UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Idaho Power Company	**)**	**Docket No. ER10-2126-000**

COMMENTS OF THE DEPARTMENT OF MARKET MONITORING FOR THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

The Department of Market Monitoring (DMM) for the California Independent System Operator Corporation (CAISO) files comments in the above-captioned proceeding. In this proceeding, Idaho Power Company (Idaho Power) notifies the Commission that Idaho Power anticipates commencing financially binding operations in the CAISO's Energy Imbalance Market (EIM) on April 4, 2018; and requests authorization from the Commission to transact in the EIM at market-based rates. As shown by the analysis in Idaho Power's filing, the Idaho Power EIM balancing authority area (BAA) can be expected to be very structurally competitive during most or all market intervals, due the relatively small amount of imbalance energy demand within the Idaho Power BAA and the large amount of import transmission capacity expected to be available in the EIM. Any potential structural market power in the Idaho Power BAA that may exist in the EIM would be effectively mitigated by the CAISO's real-time bid mitigation procedures. Allowing Idaho Power to participate in the EIM under market-based rates, subject to the existing market power mitigation provisions of the CAISO tariff, will be beneficial for the overall efficiency and competiveness of the EIM. Therefore, as the independent market monitor for the CAISO, DMM supports Idaho Power's request for market-based rates in the EIM.

I. The Idaho Power BAA Is Expected to be Structurally Competitive

DMM has performed a series of analyses of the structural competitiveness of the EIM. The analysis in these reports indicates that since the addition of the NV Energy balancing authority area (BAA) in December 2015, all of the BAAs in the EIM have been structurally competitive – individually and collectively – during almost all intervals.[1] Although there is a single entity within each EIM BAA that accounts for most or all of the generation participating in EIM, these EIM BAAs are very structurally competitive during most or all real-time market intervals. These markets are structurally competitive since the amount of imbalance energy demand within each BAA that must be met in the EIM is relatively small compared to amount of competitive supply that can be scheduled into each of these BAAs through the EIM.

As shown by the analysis in Idaho Power's filing, the Idaho Power EIM BAA can be also expected to very structurally competitive during most or all time intervals for the same reasons. The demand for imbalance energy in the Idaho Power BAA that will be met in the EIM is estimated to average about 40 to 66 MW, with an upper range of 122 to 179 MW.[2] Meanwhile, the analysis of historical data in Idaho Power's filing shows that the amount of transfer capacity into the Idaho Power BAA in the EIM can be

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[1] *Report on Structural Competitiveness of Energy Imbalance Market,* December 6, 2016 Department of Market Monitoring, http://www.caiso.com/Documents/Dec6_2016_Department_MarketMonitoring_EIM_StructuralMarketPowerInformationalReport_ER14-1386.pdf

Structural Competitiveness of the Energy Imbalance Market: Analysis of Market Power of the Berkshire Hathaway Entities, June 29, 2017, (the "*DMM BHE Report*"). https://www.caiso.com/Documents/AnalysisofMarketPoweroftheBerkshireHathawayEntities.pdf.

[2] Idaho Power filing, pages 7-8. The upper range, which represents the 95th percentile of the distribution of estimated imbalance demand, equals about 6 to 9 percent of total average load in the Idaho Power BAA (1,982 MW). By comparison, DMM's analysis indicates that the 95ths percentile of net demand for imbalance energy in the combined BAAs of PacifiCorp East, PacifiCorp West and Nevada Energy equaled 4.3 to 7.6 percent of total load. See *DMM BHE Report* at page 10.

expected to average about 963 MW, with a lower range of about 421 MW.[3] Thus, even with extremely high demand for imbalance energy -- combined with the lower range of transmission expected to be available -- the amount of competitive supply that may be transferred into the Idaho Power BAA through the EIM should be two to three times greater than the demand for imbalance energy within the Idaho Power BAA.

Idaho Power's filing also provides detailed analysis showing that Idaho Power passes the Commission's market share screen and pivotal supplier screen for the overall combined EIM footprint (i.e. including the CAISO and other EIM areas). [4]

II. CAISO's Current Market Rules Effectively Mitigate Market Power in the EIM

In the event that competitive supply from the rest of the EIM available for import into the Idaho Power BAA is limited by unusual or unexpected system or market conditions (such as extremely low levels of available transmission), any potential structural market power will be effectively mitigated by the CAISO's real-time bid mitigation procedures.

The Commission's November 19, 2015 order cited concerns regarding the ability of the CAISO's automated market power mitigation procedures to mitigate the potential market power in the expanded EIM.[5] In prior orders, the Commission has specifically noted the concern raised by some parties about the potential for *under-mitigation* to occur when EIM transfer constraints were congested (or binding) in the market runs, but were not binding in the prior market runs used to trigger bid mitigation. This concern

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[3] Idaho Power filing, pages 7-8.

[4] Idaho Power filing pages 10-12.

[5] *Nev. Power Co., et al.,* 153 FERC ¶ 61,206 (2015) ("BHE EIM MBR Order"),

was based on prior annual and quarterly reports by DMM in which DMM has highlighted this issue.[6]

Since DMM identified the potential for under-mitigation in the real-time market, DMM continued to monitor this issue and began to work with the CAISO to develop software enhancements to effectively address this concern. As a result of this effort, enhancements to address the issue of under-mitigation in the CAISO's real-time energy market were implemented in the 15-minute market in fall 2016 and in the 5-minute software in spring 2017.

As noted in Idaho Power's filing, analysis by DMM indicates these enhancements have greatly improved the effectiveness of the CAISO's real-time market power migration procedures.[7] Shortly prior to the Idaho Power's filing, DMM issued a report that provides more detailed description and analysis of these enhancements (see Attachment 1).[8] The analysis in this report is based on several months of data following implementation of these enhancements, and confirms that these recent enhancements have greatly decreased the potential for any under-mitigation when EIM transfer constraints may be binding. In the 15-minute market, potential under-mitigation occurring during the small portion of intervals when EIM transfer constraints have been binding dropped from 25 percent to less than 3 percent of intervals. In the 5-minute

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[6] DMM has provided discussion and analysis of the issue of potential under-mitigation in its annual report dating back to DMM's 2013 Annual Report. See *2013 Annual Report on Market Issues and Performance*, pp. 160-163, available at:. http://www.caiso.com/Documents/2013AnnualReport-MarketIssue-Performance.pdf

[7] Idaho Power filing, pages 18-19.

[8] *Impact of real-time market power mitigation enhancements in EIM areas,* August 28, 2017, Department of Market Monitoring, included in DMM's comments as Attachment 1. http://www.caiso.com/Documents/ImpactofReal-timeMarketPowerMitigationEnhancementsinEIMAreas.pdf

market, potential under-mitigation during intervals when EIM transfer constraints have been binding dropped from 41 percent to less than 8 percent of intervals.[9]

The recent improvements to CAISO's real-time market power mitigation procedures have made dramatic reductions to the instances of potential under-mitigation during the relatively small portion of intervals when EIM transfer constraints have been binding. The increased accuracy ensures the effectiveness of these automated mitigation procedures and mitigates concern that an EIM entity would have the opportunity to exercise market power through economic withholding.

III. Allowing Idaho Power to Participate in the EIM Under Market-Based Rates Will be Beneficial for the Overall Efficiency and Competiveness of the EIM.

CAISO market rules are designed to allow the type of bidding flexibility provided to participants with market-based rates as requested by Idaho Power. Under the CAISO tariff, cost-based Default Energy Bids (DEBs) are developed for each resource as an estimate of each resource's marginal costs for use only during intervals when the CAISO's automated bid mitigation procedures are triggered.[10] During these intervals, the CAISO's market power tests have indicated that a portion of the CAISO system is not structurally competitive.[11] Therefore, resources within the area that is not structurally competitive may have their bids mitigated so they do not exceed levels expected in a competitive market. Moreover, when bid mitigation occurs, market bids are not automatically lowered to the DEBs. Instead, bids are mitigated to the higher of

[9] The higher rate of potential under mitigation in the 5-minute market appears to be driven by special limitations placed on transfer constraints involving transmission through the BPA balancing area.

[10] CAISO tariff sections 39.7.1 and 34.1.5

[11] CAISO tariff section 39.7.2

the unit's DEB or a competitive market price; which the CAISO calculates for each interval based on the system marginal energy price plus congestion on competitive constraints.[12]

Current CAISO rules and software require that these DEBs be calculated the evening prior to each operation day. For gas-fired units participating in EIM, DEBs calculated under the Variable Cost Option are based on published price indices for natural gas in the next day market.[13] These DEBs include a 10 percent adder, which is applied to each resource's total estimated marginal costs, including fuel and variable operating and maintenance costs.[14]

Under some conditions, however, EIM participants seeking to purchase gas after the close of the next day market may be exposed to market prices that exceed the price indices used by the CAISO. If these market conditions or price premiums in the same-day gas market were predictable or systematic, they could be incorporated in DEBs developed by DMM in consultation with participants under the Negotiated Rate Option in the CAISO tariff.[15] However, current market processes also require that DEBs under this Negotiated Rate Option be calculated the evening prior to each operating day. This prevents any DEBs under the Negotiated Rate Option from being adjusted for any significant increases in gas costs in the same-day market that may occur at the beginning of, or during, any operating day.

[12] CAISO tariff sections 31.2.3, 34.1.5.2 and 34.1.5.4.

[13] CAISO tariff section 39.7.1.1.1.3 (c). DMM is recommending the CAISO develop the ability for DEBs to be updated at the start of each operating day based on observed same day gas market prices and conditions. However, any such changes would not be implemented until at least fall 2018.

[14] CAISO tariff section 39.7.1.1.1

[15] CAISO tariff section 39.7.1.3

Under the Negotiated Rate Option, DEBs for hydro resources with limited amounts of dispatchable energy can be developed that reflect the opportunity costs of these energy limits. However, these DEBs must be also calculated the evening prior to each operating day and require information on energy limits to be provided in advance by participants managing these resources. This can also result in cases when DEBs may not reflect the full opportunity cost of a hydro resource, given actual resource limits and real-time market conditions, which develop or unfold during an operating day.

DMM believes these cost-based DEBs reflect accurate estimates of each unit's marginal costs under most conditions, and are just and reasonable for the intended use in bid mitigation during intervals when structurally uncompetitive constraints are binding.[16] During other intervals, DMM believes it is beneficial to allow participants the flexibility to bid in excess of DEBs. This allows participants to adjust bids to reflect actual real-time market conditions; account for changing resource limitations or constraints; and help manage the overall merit-order of a resource portfolio. During these intervals, the potential incentive and impact of market power is effectively mitigated by potential competition from other sources of supply.

Under some conditions, this bidding flexibility may also create an incentive for EIM participants, such as Idaho Power, to offer additional capacity in the EIM. Although EIM

[16] DMM has performed extensive analyses of available data on prices of gas in the same day market in California showing that any premiums in same day gas prices rarely exceed the 10 percent adder that is included in all DEBs. For DMM's most recent analysis, see DMM Memorandum to ISO Board of Governors, July 19, 2017, p. 3. http://www.caiso.com/Documents/Department_MarketMonitoringUpdate-Memo-Jul2017.pdf

In addition, the CAISO tariff allows EIM participants with DEBS calculated under the Variable Cost Option to file for approval from the Commission for recovery of any energy procurement costs that are not recovered as a result of the special energy bidding limits in effect on some EIM participants. (CAISO tariff section 39.7.1.1.3 (f))

rules include a variety of resource sufficiency tests designed to ensure sufficient resources are scheduled and bid into the EIM within each EIM balancing area, there is no *must-offer* requirement for all available capacity in the EIM. Allowing EIM participants to offer at prices based on their assessment of each resource's marginal or opportunity cost may, in some cases, provide additional incentive to offer capacity beyond what is needed to meet resource sufficiency tests that might not otherwise be offered. This additional capacity could be used to support transfers of supply out of the EIM participant's BAA into the rest of the EIM when this is economic based on system-wide market prices.

IV. Conclusion

The Idaho Power BAA can be expected to very structurally competitive during most or all time intervals, due the relatively small amount of imbalance energy demand within the Idaho Power BAA' and the large amount of import transmission capacity expected to be available in the EIM. Any potential structural market power in the Idaho Power BAA that may exist during any intervals in the EIM would be effectively mitigated by the CAISO's real-time bid mitigation procedures. Allowing Idaho Power to participate in the EIM under market-based rates, subject to the existing market power mitigation provisions of the CAISO tariff, will be beneficial for the overall efficiency and competiveness of the EIM. Therefore, DMM supports Idaho Power's request for market-based rates in the EIM.

Respectfully submitted,

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Dated: September 27, 2017

ATTACHMENT 1

Impact of real-time market power mitigation enhancements in EIM areas

Department of Market Monitoring

August 28, 2017

California Independent System Operator Corporation

California ISO

Impact of real-time market power mitigation enhancements in EIM areas

August 28, 2017

Department of Market Monitoring

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1 Summary

The ISO recently implemented enhancements to its automated real-time market power mitigation procedures to ensure that energy bid mitigation is triggered when structurally non-competitive constraints are binding. Due to timing limitations, mitigation in the real-time market has until recently been based only on projections of congestion on constraints made by the real-time market software for future intervals. If these projections were not accurate, this could result in under-mitigation when congestion actually occurred in the real-time market.

This report provides a summary of these enhancements and the resulting improvement in the accuracy of bid mitigation when transfer constraints in the Energy Imbalance Market (EIM) are binding. This analysis indicates that these recent enhancements have greatly decreased any potential for any under mitigation when congestion on the EIM transfer constraints.

- In the 15-minute market, intervals in which the potential for under-mitigation occurred due to congestion on EIM transfer constraints dropped from 25 percent to less than 3 percent of intervals.
- In the 5-minute market, intervals in which the potential for under-mitigation occurred due to congestion on EIM transfer constraints dropped from 41 percent to less than 8 percent of intervals. The higher rate of potential under mitigation in the 5-minute market appears to be driven by special limitations placed on transfer constraints involving transmission through the BPA balancing area.

The increased accuracy ensures the effectiveness of these automated mitigation procedures and mitigates concern that an EIM entity would have the opportunity to exercise market power through economic withholding.

2 Background

FERC's November 19, 2015 order found that the market power analyses of the expanded EIM footprint by PacifiCorp and NV Energy (Berkshire EIM Sellers) were deficient and failed to demonstrate a lack of market power in the expanded EIM.[1] The Commission also cited concerns regarding the ability of the ISO's automated market power mitigation procedures to mitigate the Berkshire EIM Sellers' market power in the expanded EIM.

As a result of these concerns, the Commission has required PacifiCorp and NV Energy to limit the price at which they offer capacity in the EIM to be not greater than the cost-based default energy bids (DEBs) that are used to limit bids when its automated market power mitigation provisions are triggered. The Commission cited similar concerns about the ISO's automated market power mitigation procedures and imposed a similar limit on Arizona Public Service (APS) when APS joined the EIM in December 2016.[2]

The ISO's automated bid mitigation procedures address the potential for the exercise of market power through *economic withholding*, or bidding in excess of a resource's short-run marginal cost. These mitigation procedures are triggered only when congestion is projected to occur on one or more constraints which are determined to be structurally non-competitive. Due to timing limitations, mitigation in the real-time market has been based on projections of congestion made for future intervals by the real-time market software.

The Commission's November 19 Order cited concerns about the effectiveness of the ISO's bid mitigation procedures in cases when congestion is not projected to occur on an EIM transfer constraint so that mitigation may not be trigged when congestion actually occurs in the real-time market. [3] DMM has highlighted this issue in prior reports, and has closely monitored its impact.[4]

While DMM's analysis indicates this issue has not adversely affected prior market competitiveness, DMM continued to work with the ISO to develop software enhancements to effectively address the issue of potential under-mitigation in the real-time market.[5] As a result of this effort, enhancements to address the issue of under-mitigation in the ISO's real-time energy market were implemented in the 15-minute market in fall 2016 and in the 5-minute software in spring 2017.

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[1] *Order on proposed market-based rate tariff changes,* November 19, 2015 153 FERC ¶ 61,206, ER15-22-81-, *Order denying rehearing and granting clarification*, May 19, 2016, 155 FERC ¶ 61,186, ER15-22-81-,

[2] *Order on market power analysis and market-based rate tariff changes,* August 31,2016, 156 FERC ¶ 61,148, ER10-2437-004, ER16-1363-000, at ¶26 p.10

[3] November 19 Order, ¶53 p. 19. See also ¶47 p. 17, which notes that "while we recognize Truckee Donners concern about under mitigation in the NV Energy portion of the EIM, we believe this concern is alleviated by [the requirement to bid at or below each unit's Default Energy bid].

[4] DMM has provided discussion and analysis of the issue of potential under-mitigation in its annual report dating back to DMM's 2013 Annual Report. E.g. see *2013 Annual Report on Market Issues and Performance*, pp. 160-163. http://www.caiso.com/Documents/2013AnnualReport-MarketIssue-Performance.pdf

[5] Tariff amendments to enhance local market power mitigation procedures, June 21, 2016.http://www.caiso.com/Documents/Jun21_2016_TariffAmendment-LocalMarketPowerMitigationEnhancements_ER16-1983.pdf

This report provides a summary of these enhancements and the resulting improvement in the accuracy of energy bid mitigation during intervals when EIM transfer constraints are binding.

2.1 Changes to 15-minute market

Prior to August 2016, the ISO's market power mitigation procedures for the 15-minute market had been using advisory interval results of the real-time market software. Congestion for a given interval was predicted by the market run that happened 15 minutes before the financially binding market run for that interval. Bid mitigation was based on that prediction of whether specific constraints would be binding based on advisory market results for these future intervals.

With this approach, the prediction would frequently be different than the actual congestion that existed in the binding market run. In these instances, it was possible that congestion was *over-predicted* (i.e. a constraint was predicted to be congested but this congestion was resolved in the financially binding run) or *under-predicted* (i.e. a constraint was not predicted to be congested, but was congested in the later financially binding market run).

One reason congestion could be *over* or *under-predicted* is that model inputs and conditions can be different in the financially binding market run. Load forecasts may be updated, forecasts for variable energy resources (VERs) could change, and other parameters could also be adjusted in the 15 minutes between the two market runs. Thus, one strategy to improve accuracy of the predictions was to eliminate those changes to inputs.

To decrease the frequency of both over- and under-predicting congestion, the mitigation process for the 15-minute market was modified to eliminate the advisory interval system for measuring competition and congestion. Under the new system, the mitigation run is part of the binding market run: the market power mitigation module runs and mitigates bids before passing them back to optimization for the binding market run. The goal of this change was to eliminate the changes in inputs between the run used to determine mitigation and the financially binding market run.

This new mitigation process for the 15-minute market was implemented in fall 2016. During the first few months of implementation, several software issues prevented the inputs to the mitigation and market runs from being as close as intended.[6] These issues were resolved by the end of 2016, with the majority of inputs to the two runs being identical.

2.2 Changes to 5-minute market

Until spring 2017, mitigation for the 5-minute market was dependent on predictions of congestion made in the 15-minute market. This created a significant time lag between the mitigation run and the binding market run. This also meant that the 15-minute model used to predict congestion was not the same as the 5-minute model used to dispatch resources and set prices. In particular, constraints in the 5-minute market can be different than those in the 15-minute market.

Differences between the 15-minute model and the 5-minute model are particularly acute in the EIM areas. Some of the EIM transfers have different limits in the 5-minute market than in the 15-minute

[6] Some issues stemmed from frequent updating of load forecast data in the market model and other issues were related to flex ramp product implementation.

market, based on interactions with non-EIM BAAs. Because these limits are different, the 15-minute results are likely to under-predict congestion in the 5-minute market.

With the new mitigation approach, mitigation may occur in the 5-minute market as a result of two different conditions. First, if bids are mitigated in the 15-minute market, these bids remain subject to mitigation in the 5-minute market during those intervals. Second, if congestion occurs in the 5-minute advisory run, bids are subject to mitigation in the binding run for that 5-minute interval. The combination of these two changes is designed to make market power mitigation more accurate and reduce under-mitigation in the 5-minute market.

Mitigation in the 5-minute market starts with the final bid set from the 15-minute market. This means that any bids mitigated in the 15-minute market will continue to be mitigated in the 5-minute market. This change may tend to decrease under-mitigation in the 5-minute market, but may increase cases when mitigation is applied (based on 15-minute market results) but no congestion occurs in the 5-minute market.

The new process for bid mitigation in the 5-minute market uses an advisory interval design similar to the prior system in the 15-minute market. Using advisory interval results can be less accurate than determining bid mitigation on the binding market run, but also uses significantly fewer computing resources. DMM analyzed the correlation between congestion in 5-minute advisory intervals versus 5-minute binding intervals and found that the correlation was significantly higher than in the 15-minute market. Because of that high correlation, DMM and the ISO determined that using 5-minute advisory interval results would be appropriate for the 5-minute market.

3 Analysis of impacts

In this analysis, we compare the accuracy of the new real-time market power mitigation procedures in terms of predicting congestion with the accuracy of the prior mitigation procedures. The accuracy of mitigation is measured by comparing the results of the mitigation run to those of the binding market run. Each time a constraint appears congested in the mitigation and/or market runs, this counts as a *congested constraint interval*. Each of these congested constraint interval fall into one of three categories:

1. **Accurately predicted.** Congestion is predicted in mitigation run on a constraint and also occurs in the market run.
2. **Predicted but resolved**. Congestion is predicted in the mitigation run, but resolved and does not occur in the market run.
3. **Under-predicted.** Congestion is not predicted in the mitigation run, but appears in the market run.

The study assesses the impact and accuracy of mitigation by comparing the percentage of congested constraint intervals that fall into each of the categories before and after implementation of the real-time market power mitigation enhancements. The primary goal of these enhancements was to increase the portion intervals in which congestion is accurately predicted, and particularly to decrease under-predicted congestion. As summarized blow, the accuracy of congestion prediction in both the 15-minute and 5-minute real-time markets has increased significantly since the implementation of the new mitigation procedures.

3.1 Result for 15-minute market

The new mitigation process for the 15-minute market was implemented in fall 2016. During the first few months of implementation, several software issues prevented the inputs to the two runs from being as close as intended. By the beginning of 2017, these issues were resolved. Therefore, this analysis compares results from the first six months of 2016 to results from the first six months of 2017.

Table 1. Accuracy of congestion prediction on EIM transfer constraints in 15-minute market January through August (2016 vs. 2017)

	Accurately predicted	Predicted but resolved	Under predicted
2016 (before)	52%	23%	25%
2017 (after)	94%	3.4%	2.8%

As is seen in Table 1, the share of congested constraints intervals that were accurately predicted is drastically higher under the new system than under the prior system. 15-minute intervals in which congestion was under-predicted now represent a very small portion of total congested constraint intervals on the EIM transfers (2.8 percent). Intervals in which congestion was predicted to occur in the

mitigation run but was resolved in the final market run also dropped by a large amount and now total only 3.4 percent of 15-minute intervals in which an EIM transfer constraint was projected to be congested and/or was congested in the market run.

3.2 Results for 5-minute market

Changes to the 5-minute market were activated starting on May 2, 2017. A comparison of the accuracy before and after recent enhancements made in the 5-minute market is shown in Table 2 . The period before the changes consists of eleven months of data from June 1, 2016 through May 1, 2017.

The decrease in under predicted congestion on the EIM transfers is significant – dropping from 41 percent to 8 percent. This 8 percent rate of under-prediction for the EIM transfers over this period is also significantly better than the average historical accuracy of congestion predictions for flow based constraints in the ISO's 5-minute market. In 2016, 24 percent of congested constraint intervals were under-predicted on flow based constraints in the ISO's 5-minute market.

Table 2. Accuracy of congestion prediction on EIM transfer constraints in 5-minute market

	Accurately predicted	Predicted but resolved	Under predicted
Before changes	29%	30%	41%
After changes	57%	35%	8%

4 Conclusion

The recent improvements to ISO's real-time market power mitigation procedures have made dramatic reductions to the instances of underestimated congestion on the EIM transfer constraints. The increased accuracy ensures the effectiveness of these automated mitigation procedures and mitigates concern that an EIM entity would have the opportunity to exercise market power through economic withholding.

CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon the parties listed on the official service lists in the above-referenced 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 this 27th day of September, 2017.

/s/ Anna Pascuzzo
Anna Pascuzzo