



September 29, 2021

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-\_\_\_\_  
August 2021 Informational Report  
Energy Imbalance Market – Transition Period Report –  
NorthWestern Energy EIM Entity**

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) hereby submits its report on the transition period of NorthWestern Energy EIM Entity during its first six months of participation in the Energy Imbalance Market (EIM) for August 1, 2021 through August 31, 2021. The Commission also directed the Department of Market Monitoring (DMM) to submit an independent assessment of the CAISO's report, which the CAISO's DMM will seek to file within approximately 15 business days.

Please contact the undersigned with any questions.

Respectfully submitted

**By: /s/ John Anders**

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# California ISO

**Energy Imbalance Market  
August 1 – August 31, 2021**

**Transition Period Report  
NorthWestern Energy (NWMT) EIM Entity**

September 27, 2021

## 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.<sup>1</sup> NorthWestern Energy (NWMT), the prospective EIM Entity entered the EIM on June 16, 2021, and the transition period will apply to the NWMT Balancing Authority Area (BAA) through November 30, 2021<sup>2</sup>.

During the six-month transition period, the price of energy in the new EIM entity's BAA 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 BAA between \$0 and \$0.01, but only when the power balance or transmission constraints are relaxed in the relevant EIM BAA. 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 NWMT to comply with the Commission's requirements in the October 29 Order. The CAISO anticipates filing these reports on a monthly basis. However, because the complete set of data is not available immediately at the end of the applicable month,<sup>3</sup> and depending on the market performance each month, along with the need to coordinate with the EIM Entity, the CAISO expects to continue to file the monthly reports approximately 25 days after the end of each month in order to provide the prior full month's data.

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<sup>1</sup> *California Indep. Sys. Operator Corp.*, 153 FERC ¶ 61,104 (2015) (October 29 Order).

<sup>2</sup> This follows from the application of CAISO Tariff section 27(b)(1), which refers to a number of months rather than a number of days.

<sup>3</sup> The earliest the CAISO can start gathering the data is 10 business days after the last day for the reporting month since this is when the price correction window expires.

## II. Highlights

Overall, NWMT's second month of operations in EIM was smooth and without significant issues. This report covers the period from August 1, 2021 through August 31, 2021. The market performance highlights are as follows:

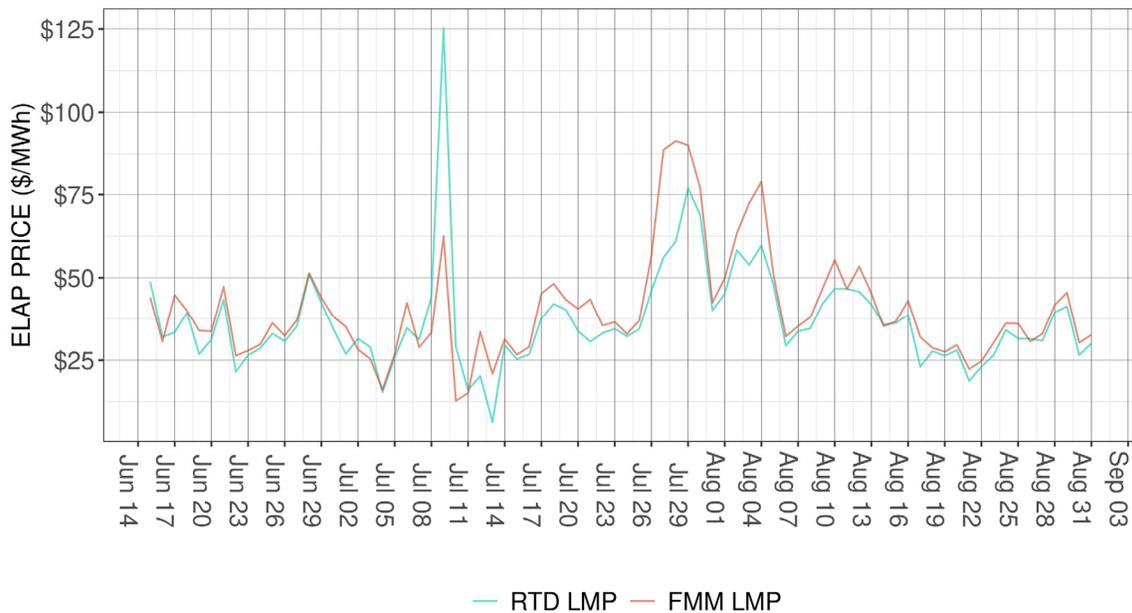
- The monthly average NWMT BAA price was \$40.78/MWh in the fifteen-minute market (FMM) and \$36.62/MWh in the real-time dispatch (RTD).
- Power balance constraint infeasibilities for the under-supply conditions were minimal for the NWMT BAA with 0 percent of the total intervals in the FMM and 0.18 percent of the total intervals in the RTD.
- NWMT passed 98.79 percent of its balancing tests, 99.06 percent in the under supply direction and 99.73 in the oversupply direction
- NWMT passed 99.39 percent of its bid-range capacity tests, 99.39 percent in the upward direction and 0 percent in the downward direction.
- NWMT passed 97.14 percent of its flexible ramping sufficiency tests, 99.33 percent in the upward direction and 99.63 percent in the downward direction.
- The price for upward flexible ramping capacity in the FMM for the NWMT BAA averaged at \$1.07/MWh, while prices for the downward flexible ramping product were \$0.06/MWh.

**III. Market Performance Related to the Transitional Period**

**a. Prices**

Figure 1 shows the daily average FMM and RTD prices in the NWMT EIM Load Aggregation Point (ELAP) for August 1, 2021 through August 31, 2021. The monthly average price was \$40.78 /MWh in the FMM and \$36.61/MWh in the RTD.

**Figure 1: Daily average prices for the NWMT BAA**



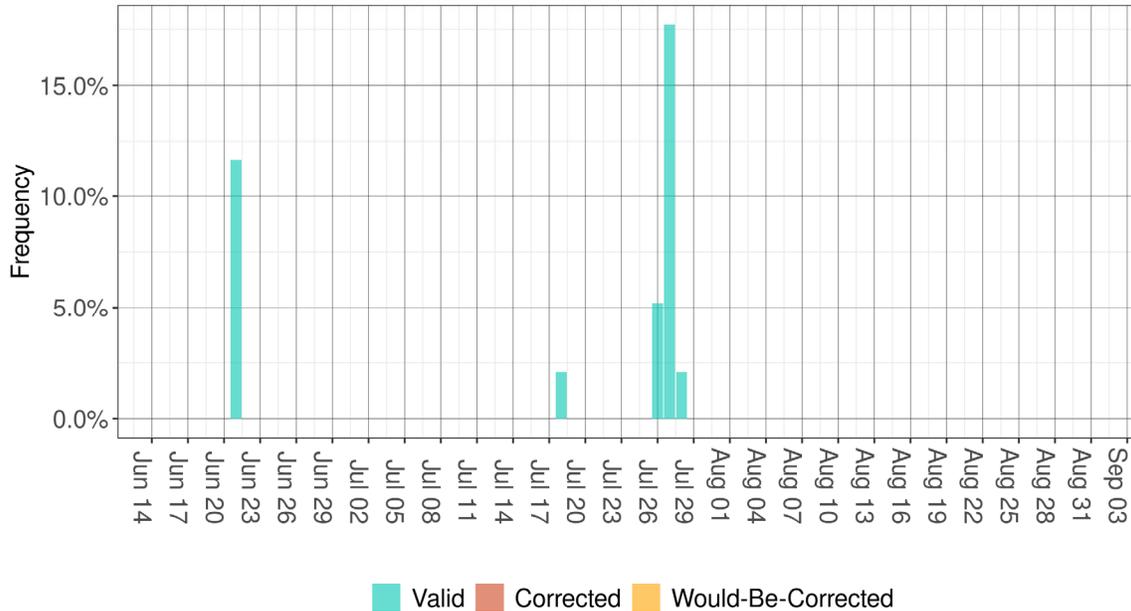
Under the CAISO’s price correction authority in Section 35 of the CAISO tariff, the CAISO may correct prices posted on its Open Access Same-Time Information System (OASIS) if it finds that: (1) the prices were the product of an invalid market solution; (2) the market solution produced an invalid price due to data input failures, hardware or software failures; or (3) the market solution produced 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. That is, the trends represent: (1) prices as produced in the market that 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 adjusted pursuant to the transition period pricing reflected in Section 29.27 of the CAISO tariff.

**b. Frequency of Power Balance Constraint Infeasibilities**

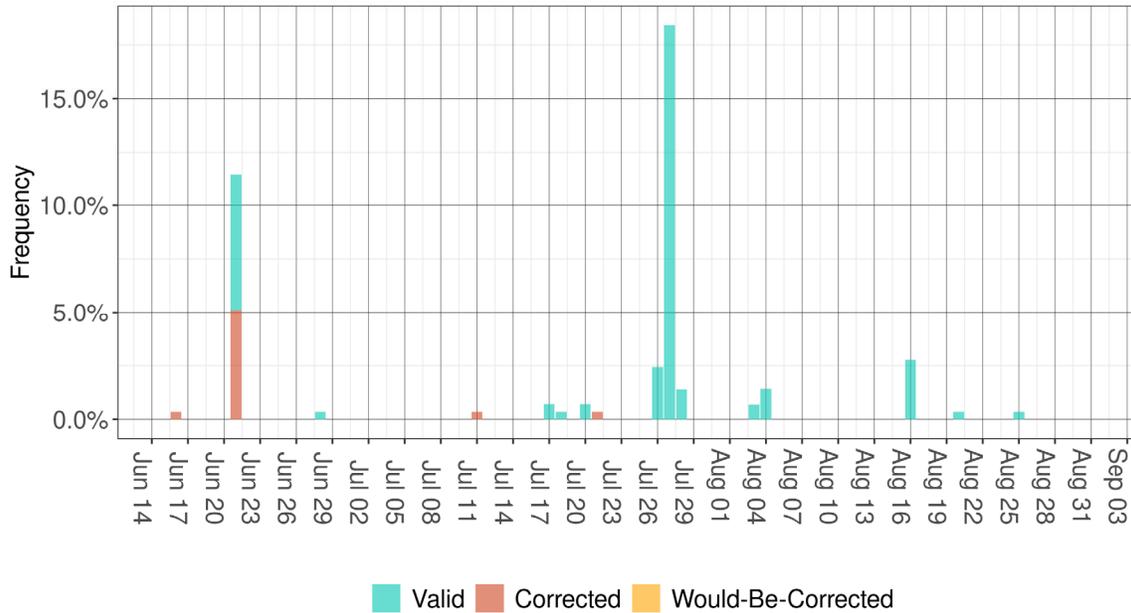
Figures 2 and 3 show the frequency of intervals in which the power balance constraint was relaxed for under-supply conditions in the NWMT BAA for the FMM and RTD. The under-supply infeasibilities are classified into three categories: Valid, Corrected and Would-Be-Corrected. Some of the under-supply infeasibilities affected by either data input failures or software failures were corrected under the price correction authority in Section 35 of the CAISO tariff, and are classified as Corrected. There are other under-supply infeasibilities that were impacted by data input failures or software failures, and which would be subject to price correction, but were not corrected because the price after correction would be the same price as that obtained by the transition period pricing. These instances are classified as Would-Be-Corrected. All remaining under-supply infeasibilities, which were driven by system conditions, are classified as Valid.

From June 16 to July 31 2021, the NWMT BAA had under-supply power balance infeasibilities in 0.78 percent of total intervals in FMM and 0.58 percent of total intervals in RTD.

**Figure 2: Frequency of FMM under-supply infeasibilities in the NWMT BAA**



**Figure 3: Frequency of RTD under-supply infeasibilities in the NWMT BAA**



Tables 1 list the RTD intervals with under-supply infeasibilities observed in August. There were no FMM intervals with under-supply power balance infeasibilities and there were 16 valid RTD intervals with under-supply power balance infeasibilities in the reported period.

**Table 1: Valid RTD under-supply infeasibilities**

Trade Date	Trade Hour	Trade Interval	MW Infeasibility
3-Aug-21	18	2	4.6
3-Aug-21	18	3	2
4-Aug-21	23	2	2.83
4-Aug-21	23	3	7.32
4-Aug-21	23	4	5.98
4-Aug-21	23	5	34.83
16-Aug-21	23	2	12.39
16-Aug-21	23	3	20.11
16-Aug-21	23	4	18.4
16-Aug-21	23	5	23.25
16-Aug-21	23	6	26.8
16-Aug-21	23	7	59.73
16-Aug-21	23	8	46.26
16-Aug-21	23	9	38.62
20-Aug-21	2	10	121.48

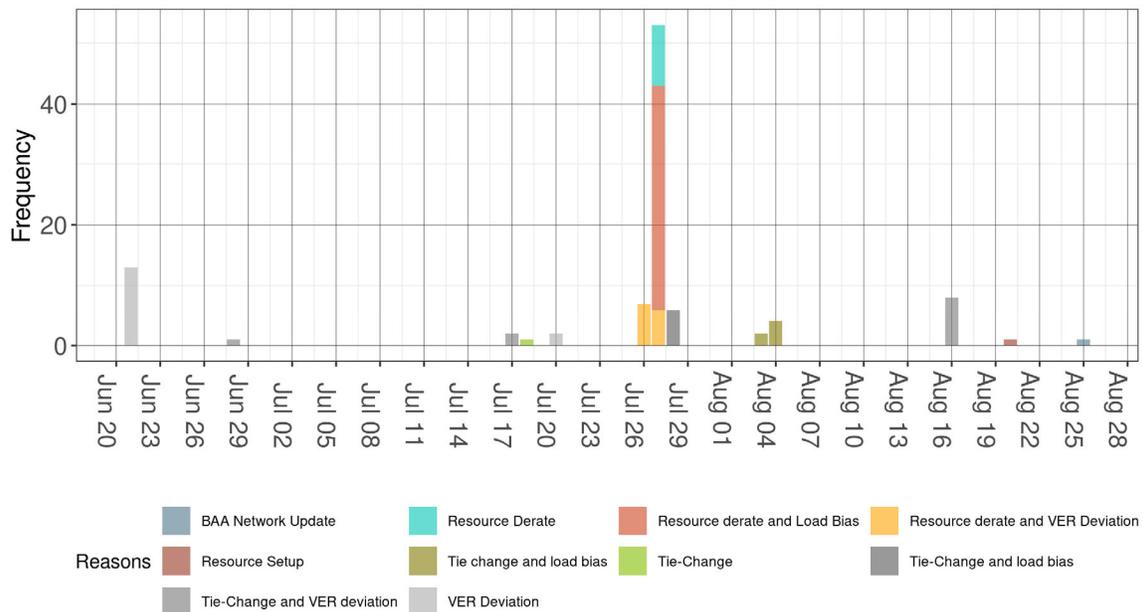
Trade Date	Trade Hour	Trade Interval	MW Infeasibility
25-Aug-21	1	7	1.89

In general, under-supply infeasibilities for a BAA could be driven by various changes to either supply or demand in a market interval. A root cause analysis was performed for all under-supply infeasibilities listed in Table 1. The main reason for each RTD under-supply infeasibility is identified and shown in Figure 4. Between July and August the RTD under-supply infeasibilities count decreased from 71 to 16. The top reasons in August are (1) tie change, decreased wind, and load bias, and (2) tie change and load bias.

The infeasibilities classified as tie change, decreased wind, and load bias are the result of conditions similar to a supply reduction. A tie-change would occur where the decreased amount of NSI is larger than the total ramp capability available from the participating solution. This occurrence usually happens for NWE between high- and low-load time frames. The variation of the net schedule interchange leads to failures in the flex ramp sufficiency and the tie change. The tie change along with other decreases in supply, like decreased wind, during the evening hours along with increased bias led to the largest reason for RTD under-supply infeasibility in August.

Similar to tie change, decreased wind and load bias is the second largest reason.

**Figure 4: Count of RTD under-supply infeasibilities in the NWMT BAA categorized by reasons**



### c. Balancing and Sufficiency Test Failures

The EIM provides an opportunity to various BAAs to serve load while realizing the benefits of increased resource diversity. Because the EIM does not include resource adequacy requirements or obligations for resources to submit bids, the CAISO performs a series of resource sufficiency tests comprised of: (i) a balancing test; (ii) a capacity test; and (iii) a flexible ramping sufficiency test. These tests occur prior to the real-time market.

Performance of a balancing test before each trading hour ensures that each participating BAA submits a balanced base schedule of generation and a net schedule interchange to meet its demand. In addition, the participating BAA is required to submit bids with enough ramping capability to meet its net load forecast uncertainty and net load movement requirements. Figure 5 shows the trend of balancing test outcomes for the period of August 1, 2021, through August 31, 2021, and Figure 6 shows the pattern of bid-range capacity test outcomes for the same period.<sup>4</sup> If a balancing test or the bid-range capacity test is affected by a data input failure or a software failure that test result is shown as a correctable event.

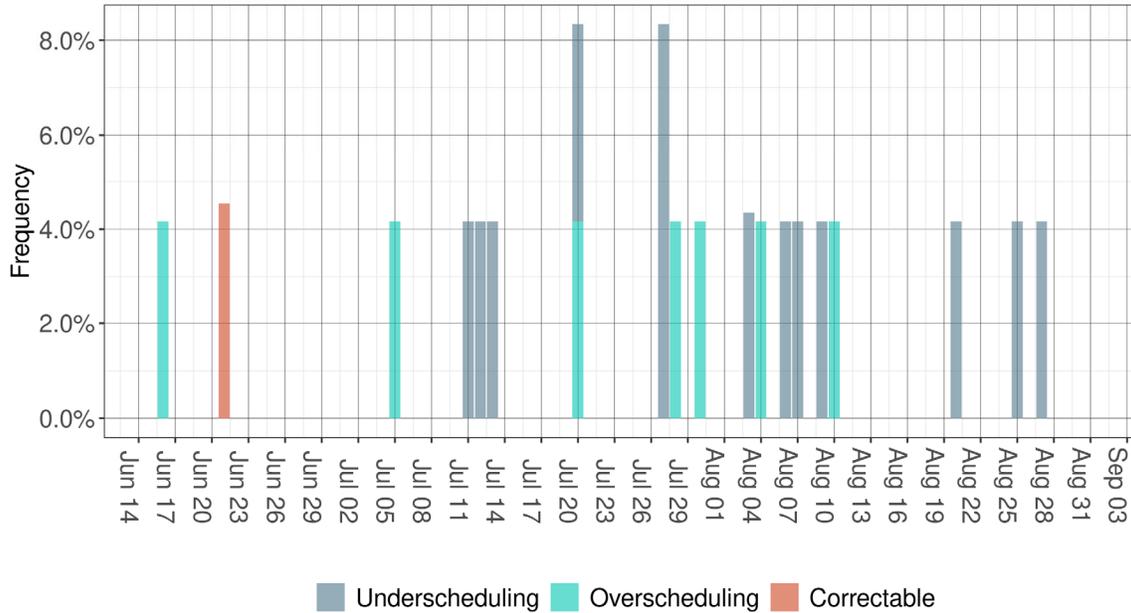
The NWMT BAA passed the balancing test in 98.78 percent of the intervals in the reported period, which is within the acceptable range of balancing test failures. There were two main reasons identified for NWMT BAA balancing test failures, which were similar to June and July. First, the CAISO market applications perform balancing tests three times before the trading hour at the following intervals: 75 minutes before the trading hour, 55 minutes before the trading hour, and 40 minutes before the trading hour. The balancing tests performed at 75 minutes and 55 minutes before the trading hour are advisory results and provide EIM operators an opportunity to adjust the resource base schedules to pass the final balancing tests performed 40 minutes before the trading hour. Several instances of balancing test failures were identified as learning opportunities for the EIM operators to improve the process of analyzing the advisory balancing test results before adjusting base schedules for the final test performed 40 minutes before the trading hour.

Second, the NWMT BAA uses a software application to submit base schedules. Software issues for scheduling and managing outages of NWMT resources resulted in some balancing test failures.

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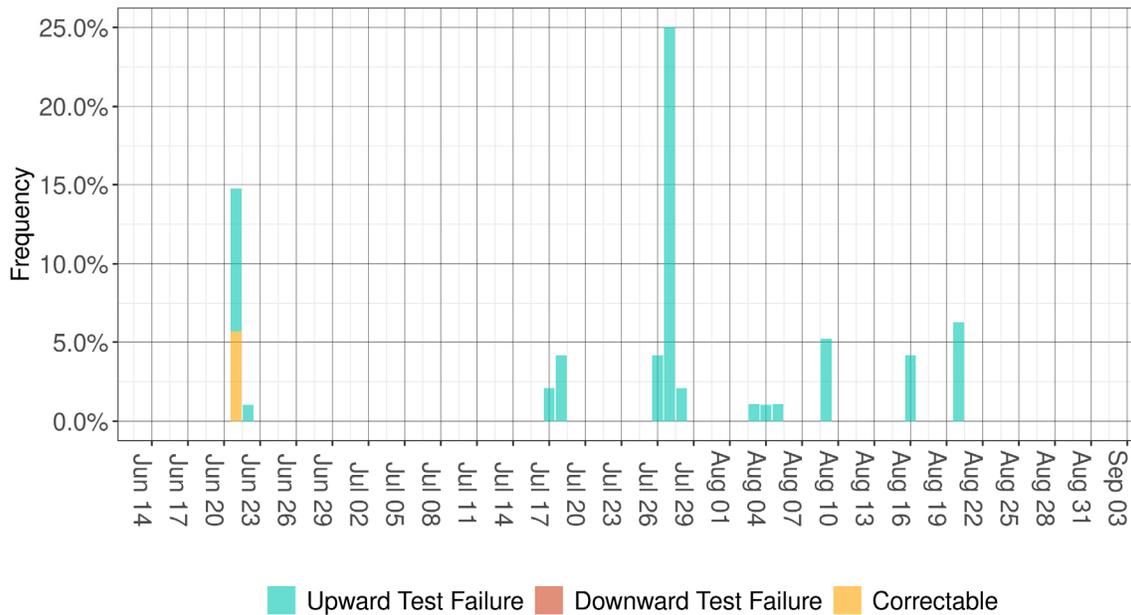
<sup>4</sup> The CAISO performs resource sufficiency tests pursuant to Section 29.34(k) of the CAISO tariff.

**Figure 5: Frequency of Balancing test failures in the NWMT BAA.**



The NWMT BAA passed 99.39 percent of the bid range capacity test. Failures of the test were typically due to resource de-rates or transfer between high and low load hours.

**Figure 6: Frequency of Bid Range Capacity test failures in the NWMT BAA**

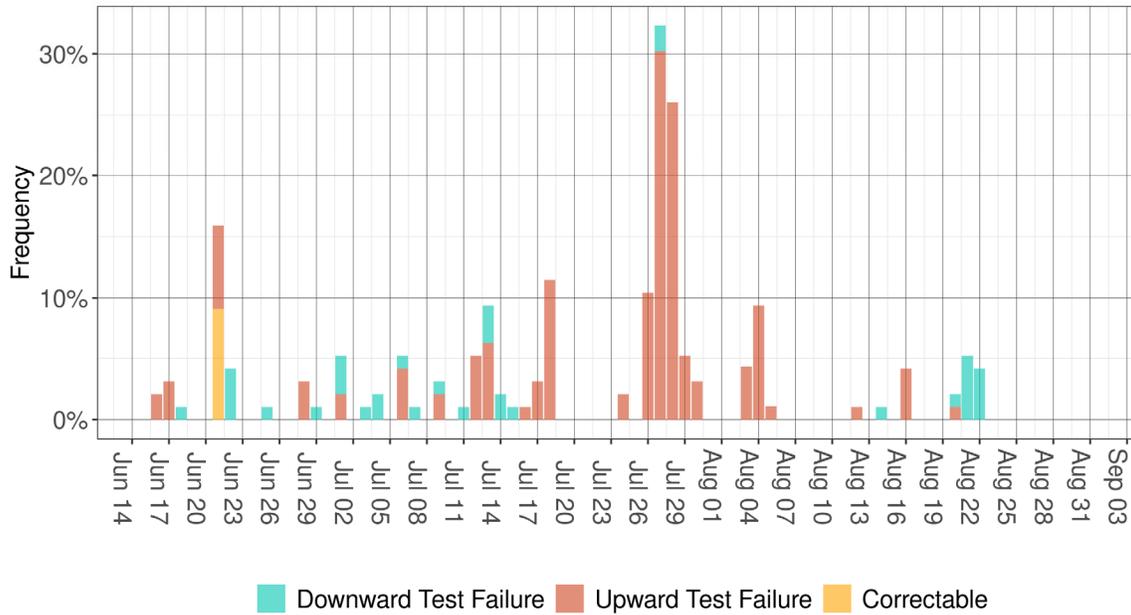


The CAISO’s system also performs the flexible ramping sufficiency test as specified in Section 29.34(m) of the CAISO tariff. Figure 7 shows the trend of the test failures for flexible ramping for the period August 1, 2021 through August 31,

2021. The NWMT BAA passed the flexible ramp up test in 99.32 percent of the intervals in August and passed the flexible ramp down test in 99.62 percent of the intervals.

Most of the failures were due to large changes on inter-tie resources during high to low-load hours or due to limited supply conditions due to resource de-rates.

**Figure 7: Frequency of flexible ramping sufficiency test failures in the NWMT BAA.**



**d. Flexible Ramping Product**

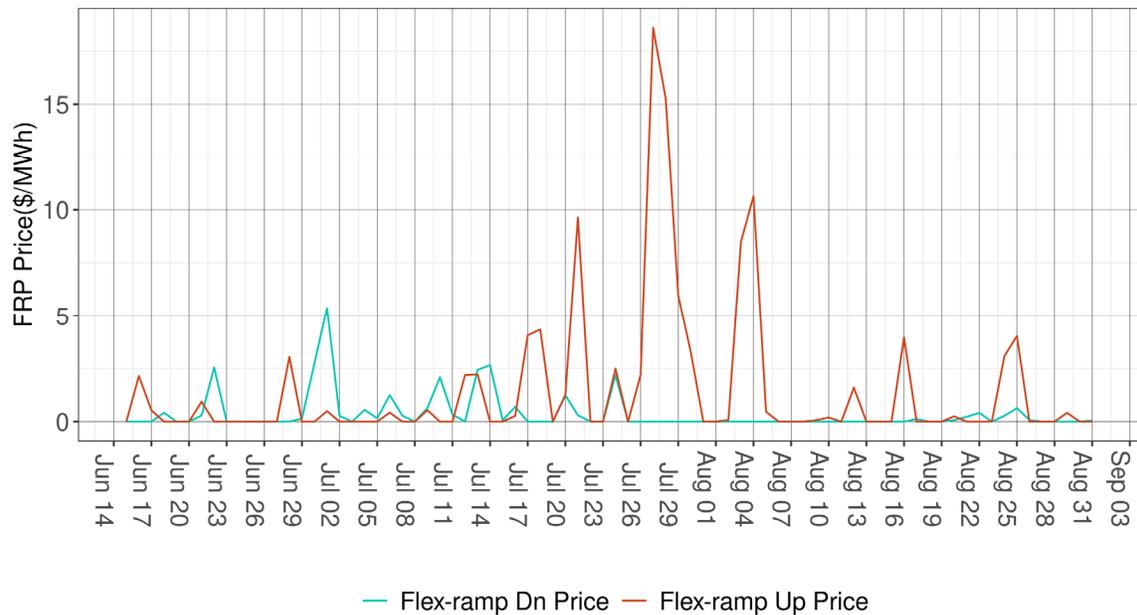
Figure 8 shows the daily average of the upward and downward flexible ramping constraint requirement and procurement in the FMM. Figure 9 shows the daily average of the upward and downward flexible ramping constraint prices in the FMM. With the implementation of the flexible ramping product on November 1, 2016, calculation of the requirement consists of historical data for uncertainty with any applicable net import/export capability or credit. This effectively reduces the amount of flexible ramping the NWMT BAA has to procure and, generally, the EIM system-wide area (which includes all the BAAs in the EIM, including the CAISO BAA) will drive the requirements. The market clearing process may result in procuring the NWMT BAA capacity towards meeting the overall EIM-system-wide area requirement. This is the main reason why the individual NWMT procurement may generally fall below or be above the individual NWMT flex ramp requirement. For most of the days, the NWMT BAA FRP procurement was below the FRP requirement.

**Figure 8: Daily Average requirement, procurement, and price of upward flexible ramping in the FMM in the NWMT BAA**



In addition, the price trend provided in Figure 9 is the nested price determined by the summation of the shadow price of the individual NWMT BAA plus the shadow price of the EIM system-wide area. In August, the average upward flexible ramping capacity price was \$1.07/MWh and the average downward flexible ramping capacity price was \$0.06/MWh.

**Figure 9: Daily Average price of downward flexible ramping in the FMM in the NWMT BAA**



## 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 29<sup>th</sup> day of September 2021.

*/s/ Anna Pascuzzo*  
Anna Pascuzzo