July 29, 2020

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-___
June 2020 Informational Report
Energy Imbalance Market – Transition Period Report –
Salt River Project EIM Entity

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) hereby submits its report on the transition period of Salt River Project EIM Entity during its first six months of participation in the Energy Imbalance Market (EIM) for June 2020. 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: *<u>/s/ Anna A. McKenna</u>*

Roger E. Collanton
General Counsel
Anna A. McKenna
Assistant General Counsel
John Anders
Assistant General Counsel
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 608-7182
Fax: (916) 608-7222
amckenna@caiso.com

Energy Imbalance Market
June 1 – June 30, 2020

Transition Period Report
Salt River Project (SRP) EIM Entity

July 29, 2020

California ISO Department of Market Analysis and Forecasting

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] Salt River Project (SRP), entered the EIM on April 1, 2020, and the transition period will apply to the SRP Balancing Authority Area (BAA) until October 1, 2020.

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 SRP 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,[2] 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 30 days after the end of each month in order to provide the prior full month's data.

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

[2] 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, SRP's third month in EIM was smooth and without significant issues. June's market performance highlights are as follows:

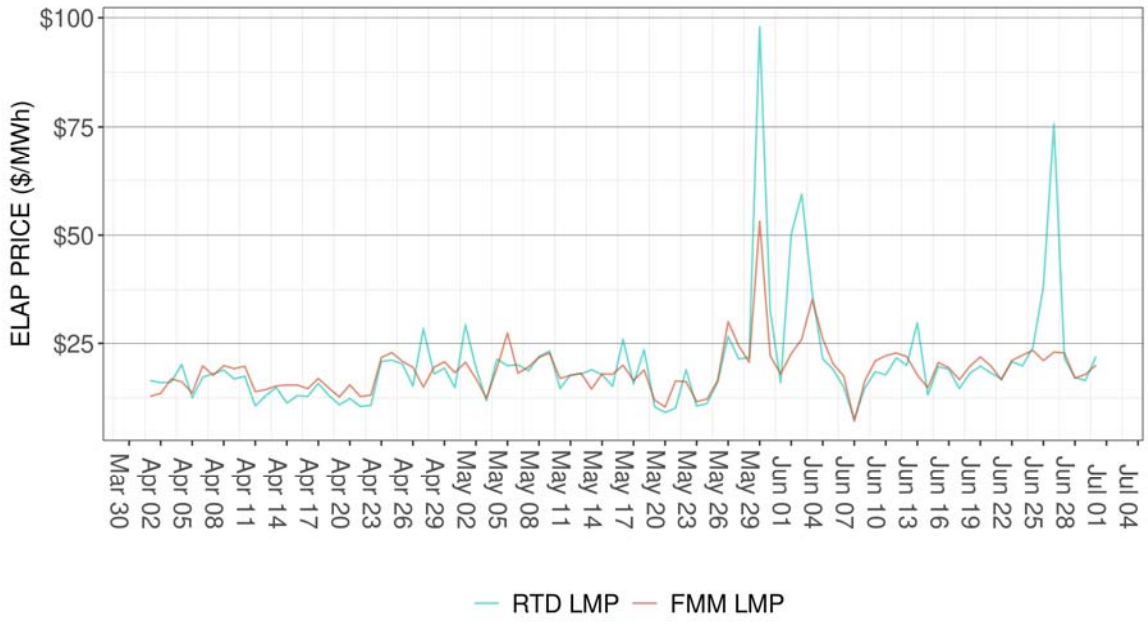
- The monthly average SRP BAA price was $20.50/MWh in the fifteen-minute market (FMM) and $24.23/MWh in the real-time dispatch (RTD).
- Power balance constraint infeasibilities for the under-supply conditions were minimal for the SRP BAA with 0.21 percent of the total intervals in the FMM and 1.38 percent of the total intervals in the RTD.
- SRP passed 97.64 percent of its balancing tests, 98.61 percent in the under supply direction and 99.03 in the oversupply direction
- SRP passed 100 percent and 99.97 percent of its bid-range capacity tests, in the downward and upward direction, respectively.
- SRP passed its flexible ramping sufficiency tests 99.83 percent in the upward direction and 99.55percent in the downward direction.
- The price for upward flexible ramping capacity in the FMM for the SRP BAA averaged at $0.05/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 SRP EIM Load Aggregation Point (ELAP) for June 1, 2020 through June 30, 2020. The monthly average price was $20.50/MWh in the FMM and $24.23/MWh in the RTD.

Figure 1: Daily average prices for the SRP 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 SRP 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 impacted by either data input failures or software failures werecorrected under the price correction authority in Section 35 of the CAISO tariff, and are classified as Corrected. There are other under-supply infeasibilities impacted by data input failures or software failures and 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. In June 2020, the SRP BAA had under-supply power balance infeasibilities in 0.21 percent of total intervals in FMM and 1.38 percent of total intervals in RTD.

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

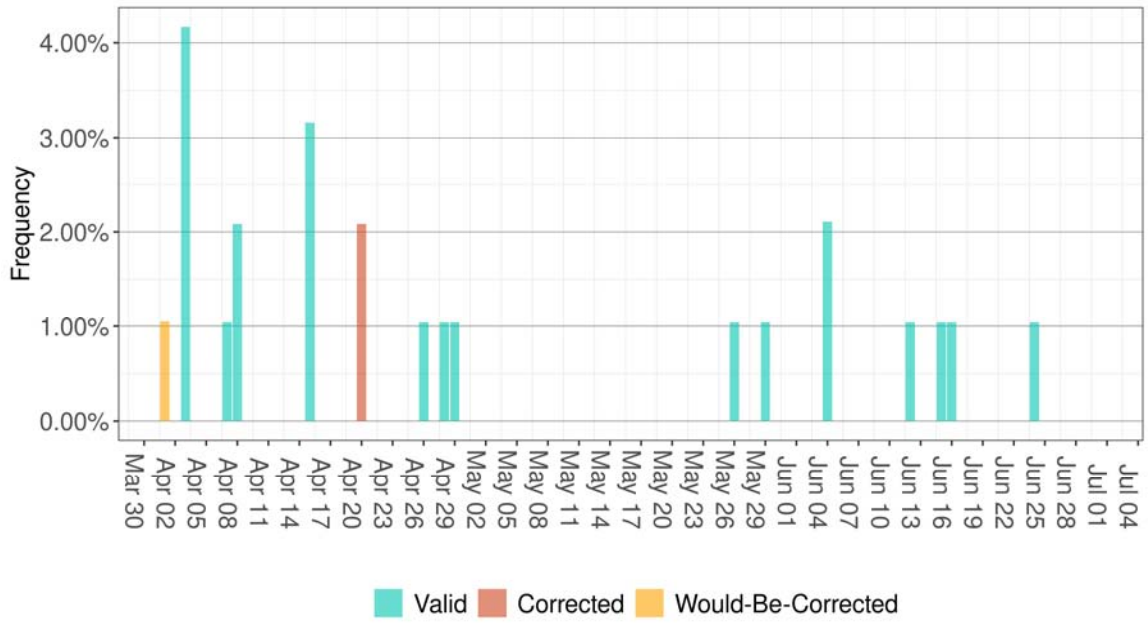
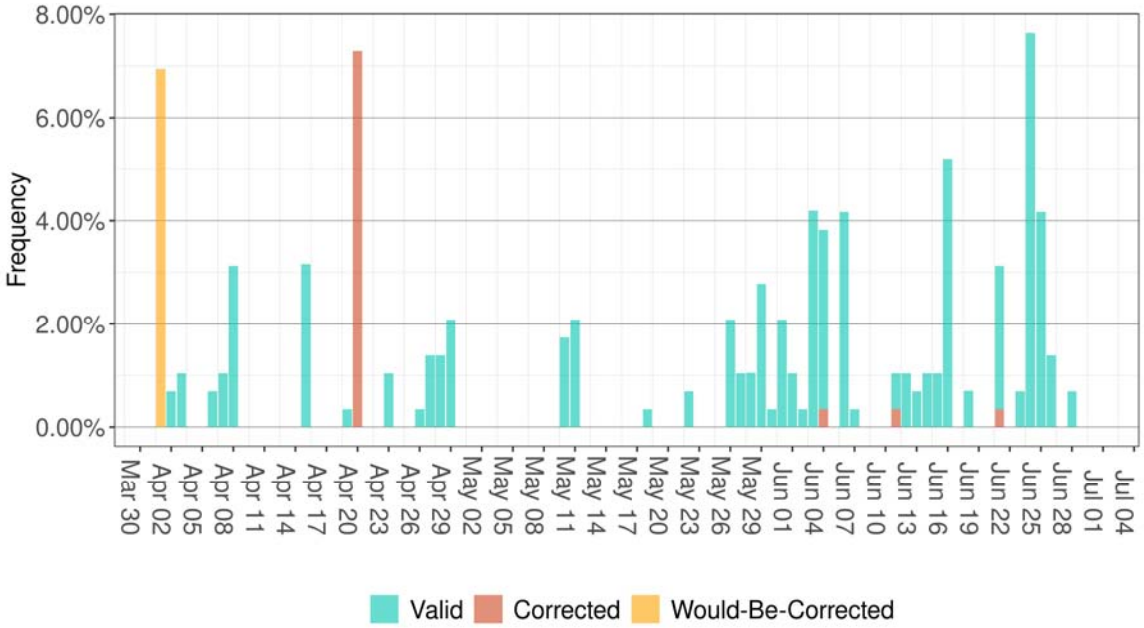


Figure 3: Frequency of RTD under-supply infeasibilities in the SRP BAA



Tables 1 and 2 list the FMM and RTD intervals with under-supply infeasibilities observed in June. There were six valid FMM intervals with under-supply power balance infeasibilities and there were 119 valid RTD intervals with under-supply power balance infeasibilities for the month.

Table 1: Valid FMM under-supply infeasibilities

Trade Date	Trade Hour	Trade Interval	MW Infeasibility
4-Jun-20	20	1	19.82
4-Jun-20	21	1	44.44
12-Jun-20	20	1	64.46
15-Jun-20	21	1	45.44
16-Jun-20	21	1	43.1
24-Jun-20	19	1	52.96

Table 2: Valid RTD under-supply infeasibilities

Trade Date	Trade Hour	Trade Interval	MW Infeasibility
1-Jun-20	12	2	51.58
1-Jun-20	12	4	3.13

Trade Date	Trade Hour	Trade Interval	MW Infeasibility
1-Jun-20	12	6	5.92
2-Jun-20	14	6	46.34
3-Jun-20	12	2	43.74
3-Jun-20	12	3	84.26
3-Jun-20	12	4	65.24
3-Jun-20	12	5	47.09
3-Jun-20	17	7	121.69
3-Jun-20	17	8	115.1
3-Jun-20	17	9	120.84
3-Jun-20	17	10	84.87
3-Jun-20	17	11	47.68
3-Jun-20	19	2	18.37
3-Jun-20	22	5	2.08
3-Jun-20	22	6	18.62
4-Jun-20	10	9	71.49
4-Jun-20	10	10	26.21
4-Jun-20	10	12	12.13
4-Jun-20	11	6	9.86
4-Jun-20	20	2	109.31
4-Jun-20	20	3	90.1
4-Jun-20	21	2	54.81
4-Jun-20	21	3	72.93
4-Jun-20	21	4	20.2
4-Jun-20	21	5	6.05
6-Jun-20	12	1	28.19
6-Jun-20	12	5	28.63
6-Jun-20	15	8	13.48
6-Jun-20	15	9	24.51
6-Jun-20	15	12	17.92
6-Jun-20	16	2	0.84
6-Jun-20	16	10	4.4
6-Jun-20	16	11	8.2
6-Jun-20	18	1	52.34
6-Jun-20	18	2	90.88
6-Jun-20	18	3	61.28
6-Jun-20	18	4	22.07
7-Jun-20	16	5	10.34
11-Jun-20	12	9	36.07
11-Jun-20	12	10	11.01

Trade Date	Trade Hour	Trade Interval	MW Infeasibility
12-Jun-20	20	1	117.05
12-Jun-20	20	2	183.13
12-Jun-20	20	3	128.69
13-Jun-20	18	7	71.25
13-Jun-20	18	8	48.58
14-Jun-20	15	5	14.18
14-Jun-20	15	6	13.6
14-Jun-20	15	7	22.11
15-Jun-20	21	1	7.21
15-Jun-20	21	2	14.18
15-Jun-20	21	3	21.16
16-Jun-20	15	10	16.53
16-Jun-20	16	2	133.39
16-Jun-20	16	3	104.14
16-Jun-20	16	4	63.49
16-Jun-20	16	5	21.01
16-Jun-20	16	6	27.94
16-Jun-20	16	7	39.99
16-Jun-20	16	8	8.61
16-Jun-20	16	9	18.67
16-Jun-20	16	10	49.46
16-Jun-20	16	11	28.98
16-Jun-20	16	12	29.7
16-Jun-20	17	4	50.36
16-Jun-20	17	5	6.99
16-Jun-20	17	8	10.55
18-Jun-20	17	1	7.53
18-Jun-20	19	2	14.98
21-Jun-20	12	4	57.38
21-Jun-20	12	5	46.93
21-Jun-20	12	9	37.88
21-Jun-20	12	10	44.59
21-Jun-20	12	11	17.66
21-Jun-20	15	6	39.47
21-Jun-20	15	7	5.67
21-Jun-20	15	12	9.55
23-Jun-20	13	6	138.58
23-Jun-20	13	7	93.72
24-Jun-20	10	12	25.86

Trade Date	Trade Hour	Trade Interval	MW Infeasibility
24-Jun-20	11	1	39.95
24-Jun-20	11	3	8.93
24-Jun-20	11	6	12.87
24-Jun-20	11	8	0.18
24-Jun-20	12	2	67.72
24-Jun-20	12	3	31
24-Jun-20	12	4	30.25
24-Jun-20	13	5	6.17
24-Jun-20	13	6	6.36
24-Jun-20	13	8	80.85
24-Jun-20	13	9	49.79
24-Jun-20	13	11	3.52
24-Jun-20	13	12	30.33
24-Jun-20	14	1	194.67
24-Jun-20	14	2	196.95
24-Jun-20	14	3	165.43
24-Jun-20	14	4	129.44
24-Jun-20	14	5	196.47
24-Jun-20	14	6	167.59
24-Jun-20	14	7	126.15
24-Jun-20	14	8	31.59
25-Jun-20	12	12	0.27
25-Jun-20	13	1	16.75
25-Jun-20	13	3	43.25
25-Jun-20	13	4	74.7
25-Jun-20	13	5	47.97
25-Jun-20	13	6	9.71
25-Jun-20	13	7	85.56
25-Jun-20	13	8	64.85
25-Jun-20	13	9	87.68
25-Jun-20	13	10	51.29
25-Jun-20	13	11	34.09
25-Jun-20	14	6	16.76
26-Jun-20	11	9	40.04
26-Jun-20	11	10	39.29
26-Jun-20	11	11	49.13
26-Jun-20	11	12	53.22
28-Jun-20	13	9	9.34
28-Jun-20	14	6	10.36

In general, under-supply infeasibilities for a BAA could be driven by various changes to either supply or demand for a market interval. A root cause analysis was performed for all FMM and RTD under-supply infeasibilities listed in Table 1 and 2. There are often many factors driving a single infeasibility. Figure 4 presents the main driver for each of the RTD under-supply infeasibilities identified and shown in Figure 4. The top three reasons are Resource Deviations, Resource Set-up, and Load Change.

The RTD under-supply infeasibilities driven by Resource Deviations refers to those intervals in which SRP resources were operating below the RTD dispatch target; at the same time, there were either limited EIM transfers or a cap on EIM transfers, because SRP had failed the flexible ramp up sufficiency test. SRP resources deviated from their dispatch target for two main reasons. First, the SRP resources were slow to start-up or slow to transition in the case of a Multi-Stage Generation (MSG) resource. Second, resources either had tripped offline fully or partially tripped to a lower point in the operating range.

For some RTD and FMM intervals related to Resource Set-up, an MSG resource was committed by the FMM into a 1X1 duct fired (DF) and would be committed in that configuration until the end of the day. The commitment to the 1X1 DF configuration occurred in mid-day hours when prices were lower and the FMM needed a small amount of incremental energy. This commitment configuration went unnoticed in the afternoon when prices would not support a downward transition to a 1x1 configuration. The economics did not support the downward transition because the market would have to satisfy the minimum up time of that configuration before transitioning up to a 2X1. Because there is no direct upward path from a 1X1 DF configuration to a 2x1 configuration, and economics did not support the transition down to go back up to a higher configuration, this led to shortages of ramp capacity as well as contributed to the under supply.

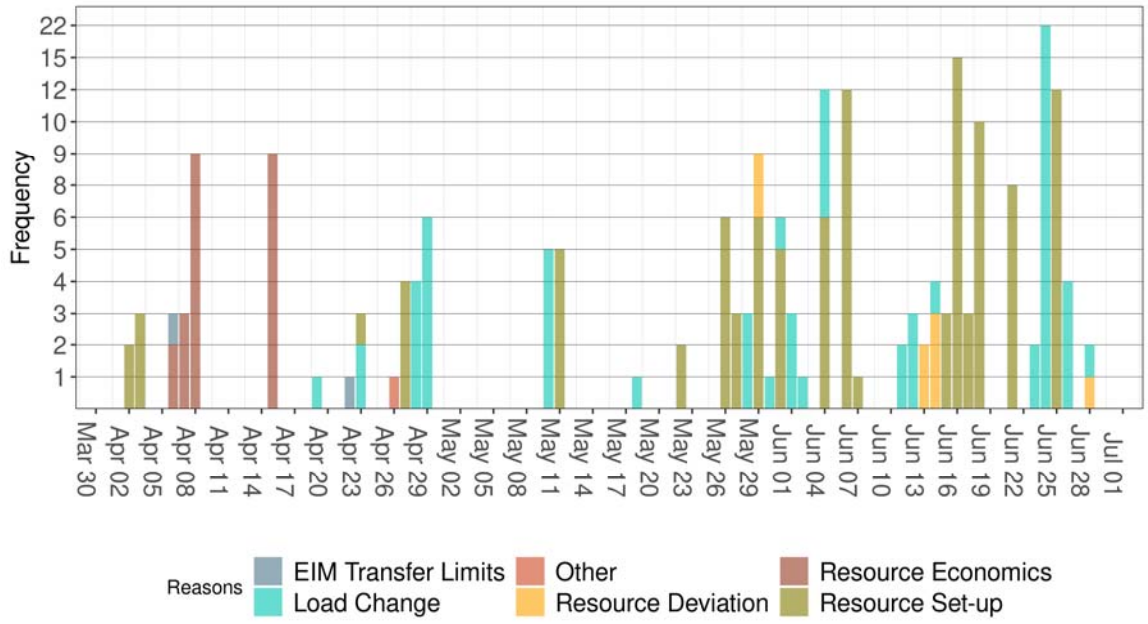
The Resource Set-up category also reflects a scenario that also led to under-supply in FMM and RTD where SRP submitted base schedules for a large amount of non-spin reserve capacity on participating resources in peak hours. This caused a loss of participating energy along with a decrease in energy schedules that contributed to upward sufficiency failures.

The SRP BAA uses a third party optimization tool to submit its hourly base schedules. For some market intervals, an MSG resource had a zero base schedule to reserve non-spin reserve capacity. With this set-up, the market application had to turn off the resource in order to preserve non-spin reserve

capacity. At the same time, SRP had failed the flexible ramp sufficiency test and there was no additional capacity in the BAA available to the market application. This resulted in an under-supply infeasibility. However, the resource did not shut down and was online for the entire hour. These intervals are shown as Resource Set-up in Figure 4 and they are part of SRP's fine-tuning processes during this transitional period of operations in the market.

The infeasibilities classified as Load Change depict those intervals in which the RTD requirement increased above the FMM load forecast such that the SRP BAA was short of the ramping capacity to meet the increase in requirement. These infeasibilities usually last two or three five-minute intervals until the resources are able to ramp-up to meet the imbalance requirement.

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



c. Balancing and Sufficiency Test Failures

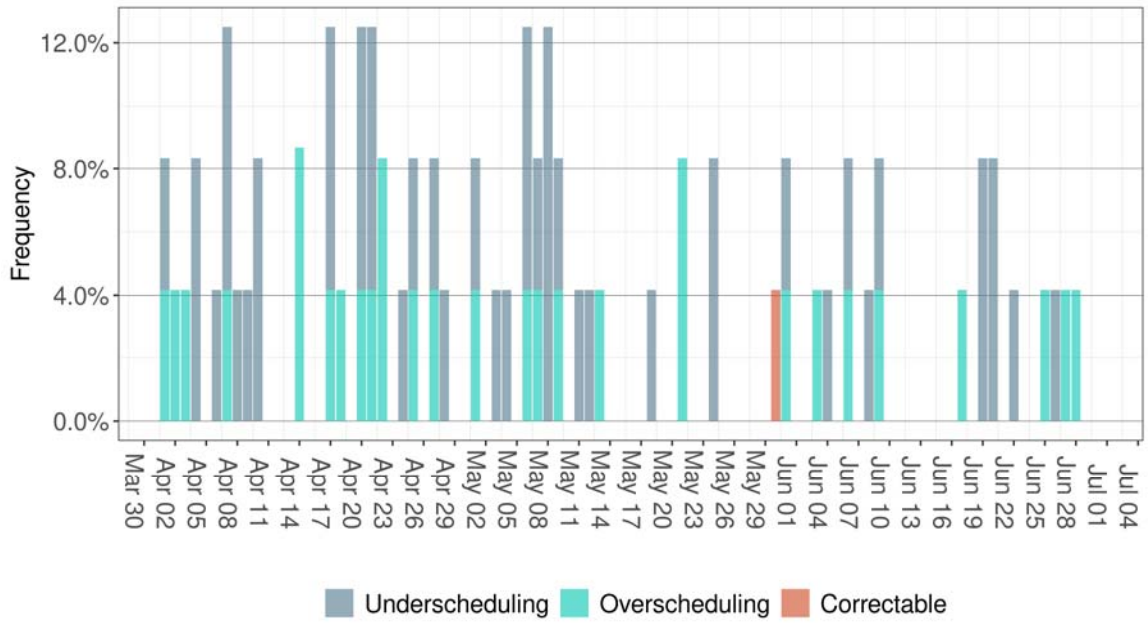
The EIM provides an opportunity to various BAAs to serve load while realizing the benefits of increased resource diversity. Because the EIM does not include resource adequacy requirements or obligations for resources to submit bids, the CAISO performs a series of resource sufficiency tests comprised 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 with its own generating resources. 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 April 1, 2020, through June 30, 2020, and Figure 6 shows the pattern of bid-range capacity test outcomes for the period of April 1, 2020, through June 30, 2020.[3] 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 SRP BAA passed the balancing test in 97.64 percent of the intervals in June, which is within the acceptable range of balancing test failures. There were three main reasons identified for SRP BAA balancing test failures. First, the CAISO market applications performs 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. In other instances, there were some issues in the software that SRP BAA uses to submit base schedules, which resulted in some balancing test failures.

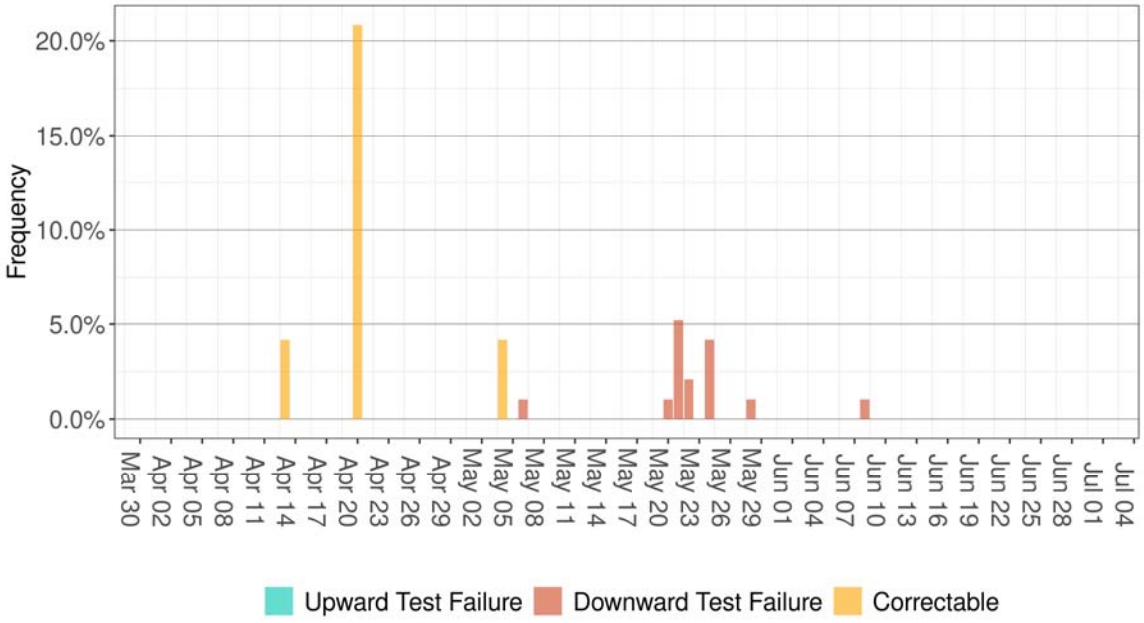
[3] The CAISO performs resource sufficiency tests pursuant to Section 29.34(k) of the CAISO tariff.

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



The SRP BAA passed 99.97 percent of the bid range capacity test in the upward direction; this is a minor reduction compared to the 100 percent pass rate observed in April and a slight improvement from May. The one capacity failure in June was in the downward direction and was attributed to a bid submission issue from SRP.

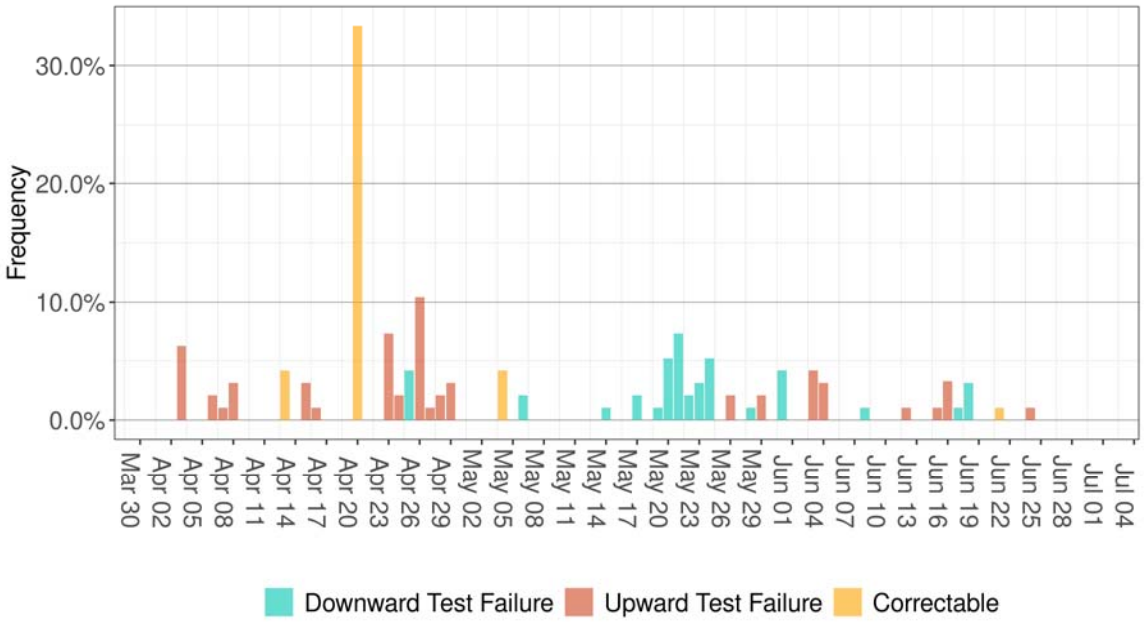
Figure 6: Frequency of Bid Range Capacity test failures in the SRP BAA



The CAISO 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 of April 1 through June 30. The SRP BAA passed the flexible ramp up sufficiency test in 99.55 percent of the intervals in June and passed the flexible ramp down sufficiency test in 99.83 percent of the intervals in June.

Most of the flexible ramping sufficiency failures were caused by the commitment of a resource in a 1X1 (duct fired) DF configuration and had limited ramp and upper transition capability. On June 22, a software variance was identified in regards to the flexible ramping sufficiency calculation for a pumped storage resource. Because the calculation was not calculating enough ramping capacity for the resource, the test incorrectly failed. This software issue was quickly resolved and a fix was applied within a week. This failure was classified as Correctable on Figure 7.

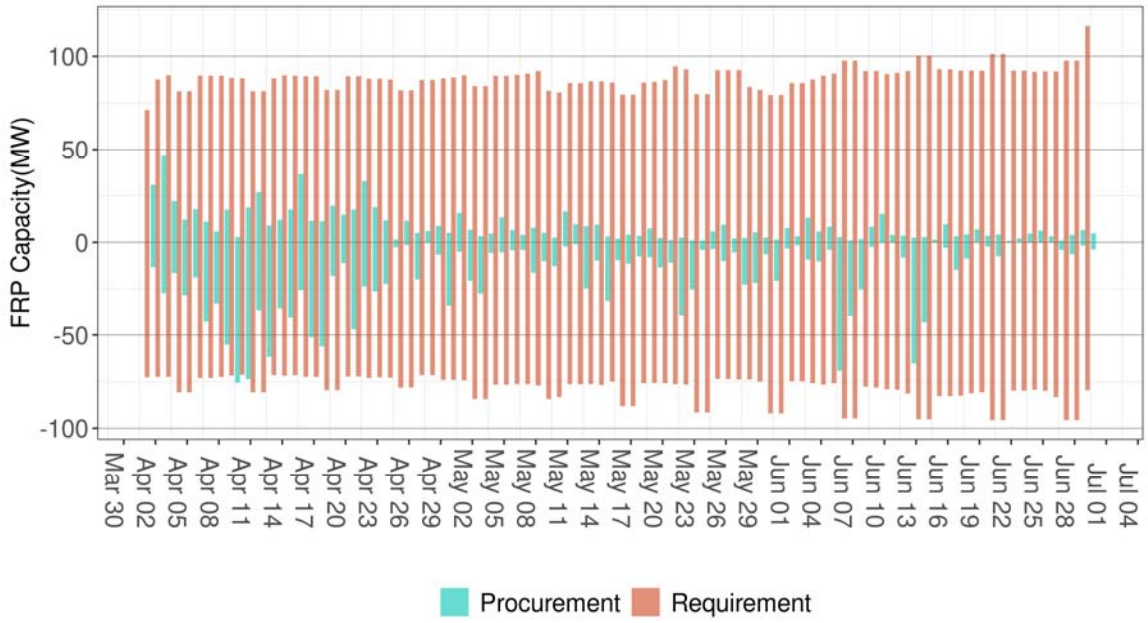
Figure 7: Frequency of flexible ramping sufficiency test failures in the SRP BAA.



d. Flexible Ramping Product

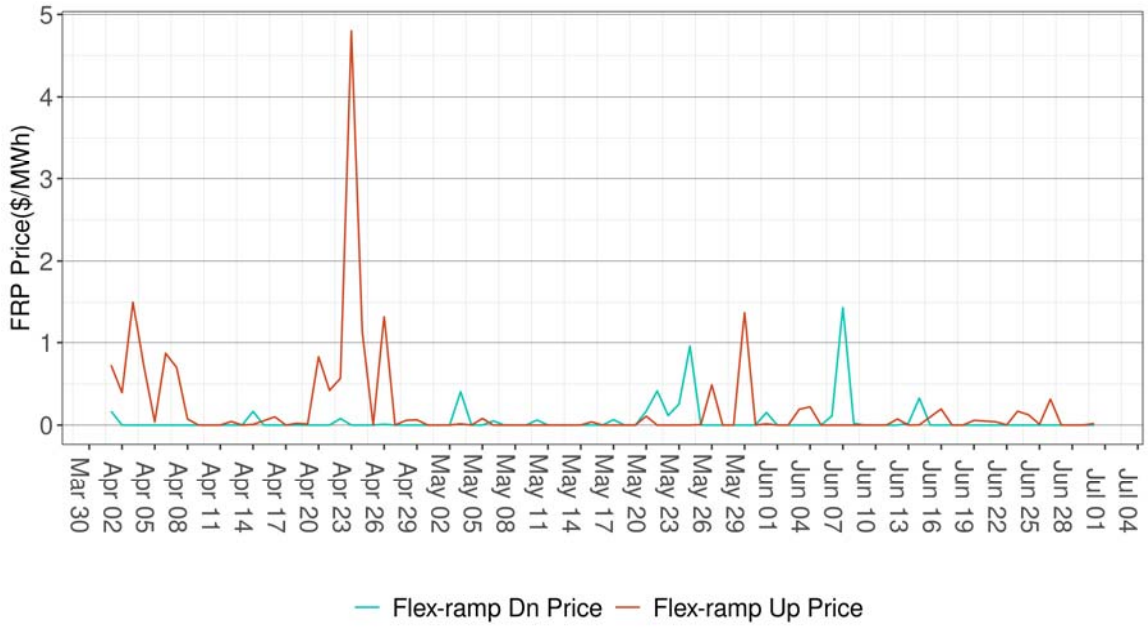
Figure 8 shows the daily average of the upward and downward flexible ramping constraint requirement and procurement in the FMM. Figure 9 shows the daily average of the upward and downward flexible ramping constraint prices in the FMM. With the implementation of the flexible ramping product on November 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 SRP 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 SRP BAA capacity towards meeting the overall EIM-system-wide area requirement. This is the main reason why the individual SRP procurement may generally fall below or be above the individual SRP flex ramp requirement. For most days, the SRP 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 SRP 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 SRP BAA plus the shadow price of the EIM system-wide area. In June, the average upward flexible ramping capacity price was $0.05/MWh and the average downward flexible ramping capacity price was $0.06/MWh.

Figure 9: Daily Average requirement, procurement, and price of downward flexible ramping in the FMM in the SRP 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 29th day of July 2020.

/s/ Anna Pascuzzo
Anna Pascuzzo