California ISO

California Independent System Operator Corporation

December 15, 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. ER15-2565-___
October 2016 Informational Report
Energy Imbalance Market – Transition Period Report – Puget Sound Energy

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) hereby submits its report on the transition period of Puget Sound Energy during its first six months of participation in the Energy Imbalance Market (EIM) for October 2016. The Commission also directed the Department of Market Monitoring to submit an independent assessment of the CAISO's report, which the CAISO will seek to file within approximately 15 business days.

The CAISO will continue filing such reports, consistent with the Commission's order, through the six month reporting period.

Please contact the undersigned with any questions.

Respectfully submitted

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

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Energy Imbalance Market

October 1 – October 31, 2016

Transition Period Report

Puget Sound Energy Entity

December 8, 2016

I. Introduction and Background

On October 29, 2015, the Federal Energy Regulatory Commission (Commission) approved the California Independent System Operator Corporation's (CAISO) proposed tariff amendments to allow a transition period for new Energy Imbalance Market (EIM) entities during the first six months of EIM participation, effective November 1, 2015.[1] Puget Sound Energy (PSE) entered the EIM on October 1, 2016, and the transition period will apply to their balancing authority area until May 1, 2017.

During the six-month transition period, the pricing of energy in the balancing authority area of a new EIM entity is not subject to the pricing parameters that normally apply when the market optimization relaxes a transmission constraint or the power balance constraint. Instead, during the six-month transition period, the CAISO will clear the market based on the marginal economic energy bid (referred to herein as "transition period pricing"). In addition, during the six-month transition period, the CAISO sets the flexible ramping constraint relaxation parameter for the new EIM entity's balancing authority area between $0 and $0.01, but only when the power balance or transmission constraints are relaxed in the relevant EIM area. This is necessary to allow the market software to determine the marginal energy bid price.

Consistent with the Commission's October 29 order, the CAISO and the Department of Market Monitoring (DMM) will file informational reports at 30-day intervals during the six-month transition period for any new EIM entity. The CAISO provides this report for PSE to comply with the Commission's requirements in the October 29 order. The Commission noted that it expected that the first report would be filed 30 days from the commencement of financially binding operations for any new EIM entity. Because the complete set of data is not available so soon after the end of the applicable month, the CAISO could not submit the report at that time. The CAISO will continue to file the monthly reports but expects that it will do so approximately 15 days after the end of each month in order to provide the prior full month's data. In addition, because the DMM must review the CAISO's report before completing its own, the DMM will file its report approximately 15 business days after the CAISO files its report.

[1] *California Indep. Sys. Operator Corp.*, 153 FERC ¶ 61,104 (2015) (October 29 order).

II. Highlights

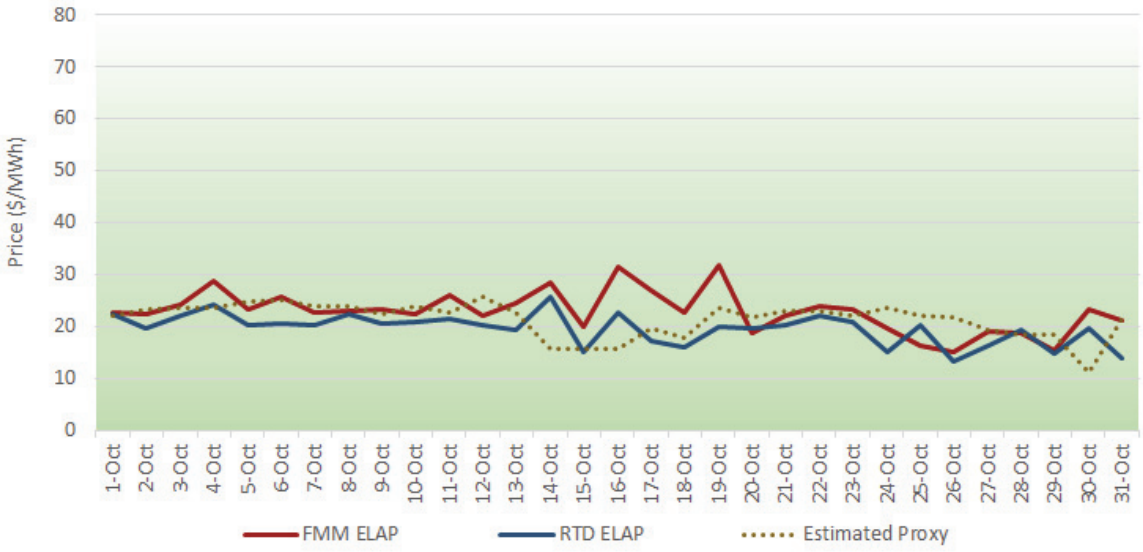
- PSE had a smooth transition period into the EIM on October 1, 2016. The first hours experienced minor transitional issues resulting in a few power balance constraint infeasibilities that were subject to price correction provisions under Section 35 of the CAISO tariff.
- PSE passed over 97 percent of their balancing tests during the month of October.
- PSE passed over 98 percent of their flex ramp sufficiency tests during the month of October.
- PSE observed power balance constraint infeasibilities in 0.03 percent of the intervals in the fifteen-minute market (FMM) and in 0.25 percent of the intervals in the real-time interval dispatch market (RTD).
- With the low frequency of power balance constraint infeasibilities experienced in the month of October in the PSE balancing authority area, transitional period pricing had little impact on the EIM prices.
- PSE observed flexible ramp constraint infeasibilities in 5.3 percent of the intervals in the FMM.

III. Report

a. Prices

Figure 1 shows that average prices in the PSE Load Aggregation Point (PSE ELAP)[2] were $22.89/MWh in the Fifteen Minute Market (FMM) and $19.56/MWh in the Real-Time Dispatch (RTD). Prices in the PSE balancing authority area were stable during the first month of operation and tracked closely between markets.

Figure 1: Daily average prices for PSE.



Under the CAISO's price correction authority in Section 35 of its tariff, the CAISO may correct prices posted on its OASIS if it finds: (1) that the prices were the product of an invalid market solution; (2) the market solution produced an invalid price due to data input failures, hardware or software failures; or (3) a result that is inconsistent with the CAISO tariff. The prices presented in Figure 1 include all prices produced by the CAISO consistent with its tariff requirements.[3] That is, the trends below represent: (1) prices as produced in the market for which the CAISO deemed valid; (2) prices that the CAISO could and did correct pursuant to Section 35 of the CAISO tariff; and (3) any prices the CAISO

[2] The ELAP provides aggregate prices that are representative of pricing in the overall area of the PSE balancing authority area.

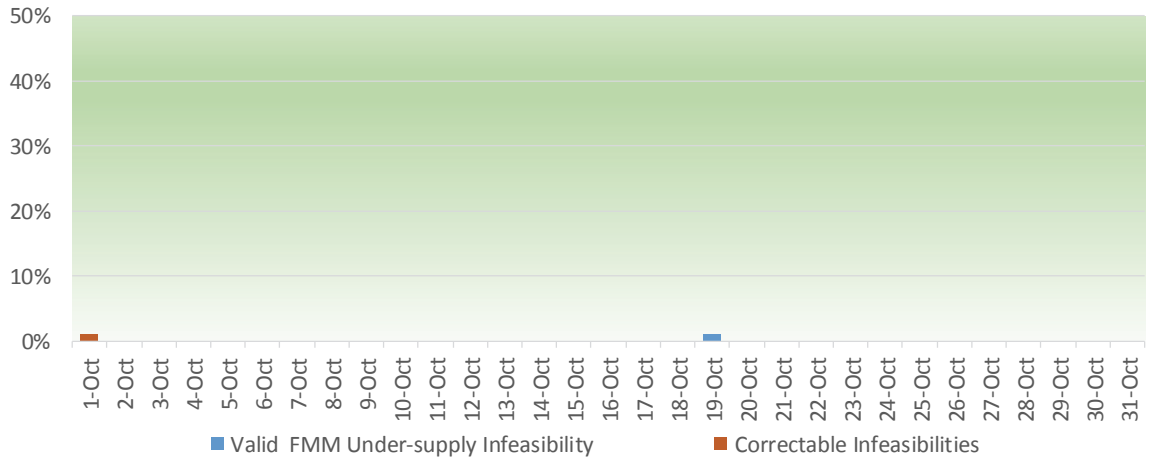
[3] Figure 1 also provides an estimated proxy price, which for PSE is the Mid C hub price taken from the Intercontinental Exchange (ICE).

adjusted pursuant to transition period pricing reflected in Section 29.27 of the CAISO tariff. For the month of October, there was one instance in the FMM and eight instances in the RTD that required a price correction for PSE under the CAISO's price correction authority in Section 35 of the CAISO tariff.

b. Frequency of Power Balance Constraint Infeasibilities

Figures 2 and 3 show the frequency of intervals in which the power balance constraint was relaxed for under-supply conditions in the PSE balancing authority area for the FMM and RTD, respectively. The under-supply infeasibilities are grouped into "valid" and "correctable" instances. Prices for the intervals that fell in the "valid" category are instances with under-supply infeasibilities not in error and that are subject to the transitional period pricing, whereas those that fell in the "correctable" category were corrected based on provision of Section 35 of the CAISO tariff due to either a software or data error.

Figure 2: Frequency of FMM under-supply power balance infeasibilities in PSE.



In the PSE balancing authority area, there was only 1 (0.03% of the time) valid under-supply infeasibility in the FMM and 22 (0.25% of the time) valid under-supply infeasibilities in the RTD. The reasons for these infeasibilities were:

i) October 14, RTD. Infeasibilities were due to resource deviations and exports that came in higher than base schedules, compounded with load forecast changes.

ii) October 19, FMM and RTD. PSE failed the flexible ramp test, which limits the transfers it can import into its balancing authority area. As a result, there was not sufficient upward capacity to meet

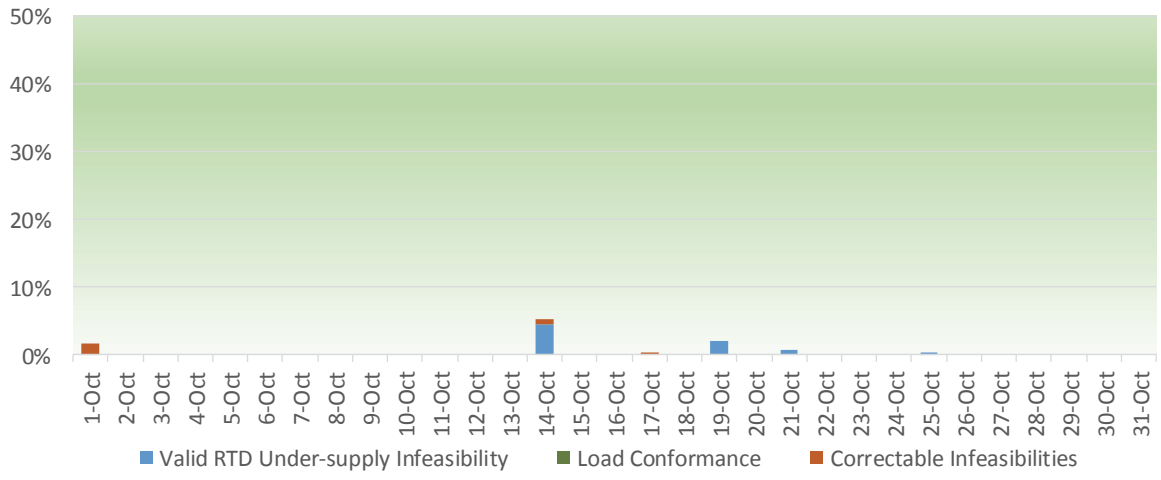
load needs in their balancing authority area. This was compounded by the derate of a resource in the PSE balancing authority area.

iii) October 21, RTD. Two infeasibilities were driven by a forced outage of a generating resource in the PSE balancing authority area.

iv) October 25, RTD. One under-supply infeasibility resulting from the interplay with the management of Rate of Change constraints.

There were no valid RTD infeasibilities in the PSE balancing authority area that coincided with the use of load conformance. The CAISO uses a load conformance limiter in the CAISO and in each of the EIM balancing authority areas to prevent over-adjustments through use of load conformance, and thus prevent an artificial infeasibility – that is, one that does not reflect actual scarcity. When the quantity of the infeasibility is less than the operator's adjustment, and the infeasibility is in the same direction as the adjustment, the load conformance limiter automatically limits the operator's adjustments to at or below the infeasibility. In the pricing run, the limiter will remove an infeasibility that is less than or equal to the operator's adjustment, *i.e.*, the load conformance. The limiter will not apply to infeasibilities greater than or in the opposite direction of the load conformance. Use of the load conformance limiter in the CAISO balancing authority area has avoided invalid constraints that arise through operational adjustments that do not reflect supply issues. During the transition period, the CAISO does not apply the load conformance limiter because it applies the transition period pricing, which obviates the need for the load conformance limiter. Therefore, Figure 3 illustrates the infeasibilities that would have been avoided by the load conformance limiter were it in effect during the transition period in the PSE balancing authority area.

Figure 3: Frequency of RTD under-supply power balance in feasibilities in PSE.



Tables 1 and 2 list the FMM and RTD intervals with infeasibilities observed in October, including the amount of load conformance to reflect the instances in which the load conformance limiter would have triggered and offset the infeasibility.

Table 1: List of valid FMM under-supply infeasibilities in PSE.

Trade date	Trade Hour	Trade Interval	MW Infeasibility	Load Conformance
19-Oct-16	11	2	2.12	0

Table 2: List of valid RTD under-supply infeasibilities in PSE.

Trade Date	Trade Hour	Trade Interval	MW Infeasibility	Load Conformance
14-Oct-16	23	2	14.6	0
14-Oct-16	23	3	45.6	0
14-Oct-16	23	4	54.8	0
14-Oct-16	23	5	30.3	0
14-Oct-16	23	6	3.5	0
14-Oct-16	23	7	3.6	0
14-Oct-16	23	11	9.6	0
14-Oct-16	23	12	5.1	0
14-Oct-16	24	2	81.5	0
14-Oct-16	24	3	96.8	0
14-Oct-16	24	4	134.0	0
14-Oct-16	24	5	115.3	0
14-Oct-16	24	7	8.8	0
19-Oct-16	11	1	13.1	0
19-Oct-16	11	2	32.0	0
19-Oct-16	11	3	33.0	0
19-Oct-16	11	4	12.9	0
19-Oct-16	11	5	8.2	0
19-Oct-16	11	7	3.1	0
21-Oct-16	9	4	57.2	0
21-Oct-16	9	5	42.3	0
25-Oct-16	10	2	16.6	0

c. Balancing and Sufficiency Test Failures

Figure 4 shows the trend of balancing test outcomes for the month of October, which the CAISO performs pursuant to Section 29.34 (k) of the CAISO tariff. PSE passed the balancing test in 97.71 percent of the intervals in October. The frequency of these failures are within expected performance tolerances for balancing tests.

The CAISO also performs the ramping sufficiency test as specified in Section 29.34(m) of the CAISO tariff. Figure 5 shows the trend of the test failures for flexible ramping for October. PSE passed the test in 98.79 percent of the intervals in October.

Figure 4: Frequency of Balancing test failures in the PSE balancing authority area.

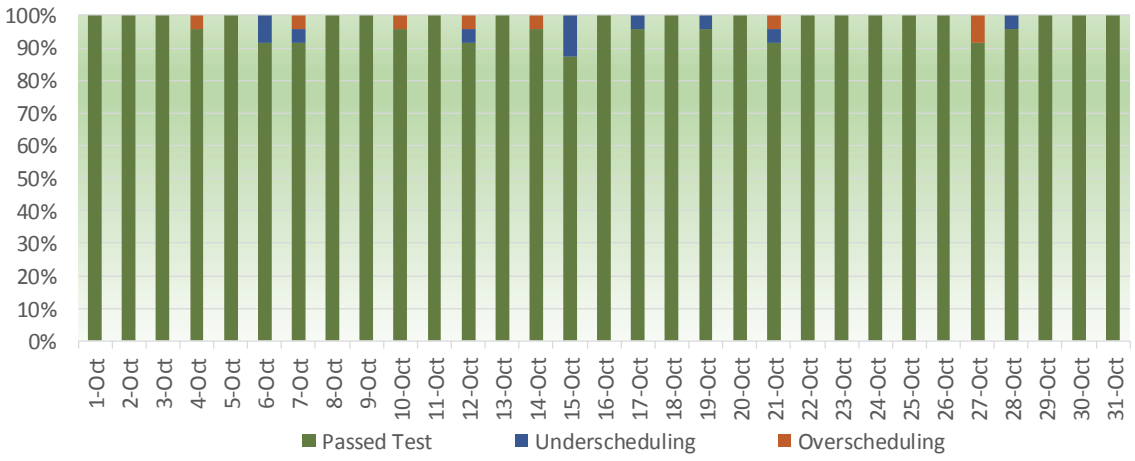
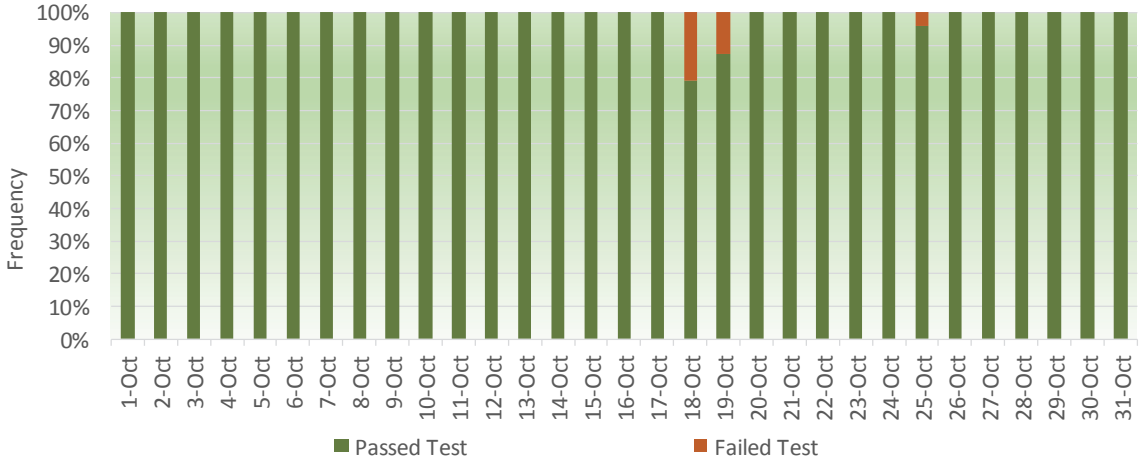


Figure 5: Frequency of flexible ramp sufficiency test failures in the PSE balancing authority area.



d. Flexible Ramping Constraint Infeasibilities

In this section, the CAISO discusses the frequency with which and the reasons why the flexible ramping constraint was binding in the PSE balancing authority area.

During the month of October, the flexible ramping constraint in the PSE balancing authority area was infeasible on a daily average in 5.3 percent of the FMM intervals. The flexible ramping constraint infeasibilities observed on October 11, 14 and 19 coincided with the power balance constraint infeasibilities described in previous sections and are driven by the same factors. The remaining infeasibilities were mainly driven by the economics of the flexible ramping constraint and its opportunity cost. Because the CAISO market co-optimizes the procurement of energy and flexible ramping capacity, resources in one EIM balancing authority area may be incrementally dispatched to provide economic transfers to another balancing authority rather than to provide flexible ramping capacity for the PSE balancing authority area. Consequently, these economics sometimes cause flexible ramping scarcity that results in the constraint to bind in the PSE balancing authority area.

Figure 6: Frequency of flexible ramp constraint infeasibilities in the PSE balancing authority area.

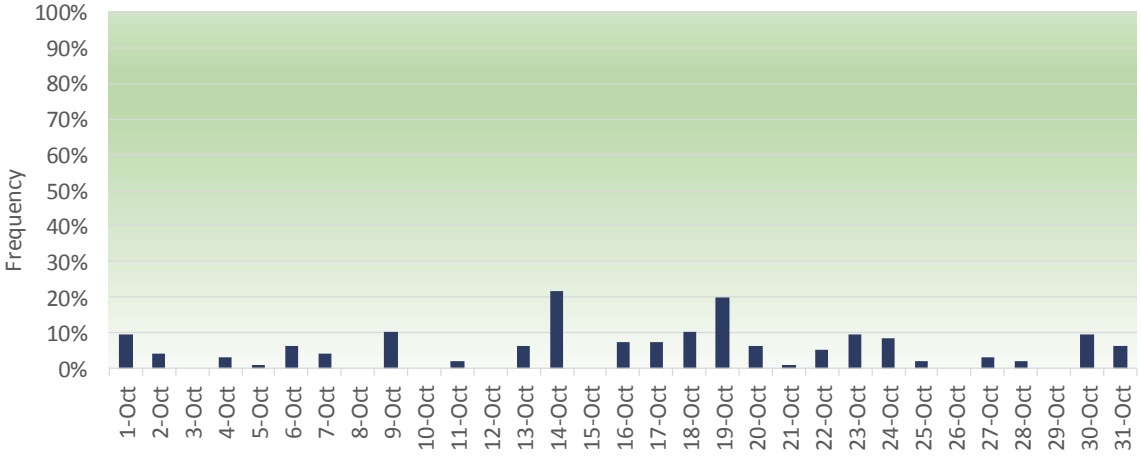
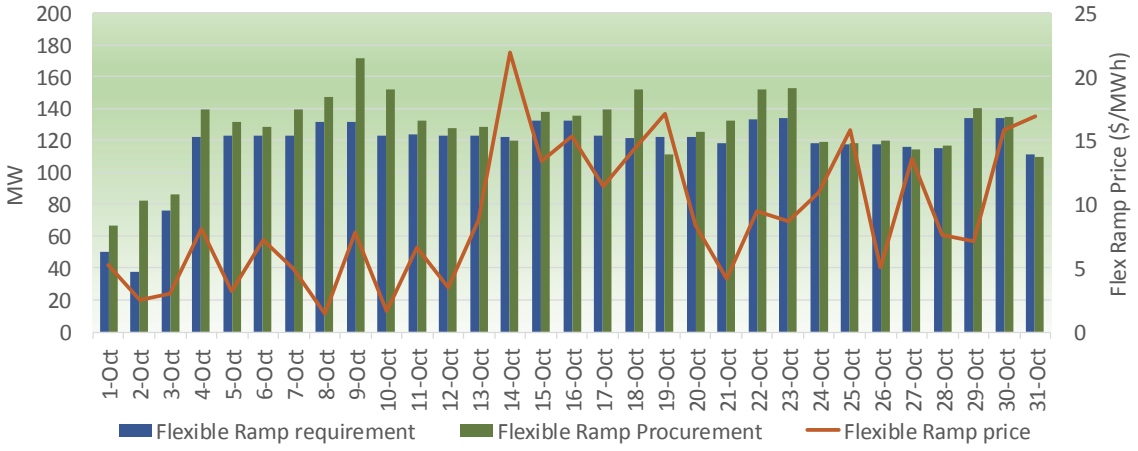


Figure 7 shows the daily average of the flexible ramp constraint requirement and procurement. In the vast majority of the hours, both the CAISO and PSE balancing authority areas were meeting their flexible ramping requirement. This plot also shows the daily average of the shadow price for the flexible ramp constraint in the PSE balancing authority area.

Figure 7: Average requirement and procurement of flexible ramp in the FMM in the PSE balancing authority area.



CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon the parties listed on the official service list in the above-referenced proceeding, 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 15th day of December 2016.

/s/ Grace Clark
Grace Clark

Document Content(s)