October 4, 2019

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 –
June 2019 for BANC-SMUD.

Dear Secretary Bose:

The Department of Market Monitoring (DMM) hereby submits its Energy Imbalance Market (EIM) special report on the transition period of Balancing Authority of Northern California (BANC) during its first six months of participation in the EIM for June 2019 BANC joined the energy imbalance market on April 3, 2019 with the Sacramento Municipal Utility District (SMUD) as a member with the balancing authority.

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

Respectfully submitted,

By: */s/ Eric Hildebrandt*

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California Independent
System Operator Corporation

California ISO

Report on energy imbalance market issues and performance: Balancing Authority of Northern California for June 2019

October 04, 2019

Prepared by: Department of Market Monitoring

Executive summary

Pursuant to the Commission's October 29, 2015 Order on the ISO's energy imbalance market (EIM), the ISO filed a report on August 1, 2019 covering the period from June 1 through June 30, 2019 (June report) for the Balancing Authority of Northern California (BANC) in the energy imbalance market.[1] BANC joined the energy imbalance market on April 3, 2019. BANC participates in the energy imbalance market with the Sacramento Municipal Utility District (SMUD) as a member within the balancing authority.

This report provides a review by the Department of Market Monitoring (DMM) of energy imbalance market performance for the BANC balancing authority area during the period covered in the ISO's June report. Key findings in this report include the following:

- Prices in the BANC area tracked very similarly to prices within the ISO. Price separation on average between these two areas occurred very infrequently. In the BANC area during the month, prices averaged about $29/MWh in the 15-minute market and $32/MWh in the 5-minute market.

- The BANC balancing authority area failed the sufficiency test in the upward direction during 13 intervals in June. In the downward direction they failed during a total of 8 intervals in the month.

- The frequency of valid under-supply infeasibilities was infrequent during June, occurring during only one 15-minute market interval and six 5-minute market intervals for the BANC area. There were no valid over-supply infeasibilities for the BANC area during June.

- On average for the month, transition period pricing decreased average 15-minute and 5-minute market prices by less than $1/MWh.

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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[1] The ISO's June 2019 Report was filed at FERC and posted on the ISO website on August 1, 2019: http://www.caiso.com/Documents/Aug1-2019-EIMTransitionPeriodReport-BANC-SMUD-Jun2019-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 June for BANC compared with prices in the ISO at the Pacific Gas and Electric (PG&E) default load aggregation point.

Average prices in the BANC area tracked very similarly to prices at the Pacific Gas and Electric (PG&E) default load aggregation point within the ISO. Price separation on average between these two areas occurred very infrequently. In the BANC area during the month, prices averaged about $29/MWh in the 15-minute market and $32/MWh in the 5-minute market.

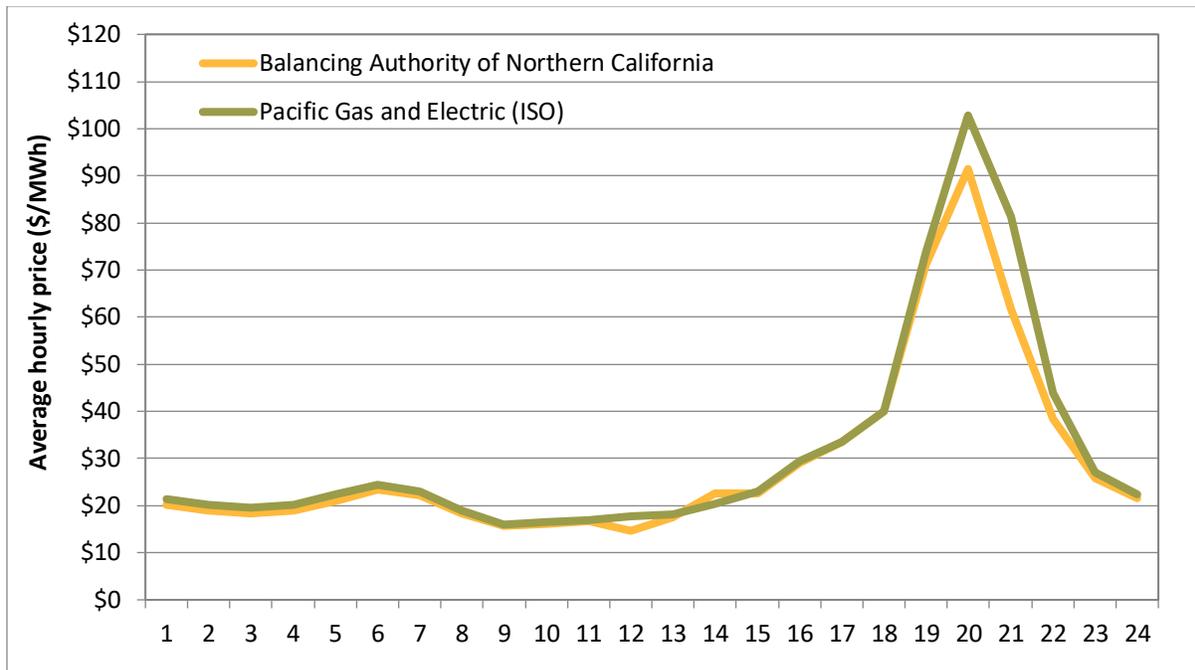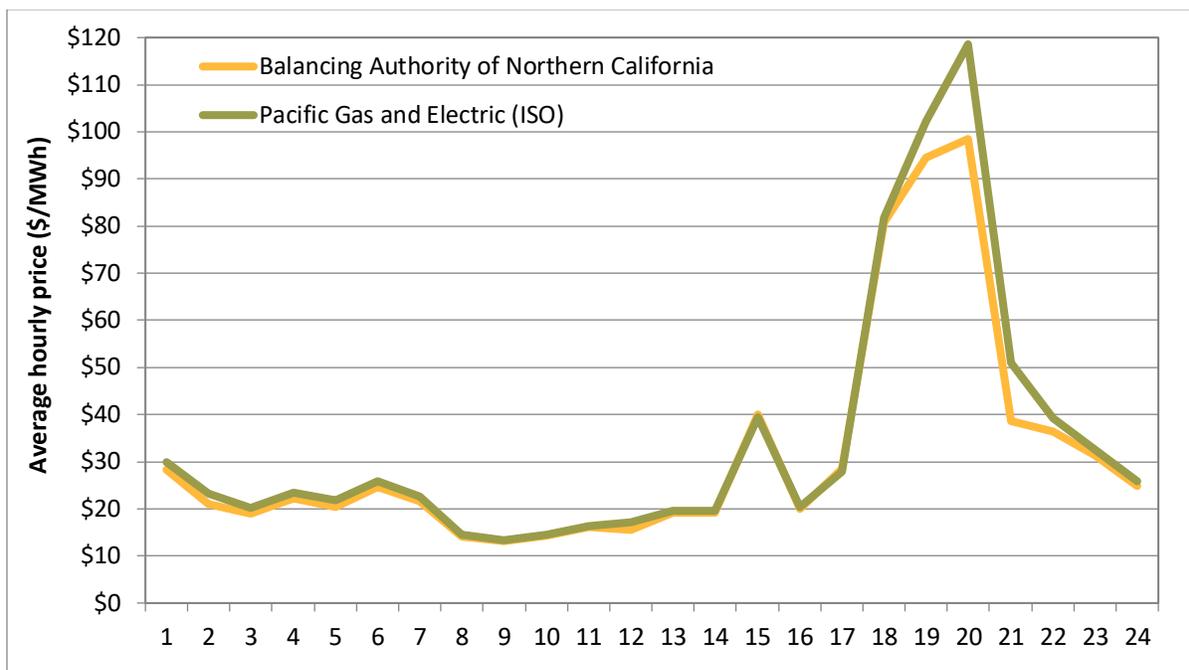**Figure 1.1   Average hourly 15-minute price (June 2019)**

Figure 1.2   Average hourly 5-minute price (June 2019)

All power balance constraint relaxations that occurred in June were subject to the six-month transition period pricing that expires in October 2019. 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.[2] 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.[3] During the transition period, the limiter does not change price outcomes because transition period pricing is applied during these intervals instead.

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[2]   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.

[3]   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.

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.[4]

Figure 1.3 and Figure 1.4 show the weekly frequency of under-supply and over-supply infeasibilities, respectively, in the 5-minute market and 15-minute market. As shown in Figure 1.3, the frequency of valid under-supply infeasibilities was infrequent during June, occurring during only one 15-minute market interval and six 5-minute market intervals for the BANC area. Most of these infeasibilities occurred within one hour on June 11, after failing the upward sufficiency test for the first two 15-minute intervals of the hour.

There were no valid over-supply infeasibilities for the BANC area during June. Also, there were no intervals when the load conformance limiter would have triggered for the BANC balancing authority area had transition period pricing not been in effect.

**Figure 1.3   Frequency of under-supply power balance infeasibilities by week
Balancing Authority of Northern California**
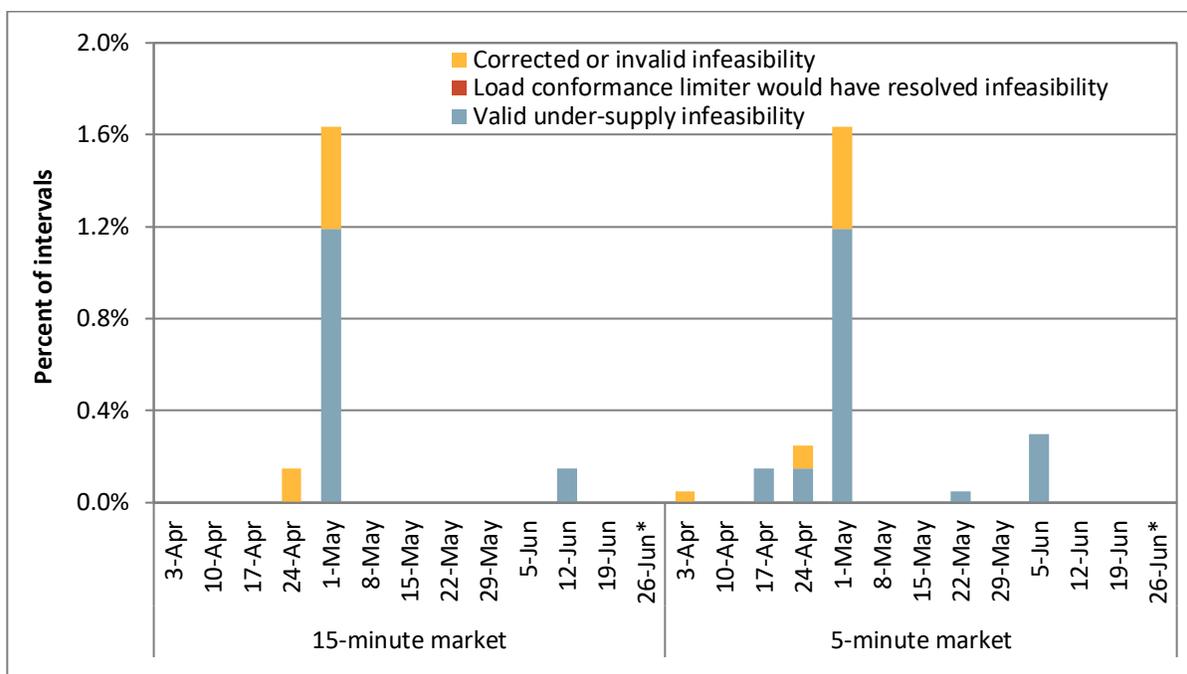
*Indicates partial week

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[4]   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.

Figure 1.4   **Frequency of over-supply power balance infeasibilities by week
Balancing Authority of Northern California**
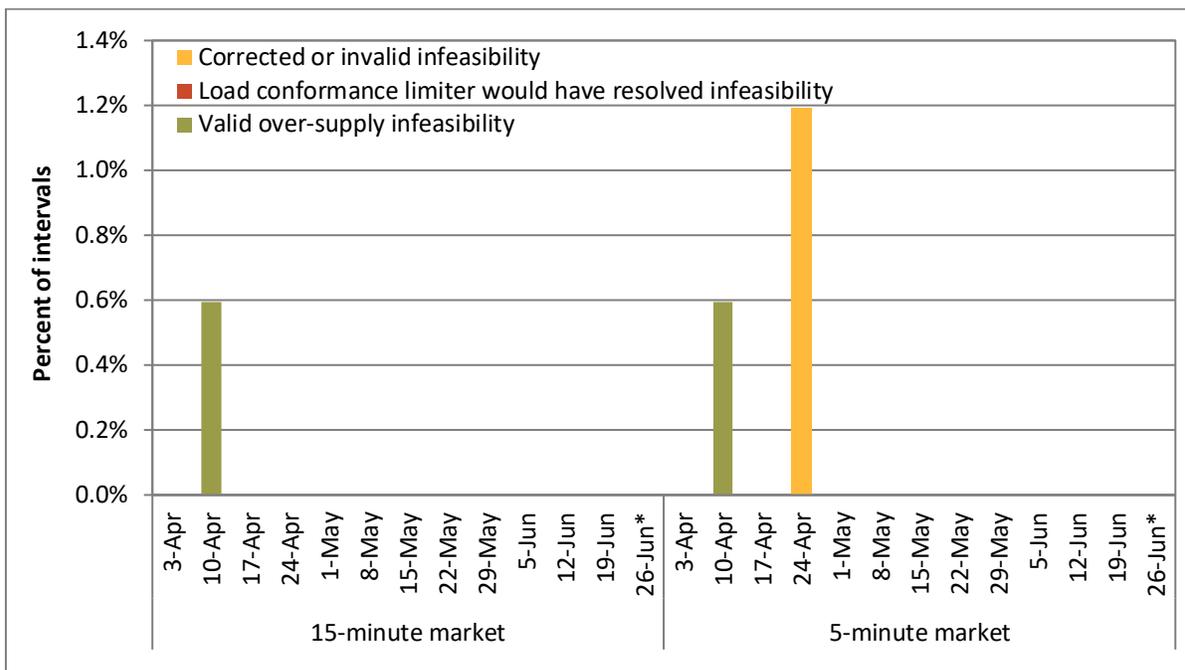
*Indicates partial week

Figure 1.5 and Figure 1.6 show the average weekly 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 BANC area during June.[5] On average for the month, transition period pricing decreased average 15-minute and 5-minute market prices by less than $1/MWh.

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[5] 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_ArizonaPublic Service_Jan2017_ER15-2565.pdf

Figure 1.5   **Average prices by week – Balancing Authority of Northern California (15-minute market)**
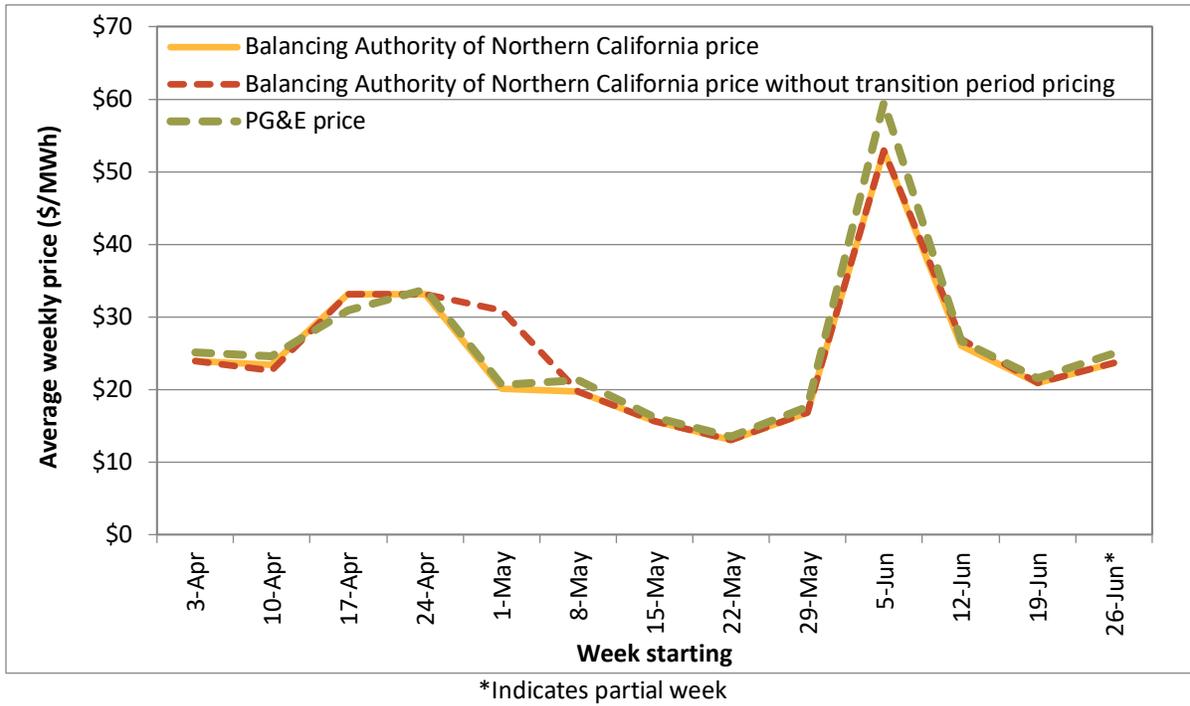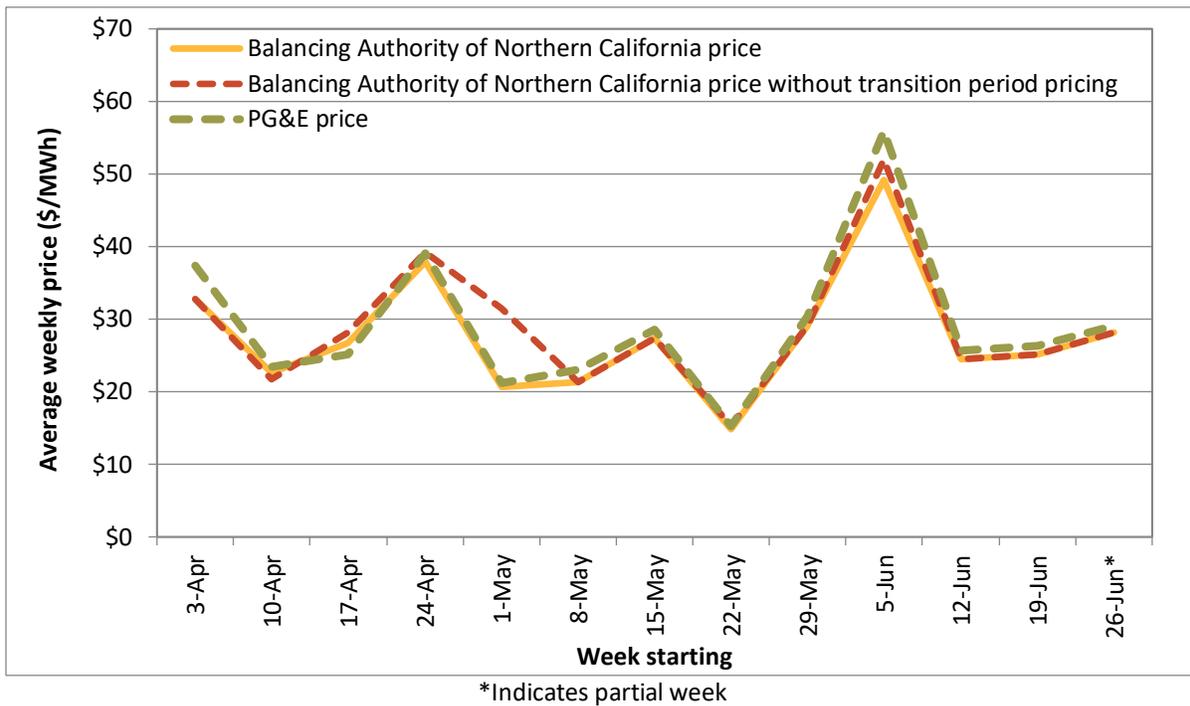

*Indicates partial week

Figure 1.6   **Average prices by week Balancing Authority of Northern California (5-minute market)**

*Indicates partial week

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.

When the energy imbalance market was initially implemented there was an upward ramping sufficiency test. In November 2016, the ISO implemented an additional downward ramping sufficiency test in the market with the introduction of the flexible ramping product, which replaced the flexible ramping constraint. If an area fails the upward sufficiency test, energy imbalance market imports cannot be increased.[6] 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.[7]

Limiting transfers can impact the frequency of power balance constraint relaxations and, thus, price separation across balancing areas. Constraining transfer capability may also impact the efficiency of the energy imbalance market by limiting transfers into and out of a balancing area that could potentially provide benefits to other balancing areas.

The ISO implemented multiple enhancements to the flexible ramping sufficiency test during 2019. First, a tolerance threshold was implemented effective February 15, 2019, that allows an energy imbalance market entity to pass the test if the insufficiency is less than either of 1 MW or 1 percent of the requirement[8]. A second enhancement, implemented on May 6, 2019, evaluates sufficiency test results and limits transfers on a 15-minute interval basis rather than for the entire hour.

Figure 2.1 shows the monthly frequency that BANC failed the sufficiency test in the upward or downward direction. During the month of June, the BANC balancing authority area only failed the sufficiency test in the upward direction during 13 intervals. In the downward direction they failed during a total of 8 intervals in the month.

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[6]   *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.

[7]   *Business Practice Manual for the Energy Imbalance Market*, August 30, 2016, p. 45.

[8]   Market Notice - EIM Resource Sufficiency Enhancements 1% Threshold Implementation, February 8, 2019: http://www.caiso.com/Documents/EIMResourceSufficiencyEnhancements-1-ThresholdImplementation-021519-Active-MAPStage.html

Figure 2.1   Balancing Authority of Northern California flexible ramping sufficiency test failures
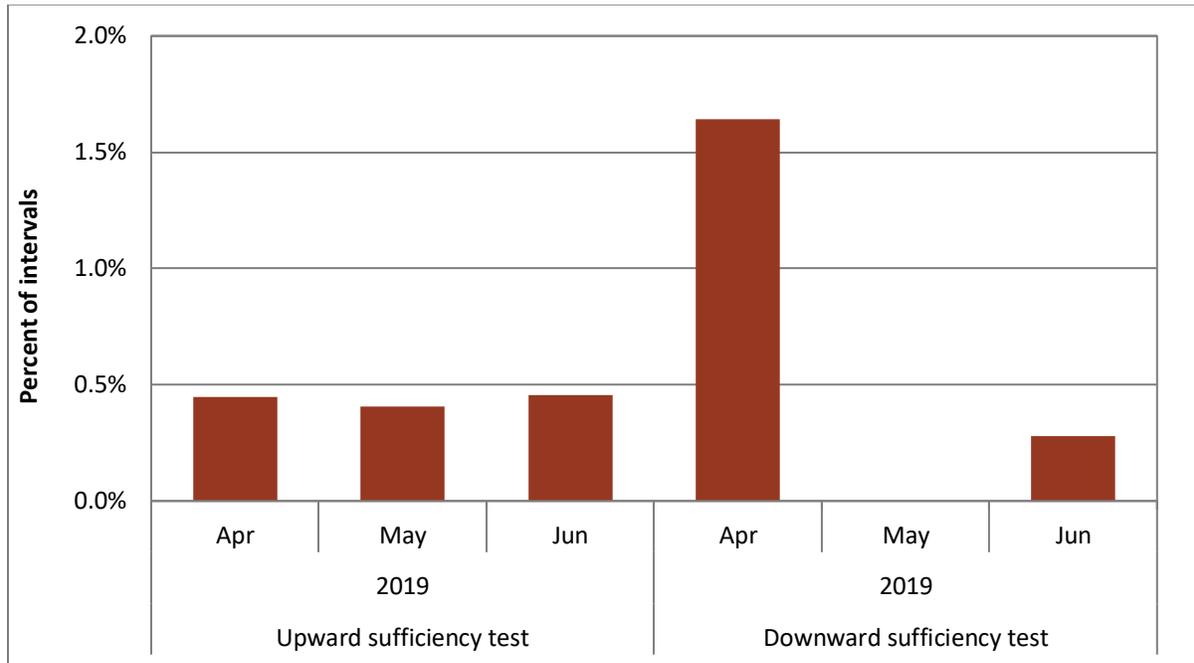
CERTIFICATE OF SERVICE

I 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, on this __th day of _____, 20__.

/s/ --------------
Signature of filer