

Memorandum

To: ISO Board of Governors
From: Eric Hildebrandt, Director, Market Monitoring
Date: July 19, 2017
Re: Department of Market Monitoring update

This memorandum does not require Board action.

EXECUTIVE SUMMARY

This memo provides comments by the Department of Market Monitoring (DMM) on Management's proposal to extend and expand several market changes and operational tools to address reliability risks caused by the limited operability of the Aliso Canyon natural gas storage facility.

In early 2016, DMM worked closely with the ISO to develop several measures to address the risk and uncertainties associated with the limited operability of Aliso Canyon. Over one year later, the ISO and participants have much more extensive experience with these measures and the impacts of Aliso Canyon limitations. Based on this experience, DMM expressed numerous concerns and recommendations about the ISO's proposal in the stakeholder process. The ISO's draft final proposal does not address many of these issues. These concerns and recommendations would need to be addressed before DMM could support approval or implementation of this initiative.

Most notably, DMM does not support continuation of the ISO's authority to continue scaling up gas prices normally used in mitigation of commitment costs and energy bids in real time market by 75 percent and 25 percent, respectively. Gas and electric market data over the last year do not support the need for these special gas price scalars. DMM also believes it is premature for the ISO to expand use of gas usage constraints beyond the area affected by Aliso Canyon to include the rest of the ISO system and the energy imbalance market until additional details are worked out and modifications are made to this feature.

GAS PRICE SCALERS

The ISO calculates cost-based bids used for mitigation in the real-time market using gas prices in the *next day* spot market for natural gas. These next day prices reflect cost for gas scheduled for delivery the following operating day. During the operating day, generators may also purchase gas in the *same day* market to sufficiently balance gas usage and schedules. Prices for additional gas in the same day market are sometimes higher (or lower) than the prices in the next day gas market used by the ISO to calculate cost-based bid caps for start-ups, minimum load and energy.

To account for potentially higher gas prices for any gas needing to be procured in the same day market, the ISO normally adds an additional 25 percent headroom above costs when calculating commitment cost bid caps. The ISO adds an additional 10 percent headroom when calculating default energy bids used when energy bids are mitigated under local market power mitigation provisions. Analysis by DMM has shown that this additional headroom is sufficient to cover same day gas prices under virtually all cases.

In early 2016, there was general concern that Aliso Canyon limitations might cause same day gas prices to be more volatile and sometimes increase significantly above next day prices used by the ISO to calculate bid caps. Therefore, beginning July 2016, gas prices used to calculate commitment costs and default energy bids used in mitigation for units in the SoCal gas system have been scaled up by 75 percent and 25 percent, respectively. These gas price scalers are applied in addition to the normal 25 percent headroom used in calculating commitment cost bid caps and 10 percent adder incorporated in default energy bids.

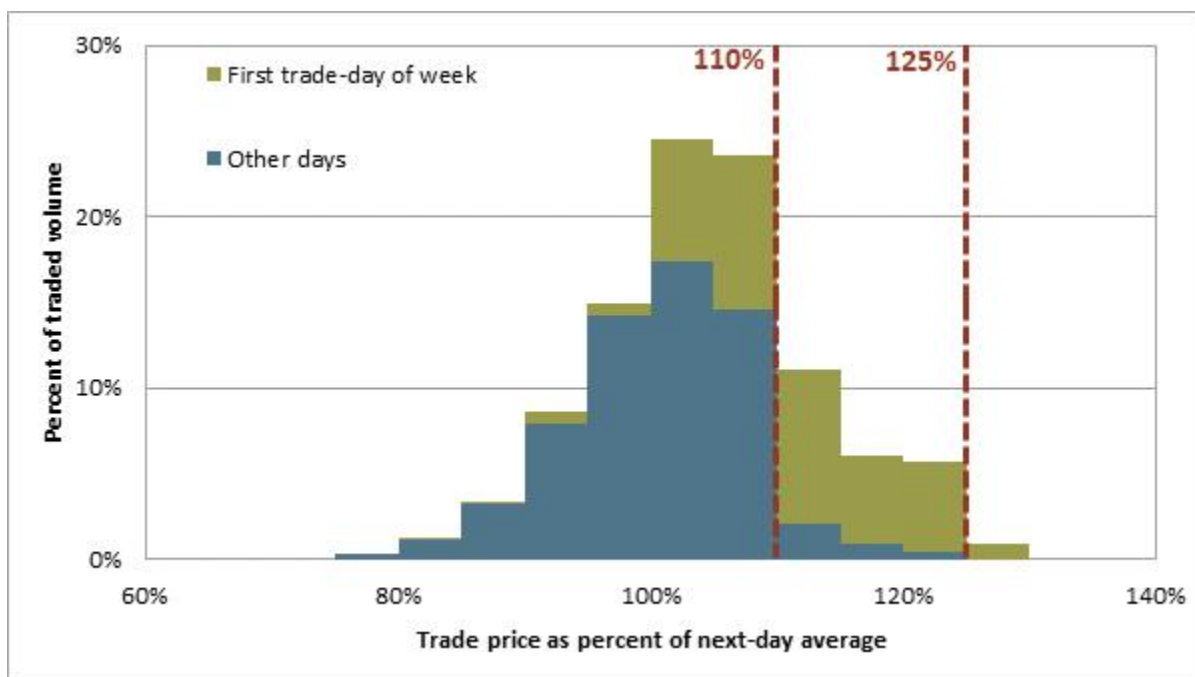
The objective of these special 75 percent and 25 percent gas price scalers was to provide more flexibility for these resources to restrict gas usage by submitting higher bid prices in excess of prevailing spot market gas prices and/or to be able to reflect any sudden spikes in the price of gas that might occur during an operating day in the same day spot market for gas under very tight market conditions.

DMM's analysis of gas and electric market data over the last year does not support the need to scale up gas prices used for mitigating potential market power in the real-time market above the next day gas price indices normally used. In our comments on the ISO's straw proposal, DMM presented an analysis of gas market outcomes in 2017.¹ DMM's analyses are based on actual gas trades reported on the Intercontinental Commodity Exchange (ICE).

¹ In our comments on the ISO's straw proposal, DMM presented an analysis of gas market outcomes in 2017. Figure 1 shows updated results of this analysis.
http://www.caiso.com/Documents/DMMComments_AlisoCanyonGas_ElectricCoordinationPhase3StrawProposal.pdf

Figure 1 compares the prices paid for gas purchased in the same day market at SoCal Citygate compared to the next day gas price index used by the ISO over the year since the special gas price scalers have been in effect (July 2016 through June 2017).² These data represent the price of same day gas trades as a percentage of the gas price index used by the ISO to calculate cost-based bid caps. The dotted lines in Figure 1 show the 10 percent normally applied in calculating default energy bids and the 25 percent adder applied in calculating commitment costs.

Figure 1. Same-day gas prices compared to next-day index (July 2016 to June 2017)



As shown in Figure 1, only about 1 percent of gas purchased in the same day market on ICE exceeded the price in the next day gas index by more than the 25 percent headroom normally used in calculating commitment cost bid caps. About 23 percent of the traded volume on ICE exceeded the normal 110 percent adder incorporated in default energy bids.

Figure 1 also shows that most same day trades above the 110 percent of next day prices occurred on days that were the first trading day of the week, which was typically a Monday (as shown in green on the chart). DMM has recommended that the ISO could address this issue by just applying a relatively low scaler only on the first trading day of the week (usually Monday).

² Purchases of gas in the same day market are based on trades reported in the Intercontinental Commodity Exchange (ICE).

Applying the 25 percent and 75 percent gas price scalars increases overall market clearing energy prices. These scalars have also increased bid cost recovery payments made for some units in the SoCal gas system which need to be committed to meet reliability requirements for that area.

DMM has been requesting that the ISO perform its own assessment of whether the current level of the gas price scalars for resources supplied by the Aliso Canyon gas system are appropriate or should be reduced or set to zero. DMM's potential support for continuing the authority to use the gas price scalars is dependent on the results of any assessment made by the ISO.

Effective period of proposed authority for gas price scalars

The *Draft Final Proposal* indicates that the ISO's authority to scale up gas prices used in mitigation of commitment costs and default energy bids "will likely no longer be needed once the ISO implements market design changes being developed under the ISO's current Commitment Costs and Default Energy Bid Enhancements (CCDEBE) policy initiative. The CCDEBE enhancements are currently planned to be effective as of fall 2018. Consequently, the ISO proposes to extend these temporary measures until it implements these long-term changes."³

DMM opposes such open-ended extension of this authority for several reasons. DMM opposes some of the "enhancements" that ISO staff seems to favor in the CCDEBE initiative. Key details of this initiative are not finalized and have not yet been considered or approved by the Board or FERC. DMM also believes the approach that seems to be favored by ISO staff is not likely to be fully implemented by fall 2018. Thus, providing such open-ended extension of this authority could mean that the ISO would continue to rely on this authority for an extended period.

MAXIMUM GAS USAGE NOMOGRAMS

The ISO proposes to make market constraints limiting the maximum gas usage of a group of generators a permanent operational tool that can be used throughout the ISO and all energy imbalance market balancing areas. DMM has expressed numerous concerns about expanding use of gas usage nomograms. DMM believes these issues need to be resolved prior to expanding use of gas nomograms.

Nomogram penalty prices

The penalty prices currently set on these nomograms (which are in \$/MMCF of gas consumption) appear to need further adjustment. The penalty prices currently placed on these nomograms appear to be relatively low in terms of the cost of electric generation at which the nomograms would be relaxed instead of enforced.

³ <http://www.caiso.com/Documents/DraftFinalProposal-AlisoCanyonGas-ElectricCoordinationPhase3.pdf>, p.17

For example, a penalty price of \$1,000/MMCF of gas consumption equates to a price of about \$7.50 to \$15.00/MWh for units with heat rates of 7,800 to 15,000 Btu/kWh.⁴ If the incremental cost of other sources of generation outside the nomogram was higher than this (\$7.50 to \$15/MWh), the nomograms will not actually limit dispatch of units within the nomogram area.

The gas nomograms have only been in effect during a total of four days in the SoCal area. During this four day period, the gas hourly usage limits incorporated in the nomogram were exceeded during numerous hours due the relatively low level at which the nomogram penalty prices are currently set. DMM believes a more detailed discussion and assessment of the effectiveness of the gas nomograms would be warranted before obtaining authority to expand use of these constraints to areas beyond the Aliso Canyon system.

The ISO stated that using the gas nomograms to accommodate physical gas limitations will be more transparent to market participants than relying on exceptional and manual dispatches. In DMM's view, this will only be true if the ISO clearly defines beforehand the situations that can lead to implementation and enforcement of a gas nomogram, and the mechanics of how the nomogram will impact dispatch and pricing.

Expanding gas nomograms beyond Aliso Canyon area

The ISO has proposed to expand its authority to use gas burn nomograms beyond the Aliso Canyon system to the rest of the ISO and all other control areas in the energy imbalance market. The Draft Final Proposal indicates that “the ISO believes gas system limitations may develop in other areas within its balancing authority area in the future as a result of higher levels of awareness of adverse impacts if gas storage facilities are unsafely operated.”⁵ In support of this, the paper cites some legislation or new regulations under consideration at the state level that could have the effect of restricting use of gas storage.

The Draft Final Proposal indicates that the “ISO understands from EIM stakeholders that similar constraints exist in portions of the EIM footprints.”⁶ However, the ISO has not cited any specific gas system limitations that the ISO might manage using gas nomograms. Given the lack of information about the impact and effectiveness of the Aliso Canyon gas nomograms, DMM does not support expansion of the use of gas nomograms until any specific physical gas limitations are identified and reviewed.

Before expanding nomograms to EIM areas, DMM also believes the ISO should develop more detail on how an EIM entity can decide to create and enforce a new gas nomogram. In the *Draft Final Proposal* the ISO states that guidelines will be developed if the authority to create and enforce these nomograms is granted. In cases

⁴ 1 MMCF = 1,037 MMBtu; 15000 Btu/kWh = 15 MMBtu/MWh; (\$1,000/1037) *15=\$14.5/MWh

⁵ *Draft Final Proposal*, p. 12

⁶ *Draft Final Proposal*, p.13

such as this, such implementation details are critical to assessing whether a policy design should be adopted.

Based on DMM's discussions with some EIM entities, it seems EIM entities may have a broader view of what constitutes a physical limitation on gas usage that should be enforced through a nomogram that extends to more contractual or commercial limitations or practices. Specifically, EIM entities may view the amount of gas that has been contracted for or scheduled by generators in the EIM balancing area (which often consist mostly or entirely of affiliates of the balancing authority area entity) as a *physical limitation*. DMM has disagreed with the ISO and some participants on how such contractual limitations or commercial practices should be viewed in terms of being binding physical limitations. DMM recommends such issues be clarified.

Incorporating gas limits in supply sufficiency tests for EIM areas

Under the ISO proposal, the impact of gas usage limits would not be incorporated into the resource capacity and flexible ramping capacity tests used in the energy imbalance market. The gas nomogram has essentially the same effect as de-rating available capacity or limiting the energy bids from a specific group of generating resources. These sufficiency tests account for such outages or capacity not bid into the energy imbalance market. DMM believes the impacts of gas nomograms should also be factored into these important supply sufficiency tests for each balancing area in the energy imbalance market.

The ISO has indicated it does not believe that generation supply limits due to the gas nomograms should be included in resource sufficiency tests because these tests don't factor in the impact of local transmission constraints either. DMM does not understand this logic, since there is no need to link these two modeling issues. The gas nomograms represent a clear limit on output from a group of gas generators. DMM believes it would be relatively straight forward to incorporate the impacts of a gas nomogram into the important supply sufficiency tests.

Automation of gas nomogram impacts on market power mitigation

Although gas nomograms limit the amount of generation available for dispatch, these limits are not factored into the calculations of available supply used to determine when local market power mitigation procedures are triggered. These calculations are performed as part of the dynamic competitive path assessment that is incorporated into the ISO's market software.

Last year, DMM agreed to monitor market results and develop a way of manually adjusting market power mitigation inputs to account for gas nomograms if appropriate. Since the nomograms have only been in effect four days, this manual analysis has not turned out to be needed and has not required excessive resources. However, DMM is strongly recommending that this process be automated within the ISO market software

if the ISO seeks to make the gas nomogram functionality permanent and expand its use beyond the SoCal gas system.

The ISO's Draft Final Proposal was not clear on this issue. The ISO indicated it is committed to doing this by fall of 2018 in Management's memo and presentation to the EIM Governing Body on this issue. Due to the complexity of this issue, DMM believes additional details of how this will be done should be worked out in the policy development phase and not left for an internal implementation process.

CONCLUSION

DMM believes that the market rule changes and tools designed last year in response to the Aliso Canyon issue can be important in managing gas related reliability issues. However, our comments on the ISO's proposal to extend and expand some of these features identified numerous important caveats and recommendations. The Draft Final Proposal does not address many of the key concerns and recommendations. These issues would need to be addressed before DMM could support implementation of the ISO's proposed measures.