

166 FERC ¶ 61,040
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Neil Chatterjee, Chairman;
Cheryl A. LaFleur, Richard Glick,
and Bernard L. McNamee.

PJM Interconnection, L.L.C.

Docket No. ER19-383-000

ORDER ACCEPTING TARIFF REVISIONS

(Issued January 18, 2019)

1. On November 20, 2018, PJM Interconnection, L.L.C. (PJM) filed, pursuant to section 205 of the Federal Power Act (FPA),¹ proposed revisions to the PJM Amended and Restated Operating Agreement (Operating Agreement) and the parallel provisions of the PJM Open Access Transmission Tariff (Tariff) to stop using certain resources to calculate the frequency regulation (regulation) market clearing price in order to reduce spikes in the clearing price in PJM's regulation market. As discussed below, we accept PJM's proposed revisions, effective January 21, 2019, as requested.

I. Background

2. Regulation service is one of the tools system operators use to balance supply and demand on the transmission system in order to maintain reliable operations. To ensure just and reasonable compensation for the provision of regulation service, the Commission revised its regulations in Order No. 755² to require each independent system operator (ISO) and regional transmission organization (RTO) that compensates for regulation service to adopt a two-part compensation system "based on the actual service provided, including a capacity payment that includes the marginal unit's opportunity costs and a

¹ 16 U.S.C. § 824d (2012).

² *Frequency Regulation Compensation in the Organized Wholesale Power Markets*, Order No. 755, FERC Stats. & Regs. 31,324 (2011), (cross-referenced at 137 FERC ¶ 61,064), *reh'g denied*, Order No. 755-A, 138 FERC ¶ 61,123 (2012).

payment for performance that reflects the quantity of frequency regulation service provided by a resource when the resource is accurately following the dispatch signal.”³

3. Under PJM’s performance-based regulation framework that the Commission approved in 2012,⁴ PJM employs two different types of regulation signals.⁵ PJM uses a traditional signal, called RegA, to dispatch slower, sustained-output resources such as steam and combustion resources. PJM uses a faster signal, called RegD, to dispatch faster, dynamic resources, such as battery storage.⁶ PJM also uses a “benefits factor” curve in the regulation market-clearing process to reflect the operational relationship between the RegA and RegD signal.⁷ The purpose of the benefits factor curve is to establish the tradeoff between RegA and RegD resources at various combinations so that the regulation market’s clearing engine can consider them on a comparable basis. PJM calculates a unit-specific benefits factor for each RegD resource in the regulation bid stack based on the benefits factor curve.⁸ The values on the benefits factor curve range from 2.9 to 0.0, with a benefits factor of 1.0 representing the point where one megawatt of RegD resources is treated as providing the same value as one megawatt of RegA resources. Traditional RegA resources have a unit-specific benefits factor equal to 1.0.⁹

³ 18 C.F.R. § 35.28(g)(8) (2018).

⁴ *PJM Interconnection, L.L.C.*, 139 FERC ¶ 61,130 (2012); *PJM Interconnection, L.L.C.*, 141 FERC ¶ 61,134 (2012), *order on reh’g and compliance*, 144 FERC ¶ 61,053 (2013), *order on reh’g*, 145 FERC ¶ 61,011 (2013).

⁵ PJM Compliance Filing Transmittal at 7, Docket No. ER12-1204-000 (Mar. 5, 2012).

⁶ The RegA and RegD signals are not resource-type dependent, as any resource that can follow a given signal can qualify to provide regulation service using that signal. PJM Transmittal at 4-5.

⁷ *See PJM Interconnection, L.L.C.*, 139 FERC ¶ 61,130 at P 12; *see also PJM Interconnection, L.L.C.*, 141 FERC ¶ 61,134, at PP 27-30.

⁸ PJM, Compliance Filing Transmittal at 11, Docket No. ER12-1204-001 (Aug. 15, 2012); *see* PJM Tariff Attachment K-Appendix and Operating Agreement, Schedule 1, § 3.2.2(j).

⁹ PJM Tariff Attachment K-Appendix and Operating Agreement, Schedule 1, § 3.2.2(j).

Resources providing regulation service in PJM are compensated based on three primary components: (i) performance score;¹⁰ (ii) mileage;¹¹ and (iii) benefits factor.

4. On April 13, 2017 and April 14, 2017, in Docket Nos. EL17-64-000 and EL17-65-000, Energy Storage Association (ESA), Renewable Energy Systems Americas (RESA), and Invenergy Storage Development, LLC (Invenergy) filed, pursuant to section 206 of the FPA,¹² complaints against PJM challenging a series of changes PJM implemented in its regulation market, including changes to the benefits factor curve methodology and to the design of the RegA and RegD signals (Complaints). On October 17, 2017, PJM filed a package of Tariff revisions to reform its regulation market design (PJM Regulation Proposal).¹³ The primary components of the PJM Regulation Market Proposal included: (1) replacement of the benefits factor curve with the Regulation Rate of Technical Substitution Curve; (2) adjustment of performance scoring; (3) revisions to the regulation settlements equation, including elimination of the mileage ratio and replacing it with the marginal Regulation Rate of Technical Substitution Curve value; and (4) revisions to lost opportunity cost calculations.

5. On March 30, 2018, the Commission granted ESA's complaint in part finding that ESA demonstrated that the PJM Tariff is unjust, unreasonable, unduly discriminatory, or preferential because it does not include the methodology for calculating the benefits factor (or other curve used to establish a common basis for clearing RegA and RegD megawatts in the Regulation market) and the parameters governing its RegD signal. The Commission directed a staff-led technical conference on the remaining issues raised in

¹⁰ All resources providing regulation receive a performance score, which reflects how well a resource follows the regulation signal and is calculated based on accuracy (the correlation between the signal and the resource's response), delay (the time delay between the signal and a resource's highest degree of correlation), and precision (the instantaneous error between the signal and response). *See PJM Interconnection, L.L.C.*, 162 FERC ¶ 61,295, at P 25 (2018).

¹¹ The term actual mileage is the absolute amount of regulation up and down a resource provides in response to the system operator's dispatch signal. *See PJM Interconnection, L.L.C.*, 141 FERC ¶ 61,134 at P 45.

¹² 16 U.S.C. § 824e (2012).

¹³ PJM Regulation Proposal Filing Transmittal, Docket No. ER18-87-000 (Oct. 17, 2017) (amended in Docket No. ER18-87-001 (Oct. 25, 2017)).

the Complaints.¹⁴ Concurrently, the Commission issued an order rejecting the PJM Regulation Proposal as inconsistent with the Commission's directives in Order No. 755 and the Commission's regulations.¹⁵ Subsequently, in May 2018, ESA and RESA/Invenergy submitted a request that the Commission (1) appoint a settlement judge to facilitate the resolution of issues raised in the proceedings, and (2) postpone the technical conference. The Commission granted the joint request and directed a joint report on the status of the settlement proceedings within 90 days of the appointment of a settlement judge.¹⁶

II. PJM's Proposal

6. PJM states that the targeted revisions that it proposes are designed to remove the use of "minimally effective resources" (RegD resources with a benefits factor of less than 0.1) in the calculation of the regulation market clearing price. PJM asserts that this will reduce the occurrence of large spikes in clearing prices that have recently been observed in the regulation market due to aberrations in the outcomes of certain formulas in the Tariff and Operating Agreement, thereby decreasing the likelihood of unjust and unreasonable outcomes for market participants.¹⁷

7. PJM emphasizes that the instant filing is narrowly-tailored and endorsed by PJM's stakeholders to address a unique occurrence that has recently been observed in the regulation market. PJM further emphasizes that its proposal will have a minimal impact on the function of the market as a whole. For instance, PJM states, its analysis shows that the proposed rule would have reduced regulation market revenues by only approximately 3.2 percent over the past year had it been implemented, and that the impact of the change is largely isolated to a very small percentage of hours.¹⁸ PJM argues that any other considerations, such as broader reforms to the regulation market, are beyond the scope of

¹⁴ *Energy Storage Ass'n v. PJM Interconnection, L.L.C.*, 162 FERC ¶ 61,296 (2018).

¹⁵ *PJM Interconnection, L.L.C.*, 162 FERC ¶ 61,295, at P 55 (2018) (March 30 Order).

¹⁶ *Energy Storage Ass'n v. PJM Interconnection, L.L.C.*, 163 FERC ¶ 61,157 (2018). According to the Fourth Report of Settlement Judge, dated January 4, 2019, the parties have reached an agreement in principle and have exchanged settlement term sheets. The report recommends continuing settlement proceedings.

¹⁷ PJM Transmittal at 2.

¹⁸ *Id.* (citing Affidavit of Damon Fereshetian at P 7).

the filing,¹⁹ and should be addressed through a further PJM stakeholder process and subsequent filings with the Commission.

8. PJM explains that the benefits factor for each RegD resource is determined based on the expected impact that fast-following resources (RegD) will have on North American Electric Reliability Corporation (NERC) reliability criteria.²⁰ PJM asserts that it adjusts the regulation offers that RegD and RegA resources submit into the market by performance score, mileage, and benefits factor to produce an adjusted offer, which accounts collectively for the performance of each resource and the differences between the RegA and RegD signals.²¹ PJM states that the regulation market is cleared hour-ahead for each hour in the operating day. PJM explains that using submitted offers and projected Locational Marginal Prices (LMP), the least-cost set of RegA and RegD resources are assigned to provide regulation service for the entire operating hour. Subsequently, PJM provides that, in real-time the regulation market clearing price²² is calculated for each five-minute interval during the operating hour, and set by the cleared Regulation resource (from the hour-ahead clearing) with the highest Total Adjusted Offer.²³

9. PJM explains that because the hour-ahead clearing uses a *projected* LMP, but the market clearing price is determined using *actual* real-time LMP, differences between the projected LMP and actual real-time LMP can produce scenarios in which actual clearing prices are unexpectedly high. The lost opportunity cost used in the hour-ahead market clearing may be \$0/MWh, and a resource with a low benefits factor value can clear based on the *projected* LMP. Subsequently, in the real-time market, clearing is based on *actual* LMP, and the lost opportunity cost may increase to a higher value. Because the benefits

¹⁹ *Id.* (citing *Midcontinent Indep. Sys. Operator, Inc.*, 164 FERC ¶ 61,069, at P 48 (2018) (“Under FPA section 205, the Commission is limited to considering the filing before it . . .”).

²⁰ *Id.* at 3. PJM notes that determination of expected response is based on a combination of off-line models, analysis of the Regulation signals, and accumulated historical operational data.

²¹ *Id.* at 3-4.

²² The Total Regulation Market Clearing Price (a price that is paid to market participants via the performance clearing price and capability clearing price) incorporates each resource’s lost opportunity cost and is set using the highest ranked resource that clears. *See* Operating Agreement, Schedule 1, § 3.2.2(c).

²³ PJM Transmittal at 4.

factor and performance score terms are in the denominator of the components that make up adjusted offers (i.e., adjusted capability, adjusted performance and adjusted lost opportunity cost), any low numerical values will dramatically increase the adjusted capability and performance offers, or the adjusted lost opportunity costs, and hence the regulation market clearing price.²⁴

10. PJM states that, recently, it has observed intervals in the regulation market where a resource with a very low benefits factor (less than 0.1) cleared hour-ahead because it had a \$0 Total Adjusted Offer, but in real-time the adjusted lost opportunity cost was not zero, and as a result, the resource set the clearing price at a significantly elevated price.²⁵ PJM explains that when dividing by very small benefits factor values, even a small change in the LMP between the *projected* LMP and the *actual* LMP can result in a very high clearing price.²⁶ PJM provides an example where a cleared resource with an 80 percent performance score and a benefits factor of 0.001 has a difference between LMP and marginal cost in real-time of only \$5. PJM explains that dividing the \$5 by the benefits factor and the performance score leads to an adjusted lost opportunity cost value of \$6,250/MWh, which can set the clearing price for that interval.²⁷

11. PJM states that five-minute regulation market clearing prices as high as \$10,000/MWh have been observed due to this phenomenon. PJM explains that in the highest of these instances, the benefits factor of the marginal resource was approximately 0.001, meaning that 1,000 MW from that RegD resource would have been needed to offset a single MW of Regulation from a RegA resource. PJM asserts that between May 1, 2018 and August 31, 2018, PJM observed 464 intervals where the marginal benefits factor was less than 0.1, and the average regulation market clearing price for those intervals was \$121 with a maximum regulation market clearing price of \$10,522. PJM states that, as a point of reference, the weighted average regulation market clearing price for the first nine months of 2018 was \$28.23 per megawatt.²⁸

²⁴ *Id.* at 3-6.

²⁵ *Id.*

²⁶ *Id.* at 5-6.

²⁷ *Id.* at 6.

²⁸ *Id.* (citing Monitoring Analytics; 2018 Quarterly State of the Market Report, http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2018/2018q3-som-pjm-sec10.pdf; p. 505).

12. PJM explains that when the benefits factor indicates that a RegD resource is minimally effective,²⁹ the minor benefit to the system derived from clearing that particular resource for regulation does not justify exposing the regulation market as a whole to the risk of dramatically increased market clearing prices.³⁰ Therefore, as a means of reducing the frequency of the large spikes in the clearing price, PJM proposes to clear only those resources which have a benefits factor of 0.1 or greater. By doing so, PJM asserts that instances in which the adjusted lost opportunity cost component of the offer increases in the real-time market clearing due to a discrepancy between projected and actual LMP will not lead to a corresponding drastic increase in the clearing price. PJM explains that this will occur because the value in the denominator of the adjusted lost opportunity price component equation will be “contained” at the 0.1 level.³¹

III. Notice of Filing and Responsive Pleadings

13. Notice of PJM’s filing was published in the *Federal Register*, 83 Fed. Reg. 61,153 (2018), with interventions and protests due on or before December 11, 2018. Timely motions to intervene were submitted by the following: Monitoring Analytics, LLC, acting in its capacity as the Independent Market Monitor for PJM (IMM); Public Citizen Inc. (Public Citizen); ESA; PJM Industrial Customer Coalition; Direct Energy, Direct Energy Business Marketing, LLC and Direct Energy Business, LLC; Exelon Corporation; Calpine Corporation; NRG Power Marketing LLC; American Municipal Power, Inc.; Northern Illinois Battery Storage Holding LLC; Ameren Services Company; Dominion Energy Services Company, Inc.; EDF Renewable Energy, Inc.; Convergent Energy and Power LP; and North Carolina Electric Membership Corporation. The IMM and Public Citizen filed comments. ESA filed a motion to intervene and protest. PJM filed an answer and ESA and the IMM filed answers to PJM’s answer.

IV. Protests and Comments

14. The IMM argues that PJM’s proposal to cap RegD MW at the point where the lowest marginal benefits factor will be 0.1 would reduce the magnitude of the price spikes observed in the regulation market but will not eliminate price spikes and will not

²⁹ *Id.* at 7. PJM states: “As used here, the term ‘minimally effective’ refers to a RegD resource whose benefits factor is less than 0.1. This means that the RegD resource would need to produce 100 MW of Regulation or more to offset a single MW of Regulation provided by a RegA resource.”

³⁰ *Id.* at 7 (citing Affidavit of Damon Fereshetian at P 6).

³¹ *Id.*

eliminate overpayment of RegD when the marginal benefits factor is less than 1.0.³² The IMM also argues PJM's proposal will not decrease the likelihood of unjust and unreasonable outcomes for market participants. The IMM asserts that the current regulation market design causes unjust and unreasonable outcomes in every hour when RegD clears the market and the marginal benefits factor is less than 1.0. Correspondingly, the IMM contends that RegD is underpaid when the marginal benefits factor is greater than 1.0.³³ The IMM further argues that, due to the inconsistent application of the marginal benefits factor between market clearing and market settlement, the current market results are not consistent with a competitive market outcome, and that in any market, resources should be paid the marginal clearing price for their marginal contribution.³⁴

15. The IMM argues that overpayment of RegD resources when the marginal benefits factor is less than 1.0 creates an incentive for RegD resources to bid zero, or significantly below their actual costs, in order to guarantee that they clear the market and benefit from possible price spikes caused by RegD resources with a within hour non-zero lost opportunity cost.³⁵ The IMM contends that this incentive extends to those RegD resources, such as hydro or combustion turbines, that have energy offers that can generate a within hour lost opportunity cost component for their price offer and cause price spikes well in excess of their offers.

16. The IMM asserts that the price spikes identified by PJM are merely a symptom of the problem, not the problem itself. The IMM contends that resolution of the identified issues with PJM's energy market would require a consistent application of the marginal benefits factor throughout PJM's market construct, not a cap on the marginal benefits factor.³⁶

17. The IMM argues that the settlement proceeding is not intended, and should not be used, to address the fundamental market design issues raised in the PJM Regulation Market Proposal, which the Commission rejected.³⁷ The IMM asserts that the settlement

³² IMM Comments at 3.

³³ *Id.*

³⁴ *Id.* at 4-5.

³⁵ *Id.* at 6.

³⁶ *Id.* at 8.

³⁷ *Id.* at 9 (citing March 30 Order, 162 FERC ¶ 61,295).

proceeding was established to address the issues raised in the complaints, specifically (1) the documentation of the determination of the marginal benefits factor curve, and (2) the signal design in the Tariff and Operating Agreement. The IMM argues that, given the limited scope of the settlement proceeding, there is no reason to wait for resolution of that proceeding before the Commission considers PJM's and the IMM's request for rehearing of the March 30 Order. The IMM contends that only rehearing of the March 30 Order can address the fundamental issues preventing efficient operation of the regulation market.³⁸

18. Public Citizen argues that the Commission must make a determination that the current PJM regulation market clearing price is unjust and unreasonable.³⁹ Public Citizen states that PJM's proposal suggests that regulation market clearing prices of \$10,000/MWh are not just and reasonable. However, Public Citizen contends that, without PJM providing more comprehensive bidding data, it is difficult to identify a just and reasonable clearing price and impossible to independently verify that PJM's conclusions are accurate.⁴⁰ Public Citizen asserts that PJM has not produced any analysis demonstrating that regulation market clearing prices of \$300/MWh are just and reasonable.⁴¹ Public Citizen argues that a \$300/MWh price is not just and reasonable simply because it is lower than \$10,000 MWh. Public Citizen argues that, absent a finding that rates are unjust and unreasonable, consumers are denied access to refunds.⁴²

19. Public Citizen further argues that PJM must amend its proposal to clarify when problems with the regulation market clearing price began and detail the origins of the current regulation market clearing price.⁴³ Public Citizen argues that PJM references 464 intervals of bids where the marginal benefits factor was less than 0.1 between May 1 and August 31, but offers no explanation of why bids in this time frame appear to deviate from the norm. Public Citizen also argues that a likely explanation may simply be that

³⁸ *Id.* at 9.

³⁹ Public Citizen Comments at 2.

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² *Id.* at 3.

⁴³ *Id.* at 3-4.

market participants were able to figure out how to exploit the regulation market clearing price and aggressively did so.⁴⁴

20. Public Citizen contends that, if PJM and the Commission rely on an RTO/ISO stakeholder process to assist with ratemaking, then details of those stakeholder meeting votes must be included as part of the record in this docket.⁴⁵ Public Citizen further argues that PJM must amend its proposal to include the names of the companies submitting bids that constituted “large price spikes” because such disclosure would not jeopardize market operations and is necessary for the public interest.⁴⁶ Public Citizen also asserts that such disclosure will help protect the integrity of the stakeholder process, which can serve as a fertile opportunity for certain, vested, market participants to play an active role in influencing market rule proposals to serve their financial self-interests.⁴⁷ Public Citizen also argues that public disclosure would dissuade many from submitting such bids.⁴⁸

21. ESA argues that the Commission recently found that “PJM’s overarching methodology for establishing the benefits factor curve, including any differences that PJM implements in particular hours, such as the ‘cap’ on RegD resources during excursion hours, should be included in the PJM Tariff because this information significantly affects the rates, terms, and conditions of Regulation service in PJM and is reasonably susceptible to specification.”⁴⁹ Similarly, ESA argues that the Commission noted that “to the extent that PJM proposes in the future to replace the benefits factor with a different substitution function, the Commission’s findings herein instruct that the substitution function calculation methodology should be set forth in the PJM [T]ariff.”⁵⁰ ESA asserts that the proposed Tariff language lacks any mention of the methodology necessary to calculate the benefits factor. As such, ESA argues that the Tariff does not

⁴⁴ *Id.* at 4-5.

⁴⁵ *Id.* at 3.

⁴⁶ *Id.* at 5-6.

⁴⁷ *Id.* at 6.

⁴⁸ *Id.* at 7.

⁴⁹ ESA Protest at 3 (citing *Energy Storage Ass’n v. PJM Interconnection, L.L.C.*, 162 FERC ¶ 61,296 at P 105).

⁵⁰ *Id.* at 3-4 (citing *Energy Storage Ass’n v. PJM Interconnection, L.L.C.*, 162 FERC ¶ 61,296 at P 106).

conform to the Commission's repeated directives, and requests that the Commission make similar findings and deem PJM's proposal unjust and unreasonable.⁵¹

V. Answers

22. In its answer, PJM contends that protesters' arguments regarding the ongoing settlement proceedings are outside the scope of the instant proceeding. PJM reiterates that the instant filing is intended to address a unique occurrence that has recently been observed in the regulation market, and argues that the instant proceeding is separate from the settlement proceedings.⁵² PJM asserts that the instant filing does not replace the benefits factor, but rather proposes a new rule under which RegD resources with a benefits factor of less than 0.1 will not clear in the regulation market in order to decrease the frequency of large upward clearing price fluctuations due to aberrations in the outcomes of certain formulas in the Tariff and Operating Agreement.⁵³

23. In response to Public Citizen, PJM argues that it has no evidence, nor can Public Citizen point to any evidence, that these high clearing prices were the result of illegal activity by any market participants.⁵⁴ Regarding Public Citizen's assertion of a lack of stakeholder transparency, PJM states that its stakeholder process is open to all participants, including Public Citizen, and that materials related to the work of specific stakeholder committees, including minutes of meetings approving particular action items, are posted on PJM's publicly-available website.⁵⁵ PJM states that the meetings themselves are open and available telephonically and through webcasts.

24. In response to PJM's answer, ESA asserts that although PJM is not replacing its benefits factor curve, PJM is including a cap on RegD resources based on attainment of a specific benefits factor score, without providing a Tariff provision on how the benefits factor is calculated.⁵⁶ ESA therefore argues that the Commission's findings in Docket

⁵¹ *Id.* at 4.

⁵² PJM Answer at 2-3.

⁵³ *Id.* at 4-5.

⁵⁴ *Id.* at 6 (citing Public Citizen Comments at 4-5).

⁵⁵ *Id.* at n.24. PJM states that the minutes for the stakeholder meetings referenced in the instant filing were not approved at the time PJM made its filing; however, they have since been approved and posted.

⁵⁶ ESA Answer at 3.

No. EL17-64-000 are relevant to the facts in the instant proceeding. ESA states that, while arguable whether the Commission could require PJM to make a change to its proposed Tariff provision, the law still allows the Commission to reject a proposed tariff filing outright as inconsistent with the Commission's mandates.⁵⁷

25. The IMM responds to PJM's answer by restating its general argument that price spikes are the symptom of a larger problem with the regulation market design and therefore PJM's proposal to cap the amount of RegD that clears the market does not address the source of the problem. The IMM asserts that PJM does not explain why the occasional "very large clearing prices" it identifies are problematic, why the observed high prices are unjust and unreasonable, or why the observed prices do not reflect the price of the marginal resource or otherwise are incorrect or inconsistent with a competitive outcome.⁵⁸ The IMM argues that its own proposal put forth in its comments is squarely within the scope of the proceeding because it is the only proposal that directly identifies and addresses the market design flaw that is the root cause of the observed price spikes.⁵⁹ The IMM further argues that PJM's proposal to cap RegD offers is an arbitrary price cap that would create incorrect market incentives and introduce inefficiencies into pricing under a corrected market design.⁶⁰

VI. Commission Determination

A. Procedural Matters

26. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2018), the timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding.

27. Rule 213(a)(2) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.213(a)(2) (2018), prohibits an answer to a protest and/or answer unless otherwise ordered by the decisional authority. We accept the answers because they have provided information that assisted us in our decision-making process.

⁵⁷ *Id.* at 3-4.

⁵⁸ IMM Answer at 2.

⁵⁹ *Id.* at 3.

⁶⁰ *Id.* at 5.

B. Substantive Matters

28. As discussed below, we accept PJM's proposed Tariff revisions establishing a market rule under which RegD resources with a benefits factor of less than 0.1 will not clear in the regulation market, effective January 21, 2019, as requested. We find PJM's proposed Tariff and Operating Agreement provisions designed to reduce the occurrence of elevated spikes in clearing prices to be just and reasonable. Specifically, we find that PJM's proposal should alleviate large price fluctuations that have occurred due to extremely low marginal benefits factors in the lost opportunity cost calculation as discussed by PJM. We agree with PJM that, because the benefits factor and performance score terms are in the denominator of the lost opportunity cost calculation, any low values can dramatically increase the lost opportunity costs even when the difference between the LMP and the marginal resource's offer is only a few dollars. We find that PJM's proposal will limit the probability of elevated price spikes.

29. Additionally, we agree with PJM that its proposal is narrowly tailored to address a unique occurrence in the regulation market and that it should have a minimal impact on the functioning of the market as a whole. We note that PJM's analysis of the 14-month period of August 2017 through September 2018 demonstrated that resources with a benefits factor of less than 0.1 cleared in only 264 or 2.58 percent of 10,224 hours analyzed.⁶¹ Therefore, we find that the PJM proposal to remove such resources from the calculation of the clearing price solves a unique market pricing issue, while having a minimal effect on the overall number of hours that resources with a benefits factor of less than 0.1 would be prevented from clearing.

30. We disagree with ESA's argument that PJM has failed to incorporate the methodology for calculating the benefits factor in the PJM Tariff as the Commission directed. In its order on the Complaints, the Commission did not at that time direct a compliance filing, pending the outcome of the technical conference and a further Commission order.⁶² As discussed above, the parties are currently engaged in settlement discussions in the technical conference proceeding. Moreover, we note that PJM's instant proposal is narrowly tailored to only address price spikes due to low marginal

⁶¹ PJM Filing, Attachment C Affidavit of Damon Fereshetian at 1-2. According to PJM's analysis, if RegD resources with a benefits factor of less than 0.1 were prevented from clearing the market, it would have only resulted in a total reduction of approximately \$3.04 million in Regulation credits out of a total of \$94.94 million market credit paid during the 14-month period that PJM analyzed.

⁶² See *Energy Storage Ass'n v. PJM Interconnection, L.L.C.*, 162 FERC ¶ 61,296 at PP 105, 110.

benefits factors in the lost opportunity cost calculation, and is not a broader proposal to replace or reform the benefits factor.

31. We disagree with Public Citizen's concerns about PJM's stakeholder process.⁶³ We find PJM's use of its stakeholder process to develop the instant revisions appropriate. We disagree that PJM's stakeholder deliberations with respect to this filing lacked transparency. PJM states that the Markets and Reliability Committee endorsed the Tariff and Operating Agreement revisions by a sector-weighted vote of 4.09/5.00 and the Members Committee similarly endorsed the revisions by acclamation.⁶⁴ As PJM explains, the materials related to specific stakeholder committees, including minutes of meetings, are posted on PJM's website. We find that PJM's development of the Tariff and Operating Agreement modifications via its stakeholder process appropriately informed interested stakeholders of potential impacts to PJM's market and operations, and appears consistent with the stakeholder process enumerated in its Tariff.⁶⁵

32. As to Public Citizen's argument that PJM should have provided more regulation market pricing data, in support of this filing,⁶⁶ we note that data pertaining to the regulation market is publicly posted.⁶⁷ We also find Public Citizen's assertion that market participants may have improperly exploited the regulation market clearing price to be unsupported. Importantly, PJM referred to intervals with a maximum clearing price of \$10,522/MWh—not the individual bids of particular market participants.⁶⁸ PJM explains that the interval prices in question are the result of hour-ahead forecast errors input into the lost opportunity cost calculation and scaled by a very low benefits factor.⁶⁹

⁶³ See Public Citizen Comments at 3, 6.

⁶⁴ PJM Transmittal at 8.

⁶⁵ See *PJM Interconnection, L.L.C.*, 133 FERC ¶ 61,071, at P 44 (2010) (finding that PJM's sector-weighted voting procedures at senior level committees, e.g., Members Committee and Markets and Reliability Committee, ensure that PJM's practices and procedures for decision making consider and balance the interests of its customers and stakeholders, and ensure that no single stakeholder group can dominate).

⁶⁶ See Public Citizen Comments at 3-5.

⁶⁷ See PJM Data Miner 2 Ancillary Service Market Results, https://dataminer2.pjm.com/feed/reserve_market_results/definition.

⁶⁸ PJM Transmittal at 6.

⁶⁹ See *id.* at 5-6.

We also disagree with Public Citizen that PJM must disclose the names of market participants here, noting that the observed extreme price spikes were due to aberrations in the Tariff formula design, as discussed above, which PJM's proposed revisions mitigate. Therefore, we deny Public Citizen's request.

33. We find the IMM's and Public Citizen's broad concerns regarding the existing regulation market design and PJM's operation of the regulation market to be beyond the scope of the instant filing, which is narrowly tailored to limit price spikes in the regulation market. Broader issues related to PJM's regulation market design are currently pending in Docket Nos. EL17-64-000, EL17-65-000, ER18-87-000, and ER18-87-001. In those dockets, the Commission found that commenters raised a number of issues related to the regulation market that warrant further examination.⁷⁰ For instance, the Commission found that the purposes for which PJM procures regulation service from regulation resources warrants further investigation because procuring regulation services for purposes other than moment-to-moment balancing could potentially be an inefficient use of regulation service and could negatively affect the ability of RegD resources to fully participate in the regulation market.⁷¹ The Commission also stated that it would examine PJM's two-signal regulation market design with respect to the requirements of Order No. 755.⁷²

34. We disagree with Public Citizen's argument that the Commission should find here that the existing regulation market clearing prices are unjust and unreasonable. We find that, in the instant proceeding, the Commission is evaluating the narrow proposal before us, which we find is a just and reasonable improvement to the current Tariff because it limits price spikes that result from a formula contained in the Tariff. In addition, we again note that the existing regulation market design is currently pending in both FPA sections 205 and 206 proceedings subject to rehearing and settlement procedures.

⁷⁰ *Energy Storage Ass'n v. PJM Interconnection, L.L.C.*, 162 FERC ¶ 61,296 at P 102; *see also* March 30 Order, 162 FERC ¶ 61,295 at P 57.

⁷¹ *Energy Storage Ass'n v. PJM Interconnection, L.L.C.*, 162 FERC ¶ 61,296 at P 111.

⁷² *Id.*; *see also* March 30 Order, 162 FERC ¶ 61,295 at P 57.

The Commission orders:

The proposed Tariff and Operating Agreement revisions are hereby accepted, effective January 21, 2019, as requested, as discussed in the body of this order.

By the Commission.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.