UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation	))	**Docket No. ER16-1649-000**

MOTION FOR LEAVE TO ANSWER AND ANSWER OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION TO COMMENTS AND PROTESTS

The California Independent System Operator Corporation (CAISO)[1] submits this answer to the comments and protests[2] filed in response to the tariff amendment the CAISO filed in this proceeding on May 9, 2016.[3] That filing contains proposed tariff revisions to provide the CAISO with a set of tools it can use in its markets on an interim basis to mitigate risks to reliability and market distortions, in southern California, posed by the limited availability of the Aliso Canyon gas natural storage facility (Aliso Canyon Tariff Amendment).

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[1] Capitalized terms not otherwise defined herein have the meanings set forth in appendix A to the CAISO tariff. References to section numbers are references to sections of the CAISO tariff as revised by the tariff amendment filed in this proceeding, unless otherwise specified.

[2] The following parties filed comments: Calpine Corporation (Calpine); Cities of Anaheim, Azusa, Banning, Colton, Pasadena, and Riverside, California (collectively, Six Cities); Environmental Defense Fund (EDF); Financial Marketers Coalition (Coalition); La Paloma Generating Company, LLC (La Paloma); NRG Power Marketing LLC and GenOn Energy Management, LLC (together, NRG); Pacific Gas and Electric Company (PG&E); Power Trading Institute of the Commodity Markets Council (PTI); Shell Energy North America (US), L.P. (Shell Energy); Southern California Edison Company (SCE); Western Power Trading Forum and Electric Power Supply Association (WPTF/EPSA); and XO Energy, LLC (XO Energy). Also, Nevada Power Company and Sierra Pacific Power Company (together, NV Energy) and WPTF/EPSA filed protests, and the Coalition and NRG filed limited protests.

[3] The CAISO files this answer pursuant to Rules 212 and 213 of the Commission's Rules of Practice and Procedure, 18 C.F.R., §§ 385.212, 385.213. The CAISO requests waiver of Rule 213(a)(2) to permit it to address the protests. Good cause for this waiver exists here because the answer will aid the Commission in understanding the issues in the proceeding, provide additional information to assist the Commission in the decision-making process, and help to ensure a complete and accurate record in the case. *See, e.g.*, *PJM Interconnection, L.L.C.*, 155 FERC ¶ 61,148, at P 10 (2016); *Equitrans, L.P.*, 151 FERC ¶ 61,063, at P 10 n.2 (2015); *Cal. Indep. Sys. Operator Corp.*, 132 FERC ¶ 61,023, at P 16 (2010).

A number of intervenors state that they support or do not oppose the tariff revisions in whole, or in part.[4] Even in cases where the intervenors request that the tariff revisions be modified or rejected, their comments and protests raise no issues that would justify such action, except for a few modifications the CAISO proposes to make in a compliance filing submitted in this proceeding to address certain comments. The Commission should accept the tariff revisions as filed, subject to the modifications the CAISO proposes in this answer.

I. Answer

A. The Commission Should Accept the Tariff Revisions to Provide Generators Information Regarding Their Potential Day-Ahead Commitments Prior to the Day-Ahead Market Run

To increase access to potentially useful market information prior to the CAISO day-ahead market, the CAISO proposes to provide scheduling coordinators, for informational purposes only, advisory commitment awards that result from a residual unit commitment process that the CAISO performs two days prior to the trading day.[5]

WPTF/EPSA and Calpine do not oppose this proposal, but request that the CAISO post aggregated results from this advisory run, including at a minimum the aggregated supply and demand amounts and resulting LMPs.[6] NRG recommends that the CAISO publish any two-day-ahead data to all market

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[4] *See* Calpine at 5-6; Coalition at 4; EDF at 4; NRG at 16; PG&E at 3; SCE at 2-3; Six Cities at 1-2; WPTF/EPSA at 6-7.

[5] Transmittal letter for Aliso Canyon Tariff Amendment at 11-12; new tariff section 6.5.2.2.3.

[6] WPTF/EPSA at 20-21; Calpine at 4 & n.7.

participants, on a non-discriminatory basis. NRG argues that the two-day-ahead advisory schedules should be kept confidential but the remainder of the "forward projections" should be publicly released.[7] The CAISO takes the reference to "forward projections" to be a request for it to provide aggregated schedules from the advisory run on a public basis. It is not feasible for the CAISO to post aggregated schedules in the two-day-ahead timeframe. Moreover, the CAISO does not see the value of providing such information given that each scheduling coordinator will only see its own schedules, and there will be no pricing information produced. With regard to any concerns regarding asymmetric information related to pricing, the CAISO clarifies that through this process, the CAISO will be providing generators advisory schedules that are produced out of the residual unit commitment process conducted two days prior to the trading day, and not prices.

WPTF/EPSA also request clarification that the submission of bids for the CAISO's two-day-ahead process is voluntary, and that the voluntary submission of such bids in no way prevents scheduling coordinators from subsequently modifying or adjusting their bids.[8] The CAISO will be using bids that have been submitted in the market for the relevant trading day to the extent they are available. Submissions of bids during this timeframe will continue to be voluntary and the fact that the CAISO would be providing this information does not mandate that participants submit bids during that timeframe. Participants can

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7 NRG at 13-14.

8 WPTF/EPSA at 21.

also change their bids up until 10 a.m. of the day on which the CAISO conducts the day-ahead market.

B. Intervenors Fail to Recognize the Primary Purpose of the Amendment to Increase the Gas Price Applicable to Commitment Cost Caps and Default Energy Bids for Resources Served by Southern California Gas Company and SDG&E so that Resources Served by Other Gas Companies Will Be Committed or Dispatched for Energy

The CAISO proposes to increase the gas commodity price used to calculate the commitment costs for gas-fired resources subject to the proxy cost methodology, generated bids for resource adequacy resources, and default energy bids under the variable cost option used for locational market power mitigation, by an amount necessary to ensure that the real-time market appropriately recognizes the gas constraints for resources served by SoCalGas and SDG&E as a result of the non-availability of Aliso Canyon. Specifically, the CAISO will increase the gas commodity price used in these calculations by an amount that: (1) helps to ensure that affected resources are not dispatched for system energy needs so that other resources can meet energy needs of the southern California area (resources needed for local reliability will still be needed and committed and dispatched accordingly); (2) better accounts for systematic differences between the day-ahead and same-day natural gas prices; and (3) improves the ability of market participants to manage their generators' gas usage within applicable gas balancing rules. The CAISO will initially increase the gas commodity price used to calculate the commitment costs and generated bids by 75 percent of the gas commodity price that would otherwise have been used.

The CAISO will initially increase the gas price used to calculate the default energy bids by 25 percent of the original gas commodity price.[9]

The primary purpose of this proposal is to ensure that the real-time market only dispatches resources on the SoCalGas and SDG&E systems for local reliability needs and not for system energy needs. The limited availability of Aliso Canyon limits the ability of the SoCalGas and SDG&E gas systems to deliver the increased amounts of gas in real-time to generators. This proposal creates a mechanism by which bids from resources taking service from SoCalGas and SDG&E reflect the constraints that the absence of Aliso Canyon imposes on them so that the real-time market can recognize these constraints.

As discussed below, the comments on these tariff revisions ignore the limited scope and primary purpose of the Aliso Canyon Tariff Amendment.[10] The tariff amendment provides a set of tools that the CAISO can use in its markets, on an interim basis, to help maintain both gas and electric reliability in light of the risks to the CAISO controlled grid posed by the limited operability of Aliso Canyon starting this summer.[11] The reports produced by the Inter-Agency Task Force identified the high probability that both the gas and electric system will experience reliability issues over the summer and the CAISO has made this emergency filing first and foremost to ensure it can operate its grid reliably and in

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[9] Transmittal letter for Aliso Canyon Tariff Amendment at 20; new tariff section 39.7.1.1.1.3(d).

[10] The failure of intervenors to acknowledge the express scope and primary purpose of the tariff amendment is a theme that recurs with regard to other tariff revisions discussed in this answer.

[11] Transmittal letter for Aliso Canyon Tariff Amendment at 1-5, 38-42. The risks presented by the limited operability of Aliso Canyon are discussed in attachment C to the Aliso Canyon Tariff Amendment and the Inter-Agency Task Force reports and other materials cited therein.

a manner that does not exacerbate gas system constraints expected this summer. The CAISO did not attempt to address global gas cost recovery issues, for example. Nor does the tariff amendment consist of disparate tariff changes that can be evaluated in isolation from one another. The CAISO has offered a set of tariff changes of limited duration[12] that it believes are necessary to address an entirely new set of circumstances caused by the limited availability of Aliso Canyon.[13]

Certain intervenors misconstrue the tariff revisions in these respects. NRG argues that there is great volatility in same-day gas trading costs, and that therefore the Commission should direct the CAISO to (i) minimize any delay between spikes in real-time gas costs and a generator's ability to reflect these costs, and (ii) reset the commitment cost and default energy bid price caps if actual gas procurement costs exceed the levels the CAISO anticipates on an emergency basis.[14] The primary purpose of the tariff revisions, however, is not to guarantee gas cost recovery, but rather to enhance reliability by making resources inside southern California more likely to be dispatched by the real-time market for local needs, while also accounting for systematic differences in natural

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[12] All of the tariff modifications proposed by the CAISO in the Aliso Canyon Tariff Amendment will terminate as of November 30, 2016 unless the CAISO makes a separate filing requesting, and the Commission authorizes, their extension beyond that date.

[13] *See id.* The existing tariff already includes provisions allowing just and reasonable recovery of commitment costs and default energy bid costs. *See* existing tariff sections 30.4.1.1 and 39.7.1.

[14] NRG at 7-10. The data that NRG provides to show volatility in same-day gas trading costs is thin, as it solely concerns a single day from more than two years ago (February 6, 2014). *See also id.* at 6-7 (arguing that the CAISO should enhance cost recovery under the default energy bid calculation).

gas prices and managing the resources' gas usage within gas balancing rules.[15] Indeed, the initial amounts are set based on DMM's analysis of the amount needed to enable the CAISO market to "dispatch generators on the SoCal gas system only for local electricity needs and not system electricity needs that can be met by other resources."[16]

Further, it appears that NRG is looking at the tariff revisions in isolation, without considering that the CAISO also proposes to allow resources to seek after-the-fact cost recovery from the Commission pursuant to filings submitted under section 205 of the Federal Power Act in the event they are unable to recover their gas costs in the CAISO's markets.[17] Therefore, if NRG or any other market participant believes its resources are unable to fully recover their gas procurement costs, it can utilize this after-the-fact process.

NRG also fails to recognize that the tariff revisions will be in effect on only an interim basis. The CAISO will establish a stakeholder process to develop any tariff revisions that may be needed after November 30 in the event Aliso Canyon is not yet fully available, and the CAISO intends to make a filing with the Commission by October 1, 2016 if the measures need to be extended or modified and extended. The CAISO is also committed to continuing to address cost recovery issues and will launch a new stakeholder initiative early this summer addressing bidding in the CAISO markets to start that process. NRG

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15 Transmittal letter for Aliso Canyon Tariff Amendment at 14-17.

16 DMM comments, attachment F to Aliso Canyon Tariff Amendment, at 1-3, 17-25. *See also* transmittal letter for Aliso Canyon Tariff Amendment at 17 (discussing DMM's analysis).

17 *See id.* at 36-38.

and any other stakeholder can raise issues regarding cost recovery for consideration in that stakeholder process.[18] Raising such issues here, however, is beyond the limited scope of this proceeding.

Calpine argues that the CAISO should also increase gas commodity costs for resources located outside of southern California, in order to allow such resources to more fully recover their costs.[19] Again, the primary purpose of the tariff revisions is to avoid the real-time commitment and dispatch of resources served by SoCalGas and SDG&E except to the extent needed for local reliability. The CAISO is proposing measures to increase these resources' gas costs used by the CAISO real-time market so that these resources are more likely to be dispatched for only local reliability needs. At the same time, the CAISO is also proposing to modify the method used to determine the gas commodity price used in the day-ahead market so that it will be based on gas prices traded on the morning of the day-ahead market run. This change applies to all resources and will help reduce gas cost recovery risk.[20]

On a separate matter, the CAISO agrees that it needs to make a minor clarification to its proposed tariff revisions. NRG asserts that the CAISO should

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[18] The CAISO also notes that the Commission has established its own process to address issues regarding price caps and cost recovery in markets operated by system operators such as the CAISO. *See Offer Caps in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 154 FERC ¶ 61,038 (2016). This Commission proceeding may resolve some of the issues that NRG raises.

[19] Calpine at 5-6.

[20] The CAISO recognizes that the EIM participating resources do not benefit from these two enhancements in the same way because they do not participate in the day-ahead market. However, as noted above, the after-the-fact recovery filings and any possible adjustments to those resource's default energy bids to ensure their costs are properly captured could provide the necessary relief over the summer.

use not $2.50 but $25 in the cap on any subsequent increase of the gas commodity price used to calculate commitment costs and generated bids. NRG notes that $25 is the penalty amount listed for a stage 5 operational flow order (OFO) under the Southern California Gas Company (SoCalGas) natural gas tariff.[21] The CAISO believes this comment was prompted by a lack of clarity in the tariff language, which states that the cap is $2.50 but does not specify the unit of measurement, *i.e.*, $2.50/therm. As noted in the table of SoCalGas tariff values that NRG provides, $2.50/therm is equal to $25/MMBtu (the penalty amount that NRG supports). The CAISO proposes on compliance in this proceeding to specify the unit of measurement used in the cap.

The CAISO notes the DMM's concern, as expressed in their comments attached to this answer, that the increase of this amount to $25/MMBtu can exacerbate costs and increase the potential for exercising market power and gaming, without making any additional supply available. [22] The CAISO agrees with its DMM that the CAISO must make any adjustments to these scalar amounts judiciously to avoid the issues it raises in its comments. Therefore, the CAISO reiterates that such increases would only occur after coordinating with DMM and carefully considering the market conditions present at the time. The CAISO will also modify its BPM to reflect the actual amount should an increase occur after coordination with the DMM and the CAISO will vet and support its proposed increase through its BPM stakeholder process.

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[21] NRG at 5-6. *See also* WPTF/EPSA at 19-20.

[22] DMM Response to Comments on ISO's Final Aliso Canyon Gas-Electric Coordination Proposal, May 24, 2016, attachment 1 to this answer, at 6-7 (DMM Response to Comments).

C. The Commission Should Accept the Tariff Revisions to Include New Constraint to Allow the CAISO to Better Ensure that Dispatches Are Consistent with Gas System Limitations and to Deem Transmission Paths Uncompetitive

In order to better ensure electric grid reliability given the limited operability of Aliso Canyon, the CAISO proposes to implement a constraint in the CAISO markets that limits the minimum or maximum amount of energy that gas-fired resources can produce to help manage the collective gas burn of these resources within the capability of the gas companies to supply the gas. When this natural gas constraint is binding, the shadow price of the constraint will be reflected in the marginal cost of congestion component of the resource-specific LMPs of only the affected gas-fired resources served by SoCalGas and SDG&E.

The CAISO will implement this approach by applying the constraint only to the resource-specific price for the affected gas-fired resources served by SoCalGas and SDG&E. The CAISO does not propose to have the constraint impact the price used for load, virtual bids, congestion revenue rights, and non-gas resources at the same bus location reflecting the point of delivery or receipt on the CAISO controlled grid. In other words, the CAISO poses no change to its current pricing approach for these purposes. Prices for trading hubs will not be affected by the gas constraint. Although prices for trading hubs will not be affected, after it made its filing the CAISO identified the need to modify the definition of Existing Zone Generation Trading Hub. For resources affected by the limited operability of Aliso Canyon, the CAISO will not use the price paid to generation resources but rather the price as calculated at the bus that is not affected by the gas constraint impact. The CAISO therefore proposes to modify the definition on compliance to reflect this distinction when the natural gas constraint is enforced.

In tandem with implementing the natural gas constraint, the CAISO has also proposed to add provisions to the existing tariff language setting forth the criteria for designating a transmission constraint as competitive or non-competitive on a dynamic basis, in order to ensure the CAISO's ability to designate internal constraints as non-competitive when necessary.[23]

1. Issues Regarding Use of the Natural Gas Constraint

Calpine asserts that, if a constraint is to be enforced in the day-ahead market, the CAISO should notify market participants of the location and magnitude of the constraint and should use best efforts to post this information before day-ahead bids are due. Further, if a constraint is enforced in the real-time market, the CAISO should post the hours of enforcement, and the location and magnitude of the constraint.[24] The CAISO confirms that all market participants will be able to see when the CAISO plans to enforce the constraint in the CAISO markets in their protected communications through the CAISO's secured customer portal, the CAISO Market Results Interface (CMRI). Pursuant to Section 6.5.10.1.1 the CAISO, after the results of the day-ahead market are posted, provides the daily post-Day-Ahead Market Transmission Constraints Enforcement List, which consists of the list of Transmission Constraints, including contingencies and nomograms that are enforced and not enforced in that day's

[23] Transmittal letter for Aliso Canyon Tariff Amendment at 24-31; new tariff section 27.11 and revised tariff section 39.7.2.2.

[24] Calpine at 8.

day-ahead market. This list will also include the natural gas constraint. The CAISO also posts in CMRI, before it conducts the next day-ahead market, the pre-Day-Ahead Market Transmission Constraints Enforcement List, which consists of the daily list of information for the Transmission Constraints, including contingencies and nomograms, that the CAISO plans to enforce or not enforce for the next day's day-ahead market. Again, this list will include the natural gas constraint. In addition, the CAISO has committed to providing a notification through its market notification system to all market participants ahead of enforcing the natural gas constraint, time permitting. The notification will include the location and magnitude of the constraint and the CAISO will use best efforts to post this information before day-ahead bids are due.

Calpine also argues that the CAISO should file detailed monthly reports documenting each use of the constraint. Specifically, Calpine asserts that the reports should include: information on all gas and electricity market conditions preceding the imposition of the constraint; the reasons why market solutions posed a reliability risk; whether the constraint was to set a minimum or a maximum gas burn; the magnitude, location, timing, and duration of the constraint imposed; any shadow prices created; the CNode and PNode prices; and the business practice manual provisions that authorize the particular constraint.[25] Because of the short time during which these procedures will be in effect, a monthly report is not necessary. In order to prepare such a report, the CAISO must collect sufficient data, analyze the data, validate the data internally,

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25 Calpine at 8-9.

and interpret the data. The first monthly report requested by Calpine would be due early July for June. There is not sufficient time to complete such a report in a way that would provide market participants or the Commission with meaningful information. As discussed in this answer and its initial filing, the CAISO will be posting and providing significant information regarding the proposed measures.[26] The CAISO will also be discussing issues it sees or market participants observe regarding these proposed measures in its bi-weekly Market Update calls held on every second Thursday at 10:15 AM Pacific Time and will respond to questions and concerns during those calls, which will continue throughout the summer months. The CAISO will also provide updates regarding its observation in the performance of the proposed changes in the Market Performance and Planning Forum stakeholder meetings held approximately every six weeks. The CAISO also agrees to file, by the end of August, a report on its observations of the impact of the measures proposed in this proceeding. In that report the CAISO will also state whether it anticipates additional or continuing issues related to the operations of the Aliso Canyon storage facility after November 30, 2016.

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[26] In particular, the CAISO proposes to: (1) issue a market notice specifying the amount of any increase in the gas commodity prices applicable to commitment cost caps and default energy bids on the SoCalGas and SDG&E systems for the real-time market that the CAISO may implement after the initial increase in those prices; (2) issue a market notice if the CAISO plans to enforce the natural gas constraint, which will include the location and magnitude of the constraint, as discussed above in this answer; (3) provide a market notification if the CAISO adjusts the internal transfer capacity, including the amount of the adjustment; and (4) file an informational report with the Commission in the event that the CAISO suspends or limits virtual bidding to prevent detriments effects on CAISO market efficiency. Transmittal letter for Aliso Canyon Tariff Amendment at 20, 34, 36. Further, the Commission and market participants will have transparency regarding the effects that the proposed measures have had on the CAISO markets pursuant to the quarterly Reports on Market Issues and Performance that the CAISO Department of Market Monitoring issues. *Id.* at 41.

Calpine states that, because Aliso Canyon may be disrupted beyond November 30, the CAISO should reopen its stakeholder process and continue to develop a market-based mechanism that minimizes and clearly bounds its administrative discretion.[27]

First, it is important to also keep in mind that several of the changes proposed in this emergency filing are already approved by the Board of Governors as permanent features of CAISO market rules. Those include: (1) allowing resources to rebid commitment costs in the real-time market, (2) revisions to the short-term unit commitment process to facilitate resources' gas procurement evaluations; and (3) allowing resources to seek after-the-fact cost recovery from the Commission in a Section 205 Filing. The CAISO plans to make a filing requesting Commission authorization to implement these measures as part of its tariff to allow for a seamless transition past November 30.

Second, as noted above the CAISO is launching a stakeholder process to consider additional measures needed for the fall/winter that could consist of extensions of the currently proposed measures, additional measures, or modifications of the measures proposed herein depending on an evaluation of expected conditions over the fall and winter. The CAISO will also be launching a stakeholder process to consider longer-term solutions to enhance the current commitment cost methodology discussed in prior stakeholder efforts. The CAISO anticipates that this process will also start this summer and will overlap with its Aliso Canyon related stakeholder efforts. In the context of this longer-

[27] Calpine at 9.

term solution process, the CAISO agrees that stakeholders can and should discuss possible market-based mechanisms and if found to be appropriate and implementable, the CAISO agrees to consider such measures.

NRG requests that the CAISO clarify how it will coordinate with pipeline operations.[28] The CAISO has an operating procedure, Operating Procedure 4120, devoted to the topic of gas electric coordination.[29] The CAISO will continue to develop and improve its coordination efforts and will update this operating procedure accordingly. The CAISO's dispatches and decisions to employ the tools requested in the amendment at issue will be informed by these coordination efforts. However, the CAISO has no authority to allocate gas curtailments. Such determinations are made by the applicable gas company.

La Paloma argues that the proposed constraint will create a need to have available enough generation north of Path 26 to effectuate real-time balancing up to the maximum flow capacity of Path 26. In other words, according to La Paloma, the constraint will create a reliance on an area in which insufficient local capacity area resources in an annual or monthly resource adequacy plan may be deemed to exist, and should be procured via the capacity procurement mechanism (CPM). La Paloma asserts that the CAISO should issue a CPM designation to needed assets north of Path 26 with available resource adequacy capacity, such as La Paloma, to alleviate the impact of this unsystematic reliability event.[30] The CAISO continues to have full authority to issue CPMs

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[28] NRG at 13.

[29] See document at the following link: http://www.caiso.com/Documents/4120.pdf

[30] La Paloma at 4.

under its existing tariff authority in existing tariff section 43 and will exercise that authority as necessary this summer. The CAISO did not propose any changes to the CPM provisions for the purposes of addressing the issues related to the lack of availability of Aliso Canyon. La Paloma's request for the issuance of a CPM is outside the scope of this proceeding.

2. Issues Regarding How the Natural Gas Will Impact Resource-Specific Prices versus Prices Used for Virtual Bids, Demand and CRRs.

Calpine argues that the Commission should reject the proposal to apply the constraint shadow price at CNodes and not at PNodes. Calpine claims that the separation of CNode and PNode prices will create a systemic difference in load and generation prices and result in unintended consequences.[31] Similarly, WPTF/EPSA argue that the Commission should require the CAISO to align CNode and PNode pricing, thereby reflecting the shadow price of the constraint in all prices used for settlement of nodes with affected resources.[32] It is just and reasonable to apply the shadow price of the constraint only to the resource-specific locational marginal price for generators connected to the affected gas systems because they are the only market entities subject to the gas limitations under the CAISO's proposal. Pricing the resource-specific locational marginal price based on the shadow price of the constraint ensures that the CAISO market clears the bids and dispatches generators subject to the constraint consistent with the constraint. Demand, for example, may be served by system energy from

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31 Calpine at 9-11.

32 WPTF/EPSA at 17-18.

generators not subject to the constraint, so it is not appropriate for the shadow price of the constraint to directly affect the PNode price used to settle demand.

Also, it is important that the CAISO not reflect the impact on congestion of the constraint in prices used for settling demand, virtual bids and congestion revenue rights. The CAISO explained in the transmittal letter that were the CAISO to allow the constraint to impact these prices, market participants could take large positions in the financial markets at little or no cost while increasing congestion revenue rights inadequacy and uplift, which would be borne by load serving entities. The CAISO explained that when the gas usage constraint is binding in the day-ahead market, if the CAISO allowed the constraint to impact the prices used to clear CRRs, it would result in price differentials for CRRs resulting from the gas constraint alone because no other constraint would cause such price separation. This would provide the opportunity to obtain lucrative financial positions the cost of which would be entirely borne by load serving entities that would pay the revenue inadequacy uplift charges.

The CAISO also explained that when the gas usage constraint is enforced in the real-time market but not in the day-ahead market, if the CAISO cleared virtual positions based on a price that is impacted by the constraint, virtual supply at a node whose settlement price is impacted by the constraint offset by virtual demand at a node whose settlement price is not impacted by the constraint would be paid based on the real-time shadow price of the constraint. Again, there could be numerous such node pairs with little to no other constraints creating price separation between the virtual supply and virtual demand nodes.

This again would provide market participants the opportunity to obtain large quantities of such offsetting virtual supply and demand schedules at little to no cost and with very little downside risk.

The CAISO Department of Market Monitoring (DMM) reiterates this concern in its Response to Comments provided in attachment 1 to this answer. DMM explains that, if the Commission were to reject the CAISO's proposed language in tariff section 27.11, which states "[t]he Shadow Price of the [gas usage] constraint will not be reflected in the Marginal Cost of Congestion component of Locational Marginal Prices for purposes of setting cleared Demand, Virtual Bids, or Congestion Revenue Rights," enforcement of the "maximum gas usage constraint in the real-time market would tend to decrease real-time prices at gas-constrained gas resource nodes relative to neighboring nodes."[33] DMM also explains that "[w]henever this maximum gas usage constraint was not enforced in the day-ahead market, a low-risk but profitable virtual bidding strategy would be to place virtual supply at a gas-constrained gas resource node and virtual demand at a neighboring node that was not included in the maximum gas usage constraint."[34] Further, DMM explains that these positions have impacts on the day-ahead market and that, therefore, they would not increase market efficiency.[35]

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33 DMM Response to Comments, attachment 1 to this answer, at 4.

34 *Id.*

35 *Id.* at 2-5. This portion of DMM's discussion is addressed further in section II.F of this transmittal letter, in which the CAISO responds to comments regarding its proposal for authority to suspend or limit virtual bidding that detrimentally affects CAISO market efficiency.

NRG states that it is unclear whether the CAISO could publish generators' CNode LMPs, but that doing so would enable generators to validate their CAISO settlements.[36] The CAISO agrees and will publish generators' CNode LMPs for scheduling coordinators in their confidential CMRI reports.[37]

3. Issues Regarding Designation of Transmission Constraints as Competitive or Non-Competitive

WPTF/EPSA contend that the CAISO fails to provide any evidence that it requires authority to deem transmission constraints to be non-competitive to address the limited operability of Aliso Canyon, outside of the CAISO's existing local market power mitigation framework. WPTF/EPSA argue that even if the CAISO can show that the current local market power mitigation framework is insufficient for that purpose, the proposal still gives the CAISO too much authority to deem transmission constraints to be non-competitive.[38]

The existing market model and local market power mitigation framework are based on electrical flows over the grid. Introducing constraints based on gas limits could result in congestion that is not adequately detected. Therefore, the existing framework is insufficient to give the CAISO the authority required to deem transmission constraints to be non-competitive in order to address the limited operability of Aliso Canyon.

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36 NRG at 14.

37 This publication of CNode LMPs will also address Calpine's concern that, because CNode prices are not presently published, resources will have no means of verifying that the constraint is functioning properly. *See* Calpine at 10.

38 WPTF/EPSA at 14-15.

Moreover, based on its own analysis, DMM concluded that the CAISO should have the authority because the impact of the natural gas constraint on the assessment of competitive paths can only be determined based on actual system conditions once the constraint is in place.[39] The tariff revisions specify that the CAISO will deem transmission constraints to be non-competitive only for specific days or hours based on its determination that actual electric supply conditions may be non-competitive due to anticipated electric supply conditions in the SoCalGas and SDG&E gas regions. Therefore, although the CAISO cannot predict precisely what system conditions may require it to exercise this authority, the CAISO cannot exceed the tariff parameters. Based on the foregoing, the CAISO's proposed authority is just and reasonable under the circumstances.

The CAISO agrees with DMM's responsive comments that the DMM and the CAISO would only exercise the requested authority "to account for the degree to which the gas usage constraint imposed on some resources in the SoCal system may cause the automated DCPA [dynamic competitive path assessment] to cause constraints to be incorrectly deemed competitive."[40] Therefore, the requested authority is not as broad as characterized by WPTF/EPSA. As explained by DMM, the only impact the deeming of competitive paths as non-competitive as requested by the CAISO could have is to cause constraints deemed uncompetitive in the direction into areas in which resources impacted by the gas usage constraints are located, and the "bid mitigation would

[39] Attachment F to Aliso Canyon Tariff Amendment (DMM Comments) at 10-12.

[40] DMM Response to Comments at 9.

only be triggered for resources in Southern California when congestion is projected to occur into these areas (e.g. in the north-to-south direction on Path 26 due to higher real-time energy bids in the Southern California)."[41]

DMM also makes clear that WPTF/EPSA is incorrect in its assertion that "CAISO has failed to provide any evidence that its existing LMPM framework will be ineffective given conditions at Aliso Canyon." DMM correctly points out that DMM did perform an "analysis of two years of historical information on congestion in the north-to-south direction on Path 26 showing that this constraint is often close to the threshold between competitive and non-competitive, so that the impact of the gas usage constraint may at times be enough to change the competitive status of this constraint."[42] The results of this analysis were provided in the DMM comments attached to the Aliso Canyon Tariff Amendment.[43]

D. The Commission Should Accept the Tariff Revisions to Expand the CAISO's Authority to Reserve Internal Transfer Capability by Adjusting Transmission Constraints and the Provision of CRRs

In order to ensure reliable grid operations during this summer, the CAISO proposes to add specific tariff language to ensure that the CAISO has the right to reserve internal transfer capability in the day-ahead market and then, if conditions are favorable, to release it in the real-time market. The CAISO will base both decisions on observed natural gas and electric system conditions or market inefficiencies. Further, to prevent any potential negative impacts on CRR

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41 *Id.*

42 DMM Response to Comments at 1, 9-10.

43 DMM comments, attachment F to Aliso Canyon Tariff Amendment at 10-12.

revenue sufficiency, the CAISO has proposed to revise its tariff to permit it to adjust the amount of additional CRRs it releases in the monthly CRR auction and allocation processes if needed to account for adjustments to transmission constraints to reflect reservations of internal transfer capability.[44]

1. Issues Regarding Authority to Adjust Transmission Constraints to Reserve Internal Transfer Capability

Several intervenors argue that the CAISO has not shown that it requires the requested authority to adjust transmission constraints to reserve and release internal transfer capability and are concerned that this authority is not limited to Path 26.[45] The analysis performed by the Inter-Agency Task Force indicates that the limited operability of Aliso Canyon this summer creates the risk that daily imbalances between scheduled gas nominations and actual burns of gas may adversely affect gas pipeline operating pressures, thus undermining pipeline integrity and consequently having an adverse impact on electric reliability.[46] As a result, the CAISO could be limited in the amount of additional generation connected to the SoCalGas and SDG&E systems that the CAISO can dispatch in real-time to respond to increased southern California load relative to CAISO day-ahead market schedules. The CAISO has identified the need to reserve internal transfer capability in order to provide increased assurance that the CAISO can use generation outside of southern California to meet real-time energy needs in

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[44] Transmittal letter for Aliso Canyon Tariff Amendment at 32-34; new tariff section 27.5.6(f) and revised tariff section 36.4.

[45] Calpine at 11; Coalition at 6-8; WPTF/EPSA at 8-10; XO Energy at 4-6.

[46] Attachment C to Aliso Canyon Tariff Amendment at 4-5.

southern California while continuing to rely on local southern California resources to meet local needs.

Further, the CAISO recognizes the trade-offs involved in reserving internal transfer capability in the day-ahead market. If, and when, the CAISO has to reserve internal transfer capability to maintain electric reliability, the CAISO will need to balance these trade-offs based on a situation-specific evaluation of the system conditions and market outcomes.[47]

The CAISO anticipates that it may need to reserve internal transfer capability only on Path 26,[48] but cannot be sure about this in advance of actual experience with system conditions and market outcomes this summer. In the event that the CAISO needs to reserve internal transfer capability on other transmission paths, it must have the authority to do so as quickly as possible. Absent this authority, there would not be enough time to take necessary actions to ensure reliability in the event of curtailments or other gas system limitations.[49]

The CAISO already has existing tariff authority to adjust transmission constraints in various other circumstances. The CAISO may adjust transmission constraints if it observes that the CAISO markets produce or may produce either results that are inconsistent with observed or reasonably anticipated conditions

[47] As the Coalition and WPTF/EPSA note, the CAISO recognizes that failing to balance these trade-offs appropriately could distort day-ahead and real-time prices. *See* Coalition at 8; WPTF/EPSA at 8-9. The CAISO will use its authority to balance them appropriately.

[48] Imports of power from more northerly resources into the Los Angeles Basin are bottlenecked by the limited power transfer capability of Path 26. Attachment C to Aliso Canyon Tariff Amendment at 5.

[49] For example, if the CAISO were instead to make an emergency filing with the Commission to request the necessary authority, any Commission authorization could likely be provided only after the system conditions and market outcomes had materialized.

or infeasible market solutions related to identification of congestion.[50] The CAISO may also adjust transmission constraints for the purpose of setting operating margins consistent with good utility practice to ensure reliable operation under anticipated conditions of unpredictable and uncontrollable flow volatility.[51] In addition, the CAISO may enforce or not enforce transmission constraints if the CAISO has determined that their enforcement or non-enforcement may result in the unnecessary pre-commitment and scheduling of use-limited resources,[52] or if the CAISO has determined that it lacks sufficient visibility to conditions on transmission facilities necessary to reliably ascertain constraint flows required for a feasible, accurate, and reliable market solution.[53] To the extent the existing authority may not encompass what the CAISO is now proposing, the CAISO's request for additional authority to reserve internal transfer capability is narrowly tailored to permit the CAISO, on an interim basis until November 30, to address reliability issues caused by the limited operability of Aliso Canyon.

Calpine requests that, if the Commission accepts the tariff revisions, it should require the CAISO to post any reservations on its OASIS.[54] The Commission should find that an OASIS posting is unnecessary. The proposed tariff revisions already state that, upon determining that an adjustment is

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50 Existing tariff section 27.5.6(a).

51 Existing tariff section 27.5.6(e).

52 Existing tariff section 27.5.6(b).

53 Existing tariff section 27.5.6(c).

54 Calpine at 11-12.

necessary, the CAISO will issue a notification specifying the amount of the adjustment. This notification process will provide sufficient information to market participants.

Calpine asserts that the CAISO should file monthly reports detailing each action to reserve internal transfer capability. Calpine states that the monthly reports should include: why such administrative action was necessary and why other market and administrative mechanisms did not suffice to assure reliability; and how much capacity is being reserved, over which paths, and for which sequential markets, including any compensating changes to the CRR network model or auction market.[55] As discussed above, monthly reports are not feasible in this case. To provide any meaningful report, a sufficient amount of time must pass for a robust amount of data to accumulate and to provide the CAISO a reasonable amount of time in which to collect, analyze, validate and interpret such data. The Commission should find that the CAISO's proposal to submit a report at the end of August is reasonable. The CAISO will provide information regarding the CAISO's reservation of such capacity and its effectiveness in maintaining system reliability.

Calpine argues that, if the CAISO seeks to extend its reservation authority beyond November 30, it should commence a stakeholder process to develop a market-based mechanism to compensate resources that experience opportunity costs due to their inability to transfer energy as a result of the CAISO's capacity

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[55] Calpine at 12.

reservations.[56] The CAISO does not believe it is appropriate to predetermine the specific proposals that will be included in the stakeholder process to develop tariff revisions for implementation after November 30. Like any other stakeholder, Calpine is free to raise relevant issues in that process.

WPTF/EPSA argue that, if the Commission accepts the tariff revisions, it should direct the CAISO to make a compliance filing that specifies the paths over which it will reserve transfer capability, along with an analysis of why such paths are critical to reliability, and should also require the CAISO to detail in an operating procedure or business practice manual the process by which it will determine the amount of the reservation and how to communicate that reservation sufficiently in advance of the market.[57] The CAISO requested the authority to reserve the capacity on any of the internal transmission lines because it does not know at this time exactly how the CAISO may need to impact the market flows to ensure the market dispatch does not adversely impact electric and gas reliability. The CAISO has already committed to provide a market notification when the CAISO will exercise this authority. The CAISO is also in the process of updating its business practice manuals to add an explanation of how it will exercise this authority. The Commission should find that these steps will provide sufficient transparency regarding the CAISO's use of this authority.

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[56] Calpine at 12.

[57] WPTF/EPSA at 10-11.

2. Issues Regarding Authority to Adjust the Release of CRRs if Needed

The Coalition, WPTF/EPSA, and XO Energy oppose granting the CAISO the authority to adjust the release of CRRs if needed to account for adjustments to transmission constraints to reserve internal transfer capability.[58] Their opposition can be encapsulated in the Coalition's argument that two purported wrongs (the adjustments to transmission constraints and consequently to CRRs) do not make a right. The premise of that argument is incorrect. For the reasons explained above, it is not wrong but rather is just and reasonable for the CAISO to have the authority to adjust transmission constraints in order to maintain electrical reliability by reserving internal transfer capability. It is also just and reasonable for the CAISO to adjust the release of CRRs if needed. As DMM observed, reserving internal transfer capability could cause the amount of CRRs allocated or sold by the CAISO to exceed the amount of transmission capacity actually available in the day-ahead market.[59] Thus, it would be inappropriate to adjust transmission constraints without also making any necessary adjustments to the release of CRRs.

WPTF/EPSA state that, at the time it adjusts the CRR model, the CAISO will not know the amount of reservations it will be making in its markets.[60] This is correct and it is for this reason that the CAISO cannot state at this time exactly how much and what capacity needs to be reserved to ensure the CRRs released

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[58] Coalition at 8-9; WPTF/EPSA at 10-11; XO Energy at 6-7.

[59] Attachment F to Aliso Canyon Tariff Amendment at 14.

[60] WPTF/EPSA at 10.

in the monthly process are revenue sufficient (*i.e*., sufficient congestion revenue is collected in the day-ahead market to fund released CRRs). For this reason, the CAISO must have the ability to reserve some of the capacity in the CRR market to ensure that the reservation of the transmission capacity in the Day-ahead market does not result in significant revenue insufficiency.

E. The Commission Should Accept the Tariff Revisions to Provide the CAISO with the Authority to Suspend Convergence Bidding if the CAISO Determines It Is Adversely Impacting Market Efficiency

To ensure that virtual bidding cannot detrimentally affect the efficiency of the CAISO markets and thus cause problems for system reliability, the CAISO proposes to revise its tariff to explicitly state that its existing tariff authority to suspend or limit virtual bidding activities that detrimentally affect system reliability or grid operations also includes the authority to suspend or limit virtual bidding activity that detrimentally affects CAISO market efficiency.[61]

The comments on this proposal are at opposite extremes. The Coalition, WPTF/EPSA, and XO Energy argue that the Commission should reject the proposal on the grounds that it will give the CAISO too much discretion to suspend or limit virtual bidding and will likely result in market distortions.[62] PG&E, on the other hand, supports the direction of the proposal but contends that it does not go far enough: due to the higher risk of market manipulation during the conditions created by the Aliso Canyon situation, PG&E believes the

[61] Transmittal letter for Aliso Canyon Tariff Amendment at 35-36; new tariff section 7.9.2(d).

[62] Coalition at 10-12; WPTF/EPSA at 12-13; XO Energy at 8-9.

Commission should immediately suspend virtual bidding throughout the CAISO while the interim tariff measures are in place.[63]

The CAISO's proposal is a just and reasonable middle ground between these two extremes. The proposal simply clarifies the CAISO tariff's existing authority to suspend or limit virtual bidding, in recognition of the fact that virtual bidding that adversely affects market efficiency can cause problems for system reliability. The existing tariff language also states that the CAISO may "suspend or limit the ability of *one or more*" scheduling coordinators to submit virtual bids.[64] Consistent with this language, the CAISO will limit the application of its authority only to whichever virtual bidder(s), if any, detrimentally affect CAISO market efficiency. The existing tariff procedures regarding suspension or limitation will continue to apply,[65] and any suspension or limitation will remain in effect for 90 days at most and will end sooner if appropriate.[66] In the event the CAISO suspends or limits virtual bidding pursuant to the new tariff language, it will provide transparency by filing an informational report with the Commission

63 PG&E at 3-4.

64 Existing tariff section 7.9.2 (emphasis added).

65 The existing procedures provide that, whenever practicable, before it suspends or limits virtual bidding, the CAISO will notify the affected scheduling coordinators and affected convergence bidding entities that the CAISO intends to suspend or limit virtual bidding and will confer and exchange information with those affected entities in an effort to resolve any dispute as to whether suspension or limitation of virtual bidding is warranted. In cases where taking such actions prior to suspending or limiting virtual bidding is not practicable, the CAISO will promptly notify the entities that the CAISO has suspended or limited virtual bidding, and will promptly confer and exchange information with the entities in an effort to resolve any dispute as to whether suspension or limitation of virtual bidding is warranted. Within two business days of the notice of suspension or limitation, the CAISO will provide the entities with information justifying the decision to suspend or limit virtual bidding. Existing tariff section 7.9.3(a).

66 Existing tariff section 7.9.3(b).

explaining why it took such action.[67] Further, the proposed authority will only be in effect until November 30, unless the Commission authorizes its extension past that date pursuant to a subsequent CAISO filing.

It is necessary that the tariff be clear that the CAISO has this authority while the limited operability of Aliso Canyon is stressing system conditions. The Aliso Canyon Tariff Amendment provided examples of virtual bidding activity that can reduce market efficiency.[68] DMM also explains in its Response to Comments that additional scenarios could arise "in which modeling differences between the day-ahead and real-time markets create profitable opportunities for virtual bidders that do not increase market efficiency, impose costs on other participants, and may complicate the ISO's efforts to manage the reliability and market issues stemming from the Aliso Canyon gas system outage."[69] DMM supports the CAISO's proposal because it will "limit the detrimental financial impacts that virtual bids could have under such scenarios."[70] If there was any question that the CAISO lacked the authority to suspend or limit virtual bidding that detrimentally affects market efficiency in situations like these, there would be too little time for the CAISO to address the issue by making an emergency filing with the Commission.

In its comments attached to the Aliso Canyon Tariff Amendment, DMM stated that "virtual bidding can often be profitable but provide little or no benefits

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67 Transmittal letter for Aliso Canyon Tariff Amendment at 36.

68 *Id.* at 35-36.

69 DMM Response to Comments, attachment 1 to this answer, at 5.

70 *Id.*

– and can actually decrease market efficiency, making it more difficult to manage system reliability and result in inequitable market outcomes."[71] XO Energy challenges that DMM statement, contending that it is impossible for virtual trading both to be profitable and to provide no efficiency gains, and offers several hypothetical examples that purportedly demonstrate the validity of that contention.[72]

XO Energy is incorrect. As DMM explains in its Response to Comments, "XO Energy's arguments and examples supporting their arguments rely on a theoretical construct of electricity markets that does not exist in any RTO."[73] DMM states that "it has been clearly established that modeling differences between the day-ahead and real-time markets create opportunities for financial entities to profit from virtual bids at the expense of ratepayers without increasing market efficiency."[74] DMM goes on to show how this has been established through reports and filings by DMM and the CAISO describing in detail several types of modeling differences that have been exploited by virtual bidding entities and which have already cost CAISO ratepayers over a hundred million dollars.[75] Further, as DMM points out, the fact that modeling differences between the day-ahead and real-time markets can create profits for virtual bidders at the expense of ratepayers -- while adding little or no value to the markets -- was previously

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[71] Attachment F to Aliso Canyon Tariff Amendment at 13.

[72] XO Energy at 9-19.

[73] DMM Response to Comments, attachment 1 to this answer, at 2.

[74] *Id.*

[75] *Id.* at 2-3.

demonstrated in a February 2015 paper prepared by Dr. John Parsons of the MIT Sloan School of Management and several FERC staff.[76]

DMM supports the CAISO having the authority to suspend or limit virtual bidding to mitigate circumstances where "the reliability-based Aliso Canyon constraints result in virtual profits being th[e] kind of 'parasitic drain'" described in the paper authored by Dr. Parsons and Commission staff members.[77] In addition, DMM explains that "XO Energy's example simply illustrates that virtual schedules would serve to reverse the ISO's intentional reliability action (by decreasing generation prices and schedules in the south in the day-ahead market). This supports the argument that virtual schedules may need to be suspended if the ISO is granted the authority to use this reliability tool and if the ISO subsequently decides that it should use this reliability tool."[78]

The Commission itself has recognized that virtual bidding can both be profitable and not provide efficiency gains. In 2013, the Commission accepted tariff revisions filed by the CAISO to eliminate virtual bidding at the interties until the CAISO was able to replace its then-existing dual real-time market structure with an enhanced market structure and could eliminate all issues with intertie virtual bidding.[79] The Commission explained in relevant part that, due to the dual

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76 *Id.* (citing Parsons et al., *Financial Arbitrage and Efficient Dispatch in Wholesale Electricity Markets*, CEEPR WP 2015-002, February 2015).

77 *Id.* at 3.

78 *Id.* at 4.

79 *Cal. Indep. Sys. Operator Corp.*, 143 FERC ¶ 61,087 (2013). The Commission subsequently authorized the CAISO to reinstate convergence bidding on the interties 12 months after the implementation of the CAISO's enhanced fifteen-minute market, conditioned upon a CAISO demonstration that the issues that resulted in the suspension of intertie convergence bidding have all been resolved. *Cal. Indep. Sys. Operator Corp.*, 146 FERC ¶ 61,204, at PP 96-

market structure, "virtual transactions at CAISO interties did not improve market efficiency," and that the dual market structure "create[d] incentives and opportunities for market participants to continue the same [virtual] bidding strategies" that were netting them significant profits.[80] Thus, contrary to what XO Energy argues in this proceeding, it is entirely possible for virtual bidding to be profitable and also to provide no efficiency gains, and this has actually occurred. While the CAISO does not believe that virtual bidding needs to be suspended until November 30 as PG&E suggests, it is appropriate to take the less extreme step of clarifying the CAISO's authority to suspend or limit virtual bidding as the CAISO proposes here.

F. The Commission Should Accept the Tariff Revisions to Allow Resources to Seek After-the-Fact Cost Recovery from FERC in an FPA 205 Filing, Subject to One Modification on Compliance

In order to provide scheduling coordinators with an opportunity to recover marginal fuel procurement costs not recovered through the CAISO's tariff mechanisms, the CAISO proposes to establish a process in its tariff whereby a scheduling coordinator can seek to recover such costs after the fact pursuant to an FPA 205 filing submitted to the Commission. The CAISO will provide the requested cost recovery to the extent the Commission authorizes it.[81]

NRG states that it supports this opportunity for after-the-fact cost recovery but asks the CAISO to clarify that, under the proposed process, the CAISO will

103 (2014). The CAISO has not yet reinstated intertie convergence bidding due to the continuation of these issues. *See Cal. Indep. Sys. Operator Corp.*, 152 FERC ¶ 61,234 (2015).

80 143 FERC ¶ 61,087, at PP 9, 62, 67.

81 Transmittal letter for Aliso Canyon Tariff Amendment at 36-38; new tariff section 30.11.

provide the scheduling coordinator with a written explanation as specified in the tariff language in enough time to allow the scheduling coordinator to file with the Commission within 90 business days after the day on which the resource incurred the unrecovered costs.[82] The CAISO's review of the tariff language revealed that the language erroneously states that the CAISO will provide the written explanation within 60 days after the scheduling coordinator notifies the CAISO of the unrecovered costs (which notification must be made within 30 days after the unrecovered costs are incurred). The CAISO intended the language to instead state that the CAISO will provide the written explanation within 60 days after the unrecovered costs are incurred. The CAISO proposes to make this correction in a compliance filing submitted in this proceeding.

NRG also asks the Commission to require the CAISO to expand the tariff language to state that: (1) all OFO and real-time gas procurement costs incurred to follow CAISO dispatch instructions are included in the costs for which a generator may seek after-the-fact recovery from the Commission; and (2) gas disposal costs are a legitimate ground on which to seek after-the-fact cost recovery.[83] The Commission should reject NRG's proposed alternative formulation of the tariff language. The matter before the Commission is to determine whether the CAISO's proposal, not NRG's alternative, is just and reasonable. "Pursuant to section 205 of the FPA, the Commission limits its evaluation of a utility's proposed tariff revisions to an inquiry into 'whether the

[82] NRG at 12.

[83] NRG at 10-11.

rates proposed by a utility are reasonable – and not to extend to determining whether a proposed rate schedule is more or less reasonable to alternative rate designs.'"[84] Therefore, "[u]pon finding that CAISO's proposal is just and reasonable, [the Commission] need not consider the merits of alternative proposals."[85]

The CAISO does not agree with NRG that the CAISO must state at this time what costs are recoverable. The CAISO has previously stated that under certain circumstances OFO-related costs may be recoverable. However, the CAISO does not agree with NRG that all such costs should be recoverable. The CAISO also cannot agree that gas disposal costs are a legitimate ground on which to seek cost recovery. To make such a determination, the actual proceeding must first ensue. NRG is essentially requesting that the CAISO pre-judge what the Commission may consider as appropriate cost recovery in the after-the-fact cost recovery filings. This is inconsistent with the CAISO's proposal to allow parties to demonstrate, under section 2015 of the Federal Power Act,

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84 *Cal. Indep. Sys. Operator Corp.*, 141 FERC ¶ 61,135, at P 44 n.43 (2012), quoting *City of Bethany v. FERC*, 727 F.2d 1131, 1136 (D.C. 1984). In that same order, the Commission also explained that the revisions proposed by the utility "need not be the only reasonable methodology" and that "even if an intervenor develops an alternative proposal, the Commission must accept a section 205 filing if it is just and reasonable, regardless of the merits of the alternative proposal." *Cal. Indep. Sys. Operator Corp.*, 141 FERC ¶ 61,135, at P 44 n.43 (citing federal court and Commission precedent). *See also New England Power Co.*, 52 FERC ¶ 61,090, at 61,336 (1990), *aff'd*, *Town of Norwood v. FERC*, 962 F.2d 20 (D.C. Cir. 1992) (rate design proposed need not be perfect, it merely needs to be just and reasonable); *Louisville Gas and Elec. Co.*, 114 FERC ¶ 61,282, at P 29 (2006) (the just and reasonable standard under the Federal Power Act is not so rigid as to limit rates to a "best rate" or "most efficient rate" standard, but rather a range of alternative approaches often may be just and reasonable).

85 *Cal. Indep. Sys. Operator Corp.*, 141 FERC ¶ 61,135, at P 44.

that they have incurred gas related costs that they have not been able to recover and that it would be just and reasonable to allow recovery of such costs.

PG&E, on the other hand, states that it is not opposed to after-the-fact cost recovery in certain circumstances but that the Commission should limit such recovery to costs incurred due to a CAISO dispatch order occurring after 4:00 p.m. and before midnight, when generators are unable to update their gas nominations to adjust their supply in accordance with tariffs and system needs.[86] The Commission should reject this alternative proposal as well. Although the CAISO agrees that in its consideration of any after-the-fact recovery request the Commission can and should take into account the ability of generators to update their gas nominations, there may well be circumstances that would justify cost recovery outside of the proposed 4:00 pm to midnight timeframe.

G. The Tariff Revisions Will Not Adversely Affect Resources Participating in the Energy Imbalance Market

NV Energy makes a number of arguments that implementing the tariff revisions in the Aliso Canyon Tariff Amendment will adversely affect resources participating in the Energy Imbalance Market (EIM).[87] These arguments are without merit and beyond the scope of this proceeding.

As explained above, the tariff amendment provides a set of tools that the CAISO can use in its markets, on an interim basis until November 30, to maintain gas and electric reliability in light of the risks to the CAISO controlled grid posed by the limited operability of Aliso Canyon starting this summer. The tariff

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86 PG&E at 4-5.

87 NV Energy at 5-15.

amendment is intended in particular to maintain reliability in southern California. The tariff amendment is not meant to be a permanent solution or to ensure cost recovery by any resources, including EIM participating resources. NV Energy is not similarly situated to the generators taking service of the SoCalGas and SDGE gas system. While there may be spillover effects into the NV Energy balancing authority area just like there may be impacts on Puget Sound and other EIM balancing authority areas, NV Energy's resources are not subject to the potential operational restrictions that resources on the SoCalGas and SDG&E systems will face. Again, as discussed above, the overriding purpose of the various constraint and price increase mechanisms is not to guarantee full recovery of any and all costs incurred by resources, but rather to ensure that the CAISO can dispatch resources relying on the SoCalGas and SDG&E systems reliably through its markets.

The CAISO recognizes that NV Energy is required to submit cost-based bids at all times. If NV Energy believes additional flexibility to bid above DEBs is necessary, it may file with the Commission to modify its rate schedule and propose a specific alternative to the provision that requires it to participate in the Energy Imbalance Market at its default energy bid. Moreover, if an EIM participating resource believes it is unable to fully recover its gas procurement costs, the CAISO's proposal will permit it to seek after-the-fact cost recovery from the Commission pursuant to an FPA 205 filing. NV Energy expresses concern that EIM participating resources may not be eligible to utilize the after-the-fact cost recovery mechanism.[88] The CAISO clarifies that EIM participating resources are so eligible, and to the extent necessary the CAISO proposes to make this clear in the tariff in a compliance filing submitted in this proceeding.[89] Further, NV Energy will have the opportunity to participate in the upcoming stakeholder process to develop tariff revisions to be implemented after November 30. NV Energy can raise any issues specific to EIM entities and EIM participating resources at that time.

NV Energy also asserts that all EIM entities' merchant divisions should be granted market-based rate authority to bid into the EIM. NV Energy maintains that, at a minimum, the Commission should grant EIM entities' merchant divisions the ability to bid their marginal unit cost, in accordance with a proposal that Arizona Public Service Company has made in a separate proceeding.[90] These proposals are beyond the scope of this proceeding on the Aliso Canyon Tariff Amendment.

H. The Commission Should Not Require the CAISO to Initiate Stakeholder Processes to Develop Permanent Measures Beyond November 30 and Make Other Changes

EDF supports the CAISO's proposal as an emergency measure. However, EDF argues that the Commission should condition its acceptance of

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88 NV Energy at 14-15.

89 However, it would not be appropriate to grant NV Energy's request that the CAISO revise its tariff to state that EIM participating resources are eligible to receive the increased gas commodity price for commitment costs and default energy bid costs pursuant to new tariff section 39.7.1.1.1.3(d). *See* NV Energy at 12. For the reasons explained above, that tariff section applies solely to resources in southern California, not EIM participating resources.

90 NV Energy at 15-17.

the proposal on the CAISO's filing, by December 31, 2016, tariff revisions to resolve price formation problems that prevent generators from accurately reflecting and/or recovering fuel costs in the CAISO markets, consistent with prior Commission directives.[91] The Commission should reject EDF's proposal. Imposing such conditions at any time, but particularly s during emergency situations is not appropriate. In any event, the CAISO has already stated it will launch a stakeholder process to consider these very issues.

EDF argues that the Commission should require the CAISO to initiate a stakeholder process to reconsider its decision in its Order No. 809 compliance filing to maintain the current timing of the natural gas and electric markets. Without Aliso Canyon storage, EDF claims, such reconsideration is warranted so that day-ahead market results are announced before the timely nomination cycle.[92] This issue is beyond the scope of the instant proceeding. The Commission should not revisit its December 2015 order accepting the CAISO's filing to comply with Order No. 809. In that order, the Commission also directed the CAISO to file annual informational reports for the next three years that explain ongoing efforts to further improve gas-electric coordination. The CAISO will do so.

EDF asserts that the CAISO should have considered additional market-based measures on the electricity demand side, such as expansion of the California Flex Alert program or a market-based procurement of demand

91 EDF at 4-6.

92 EDF at 6-7.

response reliability MWh.[93] The CAISO is already looking into these possible measures. As stated in the Revised Draft Final Proposal, besides the issues evaluated in the stakeholder process, CAISO operations is also considering other measures to support reliability, including use of Flex Alerts and demand response measures.[94]

EDF argues that the Commission should require the CAISO to develop and propose a demand response program element should there be a need to continue out-of-market reliability measures beyond the summer of 2016.[95] This proposal is beyond the scope of the instant proceeding to implement emergency measures that will expire on November 30 unless extended by the Commission. During this time, the CAISO will dispatch demand response in the market economically based on bids. The CAISO recognizes that bid-in demand response can be useful and competitive within the southern California region, and that utility-based demand response may also help mitigate conditions.

NRG argues that the Commission should mandate that the CAISO develop permanent fixes to its market rules that do not allow generators to fully reflect their fuel costs in offers to the CAISO, for implementation by December 1, 2016. NRG also states that the CAISO has not yet fulfilled a Commission expectation to consider longer-term market design changes to its commitment cost rules.[96] The Commission should find no merit in NRG's comments. The

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93 EDF at 7.

94 Attachment D to Aliso Canyon Tariff Amendment, Revised Draft Final Proposal, at 12.

95 EDF at 7-8.

96 NRG at 2-3, 14-16.

CAISO has diligently explored how to improve its commitment costs polices and has implemented continuous improvements over the years that have increased bidding flexibility and identified costs that can be recovered.[97] The CAISO is exploring and will continue to explore longer-term design changes. This does not mean, however, that the CAISO will implement NRG's preferred design or implement design changes on a timetable that NRG desires. Nor has the Commission directed the CAISO to implement any specific changes or imposed a specific timetable for changes. NRG desires the ability to have greater flexibility on bidding commitment cost similar to the flexibility that applies to energy bids. DMM has pointed out that market power mitigation would need to be an integral component of increased commitment cost bidding flexibility. The CAISO will continue to engage with stakeholders on the topics of bidding flexibility and cost recovery, *e.g.*, in the ongoing bidding rules enhancements stakeholder initiative.[98]

I. Other Issues

NRG states that the Commission should accept the Aliso Canyon Tariff Amendment, subject to an emergency compliance filing to be submitted by the end of May to address the concerns raised by NRG.[99] As discussed within the body of this answer and the transmittal letter accompanying the emergency tariff

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97 Two recent notable changes include allowing scheduling coordinators electing the proxy cost option to bid up to 125 percent of proxy costs and adding the major maintenance cost category. *See Cal. Indep. Sys. Operator Corp.*, 145 FERC ¶ 61,082 (2013); *Cal. Indep. Sys. Operator Corp.*, 149 FERC ¶ 61,284 (2015).

98 Materials related to the bidding rules enhancements stakeholder process are available on the CAISO website at http://www.caiso.com/informed/Pages/StakeholderProcesses/BiddingRulesEnhancements.aspx.

99 NRG at 2, 16.

amendment, the CAISO does not agree with NRG's demands, which are largely unsupported and an attempt to use this emergency filing as the basis for obtaining rule changes it has not in the past been successful in obtaining. The only clarifications requested by NRG that the CAISO agrees to are: (1) the clarification that the units for the scaler cap to be used for commitment costs are limited to resources served by SoCalGas and SDG&E; and (2) the fact that the after-the-fact cost recovery applies to all resources and not only those resources in the southern California region.

NRG argues that the Commission should direct the CAISO to develop a document, such as a business practice manual dedicated to Aliso Canyon issues, which details how the CAISO will implement its emergency authority. NRG asserts that the document should be made available to market participants by June 2.[100] The CAISO is already preparing a business practice manual dedicated to the interim Aliso Canyon issues and plans on publishing the draft in the upcoming days.

PG&E argues that the Commission should condition its acceptance of the Aliso Canyon Tariff Amendment on the CAISO's performing at least two weeks of market simulation and testing for market participants prior to implementing the tariff revisions. As the CAISO has explained, given the urgency of the situation and the need to have these provisions in place by June 2, the CAISO cannot conduct a market simulation beforehand. However, the CAISO is deploying the necessary software changes consistent with its software development

100 NRG at 12-13.

procedures and will be monitoring for and remedying any software issues after go live.[101]

PG&E states that the CAISO's current mitigation rules should be kept in place, and that the Commission and the CAISO should monitor for market behavior and institute new rules if necessary.[102] The CAISO agrees with PG&E that there is no basis for lifting the bid caps at this time. The CAISO has not proposed any such changes and also agrees that the CAISO's current mitigation procedures should remain in place.

PG&E argues that the Commission should require the CAISO to file detailed monthly reports to monitor market results while the interim measures are in place.[103] Again, as discussed above, monthly reports are not feasible for the CAISO to produce, and the Commission should find the CAISO's alternative proposal to submit a report at the end of August is reasonable.

Six Cities state that, although the Commission should approve the Aliso Canyon Tariff Amendment, it does not address local reliability issues exacerbated by the limited operability of Aliso Canyon, which creates outage risks affecting the Pasadena and Riverside municipal electric systems. Six Cities assert that the Commission should order the CAISO to work directly with Pasadena and Riverside to resolve these concerns.[104] The CAISO has already met with Six Cities members in their role as transmission owners and load-

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101 *See* transmittal letter for Aliso Canyon Tariff Amendment at 20, 31.

102 PG&E at 6-7.

103 PG&E at 7.

104 Six Cities at 2-4.

serving entities to discuss the reliability impacts of the limited operability of Aliso Canyon, and the CAISO commits to continuing these discussions.

WPTF/EPSA argue that the Commission should impose the following monitoring and reporting requirements: (1) direct the CAISO to make a filing every thirtieth day detailing the status and implementation of any proposals accepted in this docket, and provide interested parties with an opportunity to comment on this report;[105] and (2) thirty days after submission of the second such report, the Commission should hold a technical conference in California to provide a forum for further considering the efficacy of the measures and any necessary changes.[106] As discussed above and in the Aliso Canyon Tariff Amendment, the CAISO is conducting a stakeholder process to evaluate the performance of the proposed measures and determine whether the CAISO needs to make further changes, modify the proposed changes, or retain the proposed changes as-is beyond November 30 to address fall and winter conditions. Therefore, there is no need for a technical conference. Rather, the Commission should allow the CAISO and interested parties to address these issues through the upcoming stakeholder process. All stakeholders will also have the opportunity to participate in the Commission proceeding addressing the CAISO's subsequent filing regarding further changes.

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105 WPTF/EPSA at 22-23.

106 WPTF/EPSA at 23.

II. Conclusion

For the foregoing reasons, the CAISO requests that the Commission accept the tariff revisions contained in the Aliso Canyon Tariff Amendment as submitted, subject only to the modifications the CAISO proposes in this answer.

Respectfully submitted,

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Dated: May 24, 2016

Attachment 1

Response to Comments on ISO's Final Aliso Canyon Gas-Electric Coordination Proposal

Department of Market Monitoring

May 24, 2016

The Department of Market Monitoring (DMM) responds to the following comments filed on the ISO's proposed tariff changes on Aliso Canyon.

- XO Energy argues that virtual bids should never be suspended during the Aliso Canyon outage based on the assertion that "[t]he basic economic principles of convergence bidding dictate that if convergence bidding is profitable, by definition, market efficiencies will have increased."[1] In these comments, DMM explains why this assertion is incorrect. DMM explains how modeling differences between the ISO's day-ahead and real-time markets – such as those being proposed to manage gas issues related to Aliso Canyon – create opportunities for financial entities to profit from virtual bids at the expense of ratepayers without increasing market efficiency.

- NRG argues that the gas cost adders proposed by the ISO are too low, stating that same day gas prices have historically exceeded next day gas prices by more than the 200 percent level for commitment costs incorporated in the ISO's proposal.[2] The single day used by NRG to support this statement (February 6, 2014) represents the *only* day in the last 10 years that same day gas prices have exceeded next day gas prices by more than the 200 percent level incorporated in the ISO's proposal. These comments provide additional analysis by DMM showing that that the initial gas price adders being proposed by the ISO will result in bid caps that cover almost all of the historic volatility observed at Southern California trading hubs.

- The Western Power Trading Forum (WPTF) opposes the additional authority to deem constraints non-competitive in cases when the ISO's automated mitigation procedures may incorrectly identify constraints as competitive due to special gas usage constraints imposed on some resources in the Socal gas area. DMM explains how WPTF erroneously asserts that this may result in resources in Northern California being mitigated for congestion into gas constrained areas in the Socal gas system.[3] WPTP also erroneously contends that "CAISO has failed to provide any evidence that its existing LMPM framework will be ineffective given conditions at Aliso Canyon." [4] In fact, DMM's comments included analysis of two years of historical information on congestion in the north-to-south direction on Path 26 showing that this constraint is often close to the threshold between competitive and non-competitive, so that the impact of the gas usage constraint may at times be enough to change the competitive status of this constraint.

[1] Comments of XO Energy, LLC on CAISO's Proposed Tariff Amendment, May 16, 2016, ER16-1649 (XO Energy Comments).

[2] Limited Protest and Comments of the NRG Companies, May 16, 2016, ER16-1649, (NRG Comments, p. 7).

[3] Motion to Intervene, Protest, and Comments of the Western Power Trading Forum and the Electric Supply Association, May 16, 2016, ER16-1649 (WPTF Comments, pp. 14-15).

[4] WPTF Comments, p. 15.

Response to XO Energy comments on the ISO's request for authority to suspend or limit virtual bidding that detrimentally affects ISO market efficiency

XO Energy, LLC (XO Energy) argues that virtual bids should never be suspended during the Aliso Canyon outage. The basis underlying all of XO Energy's arguments is the incorrect assertion that "[t]he basic economic principles of convergence bidding dictate that if convergence bidding is profitable, by definition, market efficiencies will have increased."[5] Based on this incorrect assertion, XO Energy contends that FERC and the ISO should not consider potential inefficiencies caused by the interaction between virtual bids and the ISO's proposed Aliso Canyon reliability tools.

DMM believes that it has been clearly established that modeling differences between the ISO's day-ahead and real-time markets create opportunities for financial entities to profit from virtual bids at the expense of ratepayers without increasing market efficiency. XO Energy claims that DMM's statement of this concept in prior comments submitted to the Commission "appear to be both false and misleading."[6] As discussed below, this concept has been established through reports and filings by DMM and the ISO describing in detail several types of modeling differences that have been exploited by virtual bidding entities and which have already cost ISO ratepayers over a hundred million dollars. The fact that modeling differences between the day-ahead and real-time markets can create profits for virtual bidders at the expense of ratepayers – while adding little or no value to the markets – was also established by Dr. John Parsons of the MIT Sloan School of Management and several FERC staff in a February 2015 paper. [7]

As described in the Aliso Canyon Action Plan, the Aliso Canyon outage is likely to create reliability constraints on the operation of Southern California gas resources in real-time that do not exist on these resources in the day-ahead time frame.[8] The ISO is asking in its tariff amendment for, among other things, the authority to implement modeling differences between the ISO's day-ahead and real-time markets in order to manage these real-time reliability constraints. Depending on which elements of the ISO's proposal FERC approves – and the frequency and magnitude with which the ISO implements any reliability-based modeling differences – these modeling differences may create opportunities for financial entities to profit from virtual bids at the expense of ratepayers while undermining reliability or contributing little or nothing to market efficiency.

XO Energy's arguments and its examples supporting those arguments rely on a theoretical construct of electricity markets that does not exist in any RTO. As Dr. John Parsons of MIT and several FERC staff concluded in their February 2015 paper, the basic "theory behind virtual bidding relies on a very strong assumption that the stages of organized wholesale markets operate identically."[9] However, the day-ahead and real-time stages are designed in reality to never operate identically. This will be particularly

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[5] Comments of XO Energy, p. 6.

[6] Comments of XO Energy, p. 9.

[7] Parsons et al., *Financial Arbitrage and Efficient Dispatch in Wholesale Electricity Markets*, CEEPR WP 2015-002, February 2015. This paper is available on MIT's website at: http://www.mit.edu/~jparsons/publications/20150300_Financial_Arbitrage_and_Efficient_Dispatch.pdf.

[8] *Aliso Canyon Action Plan to Preserve Gas and Electric Reliability for the Los Angeles Basin*, April 8, 2016. Available at: http://www.energy.ca.gov/2016_energypolicy/documents/2016-04-08_joint_agency_workshop/Aliso_Canyon_Action_Plan_to_Preserve_Gas_and_Electric_Reliability_for_the_Los_Angeles_Basin.pdf.

[9] Parsons et al., 2015 p. 2.

true for the ISO if it implements more modeling differences between the day-ahead and real-time markets in order to address reliability concerns during the Aliso Canyon outage.

Dr. Parsons et al., established that when there are modeling differences between the day-ahead and real-time markets, "virtuals may cause the average DA/RT spread to move closer to zero, and nevertheless all virtual profits are a purely parasitic drain, and, in addition, virtual trading has increased system costs."[10] If the reliability-based Aliso Canyon constraints result in virtual profits being this kind of "parasitic drain", the ISO should have the authority to suspend virtual bidding.

As described in detail in several filings and reports prepared by DMM and the ISO since the inception of virtual bidding in the ISO in 2011, ISO ratepayers have already borne the cost of over a hundred million dollars of uplift payments to virtual bidding entities that have profited from modeling differences, while adding little to no value in terms of market efficiency. For example, an April 2013 report by DMM described two strategies that virtual bidders have used to profit from modeling differences at the expense of ratepayers while creating no market efficiency benefits:[11]

- Offsetting virtual supply and demand schedules that profited from the intentional modeling difference under which real-time intertie node schedules settled on hour-ahead scheduling process (HASP) market prices but real-time internal node schedules settled on real-time dispatch (RTD) market prices.[12]
- Offsetting virtual supply and demand schedules that profit from transmission constraints being modeled to have more capacity for market schedules in the day-ahead market than in the real-time market. [13]

Over the period analyzed in DMM's April 2013 report, these types of modeling differences accounted for the vast majority of all net virtual bidding profits.

During the Aliso Canyon outage, DMM is concerned that similar virtual bidding strategies may be employed to profit from Aliso Canyon reliability-based modeling differences, while undermining reliability and not increasing market efficiency. The specific virtual bidding strategies that may be employed will depend on which elements of the ISO's proposal that FERC approves and on the frequency and magnitude with which the ISO implements any reliability-based modeling differences.

DMM described one problematic virtual bidding strategy on pages 13-14 of its prior comments provided in attachment F to the ISO's tariff amendment. The strategy would be used in conjunction with the ISO's proposal to reserve transfer capability into a gas-constrained region in the day-ahead market. If the ISO routinely releases the reserved transfer capability in real-time, the day-ahead congestion price of the transfer path could be expected to be higher than the real-time congestion price. Virtual supply placed

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[10] Parsons et al., p. 52.

[11] *Real-time Revenue Imbalance in CAISO Markets*, Department of Market Monitoring, April 24, 2013 (DMM Revenue Imbalance Report). Available at: http://www.caiso.com/Documents/DiscussionPaper-Real-timeRevenueImbalance_CaliforniaISO_Markets.pdf

[12] DMM Revenue Imbalance Report, p.14.

[13] DMM Revenue Imbalance Report, pp. 15-17.

downstream of the path and virtual demand placed upstream of the path could expect to profit from this difference in the path's congestion price.

XO Energy argues that, under the scenario identified in DMM's prior comments, virtual schedules would tend to decrease the day-ahead prices and schedules of the gas generators in the gas constrained area downstream of the relevant constraint. However, as described below, XO Energy's comments actually confirm that virtual schedules would undermine the ISO's ability to use transfer capacity reservations to protect electric grid reliability.

In the scenario that DMM identified in its prior comments, the purpose of reserving transfer capacity into the gas-constrained region in the day-ahead market would be to increase the day-ahead schedules of gas resources in the region. Increasing the day-ahead schedules of gas resources in the region would allow the reserved transfer capacity to be used to respond to real-time load and supply uncertainties and contingencies. This could play an important reliability role in scenarios when protecting real-time gas system reliability requires constraining real-time incremental dispatches of the gas resources in the region.

Reserving transfer capacity in the day-ahead market would raise prices in the gas-constrained region *by design*. The cost of reserving this transfer capacity in the day-ahead market would be an intentional expense incurred to protect the reliability of the electric power grid.[14] By reserving the transfer capacity in the day-ahead market and releasing it in real-time, the ISO would be intentionally creating a modeling difference between the day-ahead and real-time in order to address a gas system reliability issue.

As Parsons et al. established, when there are modeling differences between the markets, profitable virtual bids may not be helping the markets. XO Energy's example simply illustrates that virtual schedules would serve to reverse the ISO's intentional reliability action (by decreasing generation prices and schedules in the south in the day-ahead market). However, this supports the argument that virtual schedules may need to be suspended if the ISO is granted the authority to use this reliability tool and if the ISO subsequently decides that it should use this reliability tool.

Depending on the elements of the ISO proposal that FERC approves and that the ISO decides to utilize, other scenarios could arise in which a virtual bidding strategy is profitable on average when employed over time, but which would tend to undermine a reliability tool or create costs for ratepayers without increasing market efficiency. For example, one such concern would arise under a scenario in which FERC rejected the ISO's proposed tariff language in section 27.11 stating, "[t]he Shadow Price of the [gas usage] constraint will not be reflected in the Marginal Cost of Congestion component of Locational Marginal Prices for purposes of setting cleared Demand, Virtual Bids, or Congestion Revenue Rights."

Under this second scenario, if the ISO uses the proposed maximum gas usage constraint in real-time to manage reliability, this constraint would tend to decrease real-time market prices at gas-constrained gas resource nodes relative to neighboring nodes. Whenever this maximum gas usage constraint was not enforced in the day-ahead market, a low-risk but profitable virtual bidding strategy would be to place virtual supply at a gas-constrained gas resource node and virtual demand at a neighboring node that was not included in the maximum gas usage constraint. The offsetting virtual schedules would allow the

[14] The concept of enforcing a constraint that increases system costs in order to protect reliability is not a new concept. Every thermal-based transmission constraint enforced in the market creates additional costs in order protect grid reliability.

virtual bidder to profit from the maximum gas usage constraint real-time market shadow price, or at a minimum would allow the virtual bidder to break even. This profitable offsetting virtual strategy would have no impact on the day-ahead market. Therefore it would not increase market efficiency. Moreover, the profits received by the offsetting virtual schedules would come from revenue imbalance that would be paid by ratepayers through real-time imbalance offset charges.

In conclusion, depending on the elements of the ISO proposal that FERC approves and how the ISO decides to utilize them, scenarios could arise in which modeling differences between the day-ahead and real-time markets create profitable opportunities for virtual bidders that do not increase market efficiency, impose costs on other participants, and may complicate the ISO's efforts to manage the reliability and market issues stemming from the Aliso Canyon gas system outage. In order to limit the detrimental financial impacts that virtual bids could have under such scenarios, DMM supports the ISO having expanded ability to suspend virtual bidding as part of the special temporary measures being proposed to manage the Aliso Canyon issue.

Response to NRG comments on proposed gas prices adders

NRG states that "real-time natural gas prices by themselves – even ignoring the OFO penalty charges – have historically exceeded the 200% cap proposed by the CAISO."[15] NRG supports this comment showing data for a single day (February 6, 2014).[16] As described below, this represents the *only* day in the last 10 years that same day gas prices have exceeded next day gas prices by more than the 200 percent level incorporated in the ISO's proposal.

Figure 1 shows the deviations in same day prices from the corresponding next day average price (as a percent of the next day average price) for all days where at least one same day trade was reported since 2005.[17] The green dots represent the weighted average same day price, and the green vertical lines show the range between the minimum and maximum price for each day.

As shown in Figure 1, the day shown in NRG's comments represents the *only* day in the last 10 years that same day gas prices have exceeded next day gas prices by more than the 200 percent adder level incorporated in the ISO's proposal.[18] The maximum by which same day prices exceeded next day prices was less than 250 percent, which occurred during the February 2014 polar vortex event upon which NRG's comments are based. Even this isolated 250 percent increase is significantly lower than the level of the proposed operational flow order stage 5 penalty for commitment costs.[19] The ISO's proposed

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[15] NRG Comments, p. 7.

[16] NRG Comments, p. 8.

[17] The calculations are based on next day and same day trading on the InterContinental Exchange (ICE) using the SoCal Border prices from November 2005 to September 2008 and the SoCal Citygate prices from October 2008 to April 2016.

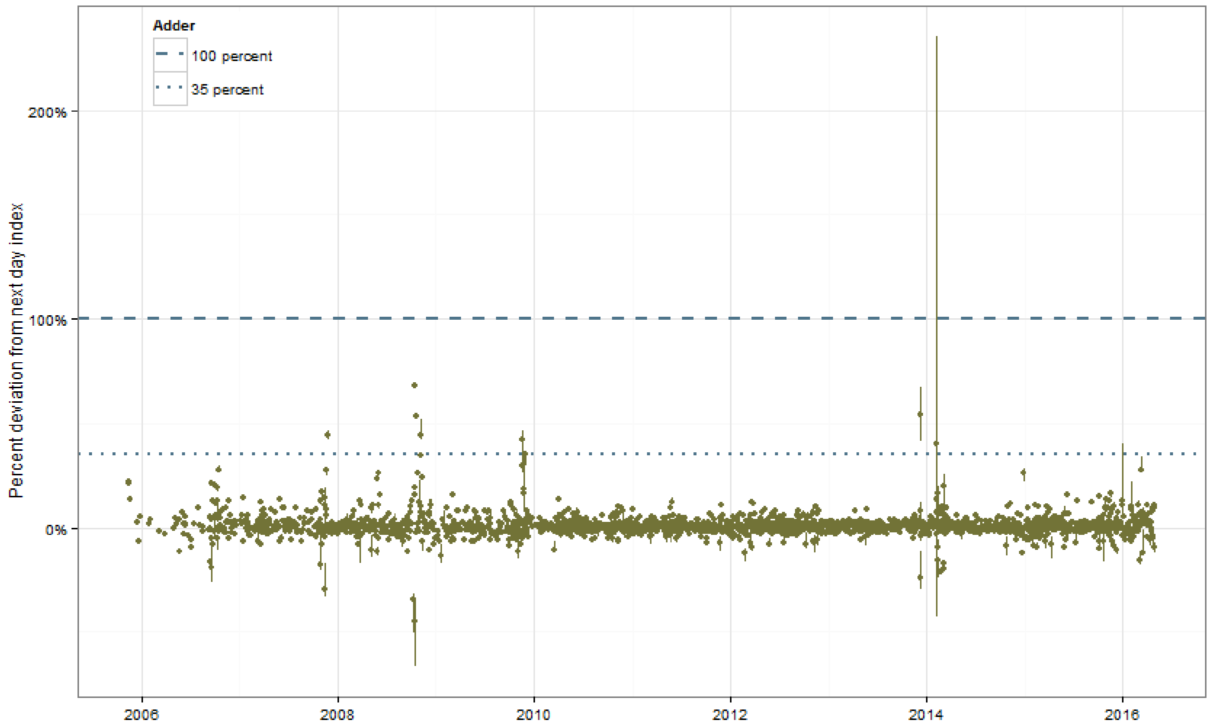
[18] With an adder of 100 percent (current 25 percent plus proposed 75 percent scalar) for commitment costs, only one day has ever had same day gas prices higher and that was in early February 2014 as a result of the unique polar vortex conditions that occurred during that winter.

[19] DMM understands that a new operational flow order process was only added to the SoCal Gas and SDG&E systems at the beginning of the year. But this further reinforces the uncertainty of the new conditions on prices. The ISO has proposed to analyze the market changes and make adjustments based on "systematic" changes in market prices.

after-the-fact recovery provisions were designed to cover the rare events, such as the polar vortex events, that could occur.

Furthermore, DMM's analysis of historic same day trading of natural gas in Southern California since 2005 finds that the adjusted headroom proposed by the ISO for default energy bids is sufficient in covering 99.7 percent of the upward volatility in same day trading relative to next day indices.[20]

Figure 1. Historic difference between next-day and same gas day prices in Southern California



As noted by NRG, the ISO intended its cap on the potential increase in the commitment cost scalar to reflect the stage 5 operational flow order penalty.[21] The ISO transmittal letter noted the cap as $2.50 plus two times the next day gas index.[22] NRG clarified with the ISO that this is to reflect $2.50/therm,

[20] An adder of 35 percent (current 10 percent plus proposed 25 percent scalar) covers the range of same day trading on the InterContinental Exchange (ICE) during 99.7 percent of days. In total there were 12 days (0.3 percent), where the 35 percent cap was less than the maximum trade price reported on ICE.

[21] NRG Comments, p. 6.

[22] See ISO transmittal letter, *Tariff Amendment to Enhance Gas-Electric Coordination to Address Risks Posed by Limited Operability of Aliso Canyon Natural Gas Storage Facility*, May 9, 2016, p. 17: http://www.caiso.com/Documents/May9_2016_TariffAmendment_EnhanceGas-ElectricCoordination_LimitedOperation_AlisoCanyonNaturalGasStorageFacility_ER16-1649.pdf.

which would result in a price of $25/MMBtu plus two times the natural gas price index. [23] DMM believes that the higher cap further reinforces DMM's position that raising the scalar adder on natural gas prices used in commitment cost caps or default energy bids to reflect these potential gas penalty levels would likely just exacerbate costs and increase the potential for exercising market power and gaming, without making any additional supply available.

NRG notes that dispatches causing operational flow order penalties would be done under careful coordination between the gas company and the ISO based on "authorized" dispatches and commitments.[24] However, it is important to note that the increase in bidding parameters would reflect the *possibility* of operational flow order penalties, rather than actual realized operational flow order penalties. Thus, resources would be, in many cases, receiving bid costs that were not associated with any actual penalties as they are not true marginal costs. This is discussed in further detail below.

With respect to commitment costs, DMM believes that the most important argument for including a scalar value is that the cap should be high enough to adjust the merit order such that natural gas resources in the SoCal gas regions are only committed to meet local generation needs as opposed to system generation needs. Based on DMM's analysis, we found that with a 75 percent scalar for minimum load costs, about 82 percent of gas-fired capacity in the Socal gas regions would have minimum load bid caps higher than resources elsewhere in the ISO system.[25] When comparing results for each generation type separately (combined cycle, combustion turbine, and steam turbine), DMM found that a 75 percent scalar for minimum load costs was more than sufficient to minimum load bid caps for almost all natural gas fired generation in the Socal gas areas higher than resources of the same generation type elsewhere in the ISO system.

As long as a resource is able to raise bids to avoid being dispatched for system needs, adders that go beyond this point do nothing to improve commitment decisions but rather increase costs. Once a resource is needed for a local need, the ISO software or operators will attempt to commit this resource to meet the local need. Reflecting the operational flow order penalty in commitment costs, which could be over 17 times the prevailing natural gas prices, has the potential to increase bid cost recovery and increase the possibility of gaming make whole payments.[26]

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[23] Using this clarification, we modify our calculation of the cap. Prevailing natural gas prices at the SoCal Citygate are currently around $2.10/MMBtu. This results in an adder of $25 + $2.10 *2 = $29.20/MMBtu. Combined with the current adder of 125 percent this would result in a total fuel cost of ($29.20/MMBtu * 1.25) = $36.50/MMBtu. This results in a price that is over 17 times larger than the $2.10/MMBtu gas price.

[24] NRG Comments, p. 6.

[25] DMM *Comments on Final Aliso Canyon Gas-Electric Coordination Proposal*, May 9, 2016: http://www.caiso.com/Documents/May9_2016_TariffAmendment_EnhanceGas-ElectricCoordination_LimitedOperation_AlisoCanyonNaturalGasStorageFacility_ER16-1649.pdf.

[26] For example, assume a 400 MW Southern California unit with a minimum load of 100 MW at a cost of $5,000 at the proxy cost cap of 125 percent. Assume that the fuel costs represent 60 percent of the total cost for a cost of $3,000. A scalar adder of 75 percent would result in a new minimum load cost of $7,250 ($3,000 * 1.75 + $2,000). If the unit bid its costs near that operational flow order penalty, the fuel costs would be over 17 times the price of gas. Multiplying the fuel cost by 17 results in a total cost of $53,000 ($3,000 * 17 + $2,000). Assume there is a Northern California system resource with a minimum load cost at $6,000. Also assume that in both cases the units are already on-line, but not scheduled for an hour. With no scalar, the Southern California resource is cheaper than the Northern California resource and would likely be accepted by the market first. With the scalar adder, the Southern California resource is now more expensive and likely would not be accepted for a system need. However, if the need were local and not system and this was the only resource that could resolve

With respect to energy bids, DMM notes that participants can place energy bids up to the offer cap of $1,000/MWh. DMM expects that participants will reflect their expectations of risk into their energy market bids. Default energy bids are only used to limit market bids when congestion is projected to occur on a constraint that is structurally non-competitive. Moreover, in this situation default energy bids are only used to mitigate market bids for resources that can relieve this congestion.[27]

Furthermore, it is important to recognize that the operational flow order penalty may not in fact be an hourly marginal cost at the resource level for a variety of reasons. First, the penalty is applied on daily imbalances, not hourly imbalances. Second, DMM has spoken with several market participants and has learned that in many, if not most cases, participants buy natural gas from the gas company as part of a pool of multiple resources. For instance, a scheduling coordinator may have 10 natural gas generators that they buy natural gas for as part of one group. The pipeline assesses penalties if the combined pool of resources deviates by more than their target threshold, which is not necessarily an individual natural gas plant. For instance, if the operational flow order threshold is 5 percent and one power plant increases its output by 6 percent in real-time relative to its day-ahead schedule, then the possibility of the pool exceeding its gas imbalance threshold depends on the size of this resource relative to the rest of the pool. DMM understands that power plants entered into these pooling arrangements to minimize pipeline penalty risk and will continue to do so going forward.

Finally, DMM strongly supports the right for participants to recover any costs that have not been recovered in the market through an after-the-fact review of both commitment and energy costs. If this cost recovery provision had been in effect during the polar vortex period during the winter of 2014, the under-recovery concerns because of same day price volatility that NRG outlines in its comments may have been resolved very differently.[28]

DMM recognizes this and has been very supportive of the provisions to recover after-the-fact costs. DMM supports explicit provisions on allowing recovery of gas penalties which are incurred as a direct result of (1) an ISO real-time commitment, (2) exceptional dispatch or (3) real-time energy dispatch when a unit was subject to bid mitigation. This approach provides more protection against local market power, potential gaming of commitment costs, and excessive costs to consumers in excess of actual incurred gas procurement costs.

In sum, DMM believes that the increased bidding flexibility allowed under the ISO proposal with appropriate caps well below operational flow order penalty levels should be sufficient to continue to cover the vast majority of natural gas volatility. Any gas costs actually incurred due to an ISO

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the local need, the Southern California resource would likely be accepted irrespective of the bid at $7,250 or $53,000. The additional generation may or may not cause the gas resource pool to exceed the imbalance tolerance, but the total cost to load will have increased by $45,750 with no additional benefit. If the cost of gas to the generators was more than $7,250, they could seek after-the-fact recovery. If the same day price was systematically different, then the scalar would have been adjusted to account for the systematic gas price difference.

[27] Furthermore, when bid mitigation is triggered, bids are lowered to the *greater* of 1) a competitive price absent any congestion that is deemed uncompetitive, and 2) the resource's default energy bid. Thus, bids may not be mitigated down to the default energy bid when mitigation is applied.

[28] NRG Comments, pp. 8-9. NRG's comments reflect specific conditions during the extraordinary polar vortex conditions in the winter of 2014.

commitment or dispatch of energy bids subject to mitigation should be recovered through the ISO's proposed after-the-fact recovery process. DMM strongly believes that extending a participant's ability to exercise local market power in the electric market up to an administrative penalty set by the gas company is not just and reasonable.

Response to WPTF comments on mitigation

The Western Power Trading Forum (WPTF) opposes the additional authority to deem constraints non-competitive in cases when the automation procedures would overestimate the actual available supply of counter-flow due to the gas usage constraints imposed on some resources in the Socal gas area. WPTF opposes based on the incorrect argument that this could result in mitigation of resources in Northern California. As WPTF explains:

> … CAISO's proposal is unduly broad and will result in the mitigation of market participants who do not pose any market power concerns. CAISO's proposal appears to be driven by a concern that gas limitations in Southern California will limit the availability of resources able to provide counterflow during those intervals when Path 26 is congested in the north-to-south direction. Under CAISO's proposal, it appears that CAISO would deem Path 26 uncompetitive whenever it believes that it is being affected by gas usage constraints in Southern California, with the result that all bids effective at relieving this constraint in Northern and Southern California will be subject to bid mitigation. What CAISO ignores, however, is that, regardless of conditions in Southern California, there will be ample resources available in Northern California. The mere fact that there may be supply limitations in Southern California, does not mean that resources in Northern California will exercise market power. Yet, under CAISO's Proposal, it appears that these resources will be subject to bid mitigation anytime that CAISO believes that gas usage restrictions in Southern California create competitive concerns. [29]

WPTF's arguments are based on a complete misunderstanding – or misrepresentation – of the ISO's local market power mitigation procedures and the ISO's proposal. As explained in DMM's comments included in the ISO's filing, this authority would only be exercised to account for the degree to which the gas usage constraint imposed on some resources in the SoCal system may cause the automated DCPA to cause constraints to be incorrectly deemed competitive. Thus, the only impact that this could have is to cause constraints deemed uncompetitive in the direction *into* areas in which resources impacted by this the gas usage constraint are located. Moreover, bid mitigation would only be triggered for resources in Southern California when congestion is projected to occur into these areas (e.g. in the north-to-south direction on Path 26 due to higher real-time energy bids in the Southern California). In this case, since only resources in Southern California could relieve this congestion, only resources in Southern California would be subject to bid mitigation.

WPTP also erroneously contends that "CAISO has failed to provide any evidence that its existing LMPM framework will be ineffective given conditions at Aliso Canyon." [30] On the contrary, DMM's comments provided an empirical analysis of the sensitivity of the ISO's automated Dynamic Competitive Path Assessment (DCPA) results when congestion was projected to occur on Path 26 in the *north-to-south*

[29] WPTF Comments, pp. 14-15.

[30] WPTF Comments, p. 15.

direction over the last two years from any overestimation of the actual supply of available counter-flow due to the gas usage constraint. This analysis showed that when congestion occurs in this direction on Path 26, results of the DCPA are often close to the threshold between competitive and non-competitive.[31]

Both of these analyses show that Path 26, like other constraints in the ISO system, is often close to the threshold between competitive and non-competitive. The impact of the gas usage constraint may be enough to change the competitive status of constraints at times, but cannot be incorporated into the DCPA. While this analysis centers on Path 26, the gas usage constraint may cause the DCPA to overestimate the competitiveness of a variety of constraints within Southern California.

[31] For example, DMMs's analysis showed that "during about 43 percent of the intervals in which Path 26 was projected to be binding over the last two years, the competitive supply of counter-flow exceeded demand by less than 200 MW. If the gas usage constraint were in place in those intervals and decreased the competitive supply of 15 minute counter-flow by 200 MW or more, the constraint would be structurally non-competitive" (pp.10-12)

CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon all of the parties listed on the official service list for the above-referenced proceeding, pursuant to the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Washington, DC this 24th day of May, 2016.

/s/ Bradley R. Miliauskas
Bradley R. Miliauskas