January 6, 2016

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: California Independent System Operator Corporation
Docket No. ER14-1386-000
Energy Imbalance Market – Structural Market Power Informational Report

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) hereby submits its six-month informational status report on the presence of structural market power in PacifiCorp's balancing authority areas due to limits on transmission interties into and between these balancing authority areas under the Energy Imbalance Market (EIM) structure.[1] Consistent with the June 19 order, on July 23, 2014, the CAISO filed to amend its tariff to apply market power mitigation provisions to EIM transfer constraints into EIM balancing authority areas. The Commission approved the CAISO's July 23 tariff amendment agreeing "with CAISO and the Department of Market Monitoring's arguments that applying real-time local market power mitigation procedures on scheduling constraints limiting transfers of energy into and between PacifiCorp's balancing authority areas would be appropriate."

The Department of Market Monitoring report submitted today concludes that circumstances warranting market power mitigation specified in its report accompanying the July 23 tariff amendment persist and that there is no new information that warrants changing the current application of market power mitigation on the EIM transfer constraints.

[1] *See California Indep. Sys. Operator Corp.*, 147 FERC ¶ 61,231 at P 216 (2014)(June 19 Order).

Please contact the undersigned with any questions.

Respectfully submitted

By: *<u>/s/ Anna A. McKenna</u>*

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California Independent
System Operator Corporation

California ISO

Report on Energy Imbalance Market Competiveness

January 6, 2016

Department of Market Monitoring

Summary

In its June 19, 2014 Order, the Federal Energy Regulatory Commission (Commission) directed CAISO to provide the Commission with informational status reports, every six months for two years following the launch of the Energy Imbalance Market (EIM), on the presence of structural market power in PacifiCorp's balancing authority areas due to limits on transmission interties into and between these areas. The Commission indicated it will use the information in these reports to determine if any action is necessary to address structural market power in PacifiCorp's Balancing Authority Areas (BAA) under the EIM structure.

Pursuant to the June 19 Order, in July 2014 the ISO filed to amend its tariff to apply market power mitigation provisions on EIM transfer constraints into EIM balancing areas. In support of this filing, the Department of Market Monitoring (DMM) provided a report on structural competiveness of the PacifiCorp balancing areas. Since implementation of EIM in November 2014, DMM has submitted monthly reports pursuant to the Commission's December 1, 2014 Order, which provide additional analysis and metrics on the performance, competitiveness and potential market power in PacifiCorp's balancing authority areas under the EIM design.

This report summarizes and updates information contained in prior reports relating to the structural competitiveness and performance of the PacifiCorp balancing authority areas in the first 12 months following EIM implementation in November 2014. Information summarized in this report indicates that the degree of potential structural market power in the PacifiCorp balancing authority areas remains high and warrants continuation of EIM market power provisions currently in effect. While bidding in the EIM has been highly competitive within these balancing authority areas, DMM believes the application of price mitigation to scheduling constraints into the PacifiCorp balancing authority areas represents an important safeguard to protect against noncompetitive high prices in the EIM.

1 Background

In its June 19, 2014 Order, the Commission declined to require that real-time local market power mitigation be implemented on transfer constraints between the ISO and EIM areas at EIM start-up, as requested by some interveners. As explained in the June 19, 2014 Order, this decision was based on two factors:

> First, CAISO has not proposed, and we are not persuaded, that market power mitigation on EIM interties is warranted on EIM start-up. Second, PacifiCorp currently has market-based rate authority, which includes authorization to sell energy and ancillary services at market-based rates within its two BAAs.[1] Therefore, implementing real-time local market power mitigation on EIM interties for PacifiCorp's BAAs at EIM start-up could result in unnecessary mitigation.

However, to help identify any potential for exercise of market power following implementation of EIM, the Commission also took the following two steps. As explained in the June 19, 2014 Order:

> First, in the order issued contemporaneously with this order in Docket No. ER14-1578-000, we are directing PacifiCorp to make a market-based rate change of status filing within nine months of the launch of the EIM so that the Commission can assess whether PacifiCorp has structural market power in its BAAs under the EIM structure. Second, in order that the Commission may monitor for the existence of market power at the interties during the pendency of PacifiCorp making a change of status filing and the Commission's review of that filing, we direct CAISO to provide the Commission with informational status reports every six months for two years following the launch of the EIM on the presence of structural market power in PacifiCorp's BAAs due to limits on transmission interties into and between these BAAs under the EIM structure. The Commission will use the information in these reports to determine if any action is necessary to address structural market power in PacifiCorp's BAAs under the EIM structure.

In addition, the June 19, 2014 Order went on to add that:

> … CAISO may file with the Commission to implement real-time local market power mitigation on EIM interties if it believes, and can demonstrate, that such mitigation is warranted after the Department of Market Monitoring completes its assessment of structural market power in PacifiCorp's BAAs. In that regard, CAISO may propose additional tariff detail regarding its proposed structural market power analysis and how decisions regarding activation/deactivation of market power mitigation on EIM interties will be made. The Commission will evaluate the extent to which the rules regarding real-time local market power mitigation on EIM interties are objective and clearly set forth in the tariff and, based on that, decide whether future determinations regarding market power mitigation on EIM interties should be filed with the Commission.

[1] *See PacifiCorp*, Docket No. ER97-2801-030, *et al*., (June 29, 2011) (unpublished letter order accepting updated market power analysis and notice of change in status).

Pursuant to the June 19, 2014 Order, on July 23, 2014 the ISO filed to amend its tariff to apply market power mitigation provisions to EIM transfer constraints into EIM balancing areas. In support of this filing DMM provided a report on the structural competiveness of PacifiCorp's balancing authority areas.[2]

In an order on September 22, 2014, the Commission "[agreed] with CAISO and the Department of Market Monitoring's arguments that applying real-time local market power mitigation procedures on scheduling constraints limiting transfers of energy into and between PacifiCorp's balancing authority areas would be appropriate," and approved the proposed tariff revisions.[3]

Since implementation of EIM in November 2014, DMM has submitted monthly reports pursuant to the Commission's December 1, 2014 Order which provide additional analysis and metrics on the performance, competitiveness and potential market power in PacifiCorp's balancing authority areas under the EIM design. DMM's most recent report covered the full 12 month period since implementation of EIM in the PacifiCorp areas in November 2014 through October 2015.[4]

As directed in the Commission's June 19, 2014 Order, this report provides information on market performance, following the launch of EIM, relating to the presence of structural market power in PacifiCorp's balancing authority areas due to limits on transmission interties into and between these balancing authority areas under the EIM structure. The report incorporates information provided to the Commission subsequent to the June 19, 2014 Order in DMM's 2014 analysis of structural market power in PacifiCorp balancing authority areas and the monthly reports submitted by DMM after EIM implementation pursuant to the Commission's December 1, 2014 Order. As noted in the Commission's June 19, 2014 Order, the Commission may use the information in this report to determine if any action is necessary to address structural market power in PacifiCorp's balancing authority areas under the EIM structure.

[2] *Assessment of Potential Market Power in Energy Imbalance Market*, ISO Department of Market Monitoring, Updated June 30, 2014. http://www.caiso.com/Documents/Jul23_2014_TariffAmendment_EnergyImbalanceMarketEnhancements_ER14-2484.pdf.

[3] September 22, 2014 Order, page 6 ¶13.

[4] *Report on Energy Imbalance Market Issues and Performance*, Department of Market Monitoring, December 22, 2015. http://www.caiso.com/Documents/Dec28_2015_Department_MarketMonitoringReport_Performance_Issues_EIM_Oct2015_ER15-402.pdf.

2 Potential market power

As indicated in DMM's June 2014 report on the potential structural competiveness of the PacifiCorp balancing authority areas, the potential degree of structural market power in the two PacifiCorp EIM balancing authority areas depends on a number of factors. Three main factors examined in DMM's June 2014 report include the following:

- The amount and ownership of generation participating within EIM.
- Scheduling constraints between EIM balancing authority areas and the ISO.
- Net demand for imbalance energy from other load serving entities and intermittent resources.

As summarized below, additional information regarding these factors that has become available since EIM implementation indicates that the degree of potential structural market power remains high and warrants continuation of market power mitigation provisions currently in effect.

Amount and ownership of supply and first year market results

DMM's June 2014 report noted that "based on information submitted by PacifiCorp to the ISO for generating resources being registered to be eligible to participate in the EIM, there may be a substantial amount of PacifiCorp generation within the PacifiCorp balancing authority areas relative to the potential demand of imbalance energy," and that "about 160 MW of additional gas-fired [generation] within the PacifiCorp East BAA owned or controlled by one or more other entities may also participate in the EIM upon implementation." [5]

At this time, all capacity bid into EIM continues to be owned or controlled by PacifiCorp.[6] As noted in a recent filing by the ISO, one entity has registered an EIM participating resource, effective June 17, 2015, and one entity had registered as an EIM participating resource scheduling coordinator, effective February 23, 2015.[7]

As noted in recent reports by DMM submitted pursuant to the Commission's December 1, 2014 Order:

- The amount of capacity bid into the EIM generally exceeds the amount of energy dispatched from EIM resources.
- Bidding in the EIM has been highly competitive, with bids for most capacity slightly below or above default energy bids (DEBs) used in market power mitigation.

[5] *Assessment of Potential Market Power in Energy Imbalance Market*, ISO Department of Market Monitoring, Updated June 30, 2014, p. 10.

[6] One resource in PacifiCorp East controlled by another entity has become eligible to participate in EIM but has not submitted market bids into the EIM as of October 31, 2015.

[7] For further information see: http://www.caiso.com/Documents/Nov2_2015_InformationalReport_Status_ThirdPartyParticipation_EnergyImbalanceMarket_ER15-402.pdf.

- During most intervals, prices in the EIM have been highly competitive and have been set by bids closely reflective of the marginal operating cost of the highest cost resource dispatched to balance loads and generation.
- During the first 12 months of market operation, average prices in all of the EIM markets were about equal to or below bilateral trading hub prices, indicating that EIM results are consistent with those of a competitive market.

However, as also noted in DMM's reports:

- During a relatively small portion of intervals during the year, energy or flexible ramping constraints have had to be relaxed for the market software to balance modeled supply and demand.
- Without special price discovery features currently in place in the PacifiCorp balancing authority areas, prices during these intervals could be set by the $1,000/MWh penalty price normally applied by the market software when a modeled constraint must be relaxed to balance modeled load and supply.

As explained in numerous reports and filings submitted by the ISO to the Commission, some of the need to relax these software constraints to balance modeled load and supply has resulted from a variety of process and software issues, rather than any actual shortage of supply. The ISO continues to work with PacifiCorp to address issues causing the need to relax these software constraints when no actual shortage of capacity exists.

However, DMM notes that when the amount of supply bid into the market is insufficient to meet modeled demand, requiring relaxation of the power balance constraint, all suppliers are pivotal and have market power. Under these conditions, entry of a limited amount of additional supply from other suppliers would not significantly decrease structural market power.

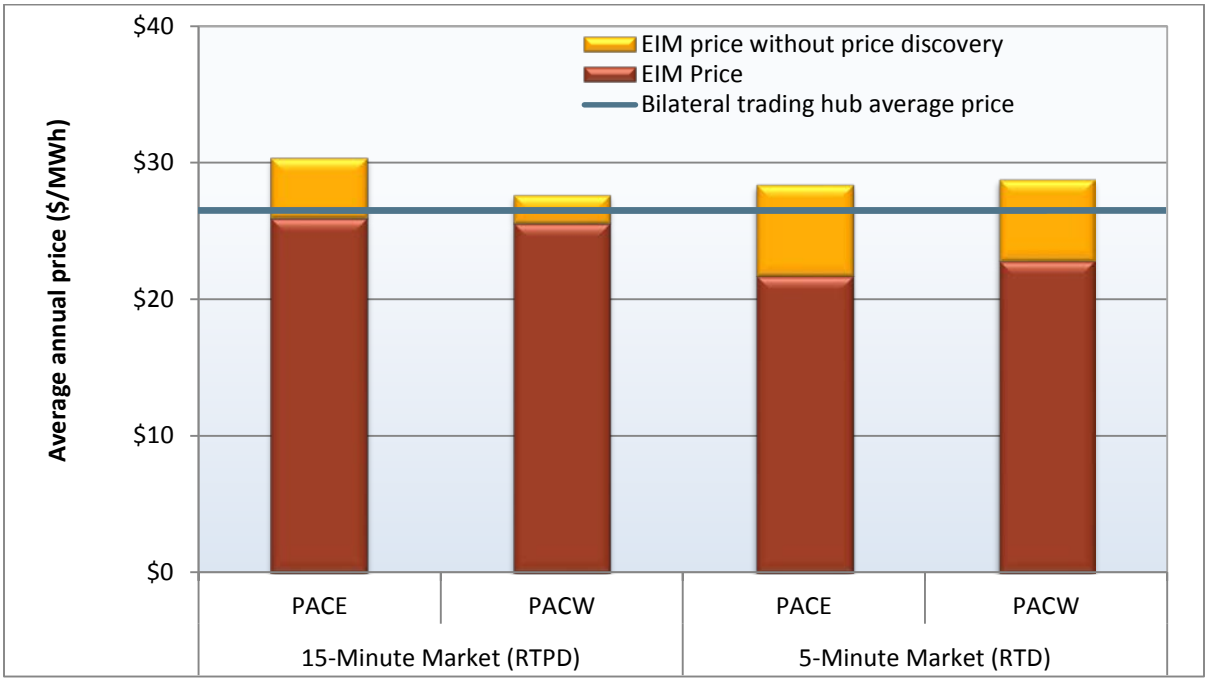
Several general results and trends may be observed during the first year of market operation and are summarized in Figure 1 below. Bilateral trading hub prices for energy averaged under $26.50/MWh during the first year of EIM operations.[8] During that same time period prices in PacifiCorp East averaged about $26/MWh in the 15-minute market, or 2 percent lower than bilateral prices, and prices averaged about $22/MWh in the 5-minute market, or about 20 percent lower than bilateral prices. Prices in PacifiCorp West averaged about $25.50/MWh in the 15-minute market, or 3 percent lower than bilateral prices, and almost $23/MWh in the 5-minute market, or about 15 percent lower than bilateral prices. This suggests that prices across the market have been competitive.

Furthermore, during the first year, several multiple-month trends emerged that should be noted. During the first few months of EIM market prices were heavily influenced by price discovery, and, with the price discovery provisions in place, EIM market prices were roughly equal to the bilateral trading prices that had been used to set market prices prior to implementation of EIM. Then, during the summer months, there was better convergence between the EIM prices with and without price discovery, and generally the prices tended to be below the bilateral trading prices. Finally, in recent months, there continues to be good convergence between prices with and without price discovery, but

[8] The bilateral market index represents a daily average of peak and off-peak prices for four major western trading hubs (California Oregon Border, Mid-Columbia, Palo Verde and Four Corners) using ICE data.

the prices in the 15-minute markets have been elevated above bilateral trading prices due to increased relaxations of the flexible ramping constraint.

Figure 1 Average EIM annual prices with and without price discovery[9]



EIM scheduling constraints

As noted in DMM's June 2014 report, the incentive for any entity to exercise market power within the two PacifiCorp balancing authority areas can be limited by competition from transfers from the ISO or other EIM balancing authority areas. However, based on analysis in that report, DMM concluded that the amount of transfer capacity available in the EIM between the ISO and the two PacifiCorp balancing authority areas also remains uncertain at this time and may be somewhat dynamic from hour-to-hour.

DMM continues to find that the amount of energy that can be scheduled from the ISO into PacifiCorp balancing authority areas in the EIM remains uncertain and is limited during many intervals, particularly in the 5-minute market. For example:

- The scheduling limit on the amount of energy that can be scheduled into the PacifiCorp East balancing authority area in the EIM continues to be 0 MW.[10]
- As also noted in DMM's June 2015 report, the amount of additional energy capacity that may be scheduled into PacifiCorp balancing authority areas can also be limited during periods when any of

[9] Data from the first two weeks in November 2014 was excluded due to lack of price discovery information.

[10] This limit will change with the integration of the Nevada EIM on December 1, 2015, when imports will be allowed into PacifiCorp East from Nevada.

the PacifiCorp balancing authority areas fail the flexible ramping sufficiency test.[11] As shown in the most recent reports on EIM market performance, submitted by DMM and the ISO, transfers into the PacifiCorp areas from the ISO continue to be limited by failures of the flexible ramping sufficiency test.[12]

DMM's June 2015 report also noted the amount of additional energy capacity that may be scheduled into the PacifiCorp balancing authority areas in the 5-minute market will be limited by the fact that "PacifiCorp will also be required to abide by any additional transfer limitations for dynamic transfers imposed by BPA as the path operator."[13] As described in prior DMM reports on EIM to the Commission, dynamic transfer limits restrict the additional energy that may be transferred into the PacifiCorp balancing authority areas from the ISO in the 5-minute market to an average of about +11 MW during peak hours and about +110 MW during off-peak hours.[14] These limits remained in this range until October 9, 2015, after which limits were changed to an average transfer capacity of about +50 MW during peak hours and about +60 MW during off-peak hours in the 5-minute market.[15]

In addition, as shown in Table 1 and Table 2, since EIM has been implemented, scheduling constraints into the PacifiCorp areas have been binding a relatively high percentage of intervals in both the 15-minute and 5-minute markets.

Non-PacifiCorp demand for imbalance energy

DMM's June 2014 report also noted that incentives to exercise structural market power in the PacifiCorp areas may also be limited if the net demand for imbalance energy from other load serving entities is low and if there is a relatively small amount of intermittent resources. Although this net demand may be considered as part of future assessments of potential market power in EIM balancing authority areas, DMM has not sought to incorporate any additional data or analysis of net demand for imbalance energy from non-PacifiCorp entities at this time.

[11] *Assessment of Potential Market Power in Energy Imbalance Market*, ISO Department of Market Monitoring, Updated June 30, 2014, p, 9.

[12] *Report on Energy Imbalance Market Issues and Performance*, Department of Market Monitoring, April 2, 2015, pp. 14-15.
Energy Imbalance Market Pricing Waiver Report, March 1 – March 31, 2015, CAISO Department of Market Quality and Renewable Integration, April 24, 2015, Attachment B, pp. 63-68.
http://www.caiso.com/Documents/Apr24_2015_March2015_EnergyImbalanceMarket_PriceWaiverReport_ER15-402.pdf.

[13] *Assessment of Potential Market Power in Energy Imbalance Market*, ISO Department of Market Monitoring, Updated June 30, 2014, p, 8.

[14] *Report on Energy Imbalance Market Issues and Performance*, Department of Market Monitoring April 2, 2015, pp. 31-33.
http://www.caiso.com/Documents/Apr2_2015_DMM_AssessmentPerformance_EIM-Feb13-Mar16_2015_ER15-402.pdf.

[15] These limits were changed as a result of a stakeholder process by the Bonneville Power Administration.

Table 1 Frequency of congestion on the EIM scheduling constraint into PacifiCorp East

Month	15-minute market	5-minute market
Nov-14	22%	13%
Dec-14	18%	16%
Jan-15	17%	15%
Feb-15	55%	37%
Mar-15	56%	47%
Apr-15	55%	50%
May-15	31%	30%
Jun-15	17%	20%
Jul-15	11%	13%
Aug-15	26%	26%
Sep-15	33%	27%
Oct-15	36%	30%

Table 2 Frequency of congestion on the EIM scheduling constraint from CAISO into combined PacifiCorp East and PacifiCorp West

Month	15-minute market	5-minute market
Nov-14	4%	36%
Dec-14	8%	32%
Jan-15	4%	33%
Feb-15	8%	31%
Mar-15	8%	24%
Apr-15	8%	21%
May-15	9%	31%
Jun-15	3%	21%
Jul-15	2%	16%
Aug-15	5%	19%
Sep-15	9%	21%
Oct-15	5%	12%

3 Conclusions

Additional information on market competiveness since implementation of EIM in the PacifiCorp balancing authority areas summarized in this report indicates that the degree of potential structural market power remains high and warrants continuation of market power provisions currently in effect. While bidding has been highly competitive, DMM believes the application of market power mitigation in the PacifiCorp balancing authority areas represents an important safeguard to protect against noncompetitive high prices in the EIM.

CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon the parties listed on the official service list in the captioned proceedings, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, California this 6th day of January, 2016.

/s/ Jennifer Rotz

Jennifer Rotz