

August 20, 2018

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 –  
May 2018 for Idaho Power Company**

Dear Secretary Bose:

The Department of Market Monitoring (DMM) hereby submits its Energy Imbalance Market (EIM) special report on the transition period of Idaho Power Company (IPCO) during its first six months of participation in the EIM for May 2018. IPCO entered the EIM on April 4, 2018.

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: Idaho Power for May 2018**

**August 16, 2018**

**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 July 2, 2018 covering the period from May 1 through May 31, 2018 (May report) for the Idaho Power area in the energy imbalance market.<sup>1</sup> This report provides a review by the Department of Market Monitoring (DMM) of energy imbalance market performance in the Idaho Power area during the period covered in the ISO’s May report. Key findings in this report include the following:

- Prices in the Idaho Power area often tracked similarly to system prices on average, except during peak system load hours when Idaho Power prices were lower. Prices averaged about \$17/MWh in the 15-minute market and \$18/MWh in the 5-minute market.
- Idaho Power failed the upward sufficiency test less frequently during May, during about 3 percent of hours. In the downward direction, Idaho Power failed the sufficiency test slightly more frequently, during over 1 percent of hours.
- In the 5-minute market, valid under-supply infeasibilities occurred less frequently in May, during around 0.2 percent of intervals. Valid over-supply infeasibilities occurred in around 0.2 percent of 15-minute and 5-minute market intervals.
- DMM reviewed the results and conclusions in the ISO’s May report and found that the results are largely consistent with those reported in this document. However, the ISO’s report does not account for the number of over-supply infeasibilities.

Section 1 of this report provides a description of prices and power balance constraint relaxations, section 2 discusses the load bias limiter, and section 3 discusses the flexible ramping sufficiency test.

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<sup>1</sup> The ISO’s May 2018 Report was filed at FERC on July 2, 2018 and posted on the ISO website on July 3, 2018, [http://www.caiso.com/Documents/Jul2\\_2018\\_EIMTransitionPeriodReport\\_IPCO\\_May2018\\_ER15-2565.pdf](http://www.caiso.com/Documents/Jul2_2018_EIMTransitionPeriodReport_IPCO_May2018_ER15-2565.pdf).



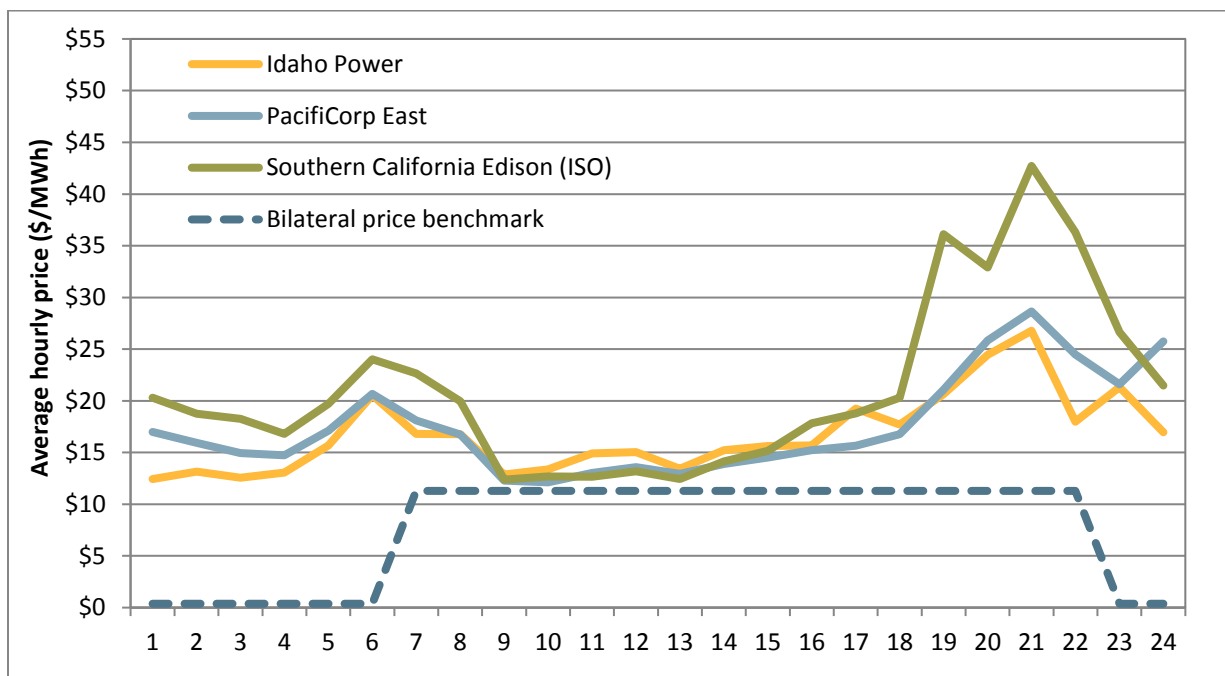
## 1 Energy imbalance market prices

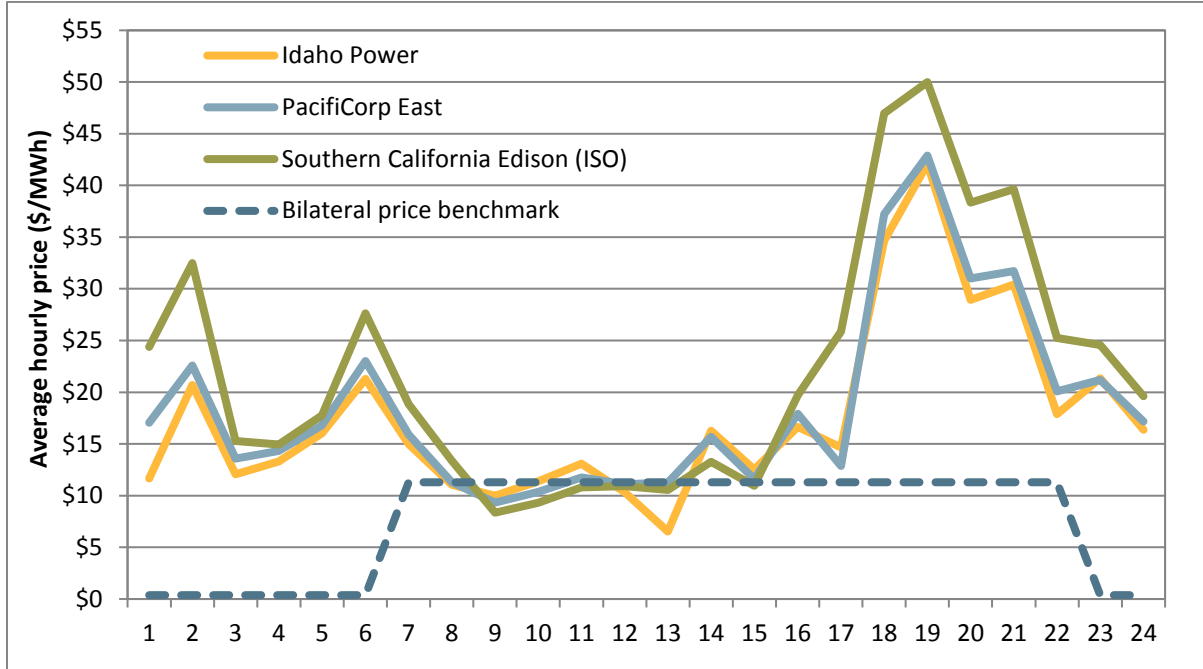
Figure 1.1 and Figure 1.2 show hourly average 15-minute and 5-minute prices during May for Idaho Power, PacifiCorp East, and Pacific Gas and Electric (PG&E), as well as the bilateral prices DMM used as an additional benchmark for energy imbalance market prices.

The bilateral price benchmark for Idaho Power is composed of energy prices at the Mid-Columbia hub published by ICE. These are representative of prices used for settling imbalance energy in the Idaho Power area prior to energy imbalance market implementation.

Prices in the Idaho Power area often tracked similarly to system prices on average, except during peak system load hours when Idaho Power prices were lower. Price separation during these hours was largely the result of several days when high system prices caused transfers out of the Idaho Power and PacifiCorp East areas to reach their upper scheduling limits. In the Idaho Power area during the month, prices averaged about \$17/MWh in the 15-minute market and \$18/MWh in the 5-minute market. During the majority of intervals, real-time prices in Idaho Power and PacifiCorp East were similar.

**Figure 1.1 Average hourly 15-minute price (May 2018)**



**Figure 1.2 Average hourly 5-minute price (May 2018)**

All power balance constraint relaxations that occurred in May were subject to the six-month transition period pricing that expires in October 2018. 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 bias limiter would have resolved infeasibility.** These occurred when a load adjustment entered by operators exceeded the amount of the power balance constraint relaxation and in the same direction. During the transition period, the load bias limiter did not change price outcomes because transition period pricing was applied during these intervals instead. However, in these

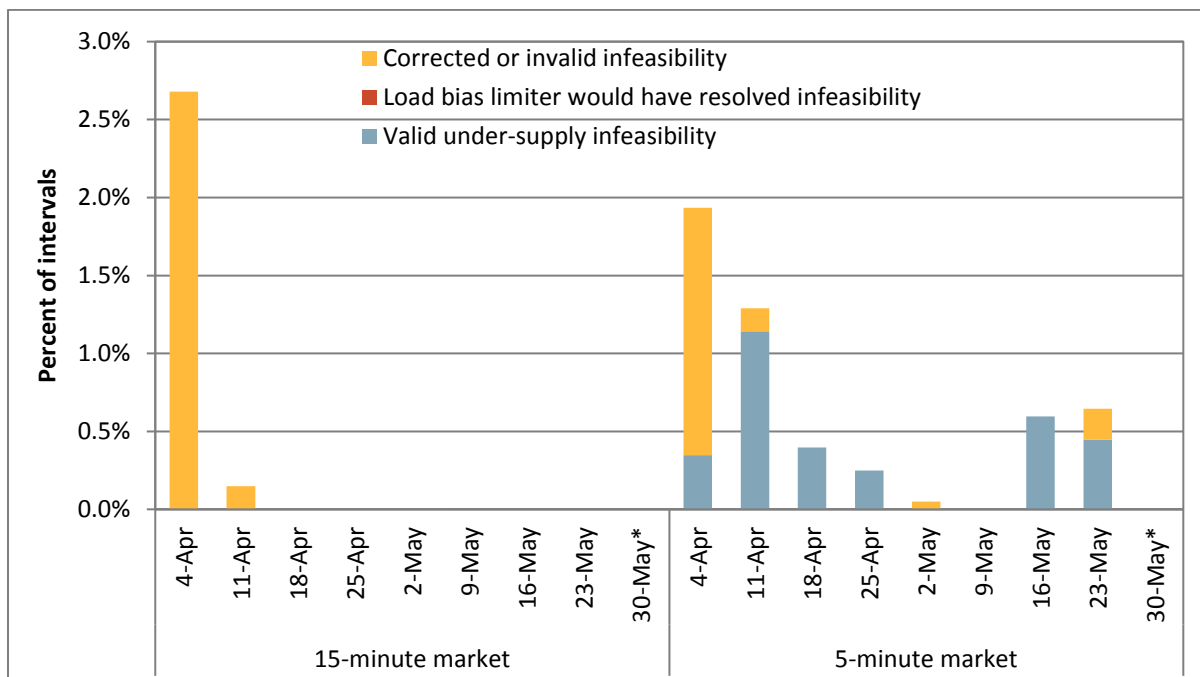
<sup>2</sup> When transition period pricing provisions are triggered by relaxation of the power balance constraint, any shadow price associated with the flexible ramping product is set to \$0/MWh to allow the market software to use the last economic bid dispatched.

cases, the load bias limiter would have reduced the operator adjustment in the pricing run to resolve the infeasibility had transition period pricing not been in effect.

- **Correctable infeasibility.** These occurred when the ISO software relaxed the power balance constraint because of either a software error or data error. These required a price correction or would have triggered a price correction if transition period pricing were not active.<sup>3</sup>

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, valid under-supply infeasibilities did not occur in the 15-minute market for Idaho Power during May. In the 5-minute market, valid under-supply infeasibilities occurred less frequently in May, during around 0.2 percent of 5-minute intervals. Valid over-supply infeasibilities occurred in around 0.2 percent of 15-minute and 5-minute market intervals. Most of the over-supply infeasibilities occurred within two hours on May 3 after failing the downward sufficiency test.

**Figure 1.3 Frequency of under-supply power balance infeasibilities by week Idaho Power**



<sup>3</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 1.4 Frequency of over-supply power balance infeasibilities by week Idaho Power**

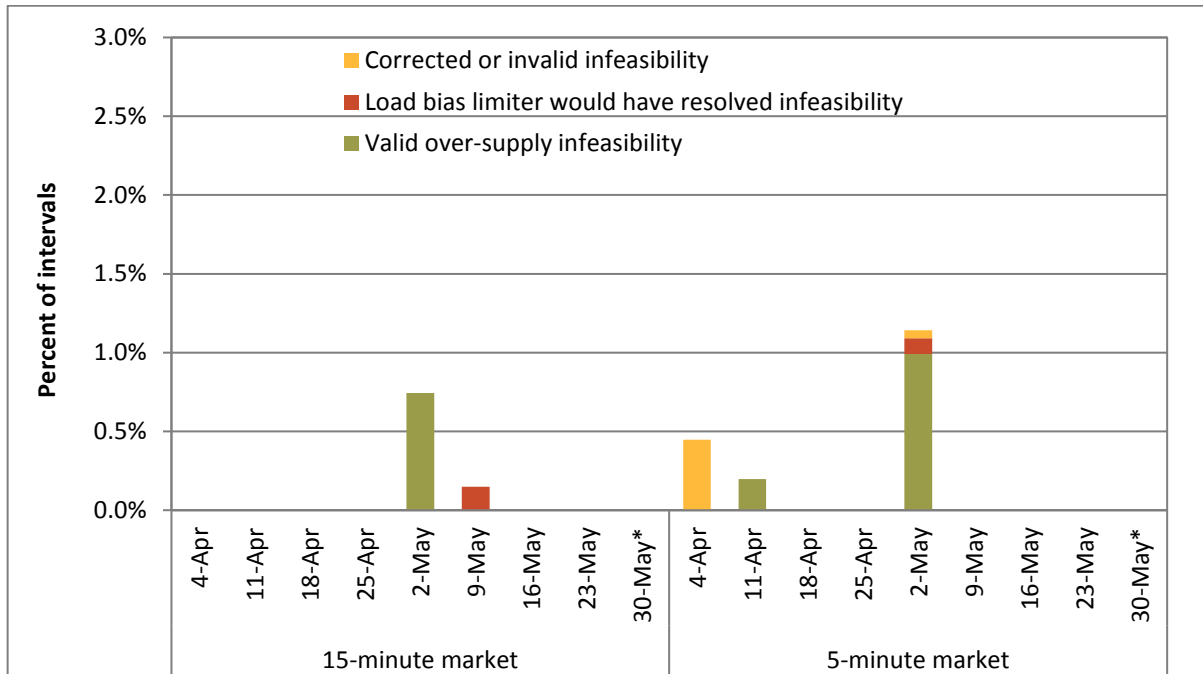
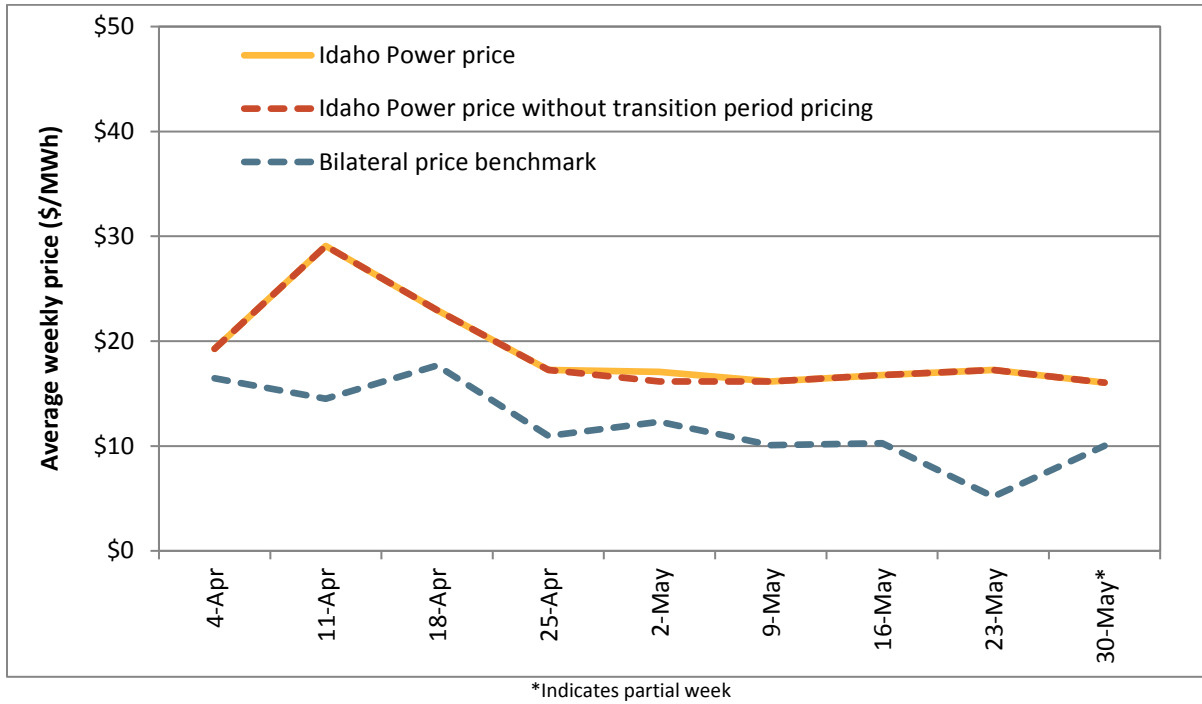


Figure 1.5 and Figure 1.6 show the average weekly prices in the 15-minute market and 5-minute market *with* and *without* the special transition period pricing provisions applied to mitigate prices in the Idaho Power area during May.<sup>4</sup> These figures also include the average bilateral price benchmark for comparison to Idaho Power prices, depicted by the dashed blue line.

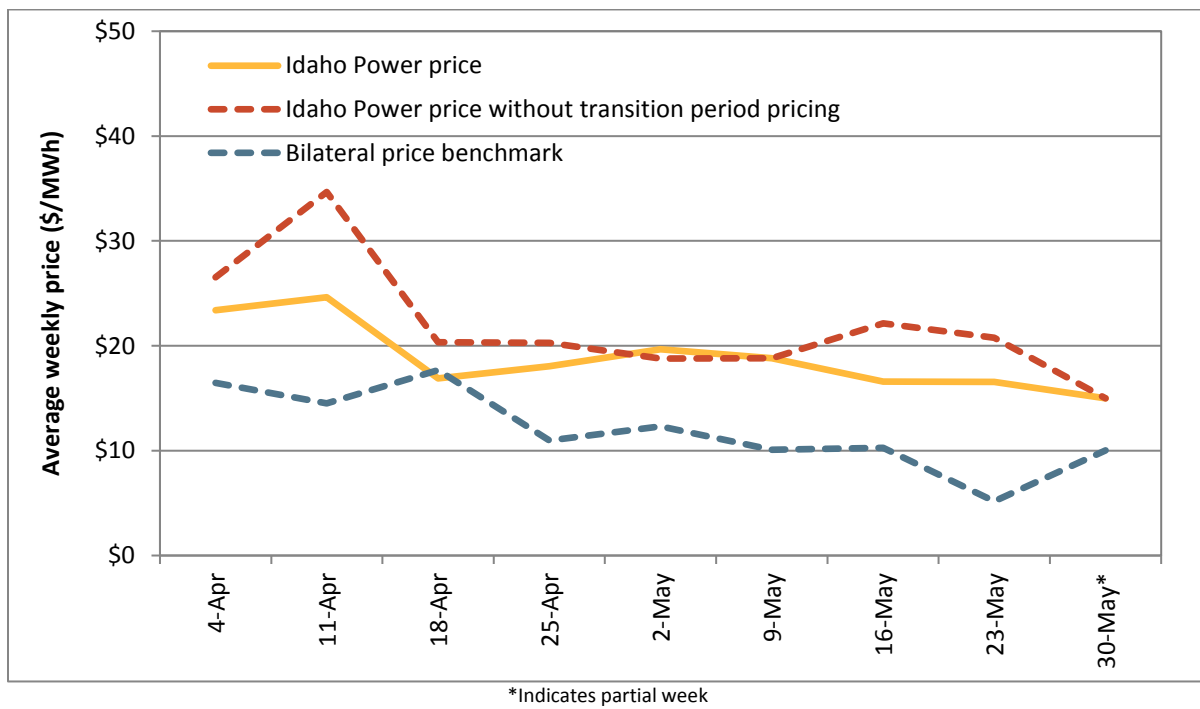
Because of the number of power balance constraint relaxations in the 5-minute market for Idaho Power during May, average prices without transition period pricing would have been higher than actual prices with transition period pricing. On average for the month, transition period pricing decreased average 5-minute market prices by around \$2/MWh. In the 15-minute market, there were more valid over-supply infeasibilities than under-supply infeasibilities such that transition period pricing increased average monthly 5-minute market prices slightly, but by less than \$0.3/MWh.

<sup>4</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: <https://records.oe.caiso.com/sites/GCA/legal/mm/Records/EIM/FERC%20Report/2017-01%20Arizona/EIM%20Special%20Report%20January%20APS.pdf>.

**Figure 1.5 Average prices by week – Idaho Power (15-minute market)**



**Figure 1.6 Average prices by week – Idaho Power (5-minute market)**





## 2 Load bias limiter

When the load bias limiter is triggered it has the same effect as the transition period pricing feature and causes prices to be set by the last economic bid dispatched rather than the \$1,000/MWh penalty price for under-supply power balance relaxations or the -\$155/MWh penalty price for over-supply power balance relaxations. A more detailed description of the load bias limiter is included in DMM’s April 2015 report.<sup>5</sup>

Table 2.1 shows average 15-minute and 5-minute market prices with transition period pricing as well as counterfactual estimates for prices without transition period pricing and without either transition period pricing or the load bias limiter. While there were a number power balance constraint shortages in the 5-minute market, the load bias limiter would not have triggered during any of the under-supply infeasibilities. However, the load bias limiter triggered during one over-supply infeasibility in the 15-minute market and two over-supply infeasibilities in the 5-minute market. However overall, the load bias limiter would have had almost no impact on prices, had transition period pricing not been in effect.

**Table 2.1 Impact of load bias limiter on Idaho Power prices (May 2018)**

	Average proxy price	Price with transition period pricing	Estimated price without transition period pricing	Estimated price without transition period pricing or load bias limiter	Potential impact of load bias limiter	
					Dollars	Percent
<i>Idaho Power</i>						
15-minute market (FMM)	\$7.65	\$16.76	\$16.55	\$16.55	\$0.01	0.0%
5-minute market (RTD)	\$7.65	\$17.68	\$19.68	\$19.67	\$0.00	0.0%

<sup>5</sup> *Report on Energy Imbalance Market Issues and Performance*, Department of Market Monitoring, April 2, 2015, pp.34-35. [http://www.caiso.com/Documents/Apr2\\_2015\\_DMM\\_AssessmentPerformance\\_EIM-Feb13-Mar16\\_2015\\_ER15-402.pdf](http://www.caiso.com/Documents/Apr2_2015_DMM_AssessmentPerformance_EIM-Feb13-Mar16_2015_ER15-402.pdf).



### 3 Flexible ramping sufficiency test

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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.<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>

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.

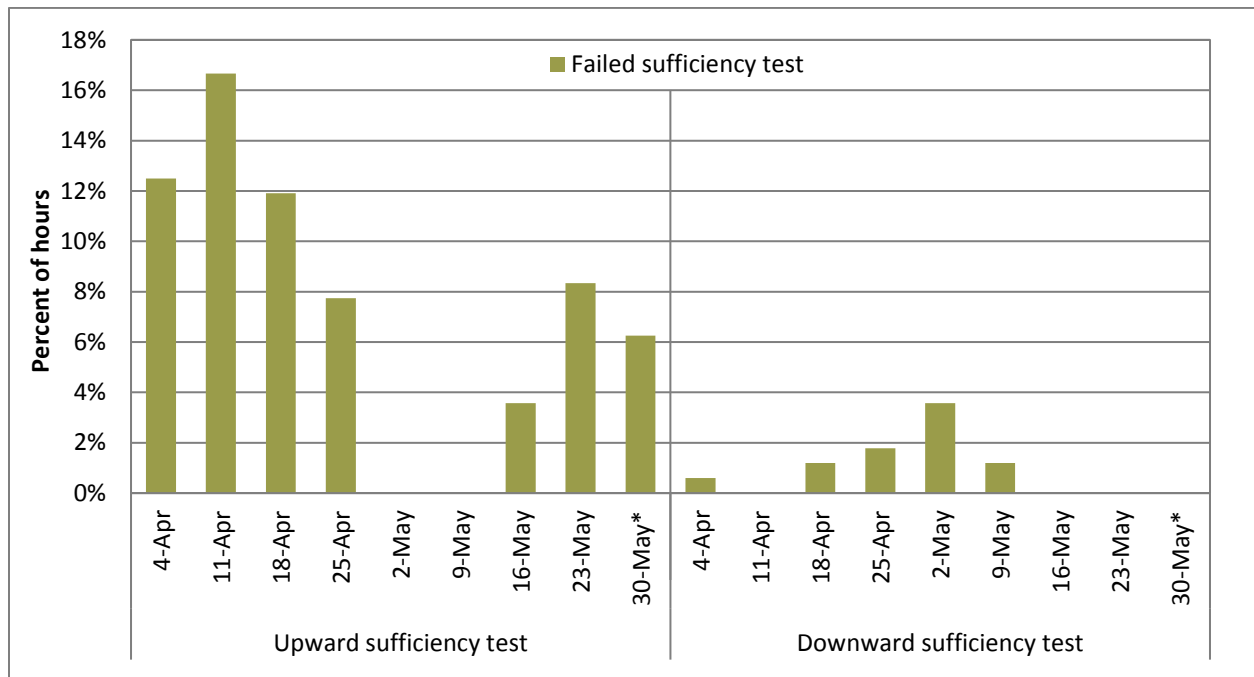
Figure 3.1 shows the frequency that Idaho Power failed the sufficiency test in the upward or downward direction. As shown in Figure 3.1, Idaho Power failed the upward sufficiency test less frequently during May, during about 3 percent of hours. In the downward direction, Idaho Power failed the sufficiency test slightly more frequently, during over 1 percent of hours.

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<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.

**Figure 3.1 Idaho Power flexible ramping sufficiency test results**



\*Indicates partial week

## 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 20<sup>th</sup> day of August, 2018.

*/s/ Grace Clark*  
Grace Clark