California. In addition, physical gas limitations can exist throughout the ISO and western energy imbalance market balancing areas. Because of this, Management proposes to make one of these measures, the maximum natural gas burn constraint, a permanent operational tool that can be used throughout the ISO balancing area and balancing areas in the western energy imbalance market. It is a valuable operational tool that enhances electric system reliability by reflecting gas system limitations in the ISO market. Extending to balancing areas in the western energy imbalance market was approved by the EIM Governing Body at their July 13, 2017 meeting subject to approval on the Board's consent agenda.

Management also proposes to extend the other temporary market measures currently in place beyond their current November 30, 2017 expiration date. Management proposes to make permanent the provision to publish two-day-ahead market results. Management proposes that the other temporary measures be further extended and expire once the ISO implements more comprehensive bidding rule changes being developed as part of the ISO's *Commitment Costs and Default Energy Bid* policy initiative.

Moved, that the ISO Board of Governors approves the Aliso Canyon gas electric coordination phase 3 proposal, as described in the memorandum dated July 19, 2017; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.

DISCUSSION AND ANALYSIS

Based on an inter-agency task force study completed this spring, the limitations resulting from the loss of the Aliso Canyon storage facility are expected to continue to stress the gas system in southern California. In addition, physical gas limitations can exist throughout the ISO and western energy imbalance market balancing areas.

Because of this, Management proposes to make the market constraint that limits the maximum gas burn of a group of generators a permanent operational tool that can be used throughout the ISO and EIM balancing areas. Experience over the past year has shown that the ISO's use of this tool has proved prudent and particularly effective.

Because the Aliso Canyon natural gas storage facility is expected to have limited operability for an extended period of time, Management proposes to extend the temporary market measures currently in-place so that they remain in-effect beyond November 30. Management proposes to make permanent the provision to publish two-day-ahead market results. Management proposes to extend the remainder of the temporary market measures until it implements more comprehensive bidding market rule changes it is developing with stakeholders through the *Commitment Costs and Default Energy Bid Enhancements* policy initiative. Management anticipates implementing these changes in fall 2018.

Maximum natural gas burn constraint

The maximum natural gas burn constraint limits the market's dispatch of a group of generators on a constrained part of the gas system so that these generators in aggregate burn no more than a specified gas burn rate. The gas burn constraint is a valuable operational tool used to ensure that electric system dispatches respect gas system operational limits which, if exceeded, could compromise electric system reliability. In coordination with gas system operators, ISO operators enforce the constraint during

conditions for which they are concerned that if gas system limitations are exceeded the electric system reliability could be compromised.

Because of the constraint's importance in ensuring reliability, and because physical gas system limitations may develop elsewhere, Management proposes to make the gas constraint a permanent feature for use throughout the ISO and balancing areas in the EIM. Management believes gas limitations may develop in the ISO balancing area outside of southern California because of California's more stringent requirements for operating gas storage facilities put in place in response to Aliso and new state rules aimed at combatting emissions from methane leaks. Gas limitations also exist in EIM areas because of limited pipeline capacity and limited storage. For example, one EIM Entity has explained to the ISO that it has a group of generators with only a limited share of the physical capacity of the pipeline they are connected to. It must limit its gas burn from this group of generators on days with high demand for gas because the pipeline reserves the capacity for its core non-electric customers.

The maximum natural gas burn constraint offers additional protections to manage gas limitations more efficiently than other tools that include energy bid prices, outages reported to the market systems, and exceptional dispatch in the ISO balancing area or manual dispatch in EIM balancing areas. It can efficiently manage a group of generators' overall dispatch and gas burn. The gas constraint, when binding, limits the dispatch of those generators and affects resource-specific prices used for dispatch and settlement purposes. However, it does not impact the locational marginal price used for other purposes such as settling load or non-gas resources.

The ISO will add additional natural gas burn constraints in coordination with the applicable gas system operator in its balancing area and as requested by EIM balancing area operators (i.e., EIM Entities). The ISO will enforce a natural gas burn when needed to address current or anticipated gas system limitations. The EIM balancing area operator will communicate the maximum gas burn to be enforced and the portion of the gas system it applies to. Acceptable use of the gas constraint will be limited to addressing physical gas system limitations. The EIM balancing authority areas already have the ability to use manual dispatch to manage the gas burn on their system should there be such a need. The maximum gas burn constraint automates and allows the market to optimize what otherwise would be managed by EIM Entities through their existing manual dispatch authority. In the EIM, only participating EIM generators in the affected area will be subject to the constraint. This aspect of the proposal was approved by the EIM Governing Body subject to approval on the Board's consent agenda.

Management also proposes to make permanent two related measures that protect the market when the ISO enforces the maximum gas burn constraint. These measures are the ISO's authority to deem transmission constraints uncompetitive when the gas burn constraint is enforced and to suspend convergence bidding if the constraint adversely impacts market efficiency.

ISO market measures

As discussed above, Management proposes further extending the temporary market measures currently in place that are set to expire on November 30, 2017. This will continue to ensure the ISO market produces prices that reflect gas system limitations so that the risk that ISO dispatch could adversely impact gas operators' efforts to manage reliability is mitigated.

The first of these market measures is to increase the gas cost estimate that is used to calculate the ISO real-time market commitment costs bid cap and default energy bids for generators on the SoCalGas and SDG&E systems. This market measure allows generators' real-time bid prices to better reflect gas system limitations and gas prices. This greater bidding flexibility increases the likelihood that the ISO market will only dispatch these generators for local needs and not for system energy that can be provided by generators not subject to gas limitations in other areas of the electric grid.

This market measure provides for the ISO to increase these gas cost estimates in the real-time market by an amount that is:

- Sufficient to enable the ISO market to dispatch generators on the SoCalGas and SDG&E systems only for local electricity needs and not system electricity needs;

- Accounts for systematic differences between actual day-ahead and same day gas prices that are likely to be more volatile for same day purchases on the constrained gas systems; and

- Needed to improve generators' ability to manage gas company requirements on the constrained systems to limit differences between individual generators' gas schedules and usage (*i.e.*, gas balancing requirements).

The ISO currently scales the gas commodity price used in its commitment cost proxy cost calculations for generators on the SoCalGas and SDG&E systems to 175 percent of the gas index price and scales the gas price used in the default energy bid calculations continues to 125 percent of the gas commodity price. The ISO scales the gas price used in its commitment cost proxy cost calculation more than the gas price used for default energy bid calculations to help avoid commitment of these generators for system needs.

This market measure also provides the ISO with the authority to adjust the scaling of the gas commodity price, up to specified maximum amounts, in the event it is too high or too low based on observed electric and gas market outcomes. The ISO is currently analyzing whether the current scaler levels are appropriate to meet the three objectives listed above and may adjust them based on this analysis.

The second market measure Management proposes to extend, applicable to all gas-fired generators, not just those in the affected area, is to create a gas price index for the day-

ahead market by drawing from the Intercontinental Commodity Exchange, which is an index published between 8:00 a.m. and 9:00 a.m. Pacific Time. This measure improves the gas price information used by the ISO day-ahead market to establish commitment costs bid caps and default energy bids for mitigated energy offers. Without this measure, the day-ahead market would use gas price information based on gas trading occurring the previous day that consequently may not align with gas trading for the majority of the operating day for which the ISO's day-ahead market is being run.

The third market measure Management proposes to extend is to permit market participants to file with Federal Energy Regulatory Commission to recover costs incurred that exceed that exceed a mitigated energy bid. This measure is in addition to a permanent provision that allows them to file to recover costs that exceed commitment cost bid caps.

Management proposes extending these three measures until the ISO implements more comprehensive bidding market rule changes being developed through its *Commitment Costs and Default Energy Bid Enhancements* policy initiative that it anticipates implementing in fall 2018.

Finally, Management proposes to make permanent the provision to make two-day-ahead advisory market results available to scheduling coordinators. Making this advisory information regarding estimates of resources' day-ahead market schedules available to market participants allows them to consider this information in purchasing gas in the next day gas trading, which primarily occurs before ISO day-ahead market results are available.

POSITIONS OF THE PARTIES

With the exception of the ISO Department of Market Monitoring, stakeholders generally support Management's proposal, though some expressed concerns or opposition to specific aspects of the proposal, as discussed below. Arizona Public Service and Puget Sound Energy note that extending the use of the maximum gas burn constraint to EIM balancing areas will be beneficial as it allows the market to recognize gas system constraints in their balancing areas.

The Department of Market Monitoring does not support the ISO continuing to scale the day-ahead gas commodity price used in its commitment cost proxy cost and default energy bid calculations for generators on the SoCalGas and SDG&E systems. The Department of Market Monitoring states it does not support continued scaling of the gas prices because their analysis shows same-day gas prices infrequently rise to levels above the day-ahead gas prices that would justify the current scaling amounts, 175 percent and 125 percent, respectively.

Management understands that the Department of Market Monitoring's opinion is primarily based on the fact that over the past year the system has not often experienced constraints that warrant the use of the scalers. Management does not believe that the lack of such experience should be the criteria for whether or not it continue to have the authority to apply the scalers if conditions so warrant. Because the potential for constrained gas system

operating conditions still exists, Management believes it is important to retain the authority to scale gas prices. This is necessary not only to reflect real-time gas prices, but to also help manage gas usage on the SoCalGas and SDG&E systems by allowing higher bids in those areas so that the market tends to dispatch generators in those areas only for local electricity needs and not system electricity needs.

Consequently, consistent with the criteria currently in effect for use of the scalers described earlier in this memorandum, Management is analyzing what scaling amounts continue to be needed. The analysis will determine whether there is a need to change the scalers going forward, up or down, consistent with this criteria. If warranted by the analysis, Management may lower the scalers to zero if it finds zero meets the criteria. Management has this authority today as reflected in the tariff approved by FERC. Management is only requesting that the Board approve its existing authority to apply and change the scalers beyond November 30, 2017, so that if needed in the future, Management may adjust the scalers up or down based on its analysis and as warranted by changes in gas system conditions. Management does not believe it is appropriate to remove this authority after November 30, 2017, given that the conditions on the gas system continue to be potentially constrained by the reduced usage of the Aliso gas storage facility.

Western Power Trading Forum states it will not support the proposal to extend the use of the maximum gas burn constraint to other areas if the ISO reduces the level of the scalers.

A number of stakeholders have asked the ISO to document the detailed process for using the gas burn constraint in additional areas beyond the SoCalGas and SDG&E systems, including detailing the acceptable limitations to be included in the constraint and the procedures for its implementation. The Department of Market Monitoring states it is concerned the criteria for using the constraint in EIM areas should be further defined and that it does not support extending the use of the maximum burn constraint beyond southern California until Management develops all the implementation details.

Management believes it is appropriate to develop these implementation-level details with stakeholders through its business practice manual change process. This includes developing EIM-specific procedures that will be documented in the EIM business practice manual. Management believes these procedures will be more transparent than other tools currently used to manage gas constraints, which include manual dispatch in EIM balancing areas. Management clarifies that the policy intent is for the constraint to be used for physical limitations consistent with the guidelines previously developed for its use in SoCalGas and SDG&E systems.

The Department of Market Monitoring also states that the ISO should conduct additional analysis of the penalty prices associated with the maximum gas burn constraint nomogram before it expands its use beyond the SoCalGas and SDG&E systems. Management clarifies it is in the process of doing this and will propose changes to these parameters through the business practice manual change process.

Portland General Electric and Environmental Defense Fund emphasized that the broader energy bidding rule changes Management is considering as part of the *Commitment Costs and Default Energy Bid Enhancements* policy initiative should be the priority. NRG opposes extending any of the measures until the ISO implements enhancements resulting from that initiative. Environmental Defense Fund wants the temporary measures to expire by a set date to provide incentive to implement broader bidding rule changes. Management clarifies extending the measures will not affect the planned fall 2018 implementation of the changes being developed in the *Commitment Costs and Default Energy Bid Enhancements* initiative.

Finally, the Department of Market Monitoring believes the ISO should alter the EIM resource sufficiency test to consider gas constraint limitations and to automate fully incorporating the gas constraint into the local market power mitigation process, which currently is a manual process. Management believes the electric supply limitations due to gas constraints are similar to transmission limitations, which are currently not considered by the sufficiency test. Management believes there may be merit to incorporating these types of constraints into the resource sufficiency tests. However, the use of the gas constraint is expected to be very infrequent and only used in times of severe gas system limitations. Management commits to continuing to monitor the impact of the gas constraint, as well as transmission constraints, on the efficacy of the EIM resource sufficiency test. Management will consider modifications to the resource sufficiency test if the impact warrants the additional cost and complexity required to include such constraints in the EIM resource sufficiency test. In addition, Management plans to automate the gas constraint into the local market power mitigation test in fall 2018. In the meantime, it will evaluate the workload associated with the manual process for implementing any new gas constraints and will adjust the implementation schedule accordingly.

CONCLUSION

Management requests Board approval of the proposal discussed above. The gas burn constraint is an important operational tool to ensure that electric system dispatches respect gas system operational limits. The market measures provide important functionality to mitigate the reliability impacts of the limited operability of the Aliso Canyon natural gas storage facility and other similar gas constraint issues.