

161 FERC ¶ 61,153
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.

Docket No. ER17-1567-000

ORDER ON COMPLIANCE

(Issued November 9, 2017)

1. On May 8, 2017, PJM Interconnection, L.L.C. (PJM) submitted, pursuant to section 206 of the Federal Power Act (FPA),¹ revisions to its Amended and Restated Operating Agreement and the parallel provisions of the PJM Open Access Transmission Tariff (Tariff)² to comply with the requirements of Order No. 831.³ In this order, we accept in part, and reject in part, PJM’s compliance filing, and direct further compliance. The Commission will establish the effective date of these provisions under Federal Power Act (FPA) section 206 in a subsequent order.⁴

¹ 16 U.S.C. 824e (2012).

² In its filing, PJM acknowledged that its proposed revisions to its Open Access Transmission Tariff (OATT) require parallel revisions to its Amended and Restated Operating Agreement (OA). For convenience, in this order, we refer to both PJM’s OATT and Operating agreement as “Tariff.” Appendix A lists the Tariff and Operating Agreement sections filed by PJM.

³ *Offer Caps in Markets Operated by Regional Transmission Organizations and Independent System Operators*, Order No. 831, 81 Fed. Reg. 87,770 (Dec. 5, 2016), FERC Stats. & Regs. ¶ 31,387 (2016), *order on reh’g and clarification*, Order No. 831-A, 161 FERC ¶ 61,156 (2017).

⁴ *See Aera Energy LLC v. FERC*, 789 F.3d 184 (D.C. Cir. 2015) (Commission can make a filing effective under section 5 of the Natural Gas Act, analogous to section 206 of the FPA, only when the order provides “no discretion to adjust its rate models”); *Transwestern Pipeline Co. v. FERC*, 897 F. 2d 570 (D.C. Cir. 1990) (“the Commission need not confine rates to specific, absolute numbers but may approve a tariff containing a rate ‘formula’ or a rate ‘rule’ [citation omitted]; it may not, however, simply announce some formula and later reveal that the formula was to govern from the date of

(continued ...)

I. Background

2. In Order No. 831, the Commission addressed the incremental energy offer component of a resource's supply offer,⁵ requiring regional transmission organizations and independent system operators (RTOs/ISOs) to amend their existing caps on incremental energy offers and implement additional measures, as discussed below.

A. Offer Cap Structure

3. Each RTO/ISO must: (1) cap each resource's incremental energy offer at the higher of \$1,000/MWh or that resource's verified cost-based incremental energy offer; and (2) cap verified cost-based incremental energy offers at \$2,000/MWh (hard cap) when calculating LMPs.⁶ The Commission stated that it expects RTOs/ISOs to use cost-based incremental energy offers above \$2,000/MWh to determine merit-order dispatch.⁷ In Order No. 831-A, the Commission clarified that Order No. 831's expectation was not a requirement for RTOs/ISOs to use cost-based incremental energy offers above \$2,000/MWh to determine economic merit-order dispatch, adding that in the event that RTOs/ISOs must select from several offers above \$2,000/MWh, RTOs/ISOs are *encouraged* to make those selections on a least-cost basis when possible.⁸

B. Cost Verification

4. Incremental energy offers above \$1,000/MWh must be cost-based and must be verified by the RTO/ISO or the Market Monitoring Unit before the RTO/ISO uses the offer to calculate LMPs. The verification process must ensure that a resource's cost-based incremental energy offer above \$1,000/MWh "reasonably reflects that resource's actual or expected cost."⁹ Although the Commission did not prescribe how RTOs/ISOs

announcement"). *See also, PJM Interconnection, L.L.C.*, 158 FERC ¶ 61,133, at P 126 (2017) (deferring the determination of the effective date until PJM makes the required further compliance filing proposing effective dates).

⁵ An incremental energy offer is a financial cost component consisting of costs that vary with a resource's output or level of demand reduction. It is one of the components used to calculate locational marginal prices (LMPs).

⁶ Order No. 831, FERC Stats. & Regs. ¶ 31,387 at P 77.

⁷ *Id.* P 90.

⁸ Order No. 831-A, 161 FERC ¶ 61,156 at P 16

⁹ Order No. 831, FERC Stats. & Regs. ¶ 31,387 at P 140.

or Market Monitoring Units should conduct the verification process, the Commission stated that it expected RTOs/ISOs to build upon their existing mitigation processes for calculating or updating cost-based incremental energy offers. The Commission required that RTO/ISO compliance filings explain what factors the cost verification process would consider and whether such factors are currently considered in the market power mitigation process, or whether new provisions would be necessary.¹⁰

5. If an incremental energy offer above \$1,000/MWh cannot be verified prior to the start of the market clearing process, it may not be used to calculate LMPs, but the resource may be eligible to receive an uplift payment after-the-fact, subject to verification. Resources with verified incremental energy offers above \$2,000/MWh are also eligible for after-the-fact uplift payments because the energy component of LMP is capped at \$2,000/MWh.¹¹ Any such after-the-fact uplift payment must be based on a resource's actual short-run marginal costs.¹²

6. RTOs/ISOs are not required to include adders above cost in cost-based incremental energy offers to account for cost uncertainty or risk. However, if an RTO/ISO chooses to retain an adder above cost or proposes to include a new adder above cost in cost-based incremental energy offers above \$1,000/MWh, such adders may not exceed \$100/MWh. If a resource receives uplift after-the-fact because that resource's cost-based incremental energy offer above \$1,000/MWh could not be verified prior to the market clearing process or because its cost-based incremental energy offer exceeded \$2,000/MWh, such uplift payments should not include any adders above costs.¹³

7. In Order No. 831-A, the Commission also stated that verifiable opportunity costs should not be subject to the \$100/MWh limit on adders above cost because opportunity costs are legitimate short-run marginal costs and not adders above cost.¹⁴ The Commission also clarified that resources are only eligible to receive uplift payments to make them whole to, at most, their submitted cost-based incremental energy offers if the associated offer and cost information is submitted in a manner consistent with RTO/ISO offer submission guidelines prior to the market clearing process. Such after-the-fact uplift payments that a resource would be eligible to receive if its cost-based incremental

¹⁰ *Id.* P 141.

¹¹ *Id.* PP 145-146.

¹² *Id.* n.331, P 207.

¹³ *Id.* P 207.

¹⁴ Order No. 831-A, 161 FERC ¶ 61,156 at P 38.

energy offer above \$1,000/MWh is not verified prior to market clearing shall include only actual verifiable costs. The Commission further clarified that resources that submit incremental energy offers that include opportunity costs prior to the applicable RTO/ISO submission deadlines must be eligible to receive uplift after-the-fact for those opportunity costs, subject to verification, because opportunity costs are a legitimate component of incremental energy offers.¹⁵

C. Resource Neutrality and Demand Response Resources

8. Any energy resource with short-run marginal costs above \$1,000/MWh may submit a cost-based incremental energy offer above \$1,000/MWh, regardless of resource type. As such, demand response resources that submit incremental energy offers to the energy market may also submit incremental energy offers above \$1,000/MWh, which must be verified before being used to set LMP. The Commission noted that the verification process for demand response resources would differ from the verification process for generation resources and that the short-run marginal costs of a demand response resource may equal its opportunity costs. The offer cap reforms, however, do not apply to capacity-only demand response resources that do not submit incremental energy offers into energy markets.¹⁶

D. External Transactions

9. RTOs/ISOs must permit import and export transactions¹⁷ to offer up to the \$2,000/MWh hard cap, but such transactions are not required to be subject to the verification requirement. The Commission stated, however, that, if RTOs/ISOs wish to verify or otherwise review the costs of imports or exports and/or develop additional mitigation provisions for import and export transactions above \$1,000/MWh, RTOs/ISOs may propose such verification or mitigation provisions in a separate filing under section 205 of the FPA.¹⁸

¹⁵ *Id.* PP 38-39.

¹⁶ Order No. 831, FERC Stats. & Regs. ¶ 31,387 at PP 156-159.

¹⁷ The Commission stated that Order No. 831 does not apply to Coordinated Transactions Schedules or emergency purchases. *Id.* P 198.

¹⁸ *Id.* PP 192, 197.

E. Virtual Transactions

10. RTOs/ISOs must permit market participants to submit virtual transactions¹⁹ up to the \$2,000/MWh hard cap, but such transactions are not required to be subject to the verification requirement. The Commission stated, however, that if RTOs/ISOs determine that additional measures are necessary to address any concerns that arise from permitting virtual transactions up to \$2,000/MWh, RTOs/ISOs may propose such additional measures in a separate filing under section 205 of the FPA.²⁰

II. Compliance Filing

11. For the reasons discussed below, we accept in part, and reject in part, PJM's compliance filing and direct PJM to submit revised tariff provisions.²¹

III. Notice of Filing and Responsive Pleadings

12. Notice of PJM's filing was published in the *Federal Register*, 82 Fed. Reg. 22,331 (2017), with interventions and protests due on or before May 30, 2017. Timely-filed motions to intervene were submitted by the Delaware Public Service Commission (Delaware Commission), Dominion Energy Services, Inc.,²² Exelon Corporation, NRG Companies,²³ Old Dominion Electric Cooperative, North Carolina Electric Membership Corporation, Advanced Energy Management Alliance (AEMA), American Municipal Power, Inc., and Electric Power Supply Association. In addition, motions to intervene out-of-time were submitted by Monitoring Analytics, LLC, acting as PJM's independent market monitor (Market Monitor), the New Jersey Board of Public Utilities (New Jersey Board), the Delaware Division of the Public Advocate (Delaware Advocate), PJM Power Providers Group (Power Providers Group), and Public Citizen, Inc. (Public Citizen).

¹⁹ The Commission stated that Order No. 831 does not apply to up-to-congestion transactions in PJM. *Id.* P 177.

²⁰ *Id.* PP 172, 176.

²¹ *See* Compliance Filing, Transmittal at 2-3 (citing *PJM Interconnection, L.L.C.*, 155 FERC ¶ 61,282 (2016) (*Hourly Offers Order*)).

²² Dominion Energy Services, Inc. intervenes on behalf of Virginia Electric and Power Company.

²³ For purposes of this filing, NRG Companies include NRG Power Marketing LLC and GenOn Energy Management, LLC.

13. On May 30, 2017, comments were filed by the Delaware Commission and AEMA. On May 31, 2017, out-of-time comments were filed by the Market Monitor, the New Jersey Board, and Power Providers Group. On June 12, 2017, PJM submitted an answer. On June 28, 2017, the Market Monitor filed an answer to PJM's answer.

IV. Discussion

A. Procedural Matters

14. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2017), the timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding. Pursuant to Rule 214(d) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214(d) (2017), the Commission will grant the late-filed motions to intervene of the Market Monitor, the New Jersey Board, the Delaware Advocate, Power Providers Group, and Public Citizen, and the late-filed comments of the Market Monitor, the New Jersey Board, and Power Providers Group given their interest in the proceeding, the early stage of the proceeding, and the absence of undue prejudice or delay.

15. Rule 213(a)(2) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.213(a)(2) (2017), prohibits an answer to a protest or an answer unless otherwise ordered by the decisional authority. We will accept the answers submitted by PJM and the Market Monitor because they have provided information that assisted us in our decision-making process.

B. Substantive Matters

1. Offer Cap Structure

a. PJM's Proposal

16. In response to the offer cap structure requirements in Order No. 831, PJM proposes to include only verified cost-based incremental energy offers above \$1,000/MWh, but less than or equal to \$2,000/MWh, in its market clearing process that calculates LMPs. If PJM is not able to verify a resource's cost-based incremental energy offer above \$1,000/MWh prior to market clearing, PJM proposes Tariff revisions that enable a resource to recover its costs through uplift. PJM also proposes Tariff revisions to provide for uplift for resources that submit cost-based incremental energy offers above

\$2,000/MWh. In both instances, a resource would receive uplift pursuant to an after-the-fact review by PJM and the Market Monitor.²⁴

b. Commission Determination

17. We find that PJM complies with the offer cap structure requirements of Order No. 831. Under PJM's proposal, Schedule 1, section 2.2 of the Operating Agreement is revised to clarify that only verified cost-based incremental energy offers above \$1,000/MWh, but less than or equal to \$2,000/MWh, will be considered in calculating LMPs.²⁵ We also find PJM's proposal complies with the uplift requirements in Order No. 831, as it proposes a process that would allow resources the opportunity to recover verified costs through uplift in the event that PJM could not verify incremental energy offers above \$1,000/MWh prior to the market clearing process or if a resource's verified incremental energy costs exceed \$2,000/MWh.²⁶

2. Cost Verification

a. PJM's Proposal

18. Resources in PJM currently submit their own cost-based incremental energy offers that are calculated pursuant to Schedule 2 of the Operating Agreement, the Cost Development Guidelines in PJM's Manual 15, and a PJM-approved Fuel Cost Policy.²⁷ PJM states that its recently enhanced Fuel Cost Policy review process will ensure that all cost-based offers, whether above or below \$1,000/MWh, meet the requirement in Order No. 831 that the cost-based incremental energy offers that a resource submits reasonably reflect that resource's actual or expected costs. PJM proposes to verify the cost-based incremental energy offers above \$1,000/MWh that resources submit on a segment-by-

²⁴ Compliance Filing, Transmittal at 6. *See also id.*, PJM Operating Agreement, Schedule 1, section 3.2.3(r).

²⁵ According to PJM, if a resource submits a cost-based incremental energy offer of \$1,600/MWh that is verified under proposed section 6.4.3 of the Operating Agreement, the resource would also be able to submit a market-based incremental energy offer less than or equal to \$1,600/MWh. PJM would dispatch the resource on such a market-based offer in economic merit order, and the offers included in that market-based incremental energy offer would be eligible to set LMP. *See id.* at 5 (citing *id.*, PJM Operating Agreement, Schedule 1, section 2.2).

²⁶ *Id.* at 12. *See also id.*, PJM Operating Agreement, Schedule 1, section 3.2.3(r).

²⁷ *Id.*, Transmittal at 2-3.

segment basis, using an automated screen that will compare that offer to PJM's expected costs for the generation resource, which PJM refers to as the Maximum Allowable Incremental Cost.²⁸

19. Under PJM's proposal, the Maximum Allowable Incremental Cost would act as an upper bound to compare against incremental energy offers above \$1,000/MWh. PJM would not substitute a resource's incremental energy offer with the Maximum Allowable Incremental Cost. PJM explains that the proposed screen is a reasonableness check and not a final determination of a resource's permissible costs.²⁹ If a resource's incremental energy offer segment above \$1,000/MWh is less than the Maximum Allowable Incremental Cost, that offer segment would pass the screen and would be deemed verified and eligible to set the LMP up to the \$2,000/MWh hard cap. Alternatively, if an offer segment exceeds the Maximum Allowable Incremental Cost, that offer segment will be deemed not verified (i.e., screen failure) and will not be eligible to set LMP. PJM proposes to replace the incremental energy offer segment of a resource that fails the screen with the greater of \$1,000/MWh or the offer price of that resource's highest verified incremental energy offer segment, i.e., the highest offer segment that passed the automated Maximum Allowable Incremental Cost Screen described above.³⁰

20. PJM proposes to allow resources that fail the proposed screen to challenge the results of the screen and provide PJM with supporting documentation demonstrating that the resource's actual or expected costs are higher than the PJM-determined Maximum Allowable Incremental Cost. If PJM approves the challenge before the market clearing process, then that challenged offer segment will be considered verified and eligible to set LMP.³¹ PJM states that resources remain able to seek uplift for any actual costs incurred, including unverified cost-based offer segments and amounts greater than \$2,000/MWh, that are not otherwise recovered through the market.³²

21. The Maximum Allowable Incremental Cost for a given resource's incremental energy offer segment would be equal to the difference between two values, the Maximum

²⁸ *Id.* at 6-8.

²⁹ *Id.* at 8.

³⁰ *Id.* at 12-13.

³¹ *Id.* at 8.

³² *Id.* at 8.

Allowable Operating Rate³³ and the Bid Production Cost,³⁴ for the offer segment under review divided by the incremental increase in MW for the offer segment.³⁵

22. PJM proposes to calculate a Maximum Allowable Operating Rate for a resource based on that resource's heat rate, performance factor, and two adders. PJM states that it will use fuel prices from a geographically appropriate commodity trading hub to estimate a resource's fuel cost input into the Maximum Allowable Operating Rate formula.³⁶ PJM proposes to include a 10 percent adder in the Fuel Cost component (fuel variance adder) of the Maximum Allowable Incremental Cost to account for the uncertainty involved in fuel price indices. In addition, PJM proposes to retain the 10 percent adder that is currently allowed in cost-based incremental energy offers.³⁷ This results in two nested 10 percent adders within the Maximum Allowable Operating Rate. To calculate a resource's Bid Production Cost, PJM proposes to use cost data provided in a resource's submitted cost-based incremental energy offer.³⁸

³³ The Maximum Allowable Operating Rate (\$/hour for offer segment i) = $[(\text{Heat Input}_i) \times (\text{Performance Factor}) \times (\text{Fuel Cost})] \times (1+A)$, where A is the 10 percent adder allowed for all cost-based offers under Operating Agreement, Schedule 1, section 6.4.2. The Performance Factor represents a resource's ability to convert fuel into energy. *Id.* at 9-10.

³⁴ Bid Production Cost (\$/MWh for offer segment i) = $[\sum_{i=1}^n (\text{MW}_i - \text{MW}_{i-1}) \times P_i - \frac{1}{2} \times \text{UBS} \times (\text{MW}_i - \text{MW}_{i-1}) \times (P_i - P_{i-1})] + \text{No-Load Cost}$, where UBS is a binary dummy variable set equal to 1 if the resource offer is sloped and set equal to zero if the resource offer is stepped (i.e., block offer). In addition, MW represents the quantity of MW per offer segment; P is the price, in \$/MWh, per offer segment; the subscript i represents the offer segment being evaluated; the subscript " $i-1$ " is the offer segment that immediately precedes the segment being evaluated; and the No-Load Cost input is the resource's submitted cost of operation at zero MW and is shown in \$/hour. *Id.* at 10-11.

³⁵ Maximum Allowable Incremental Cost (\$/MWh for offer segment i) = $[(\text{Maximum Allowable Operating Rate}_i) - (\text{Bid Production Cost}_{i-1})] / (\text{MW}_i - \text{MW}_{i-1})$. Compliance Filing, PJM Operating Agreement, Schedule 1, section 6.4.3(a).

³⁶ Compliance Filing, Transmittal at 10.

³⁷ *Id.* at 9.

³⁸ *Id.* at 7.

b. Protests and Comments

23. The Market Monitor raises general concerns about PJM's proposed verification process, the costs included in the Maximum Allowable Incremental Cost, and the formulation of the Maximum Allowable Incremental Cost. The Market Monitor also presents its own alternative cost verification proposal. The Delaware Commission protests the proposed fuel variance adder.

i. General Concerns About Verification Process

24. The Market Monitor raises three general concerns about PJM's proposed verification Process. First, the Market Monitor argues that PJM's proposed verification process does not comply with the requirements in Order No. 831 because it does not build on PJM's existing verification process for cost-based offers, including the use of a resource's Fuel Cost Policy. The Market Monitor claims that because the proposed verification process does not require that the data inputs used adhere to PJM's current standards for cost-based offers, such calculations may be inaccurate.³⁹ The Market Monitor argues that rather than create a new process, PJM's proposed verification process should rely on existing processes, such as the Market Monitor's process for validating cost-based incremental energy offers.⁴⁰

25. Second, the Market Monitor argues that it is illogical to use resource-provided inputs to verify a resource's submitted incremental energy offer. Specifically, the Market Monitor asserts that PJM's proposed Maximum Allowable Incremental Cost formulation, which would use components of a resource's cost-based offer as inputs via the Bid Production Cost input, is inappropriate because it would allow a resource to affect the Maximum Allowable Incremental Cost level by changing the incremental energy and No-Load costs it submits.⁴¹

26. Third, the Market Monitor asserts that in the case that a cost-based incremental offer curve exceeds the Maximum Allowable Incremental cost in the screen, and a resource provides documentation to contest the maximum allowable value, PJM's

³⁹ Market Monitor Comments at 2-3.

⁴⁰ *Id.* at 2 (citing PJM OATT at Attachment M, section IV.E-1 and Attachment M-Appendix at section II.A.2).

⁴¹ *Id.* at 8-9.

proposal provides no standards for evaluating the costs or whether the documentation sufficiently justifies the cost-based offer.⁴²

ii. **Costs Included in the Maximum Allowable Incremental Cost**

27. The Market Monitor also raises four concerns about specific aspects of the Maximum Allowable Incremental Cost and its components. First, the Market Monitor argues that PJM's proposal to use a "geographically appropriate commodity trading hub" to calculate a resource's Maximum Allowable Incremental Cost is inappropriate because geography alone is not sufficient to determine a resource's fuel costs.⁴³ The Market Monitor argues that a resource's Fuel Cost Policy is the best source of information about that resource's fuel costs and that failing to use that Fuel Cost Policy would result in an incorrect fuel price, an incorrect offer, and incorrect market clearing prices. The Market Monitor states that natural gas resources in certain PJM zones may purchase natural gas at several natural gas trading hubs and that prices at these hubs can differ significantly.⁴⁴

28. Second, the Market Monitor asserts that PJM's proposed Maximum Allowable Incremental Rate, which is a component of the Maximum Allowable Incremental Cost, fails to include some incremental costs that PJM's current rules permit resources to include in cost-based offers, such as fuel transportation or procurement costs, variable operations and maintenance costs, emissions costs, and energy market opportunity costs.⁴⁵

29. Third, the Market Monitor asserts that, under Order No. 831, the offer cap must apply to a resource's operating rate. The Market Monitor argues that PJM's proposed verification process is not compliant with Order No. 831 because the Maximum Allowable Incremental Cost formulation would not verify a resource's operating rate (i.e., a resource's incremental energy costs plus its No-Load costs).⁴⁶

30. Fourth, the Market Monitor argues that PJM's proposal fails to comply with the Order No. 831 requirement to limit any adders above cost included in cost-based

⁴² *Id.* at 2-3, 8.

⁴³ *Id.* at 4-5.

⁴⁴ *Id.* at 5-6.

⁴⁵ *Id.* at 13-15.

⁴⁶ *Id.* at 11-12 (citing Order No. 831, FERC Stats. & Regs. ¶ 31,387 at P 132).

incremental energy offers above \$1,000/MWh to \$100/MWh. The Market Monitor further asserts that PJM's proposed 10 percent fuel variance adder should be rejected, as the natural gas price variance at a given trading hub may fall above or below 10 percent on a given day and that any generic percentage-based addition to fuel costs is inaccurate.⁴⁷

31. The Delaware Commission also objects to PJM's proposed fuel variance adder (and its proposed retention of its existing adder) as unsupported and unnecessary, particularly given the expected reduction in fuel cost uncertainty and volatility tied to the allowance of offers that vary by hours, as authorized in the *Hourly Offers Order*.⁴⁸ The Delaware Commission asserts that a fuel assurance requirement could be adopted, including a reporting obligation to PJM and/or the Market Monitor addressing the costs incurred by resources to achieve fuel assurance and the corresponding benefits to customers attributable to these costs.

(a) **Formulation of the Maximum Allowable Incremental Cost**

32. The Market Monitor raises four arguments with respect to PJM's proposed formulation of the Maximum Allowable Incremental Cost and its components. First, the Market Monitor states that PJM fails to identify the Bid Production Cost that will be applied when calculating the Maximum Allowable Incremental Cost for the first offer curve segment. The Market Monitor states that assuming the Bid Production Cost is zero for a nonexistent segment, the Maximum Allowable Incremental Cost will overestimate the costs of the first segment of a stepped incremental energy offer. Second, the Market Monitor argues that although the Maximum Allowable Incremental Cost formula is correct for stepped-offers, the formula will underestimate the costs of sloped incremental energy offer curves.⁴⁹

33. Third, the Market Monitor asserts that the Maximum Allowable Incremental Cost formula contains various terminology errors,⁵⁰ and fourth, the Market Monitor argues that PJM's verification proposal appears to be based on a false assumption that a resource can

⁴⁷ Market Monitor Comments at 7.

⁴⁸ Delaware Commission Protest at 6-9 (citing *Hourly Offers Order*, 155 FERC ¶ 61,282).

⁴⁹ Market Monitor Comments at 9.

⁵⁰ *Id.* at 10-11. The Market Monitor argues, for example, that a resource's Heat Input is commonly measured in MMBtu, not "MW/mmBTU," as PJM proposes. *Id.*

or should be permitted to adjust its No-Load cost to alter its incremental energy offer. The Market Monitor asserts that such No-Load cost adjustments are not permitted and that No-Load costs should only change if the inputs used in their development are updated.⁵¹

iii. Market Monitor's Alternative Proposal

34. The Market Monitor proposes an alternative cost verification proposal which the Market Monitor asserts builds upon existing market power mitigation processes and would be more precise. Under this alternative proposal, the Market Monitor would approximate a resource's cost by using cost-based incremental energy offer inputs and Fuel Cost Policies that the Market Monitor has validated. The Market Monitor asserts that as of May 15, 2017, 89 percent of PJM units have "algorithmic, systematic, and verifiable" Fuel Cost Policies.⁵² Under the Market Monitor's proposal, if a resource submitted a cost-based incremental energy offer above \$1,000/MWh, the Market Monitor would approximate that resource's incremental energy and No-Load costs to estimate that resource's costs. If the Market Monitor's estimate of that resource's costs is lower than the resource's submitted offer, PJM would use the Market Monitor's estimate for market clearing purposes.⁵³

c. PJM's Answer

35. PJM argues that the Market Monitor misunderstands the PJM proposal when it suggests that a resource's cost-based offer greater than \$1,000/MWh would not be required to adhere to that resource's PJM-approved Fuel Cost Policy.⁵⁴ PJM explains that PJM market rules already require that all cost-based offers in PJM's energy markets be in accordance with the seller's PJM-approved Fuel Cost Policy. PJM further clarifies that it is not proposing any changes to existing requirements regarding Fuel Cost Policies. PJM states that its proposal will operate as an additional safeguard for offers greater than

⁵¹ *Id.* at 10.

⁵² *Id.* at 13.

⁵³ *Id.* at 15-17.

⁵⁴ PJM asserts that the Market Monitor's views on this issue appear to be evidenced in the Market Monitor's arguments that state: (1) prices from geographically-appropriate commodity trading hubs rather than hubs specified in market sellers' fuel cost policies are to be used to price natural gas for offers greater than \$1,000/MWh; and (2) that PJM's proposal fails to build on its current cost verification process or utilize sellers' Fuel Cost Policies. PJM Answer at 2.

\$1,000/MWh and will ensure that cost-based incremental energy offers above \$1,000/MWh will not be eligible to set LMP unless they pass the Maximum Allowable Incremental Cost screen.⁵⁵

36. PJM also responds to the Market Monitor's arguments regarding PJM's proposed calculations for its automatic screen. PJM reiterates that these calculations are appropriate for the reasons set forth by PJM in its compliance filing.⁵⁶ In addition, PJM argues that the Market Monitor's alternative verification proposal does not account for all circumstances that may be encountered by sellers. Specifically, PJM asserts that the verification process proposed by the Market Monitor will not work in all instances for all resources because, for example, many natural gas combined cycle units must change their No-Load cost in accordance with the current definition in PJM Manual 15 to provide a monotonically increasing cost curve to PJM for dispatch.⁵⁷ PJM adds that this cannot be accomplished under the Market Monitor's proposed verification process.

37. PJM also argues that the Market Monitor's proposal seemingly requires resources to have "algorithmic" Fuel Cost Policies, a requirement that PJM argues that the Commission has rejected.⁵⁸ PJM asserts that an algorithmic process cannot be employed to verify a resource's fuel costs in all circumstances and therefore it has proposed a more efficient and practical process to verify incremental energy offers above \$1,000/MWh.⁵⁹

38. Finally, with respect to adders above cost included in cost-based incremental energy offers, PJM concurs with the Market Monitor's proposed clarification that any adders above cost included in a cost-based incremental energy offer should be capped at \$100/MW, as required by Order No. 831. PJM requests that the Commission direct

⁵⁵ *Id.* 2-3.

⁵⁶ *Id.* at 3.

⁵⁷ *Id.* at 4. (citing PJM Manual 15, rev. 29, section 1.7.3: defining "No-Load Cost as "[t]he hourly cost required to create the starting point of a monotonically increasing incremental offer curve for a generating unit[;] [t]he calculated No-Load Cost may have to be adjusted to ensure that the slope of the Generator Offer Curve is monotonically increasing.").

⁵⁸ *Id.* at 4-5 (citing *PJM Interconnection, L.L.C.*, 158 FERC ¶ 61,133, at P 57 (2017) (*PJM Order*)).

⁵⁹ *Id.* at 5.

PJM to make this change at Schedule 1, section 6.4.2(a)(ii), in the form proposed by PJM in its answer.⁶⁰

d. Market Monitor's Answer

39. The Market Monitor asserts that it does not misunderstand PJM's proposal and argues that as PJM's proposed offer screening process is not consistent with the cost-based offer calculation required by Schedule 2 of the OA, PJM's screening process cannot correctly verify cost-based offers. The Market Monitor argues that the multiple differences between the cost-based offer requirements and PJM's proposed screening calculation will result in incorrect conclusions about whether cost-based offers above \$1,000/MWh are accurate. Further, the Market Monitor asserts that because the penalties for inaccurate cost-based offers are insufficient incentive for resources to submit accurate cost-based offers when market sellers expect prices above \$1,000/MWh, it requires an accurate cost-based offer verification process.⁶¹

40. The Market Monitor reiterates its argument that PJM's proposed calculation for the Maximum Allowable Incremental Cost is incorrect, and argues that PJM's response disputing the Market Monitor's proposed methodology, claiming that it does not take into account circumstances in which market sellers must change No-Load costs to create a monotonically increasing cost curve, is based on a flawed example. In particular, the Market Monitor argues that in the example provided from Attachment B of Manual 15, the cost curve is already non-decreasing. However, the Market Monitor also states that the adjustment to the No-Load cost in this example produces a result that is "approximately correct" but nonetheless uses an incorrect method.⁶²

e. Commission Determination

41. For the reasons discussed below, we find that PJM's proposed verification process using the Maximum Allowable Incremental Cost process reasonably ensures that a resource's cost based incremental energy offer reasonably reflects the resource's actual or expected short-run marginal costs. The Maximum Allowable Incremental Cost calculation relies on verified inputs contained in the Fuel Cost Policy for the resource's heat input and performance factor. The calculation also relies on natural gas index prices for geographically similar liquid hubs. All parties recognize the need to rely on natural gas index prices to establish a resource's incremental energy costs. While the use of

⁶⁰ *Id.*

⁶¹ Market Monitor Answer at 2.

⁶² *Id.* at 2-6.

geographic indices may not precisely match the actual or expected cost for each resource, they do provide a reasonable and verifiable measure of natural gas costs. We recognize that PJM relies on unverified resource-supplied no-load and incremental energy offers. However, we find that resources have little incentive to inflate their incremental energy offers or no-load cost because doing so may also increase the likelihood that the resource's offer would fail the proposed verification screen.

42. As noted above, however, the Market Monitor raised several arguments about PJM's proposed cost verification process: (1) general concerns about the verification process itself; (2) the costs included in the Maximum Allowable Incremental Cost; and (3) the formulation of the Maximum Allowable Incremental Cost. The Market Monitor also proposed an alternative cost verification process. These arguments, the Market Monitor's alternative proposal, and the Commission's directives for further compliance on some of these issues are discussed in turn below.

i. General Concerns about Verification Process

43. We disagree with the Market Monitor's claim that PJM's proposal is inconsistent with Order No. 831. While Order No. 831 encouraged RTOs/ISOs to build on existing market power mitigation processes, it did not prohibit them from developing a new verification screen in addition to its existing processes.

44. We disagree with the Market Monitor that it is inappropriate to use inputs from a resource's submitted cost-based incremental energy offer in PJM's proposed verification process. To calculate the Maximum Allowable Incremental Cost, PJM determines the Maximum Allowable Operating Rate and the Bid Production Cost. We find that the Maximum Allowable Operating Rate, which is based in part from data provided by Market Sellers, will contain information provided as part of PJM's Fuel Cost Policy annual update.⁶³ For example, the heat input and performance factor components of the Maximum Allowable Operating Rate have already been verified prior to the calculation of the proposed screen by virtue of the Fuel Cost Policy annual updates. As PJM and the Market Monitor review and approve annual Fuel Cost Policy updates, they will both use the same heat input and performance factor data in the calculation of Maximum

⁶³ Market Sellers must either submit an updated Fuel Cost Policy to PJM and the Market Monitor no later than June 15 of each year, or confirm that their approved Fuel Cost Policies remain compliant with Schedule 2 of the Operating Agreement. The Market Monitor shall review the Fuel Cost Policy, and shall consult with the Market Seller, to determine whether the Fuel Cost Policy raises market power concerns. The Market Monitor shall provide the results of its review to PJM and the Market Seller, in writing, no later than August 1. *See* Schedule 2 of the Operating Agreement; PJM Manual 15, section 2.3.1.1 Fuel Cost Policies and Guidelines.

Allowable Operating Rate. However, the inputs into the Bid Production Cost will not be verified before calculation of the Maximum Allowable Incremental Cost. Rather, PJM will use energy offer data, such as no-load cost, MW per offer segment, and price per offer segment, entered by resources into PJM's software platform.

45. We also find acceptable PJM's proposal to rely on incremental energy offer data submitted by resources because the Maximum Allowable Incremental Cost appears to be a conservative estimate of a resource's actual or expected incremental costs. First, the Maximum Allowable Operating Rate component of the Maximum Allowable Incremental Cost does not include some costs, such as variable operations and maintenance costs and emissions adders, that may be included in a resource's incremental energy offer.⁶⁴ Second, it is unlikely that a resource will be able to manipulate the Bid Production Cost component because, among other things, inflating the Maximum Allowable Incremental Cost requires lowering the resource's offer. That is, other things being equal, a lower incremental energy offer and/or no-load cost would increase the Maximum Allowable Incremental Cost. Conversely, a higher incremental energy offer and/or no-load cost would reduce the Maximum Allowable Incremental Cost and make it more likely that a resource's offer will fail the automated screen.

46. Furthermore, as PJM explains in its answer, the Tariff requires resources to submit cost-based incremental energy offers, including offers above \$1,000/MWh, that are consistent with that resource's approved Fuel Cost Policy and the associated rules in Schedule 2 of the PJM Operating Agreement.⁶⁵ Indeed, resources that submit cost-based incremental energy offers that are inconsistent with Fuel Cost Policies are subject to a penalty. Although the Market Monitor asserts that these penalties are insufficient incentive to submit accurate cost-based offers in situations when market sellers expect prices above \$1,000/MWh, the Commission has found that these penalties are just and reasonable.⁶⁶ The Market Monitor has not persuaded us that those penalties are unjust and unreasonable.

⁶⁴ A PJM approved Fuel Cost Policy for a generating unit includes the following components: (1) Incremental fuel cost, (2) Incremental maintenance cost, (3) No-load cost during period of operation, (4) Incremental labor cost, (5) Emissions allowances /adders, (6) Variable operation and maintenance (VOM) adders, (7) Ten percent adder, and (7) Other incremental operating costs. *See* Schedule 2 (Components of Cost) of the Operating Agreement.

⁶⁵ *See* PJM Answer at 2-3.

⁶⁶ *PJM Order*, 158 FERC ¶ 61,133 at P 78.

47. We disagree with the Market Monitor's arguments with respect to the lack of process for challenging the results of PJM's proposed verification process. We find that PJM's proposed Tariff revisions establish a process for a resource to challenge a screen failure, which PJM refers to as a "non-verification determination," as well as the requirement that the resource submit supporting documentation to PJM according to procedures PJM will set forth in the PJM manuals.⁶⁷ We find that PJM's proposed Tariff revisions contain sufficient detail about this process, namely that a resource must submit documentation in support of any screen failure challenge and that PJM would be the entity making the determination.

ii. **Costs Included in Maximum Allowable Incremental Energy Cost**

48. We disagree with the Market Monitor's argument that it is unreasonable to use a geographically appropriate natural gas price index as one input to calculate the Maximum Allowable Incremental Cost.

49. Further, although natural gas price indices may not be an exact estimate of the fuel costs of individual resources, they are a reasonable estimate of a resource's incremental energy costs and natural gas price indices are commonly used in RTO/ISO market monitoring processes. Furthermore, the Maximum Allowable Incremental Cost is not designed to replicate a resource's cost-based incremental energy offer. Rather, the Maximum Allowable Incremental Cost screen is a method to determine whether a given cost-based incremental energy offer above \$1,000/MWh reasonably reflects a resource's actual or expected costs. The Maximum Allowable Incremental Cost screen is one component of PJM's proposed verification process. PJM's proposed process includes two other components: (1) the requirement that a resource submit cost-based incremental energy offers that comply with that resource's approved Fuel Cost Policy and other guidelines for the development of cost-based offers; and (2) a means by which a resource can challenge the results of the Maximum Allowable Incremental Cost screen in the event that its short-run marginal costs exceed Maximum Allowable Incremental Cost. When considered together, we find PJM's multi-component process is just and reasonable and will ensure that cost-based incremental energy offers above \$1,000/MWh reasonably reflect a resource's actual or expected short-run marginal costs.

50. We disagree with the Market Monitor's assertion that PJM's proposed formula for the Maximum Allowable Incremental Cost improperly fails to include some incremental costs that PJM's current rules permit resources to include in cost-based offers. As explained above, the Maximum Allowable Incremental Cost is an automated screen that

⁶⁷ Compliance Filing, Transmittal at 8 and Compliance Filing, PJM Operating Agreement, Schedule 1, section 6.4.3(a).

would prevent incremental energy offers that are not reflective of actual or expected costs from setting LMP. To the extent the exclusion of some incremental costs lowers the Maximum Allowable Incremental Cost such that a resource's incremental energy offer fails the screen, we find that PJM's proposal provides the opportunity for that resource to challenge the results of the screen and provide PJM supporting documentation demonstrating that the seller's actual or expected costs are higher than the PJM determined Maximum Allowable Incremental Cost. Further, market sellers are eligible for uplift for any actual costs incurred that are not otherwise recovered through the market.⁶⁸

51. The Market Monitor contends that PJM erred by failing to propose the verification of a resource's full operating rate, which includes a resource's incremental energy and No-Load costs. However, Order No. 831 only required verification of the costs included in a resource's incremental energy offer and did not require verification of a resource's operating rate.⁶⁹

52. We disagree with the Market Monitor and the Delaware Commission that PJM's proposed 10 percent fuel variance adder is inappropriate. We find that the proposed fuel variance adder is reasonable given that, as PJM states, fuel price indices may be less representative of actual fuel prices during periods of illiquidity and volatility. In such circumstances, it is reasonable to make an upward adjustment to the fuel price index data and we find that 10 percent is a reasonable upward adjustment. We note that, as discussed further below, Order No. 831 required that the total amount of adders above cost included in cost-based incremental energy offers above \$1,000/MWh may not exceed \$100/MWh.

53. The second 10 percent adder included in the Maximum Allowable Operating Rate is applied to the product of the fuel price, variance adder, performance factor, and heat rate. This 10 percent adder represents the adder that PJM currently allows all resources to include in cost-based incremental energy offers, which the Commission has already found to be reasonable.

54. However, we agree with the Market Monitor and the Delaware Commission that PJM has not met the requirement to limit adders above cost included in cost-based incremental energy offers above \$1,000/MWh to \$100/MWh. Although PJM asserts that the variance adder is generally appropriate, PJM recognizes in its answer that it has not met the requirement to limit adders above cost to \$100/MWh. Accordingly, we accept PJM's proposed verification methodology but direct PJM to submit a further compliance

⁶⁸ *Id.* at 8.

⁶⁹ Order No. 831, FERC Stats. & Regs. ¶ 31,387 at P 139, 145.

filing providing tariff revisions to limit the total amount of any adders above cost included in cost-based incremental energy offers above \$1,000/MWh to \$100/MWh within 30 days of the date of this order.

iii. **Formulation of the Maximum Allowable Incremental Cost**

55. We agree with the Market Monitor that PJM's Tariff revisions do not sufficiently explain how the Maximum Allowable Incremental Cost would be calculated for a resource's first energy offer segment. Specifically, the Maximum Allowable Incremental Cost formula for a given offer segment depends, in part, on the Bid Production Cost of the offer segment that immediately precedes that segment. However, as the Market Monitor notes, no offer segment immediately precedes a resource's first incremental energy offer segment. Accordingly, we direct PJM to submit Tariff revisions in a further compliance filing that explain how the Maximum Allowable Incremental Cost would be calculated for a resource's first incremental energy offer segment, within 30 days of the date of this order.

56. With respect to the Market Monitor's assertion that the Maximum Allowable Incremental Cost formula will underestimate the incremental energy cost of stepped incremental energy offers, we find that PJM's proposed formulation is reasonable. PJM proposes to perform the verification screen prior to the market clearing process and as such, PJM would not know a resource's cleared MW, which could fall between two offer segments if the resource submits a sloped incremental energy offer. For sloped offers, PJM proposes a correction based on the midpoint between the offer segment under evaluation and the offer segment prior to that segment.⁷⁰ We find PJM's proposal to use the midpoint between the two offer segments to account for sloped offers to be a reasonable and straightforward approach.

57. We agree with the Market Monitor that PJM's proposed Tariff revisions to define the Maximum Allowable Incremental Cost formula contain minor errors in unit specification. Accordingly, we direct PJM to submit Tariff revisions in a further compliance filing which correct the units used to define the Heat Input to conform with the Heat Input definition that immediately follows in PJM's proposed tariff revisions, within 30 days of the date of this order.⁷¹

⁷⁰ Specifically, PJM proposes to use an adjustment for sloped offers in the formulation of a resource's Bid Production Cost. *See* Compliance Filing, Transmittal at 10-11.

⁷¹ PJM's Cost Development Guidelines indicate that a resource's Heat Input is measured in MMBtu/hr. *See e.g.*, PJM, *PJM Manual 15: Cost Development Guidelines*, (continued ...)

58. With respect to the arguments the Market Monitor raises about No-Load costs not being adjusted properly to account for instances when a resource's incremental energy offer is decreasing, the Market Monitor is arguing about practices that the Commission has found just and reasonable,⁷² and the Market Monitor has not shown changed circumstances to warrant revisiting these practices. Accordingly, we dismiss these arguments. However, we encourage the Market Monitor to work with PJM and its stakeholders if the Market Monitor believes refinements are needed to the examples in Manual 15 that explain how resources should calculate No Load costs in such instances. We note that such revisions would affect offers below \$1,000/MWh as well.

iv. Market Monitor's Alternative Proposal

59. The Commission declines to adopt the Market Monitor's alternative cost verification proposal because, for reasons explained above, we find PJM's proposed verification method to be just and reasonable and in compliance with Order No. 831.⁷³

3. Resource Neutrality and Demand Response Resources

a. PJM's Proposal

60. To comply with the resource neutrality requirements of Order No. 831, PJM proposes to allow Economic Load Response, Pre-Emergency Load Response, and Emergency Load Response resources to submit offers based on incremental costs greater than \$1,000/MWh to set LMP. PJM also proposes a process to verify the incremental

Revision 29 (effective May 15, 2017), at 109, <http://www.pjm.com/-/media/documents/manuals/m15.ashx>.

⁷² *PJM Order*, 158 FERC ¶ 61,133. PJM explained in its answer in Docket No. ER16-372-002 that in order to develop its dispatch solution, PJM imposes the requirement that resource incremental energy offers must be monotonically increasing. According to PJM, PJM and its stakeholders revised the definition of No-Load Costs to account for circumstances under which certain combined cycle generation units would violate this requirement. *See* PJM Answer at 40, Docket No. ER16-372-002.

⁷³ *See, e.g., City of Bethany v. FERC*, 727 F.2d 1131, 1136 (D.C. Cir. 1984), *cert. denied*, 469 U.S. 917 (1984) (utility need establish that its proposed rate design is reasonable, not that it is superior to alternatives); *Cal. Indep. Sys. Operator Corp.*, 128 FERC ¶ 61,282, at P 31 (2009).

energy offers of these demand response resources in the event that they exceed \$1,000/MWh.⁷⁴

61. PJM explains that Emergency Load Response and Pre-Emergency Load Response resources have capacity supply obligations and participate in PJM's energy market by submitting strike prices that are eligible to set LMP. Emergency Load Response and Pre-Emergency Load Response strike price offers are currently capped at stratified levels that increase with notification time.⁷⁵

62. Economic Load Response resources do not necessarily have capacity supply obligations. PJM proposes to apply the same offer cap to all three demand response resources (i.e., Economic Load Response, Pre-Emergency Load Response, and Emergency Load Response).⁷⁶

63. To comply with the verification requirement, PJM proposes a verification process for Economic Load Response, Pre-Emergency Load Response, and Emergency Load Response offers that exceed \$1,000/MWh. This process would require these resources to inform PJM that they have verified with their end-use customer(s) that the incremental cost of reducing demand is greater than or equal to \$1,000/MWh and certify its verification to PJM. To ensure that such costs reasonably reflect demand response resources' actual or expected incremental cost, PJM demand response resources would be required to provide documentation to support the end-use incremental cost offer above \$1,000/MWh. Upon such verification and notification to PJM, the offer would be eligible to set LMP. PJM states that it will update its manuals to illustrate the types of costs that qualify as incremental costs for verifying demand reduction offers.⁷⁷

64. PJM notes that Order No. 831 does not apply to "capacity-only demand response resources" but reasons that extending the proposed offer cap revisions to Pre-Emergency

⁷⁴ Compliance Filing, Transmittal at 13-16.

⁷⁵ *Id.* at 14-15. Pre-Emergency Load Response and Emergency Load Response resources' strike price caps are as follows: 30-minute response time capped at \$1,849/MWh; 60-minute response time capped at \$1,425/MWh; and 120-minute response time capped at \$1,100/MWh. *See* PJM Operating Agreement at Schedule 1, section 1.10.1A(d)(ix)(x).

⁷⁶ Economic Load Response resource offers are currently capped at \$1,849/MWh (\$1,000/MWh energy offer cap + \$850/MWh Primary Reserve Penalty Factor - \$1.00/MWh). *Id.* at 3-4.

⁷⁷ *Id.* at 15-16.

Load Response and Emergency Load Response resources is consistent with the overall intent of Order No. 831. However, PJM states that reasonable arguments can be made to exclude Emergency Load Response and Pre-Emergency Load Response resources from the offer cap reforms required by Order No. 831. PJM requests that if the Commission finds that Order No. 831 does not apply to these resources, the Commission should direct PJM to exclude Pre-Emergency Load Response and Emergency Load Response resources from the Tariff revisions proposed herein.⁷⁸

b. Protests and Comments

65. The Market Monitor objects to PJM's proposal to require demand response resources to attest to their own verification of costs with their customers prior to their submission of an energy offer, in lieu of the stricter verification requirements applicable to generation resources. The Market Monitor argues that PJM's proposal fails to comply with the verification requirements of Order No. 831 because demand response resources that submit incremental energy offers above \$1,000/MWh would not be required to submit cost information to PJM and the Market Monitor.⁷⁹ The Market Monitor adds that PJM should require Economic Load Response and Emergency Load Response resources to submit offers reflecting incremental costs that do not exceed their short-run marginal costs.⁸⁰

66. AEMA objects to PJM's proposed application of its offer verification procedures to strike prices for demand response resources participating in PJM's capacity market as Pre-Emergency Load Response resources and Emergency Load Response resources. AEMA asserts that the verification requirement of Order No. 831 does not apply to such resources, which as Order No. 831 clarified, do not submit incremental energy offers into

⁷⁸ *Id.* at 14.

⁷⁹ Market Monitor Comments at 18 (citing Order No. 831, FERC Stats. & Regs. ¶ 31,387 at P 157).

⁸⁰ *Id.* at 19.

PJM's energy market.⁸¹ Instead, AEMA argues that the scope of Order No. 831 was limited to offer caps on incremental *energy* offers.⁸²

67. AEMA states that demand response resources participating in PJM's capacity market as capacity-only resources are subject to a strike price that does not determine whether they will be dispatched. AEMA argues that, instead, such a resource would be dispatched based on a reliability trigger, with the strike price determining only the price it will be paid in the event it is dispatched as a result of that trigger. AEMA asserts that strike prices associated with capacity-only demand response resources are not incremental energy market offers and thus are beyond the scope of Order No. 831. AEMA adds that, regardless, PJM's proposal to remove the graduated scale of strike prices and implement a single strike price that does not vary with notification time is inconsistent with the Commission's previous findings regarding PJM's currently effective strike price caps.⁸³ Accordingly, AEMA requests that the Commission require PJM to retain the existing caps on strike prices for Pre-Emergency Load Response resources and Emergency Load Response resources.⁸⁴

68. Power Providers Group requests that the Commission accept the PJM compliance filing subject to the relief sought by AEMA. Power Providers Group states that Order No. 831 intended capacity-only demand response resources to be treated differently from demand response resources that participate in both the energy and capacity markets. Power Providers Group states that PJM should be required to address AEMA's concerns with PJM's proposal to change Pre-Emergency Load Response and Emergency Load Response strike prices. Power Providers Group also argues that capacity-only demand response capacity resources have different capacity supply obligations than physical generation capacity resources in a manner which Power Providers Group claims distorts the competitive playing field in favor of capacity-only demand response resources.⁸⁵

⁸¹ AEMA Protest at 8, n.32 (citing Order No. 831, FERC Stats. & Regs. ¶ 31,387 at P 159 ("reforms adopted in this Final Rule, which provide that resources are eligible to submit cost-based incremental energy offers in excess of \$1,000/MWh and require that those offers be verified, do not apply to capacity-only demand response resources that do not submit incremental energy offers in energy markets.")).

⁸² *Id.* at 3.

⁸³ *Id.* at 2 (citing *PJM Interconnection, L.L.C.*, 147 FERC ¶ 61,103 (2014)).

⁸⁴ *Id.* at 5-6.

⁸⁵ Power Providers Group Comments at 2-3.

c. Commission Determination

69. PJM complies with the resource neutrality requirement in Order No. 831 because any resource, regardless of type, can submit a cost-based incremental energy offer above \$1,000/MWh. Additionally, PJM proposes a means to verify incremental energy offers above \$1,000/MWh from demand response resources.

70. However, we reject PJM's proposal to change the offer strike prices of Pre-Emergency Load Response and Emergency Load Response resources as outside the scope of compliance with Order No. 831, without prejudice to PJM refiling these provisions under FPA section 205. Further, as explained in Order No. 831, capacity-only demand response programs are not subject to the requirements in Order No. 831, and therefore it is not appropriate to change those resources' offer cap rules in compliance with this final rule. Order No. 831 did not address strike prices on capacity-only demand response resources. Accordingly, we direct PJM to submit a further compliance filing and remove the Tariff provisions related to Pre-Emergency Load Response and Emergency Load Response resources. We dismiss Power Providers Group's comments with respect to the dissimilar capacity supply obligations of capacity-only demand response capacity resources and physical generation capacity resources as unrelated to a filing to comply with Order No. 831.

71. We find, however, that PJM's proposed revisions appropriately apply the offer cap reforms required by Order No. 831 to Economic Load Response resources, given that these resources submit incremental energy offers in PJM's energy markets and as such are subject to the requirements of Order No. 831.⁸⁶ Therefore, we accept PJM's proposal to allow Economic Load Response resources to submit verified cost-based incremental energy offers greater than \$1,000/MWh to set LMP.

72. We disagree with the Market Monitor's argument that PJM's approach to the verification of demand response resources is inconsistent with Order No. 831 and is not a resource neutral approach.⁸⁷ Order No. 831 recognized that demand response resources "should receive comparable, but not necessarily identical, treatment to generation

⁸⁶ An Economic Load Response resource may provide an offer curve similar to that of a traditional generator that indicates the volume (MW) and price (\$/MWh) at which the resource is willing to reduce load in the day-ahead and real-time energy markets. *See* PJM, 2012 Economic Demand Response Performance Report, at 4, <http://pjm.com/~media/markets-ops/dsr/20150701-order-745-impact-on-economic-dr.ashx>.

⁸⁷ Market Monitor Comments at 18.

resources.”⁸⁸ Additionally, Order No. 831 did not prescribe “how RTOs/ISOs should verify cost-based incremental energy offers above \$1,000/MWh, including offers from demand response resources.”⁸⁹ We find PJM’s approach to be reasonable as it fully meets the requirements of Order No. 831 to provide for demand response resources to submit incremental energy offers above \$1,000/MWh and provides a process for the verification of such costs.

4. External Transactions

a. PJM’s Proposal

73. PJM’s compliance filing does not address external transactions.

b. Commission Determination

74. We find that PJM’s proposal fails to comply with the requirement in Order No. 831 that import and export transactions may offer up to \$2,000/MWh.⁹⁰ Under PJM’s current rules, economic external transactions are capped at the maximum energy price (absent congestion and losses) of \$2,700/MWh.⁹¹ As PJM did not propose to modify its current caps on economic external transactions, we find that it fails to comply with this requirement. Accordingly, we require PJM, in its compliance filing, to submit Tariff revisions capping offers for external transactions at \$2,000/MWh, consistent with the requirements of Order No. 831.

5. Virtual Transactions

a. PJM’s Proposal

75. PJM’s compliance filing does not address virtual transactions.

⁸⁸ Order No. 831, FERC Stats. & Regs. ¶ 31,387 at P 158.

⁸⁹ *Id.* P 158.

⁹⁰ *Id.* P 192.

⁹¹ PJM, in its Joint Comments on the Offer Cap Notice of Proposed Rulemaking, clarified that the \$2,700/MWh level is equal to the current \$1,000/MWh offer cap plus two reserve penalty factors of \$850/MWh. *See* Joint Comments of PJM Interconnection, L.L.C. and Southwest Power Pool, Inc., Docket No. RM16-5-000, at 4, n.8 (Apr. 4, 2016).

b. Commission Determination

76. We find that PJM's proposal fails to comply with the requirement in Order No. 831 that RTOs/ISOs must permit market participants to submit virtual transactions at prices no higher than \$2,000/MWh. Under PJM's current rules, virtual transactions are capped at the maximum energy price (absent congestion and losses) of \$2,700/MWh.⁹² As PJM did not propose to modify its current caps on virtual transactions, we find that it fails to comply with this requirement. Accordingly, we require PJM to submit Tariff revisions capping virtual transactions at \$2,000/MWh, consistent with the requirements of Order No. 831, within 30 days of the date of this order.

The Commission orders:

(A) PJM's compliance filing is hereby accepted in part, and rejected in part, as discussed in the body of this order.

(B) PJM is hereby directed to submit an additional compliance filing, as discussed in the body of this order, within 30 days of the date of this order.

By the Commission.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.

⁹² PJM, in its Joint Comments on the Offer Cap Notice of Proposed Rulemaking, clarified that the \$2,700/MWh level is equal to the current \$1,000/MWh offer cap plus two reserve penalty factors of \$850/MWh. *See* Joint Comments of PJM Interconnection, L.L.C. and Southwest Power Pool, Inc., Docket No. RM16-5-000, at 4, n.8 (Apr. 4, 2016).

Appendix A
Tariff Records Filed
PJM Interconnection, L.L.C.
FERC FPA Electric Tariff
Intra-PJM Tariffs

[OATT ATT K APPX Sec 1.10, OATT Attachment K Appendix Sec 1.10 - Scheduling, 27.0.2](#)

[OATT ATT K APPX Sec 2.2, OATT Attachment K Appendix Sec 2.2 General, 8.0.0](#)

[OATT ATT K Appx Sec 3.2, OATT Attachment K Appendix Sec 3.2 - Market Buyers, 37.0.3](#)

[OATT ATT K APPX Sec 6.4, OATT Attachment K Appendix Sec 6.4 Offer Price Caps, 11.0.0](#)

[OA Schedule 1 Sec 1.10, OA Schedule 1 Sec 1.10 - Scheduling, 28.0.1](#)

[OA Schedule 1 Sec 2.2, OA Schedule 1 Sec 2.2 General., 8.0.0](#)

[OA Schedule 1 Sec 3.2, OA Schedule 1 Sec 3.2 - Market Buyers, 36.0.3](#)

[OA Schedule 1 Sec 6.4, OA Schedule 1 Sec 6.4 Offer Price Caps., 11.0.0](#)