



November 12, 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: ER15-2565-\_\_  
Energy Imbalance Market Special Report – Transition Period –  
September 2020 for Salt River Project.**

Dear Secretary Bose:

The Department of Market Monitoring (DMM) hereby submits its Energy Imbalance Market (EIM) special report on the transition period of Salt River Project during its first six months of participation in the EIM for September 2020. Salt River Project joined the energy imbalance market on April 1, 2020.

Please contact the undersigned directly with any questions or concerns regarding the foregoing.

Respectfully submitted,

**By: /s/ Eric Hildebrandt**

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**California ISO**

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**Report on energy imbalance market  
issues and performance:  
Salt River Project for September 2020**

**November 12, 2020**

**Prepared by: Department of Market Monitoring**



## Executive summary

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Pursuant to the Commission's October 29, 2015 Order on the ISO's energy imbalance market (EIM), the ISO filed a report on October 30, 2020 covering the period from September 1 through September 30, 2020 (September report) for Salt River Project (SRP) in the energy imbalance market.<sup>1</sup> SRP joined the energy imbalance market on April 1, 2020.

This report provides a review by the Department of Market Monitoring (DMM) of energy imbalance market performance for the SRP balancing authority area during the period covered in the ISO's September report. This is the sixth and final report for the transition period for the SRP balancing authority area, completeing on September 30, 2020. Key findings in this report include the following:

- Prices in the SRP area were not identical to prices within the ISO. In the SRP area during the month, prices averaged \$31.38/MWh in the 15-minute market and \$28.68/MWh in the 5-minute market.
- The SRP balancing authority area failed the upward sufficiency test in 33 intervals and the downward sufficiency tests in 3 intervals during September.
- Valid under-supply infeasibilities occurred in 8 intervals in the 15-minute market and 51 intervals in the 5-minute market in September. Valid over-supply infeasibilities were less frequent, occurring during 3 interval in the 15-minute market, and during 44 intervals in the 5-minute market for the SRP area during the month.
- For the month, transition period pricing decreased average 15-minute and 5-minute prices by \$2.43/MWh and \$4.90/MWh, respectively.

Section 1 of this report provides a description of prices and power balance constraint relaxations and section 2 discusses the flexible ramping sufficiency test.

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<sup>1</sup> The ISO's September 2020 Report was filed at FERC and posted on the ISO website on October 30, 2020: <http://www.caiso.com/Documents/Oct30-2020-EIM-TransitionPeriodReport-SaltRiverProject-Sep2020-ER15-2565.pdf>

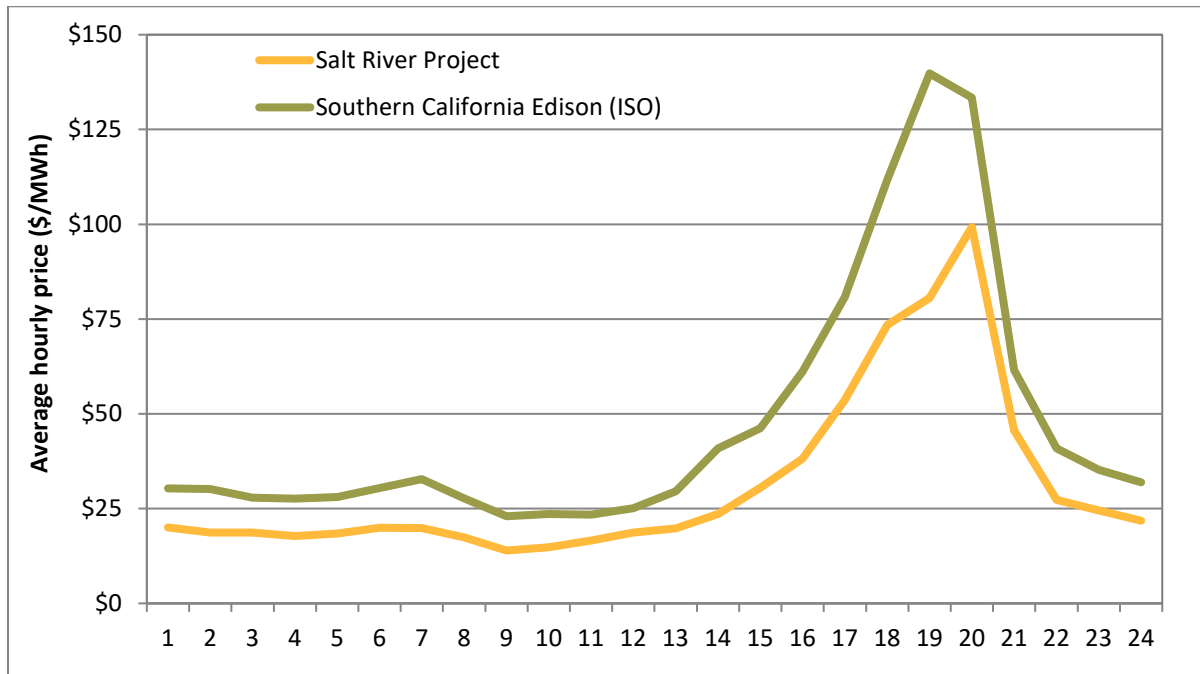


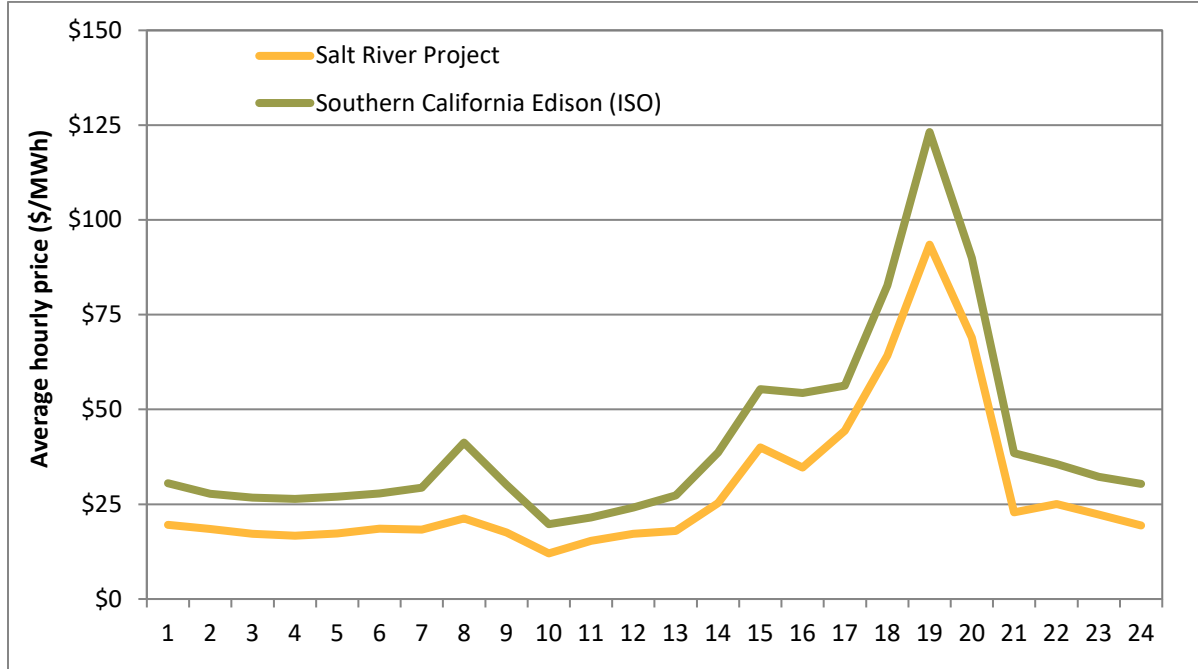
## 1 Energy imbalance market prices

Figure 1.1 and Figure 1.2 show hourly average 15-minute and 5-minute prices during September for Salt River Project compared with prices in the ISO at the Southern California Edison (SCE) default load aggregation point.

Average prices in the SRP area tracked lower than prices at the Southern California Edison (SCE) default load aggregation point within the ISO. Price separation between these two areas occurred frequently in both the 15-minute and 5-minute markets, with SRP prices being significantly lower during peak hours. In the SRP area during the month, prices averaged \$31.38/MWh in the 15-minute market and \$28.68/MWh in the 5-minute market.

**Figure 1.1 Average hourly 15-minute price (September 2020)**



**Figure 1.2 Average hourly 5-minute price (September 2020)**

All power balance constraint relaxations that occurred in September were subject to the six-month transition period pricing that expires on October 1, 2020. The transition period pricing mechanism sets prices at the highest cost supply bid dispatched to meet demand rather than at the \$1,000/MWh penalty parameter while relaxing the constraint for shortages, or the -\$155/MWh penalty parameter while relaxing the constraint for excess energy.<sup>2</sup> Power balance constraint relaxations can be grouped in the following categories:

- **Valid under-supply infeasibility** (power balance constraint shortage). These occurred when the power balance constraint was relaxed because load exceeded available generation. The ISO validated that ISO software was working appropriately during these instances.
- **Valid over-supply infeasibility** (power balance constraint excess). These occurred when the power balance constraint was relaxed because generation exceeded load. The ISO validated that ISO software was working appropriately during these instances.
- **Load conformance limiter would have resolved infeasibility.** The load conformance limiter automatically reduces the size of an operator load adjustment and sets prices at the last economic signal when the conditions for the limiter are met.<sup>3</sup> During the transition period, the limiter does not

<sup>2</sup> When transition period pricing provisions are triggered by relaxation of the power balance constraint, any shadow price associated with the flexible ramping product is set to \$0/MWh to allow the market software to use the last economic bid dispatched.

<sup>3</sup> The ISO implemented an enhancement to the load conformance limiter, effective February 27, 2019. With the enhancement, the load conformance limiter triggers by a measure based on the change in load adjustment from one interval to the next, rather than the total level of load adjustment.



change price outcomes because transition period pricing is applied during these intervals instead. However, in these cases, the load conformance limiter *would have resolved the infeasibility* had transition period pricing not been in effect.

- **Correctable infeasibility.** These occurred when the ISO software relaxed the power balance constraint concurrent with a software error or data error that resulted in a price correction or would have triggered a price correction if transition period pricing were not active.<sup>4</sup>

Figure 1.3 and Figure 1.4 show the monthly frequency of under-supply and over-supply infeasibilities, respectively, in the 5-minute market and 15-minute market. As shown in Figure 1.3, valid under-supply infeasibilities occurred in 8 intervals in the 15-minute market and 51 intervals in the 5-minute market in September.

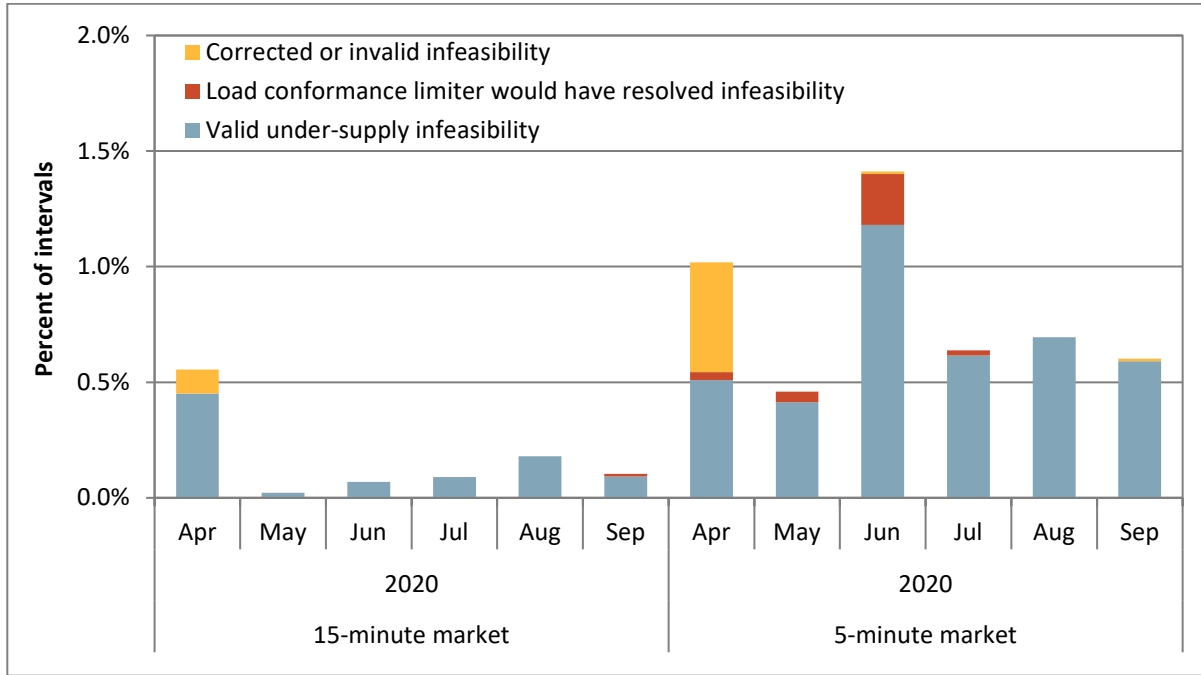
As shown in Figure 1.4, valid over-supply infeasibilities were less frequent. These occurred during 3 interval in the 15-minute market, and during 44 intervals in the 5-minute market for the SRP area during September.

There was 1 interval during September when the load conformance limiter would have triggered in both the 15-minute and 5-minute markets for the SRP balancing authority area had transition period pricing not been in effect.

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<sup>4</sup> Section 35 of the ISO tariff provides the ISO authority to correct prices if it detects an invalid market solution or issues due to a data input failure, occurrence of hardware or software failure, or a result that is inconsistent with the ISO tariff. During erroneous intervals, the ISO determined that prices resulting under transition period pricing were equivalent to prices that would result from a price correction, so no further price adjustment was appropriate.  
[http://www.caiso.com/Documents/Section35\\_MarketValidationAndPriceCorrection\\_May1\\_2014.pdf](http://www.caiso.com/Documents/Section35_MarketValidationAndPriceCorrection_May1_2014.pdf).

**Figure 1.3 Frequency of under-supply power balance infeasibilities by month  
Salt River Project**



**Figure 1.4 Frequency of over-supply power balance infeasibilities by month  
Salt River Project**

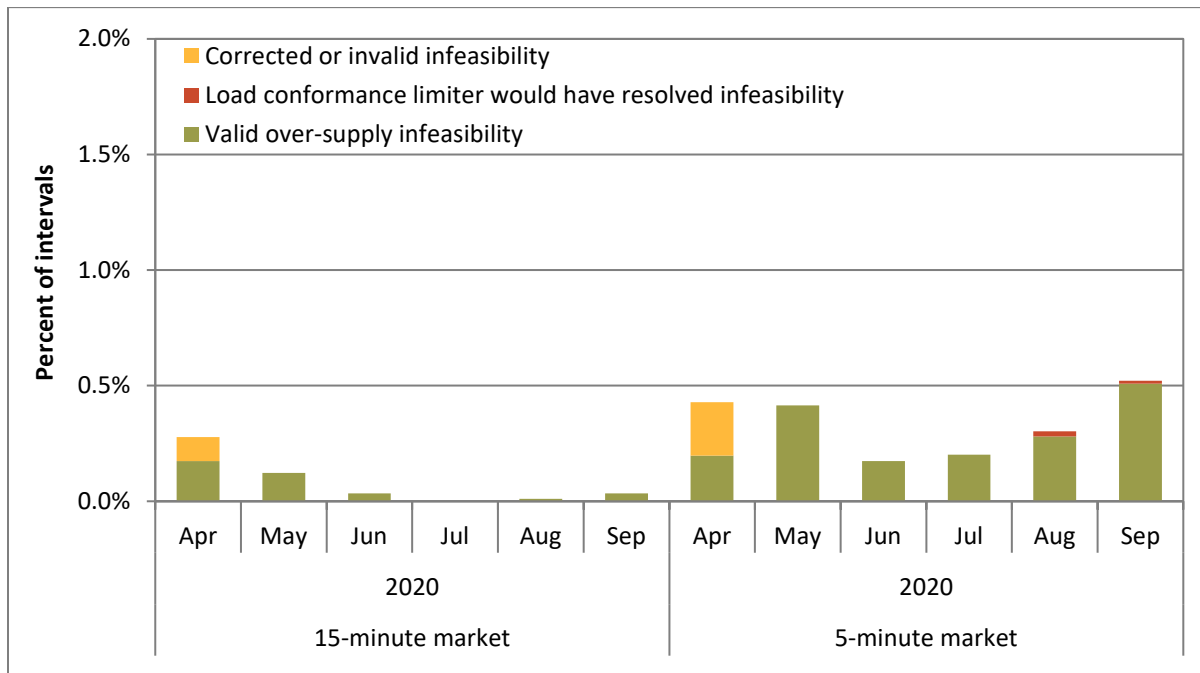
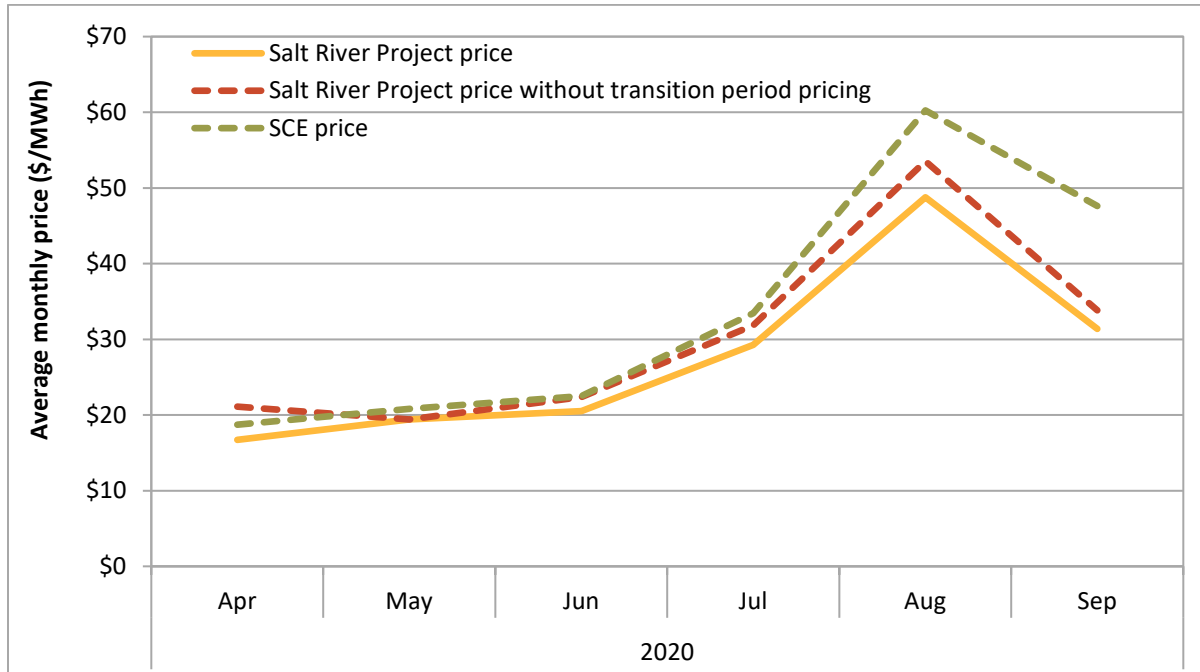


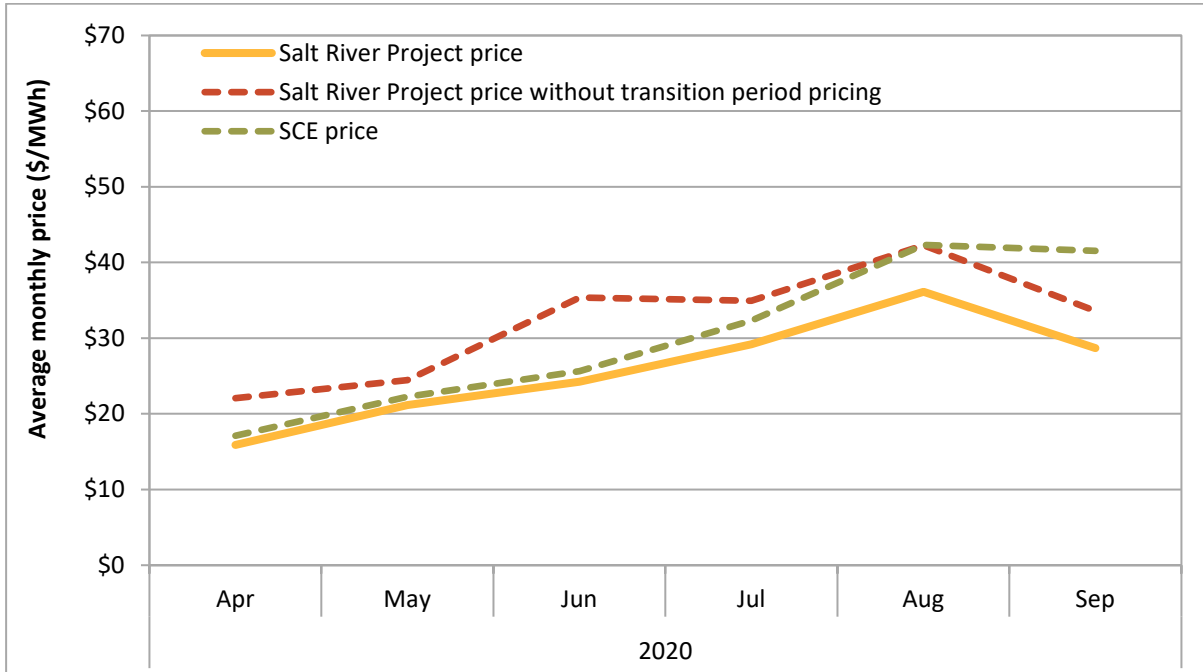
Figure 1.5 and Figure 1.6 show the average monthly prices in the 15-minute market and 5-minute market *with* and *without* the special transition period pricing provisions applied to mitigate prices in the SRP area during September.<sup>5</sup> For the month, transition period pricing decreased average 15-minute and 5-minute prices by \$2.43/MWh and \$4.90/MWh, respectively.

**Figure 1.5 Average prices by month – Salt River Project (15-minute market)**



<sup>5</sup> A detailed description of the methodology used to calculate these counterfactual prices that would result without transition period pricing was provided on p. 7 of the January 2017 report for Arizona Public Service from DMM: [http://www.caiso.com/Documents/May1\\_2017\\_Department\\_MarketMonitoring\\_EIMTransitionPeriodReport\\_ArizonaPublicService\\_Jan2017\\_ER15-2565.pdf](http://www.caiso.com/Documents/May1_2017_Department_MarketMonitoring_EIMTransitionPeriodReport_ArizonaPublicService_Jan2017_ER15-2565.pdf)

**Figure 1.6 Average prices by month – Salt River Project (5-minute market)**



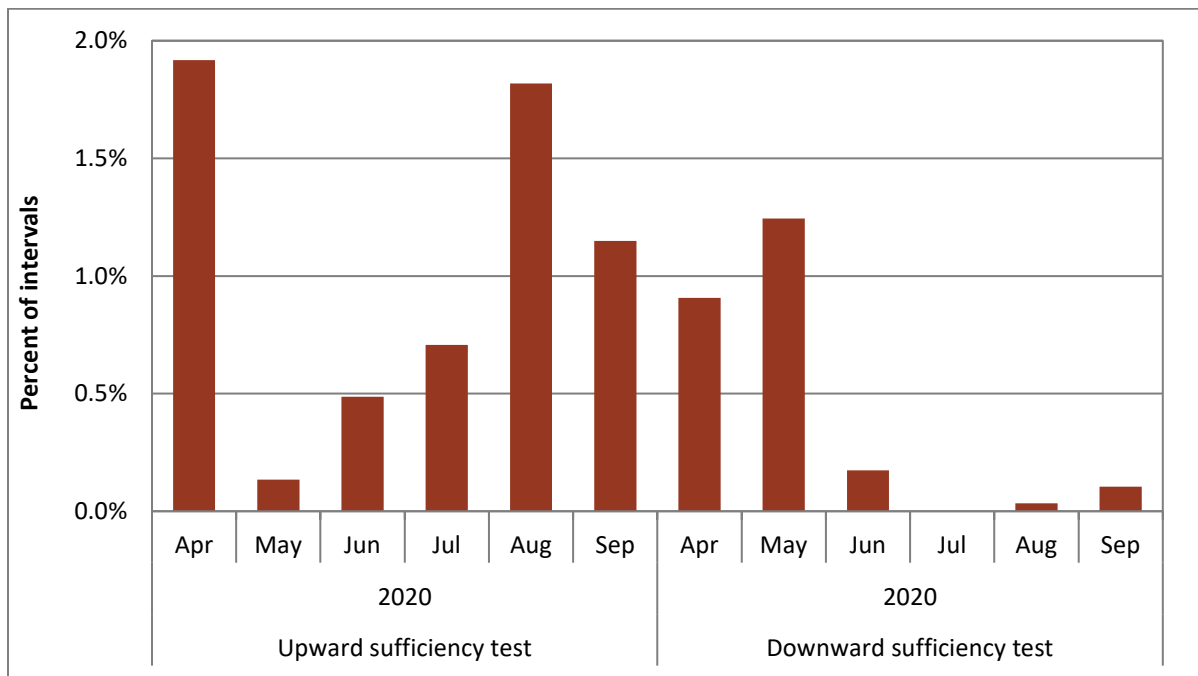
## 2 Flexible ramping sufficiency test

The flexible ramping sufficiency test ensures that each balancing area has enough ramping resources over each hour to meet expected upward and downward ramping needs. The test is designed to ensure that each energy imbalance market area has sufficient ramping capacity to meet real-time market requirements without relying on transfers from other balancing areas.

If an area fails the upward sufficiency test, energy imbalance market imports cannot be increased.<sup>6</sup> Similarly, if an area fails the downward sufficiency test, exports cannot be increased. In addition to the sufficiency test, each area is also subject to a capacity test. If an area fails the capacity test, then the flexible ramping sufficiency test automatically fails as a result.<sup>7</sup>

Figure 2.1 shows the monthly frequency that SRP failed the sufficiency test in the upward or downward direction. The SRP balancing authority area failed the upward sufficiency test in 33 intervals and the downward sufficiency tests in 3 intervals during September.

**Figure 2.1 Salt River Project flexible ramping sufficiency test failures**



<sup>6</sup> *Business Practice Manual for the Energy Imbalance Market*, August 30, 2016, p. 45-52: [https://bpmcm.caiso.com/BPM%20Document%20Library/Energy%20Imbalance%20Market/BPM\\_for\\_Energy%20Imbalance%20Market\\_V6\\_clean.docx](https://bpmcm.caiso.com/BPM%20Document%20Library/Energy%20Imbalance%20Market/BPM_for_Energy%20Imbalance%20Market_V6_clean.docx).

<sup>7</sup> *Business Practice Manual for the Energy Imbalance Market*, August 30, 2016, p. 45.