

170 FERC ¶ 61,018
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

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

PJM Interconnection, L.L.C.

Docket No. ER19-2722-000

ORDER HOLDING PROCEEDING IN ABEYANCE

(Issued January 23, 2020)

1. On December 21, 2017, pursuant to section 206 of the Federal Power Act (FPA),¹ the Commission instituted an investigation to examine PJM Interconnection, L.L.C.'s (PJM) practices regarding the pricing of fast-start resources and whether PJM should be required to revise its Open Access Transmission Tariff (OATT) and Operating Agreement (collectively, Tariff).² On April 18, 2019, the Commission issued an Order on Paper Hearing and found that PJM's fast-start pricing practices are unjust and unreasonable because the practices do not allow prices to reflect the marginal cost of serving load, and directed PJM to revise its Tariff to implement certain changes that would result in just and reasonable rates.³ On August 30, 2019, PJM submitted proposed Tariff revisions to comply with the Commission's directives in the Order on Paper Hearing. In this order, we hold PJM's fast-start pricing proceeding in abeyance until July 31, 2020 for the reasons discussed below.

I. Background and Procedural History

2. In the Order on Paper Hearing, the Commission found PJM's fast-start pricing practices unjust and unreasonable because the practices do not allow prices to reflect the marginal cost of serving load.⁴ The Commission directed PJM to make the following

¹ 16 U.S.C. § 824e (2018).

² *PJM Interconnection, L.L.C.*, 161 FERC ¶ 61,295 (2017) (December 2017 Order).

³ *PJM Interconnection, L.L.C.*, 167 FERC ¶ 61,058 (2019) (Order on Paper Hearing).

⁴ Order on Paper Hearing, 167 FERC ¶ 61,058 at P 17.

changes to its Tariff, which the Commission stated would result in rates that are just and reasonable:

- A) Implement software changes so that fast-start resources are considered dispatchable from zero to their economic maximum operating limits for the purpose of setting prices;
- B) Apply fast-start pricing to all fast-start resources instead of only block-loaded resources;
- C) Alter its real-time energy market clearing process to consider fast-start resources in a way that is consistent with minimizing production costs;
- D) Include fast-start resources' commitment costs in energy offers by implementing PJM's proposed integer relaxation approach;⁵
- E) Restrict eligibility for fast-start pricing to fast-start resources that have a start-up time (including notification time) of one hour or less and a minimum run time of one hour or less;
- F) Include its fast-start pricing practices in its Tariff;
- G) Include commitment costs in energy prices for fast-start resources in both the day-ahead and real-time markets, and include in its compliance filing a proposal to withhold uplift payments in excess of a fast-start resource's commitment costs;
- H) Implement its proposal to use lost opportunity cost payments to offset the incentive for over-generation or price-chasing.⁶

3. The Commission directed PJM to submit a compliance filing by July 31, 2019 with proposed tariff changes reflecting the above requirements. The Commission also directed PJM to file a one-time informational report by August 30, 2019 explaining how

⁵ As described by PJM, integer relaxation consists of using a separate pricing run in which a fast-start resource's commitment status is allowed to vary between zero and one, with zero representing a resource that is offline and one representing a resource that is online. *See* PJM Initial Brief, Docket No. EL18-34-000, at 5-8 (filed Feb. 12, 2018).

⁶ Order on Paper Hearing, 167 FERC ¶ 61,058 at P 17.

the proposed fast-start pricing tariff provisions would not raise new market power concerns.⁷

II. PJM Compliance Filing

4. In response to the Commission's directives to apply fast-start pricing to all dispatchable fast-start resources (not only to block-loaded resources) and to include a requirement that fast-start resources have start-up and minimum run times of one hour or less, PJM proposes to allow all resources that meet those characteristics to qualify as fast-start resources. However, PJM proposes to only allow certain fast-start resources called Eligible Fast-Start Resources to set price. Specifically, PJM proposes to exclude from the definition of an Eligible Fast-Start Resource: self-scheduled resources, pseudo-tied resources that have not committed their entire output to PJM, dynamically scheduled resources, and pumped storage hydropower resources that are scheduled day-ahead by PJM in the hydro optimization tool.⁸

5. In response to the Commission's directives to allow fast-start resources to set Locational Marginal Prices (LMP) in a manner consistent with minimizing production cost, PJM proposes to broadly alter its clearing process to implement separate dispatch and pricing runs. In order to implement these changes, PJM states that several corresponding changes to PJM's dispatch and pricing rules are required. First, PJM proposes several changes to describe how dispatch and pricing runs will be conducted in both the day-ahead and real-time markets.⁹ Additionally, in response to the Commission's directive to PJM to alter its real-time energy market clearing process by executing the cost-minimizing dispatch solution and then performing a pricing run to determine prices that would not impact the dispatch instructions sent to supply resources,¹⁰ PJM proposes to revise its Tariff to explain that it will conduct the pricing run after the dispatch run and that integer relaxation for fast-start resources occurs only in the pricing run. PJM explains that in the dispatch run, it will continue to perform a real-time joint optimization of energy

⁷ On July 5, 2019, PJM filed a motion requesting a one-month extension of time, from July 31, 2019 until August 30, 2019 to submit the compliance filing, and from August 30, 2019 until September 27, 2019 to submit the informational report. The motion requesting these extensions was granted on July 19, 2019, and PJM filed the informational report on September 27, 2019 in Docket No. EL18-34-000.

⁸ PJM Transmittal at 4-5.

⁹ *Id.* at 8-11.

¹⁰ Order on Paper Hearing, 167 FERC ¶ 61,058 at P 70.

and reserves, while in the pricing run it will use “the input data from a reference real-time security constrained economic dispatch case.”¹¹

6. Second, PJM proposes to add a new tariff term, Composite Energy Offer, in order to consider the commitment costs of Eligible Fast-Start Resources in the pricing run in both the day-ahead and real-time markets.¹² Third, PJM proposes to implement integer relaxation, which PJM states allows Eligible Fast-Start Resources to be fully dispatchable between zero and their economic maximum operating limits, in the pricing run.¹³

7. Fourth, PJM proposes to clarify that its three pivotal supplier test is not executed in the pricing run. While the Commission found, and PJM agrees, that PJM does not need to modify the three pivotal supplier test to account for fast-start pricing, PJM argues that this clarification is warranted because market power mitigation is performed at the time a resource is committed, i.e., in the dispatch run and not the pricing run.¹⁴

8. Fifth, PJM argues that the establishment of new distinct dispatch and pricing runs creates the question of when reserve shortage pricing should be triggered. According to PJM, reserve shortage pricing should be determined only based on pricing run results because energy and reserves are jointly co-optimized and therefore should be based on the same pricing run.¹⁵

9. Last, PJM argues that separate dispatch and pricing runs necessitates new make-whole payments for two circumstances. PJM proposes make-whole payments designed to cover the costs for the megawatts provided in excess of a resource’s day-ahead assignment, which are not covered by the real-time LMP in a situation in which the LMP resulting from the pricing run decreased relative to the dispatch run. PJM explains that, while such a make-whole payment was not explicitly directed in the Order on Paper Hearing, it is consistent with proper implementation of the distinct dispatch and pricing runs and the intent of lost opportunity cost payments. PJM also proposes make-whole

¹¹ PJM Transmittal at 9-10.

¹² *Id.* at 11-14. PJM defines Composite Energy Offer as the sum (in \$/MWh) of the Incremental Energy Offer and amortized Start-Up Costs and No-load Costs, and for Economic Load Response Participant resources the sum (in \$/MW) of the Incremental Energy Offer and amortized shutdown costs as determined in accordance with [the Operating Agreement and Manuals].” *Id.* at 11.

¹³ *Id.* at 14-15.

¹⁴ *Id.* at 15.

¹⁵ *Id.* at 16.

payments for virtual transactions, price sensitive demand, and dispatchable exports that clear in the day-ahead dispatch run, but would not clear at the day-ahead clearing price from the pricing run. PJM argues that these make-whole payments are necessary because a clearing price that does not support the accepted offer price in the dispatch run makes the accepted offer uneconomic to the seller, creating unwarranted financial exposure, and decreases the likelihood of such offers being made in the future such that their price convergence benefits would be reduced.¹⁶

10. In response to the Commission’s requirement for PJM to implement its proposal to use lost opportunity cost payments to offset the incentive for over-generation or price-chasing, PJM proposes to amend its market rules to implement Dispatch Differential Lost Opportunity Cost credits and Day-ahead Scheduling Reserve Lost Opportunity Cost credits.¹⁷

11. According to PJM, the implementation of separate pricing and dispatch runs requires the introduction of a new lost opportunity cost payment, the Dispatch Differential Lost Opportunity Cost credit, to ensure that resources dispatched down to accommodate the inflexibility of fast-start resources and the inclusion of commitment costs into the LMP follow PJM’s dispatch instructions. PJM states that only resources that have been instructed by PJM to provide fewer megawatts of energy than the amount of megawatts of energy indicated in the pricing run will be eligible to receive Dispatch Differential Lost Opportunity Cost credits. PJM explains that the Dispatch Differential Lost Opportunity Cost credit will be “the difference between the revenue above cost that a resource would have received if it operated at the expected output level from the pricing run based on the resource’s parameters and the real-time LMP and the actual revenue above cost the resource earned.”¹⁸ In determining a resource’s revenue above cost, PJM states that its proposed Tariff revisions will calculate such revenue (1) indicated by the LMP from the pricing run and (2) resulting from following the dispatch run’s instructions.¹⁹ According

¹⁶ *Id.* at 17-20.

¹⁷ *Id.* at 21-26.

¹⁸ *Id.* at 21-22.

¹⁹ PJM states that it will calculate the revenues resulting from following the dispatch run by subtracting (1) the lesser of the offered cost associated with the megawatts from the dispatch run or the megawatts of energy actually provided from (2) the greater of the revenues received at the megawatts from the dispatch run and the megawatts of energy actually provided. According to PJM, this will remove the incentive for price-chasing behavior because each megawatt a resource produces beyond its dispatch instructions will reduce the Dispatch Differential Lost Opportunity Cost credit. *Id.* at 22.

to PJM, if the difference between (1) and (2) is greater than zero, then the resource receives a Dispatch Differential Lost Opportunity Cost credit equal to that difference; if the revenue above cost from (2) is greater than (1), then there is no foregone opportunity and no credit will be received.²⁰

12. PJM states that, because the Dispatch Differential Lost Opportunity Cost credit is designed to mitigate behaviors associated with being dispatched down, only pool-scheduled resources and dispatchable self-scheduled resources that are dispatched to only provide energy are eligible to receive this credit.²¹ According to PJM, costs associated with Dispatch Differential Lost Opportunity Cost credits will be allocated²² to real-time load and export transactions across the entire PJM region.²³

13. In addition to the Dispatch Differential Lost Opportunity Cost credit, PJM also proposes to implement a Day-ahead Scheduling Reserve Lost Opportunity Cost credit. According to PJM, a resource's Day-ahead Scheduling Reserve commitment from the dispatch run may not be supported by the Day-ahead Scheduling Reserve clearing price from the pricing run. PJM states that the associated Day-ahead Scheduling Reserve clearing price credit may not fully cover the opportunity cost associated with the provision of the Day-ahead Scheduling Reserve assignment that resulted from the dispatch run. PJM explains that this can make resources less willing to offer to provide reserves if they can earn greater revenues by providing energy. Therefore, PJM states, the Day-ahead Scheduling Reserve Lost Opportunity Cost credit will ensure that the resource receives the same revenue opportunity it could have received if it had been assigned energy rather than reserves for the quantity of reserves it was backed down to provide in the dispatch run. In calculating this credit, PJM explains it first determines the resource's revenue based on its offer at the assigned megawatt value; next, it "determines the resource's Day-ahead

²⁰ *Id.* at 21-22.

²¹ PJM states that resources dispatched down to provide ancillary services or manually dispatched down for reliability purposes already receive opportunity cost credits for differences in revenue above cost between the dispatch run and pricing run. *Id.* at 22-23.

²² PJM states that the allocation methodology is similar to that done for balancing operative reserve credits for reliability, except that balancing operating reserve credits are allocated regionally. *Id.* at 23.

²³ PJM observes that in its initial brief submitted in EL18-34-000, it proposed to provide lost opportunity cost credits for resources dispatched down in the day-ahead market. However, PJM states that, upon further analysis, it concludes that there is no opportunity for resources to deviate from dispatch in the day-ahead market, and it is therefore not proposing such a credit here. *Id.*

Scheduling Reserve Lost Opportunity Cost by calculating what the resource would have earned at the day-ahead LMP for the megawatt difference between its day-ahead energy commitment and the economic megawatt value for energy in the dispatch run minus the cost of providing such energy.” PJM states that if the sum of these two values is greater than the revenue the resource earned from its Day-ahead Scheduling Reserves assignment, then the resource receives a Day-ahead Scheduling Reserve Lost Opportunity Cost credit equal to the difference.²⁴

14. In the Order on Paper Hearing, the Commission required PJM to “withhold uplift payments in excess of a fast-start resource’s commitment costs in order to eliminate the possibility that a fast-start resource can over-recover its commitment costs.”²⁵ According to PJM, however, this problem can occur with all resources, not just fast-start resources. Therefore, to comply with this requirement, PJM proposes to add an offset to any resource’s day-ahead make-whole calculation that removes commitment costs recovered during real-time dispatch for that Operating Day. PJM states that in order to determine any amount of commitment costs recovered during real-time dispatch, it will calculate each resource’s Day-ahead Operating Reserve Target and its Balancing Operating Reserve Target.²⁶

15. To calculate the Day-ahead Operating Reserve Target, PJM explains that it will take each resource’s total offer costs (start-up, no-load and energy) and subtract from that the resource’s day-ahead revenues spread over the real-time settlement intervals in which the resource actually provides energy that correspond to its day-ahead schedule.²⁷ Similarly, to calculate the Balancing Operating Reserve Target, PJM states that it will take the sum of the resource’s real-time start-up, no-load, and energy costs over all real-time settlement intervals that correspond to its day-ahead schedule and subtract the revenues it earned for providing energy and reserves during those Real-time Settlement Intervals. PJM states that the resource’s Day-Ahead Operating Reserve Credit will be

²⁴ *Id.* at 24-26.

²⁵ Order on Paper Hearing, 167 FERC ¶ 61,058 at P 122.

²⁶ PJM Transmittal at 26-27.

²⁷ Recognizing that day-ahead costs are hourly and real-time settlement intervals are five minutes, PJM states that it will divide the day-ahead no-load costs and energy costs by twelve to accurately determine the cost associated with each applicable Real-time Settlement Interval. *Id.* at 27-28.

reduced by the difference between resource's Day-ahead and Balancing Operating Reserve Targets.²⁸

16. In the Order on Paper Hearing, the Commission required PJM to apply the requirements of Order No. 831²⁹ to the composite energy offers of fast-start resources.³⁰ To comply with this requirement, PJM states that it must (1) verify the reasonableness of composite energy offers above \$1,000/MWh, and (2) cap composite energy offers greater than \$2,000/MWh.³¹

17. PJM proposes separate Tariff revisions to verify the reasonableness of composite energy offers above \$1,000/MWh for generation resources and also for economic load participant resources. For generation resources, PJM proposes to apply a formulaic screen prior to market clearing to evaluate the composite energy offer, which consists of the incremental energy offer, amortized start-up costs, and amortized no-load costs. PJM states that it will use the tests that already exist in its Tariff³² to verify the reasonableness of the incremental energy offer and no-load costs. For start-up costs, PJM explains that it is proposing a formula similar to one already found in Manual 15, section 2.4.1, which determines a resource's cost-based start-up cost. PJM's proposed formula calculates the

²⁸ *Id.* at 27-29. PJM states that if this difference is negative, the Day-Ahead Operating Reserve Credit will not be reduced. *Id.* at 28-29.

²⁹ *Offer Caps in Markets Operated by Regional Transmission Organizations & Independent System Operators*, Order No. 831, 157 FERC ¶ 61,115 (2016), *order on reh'g & clarification*, Order No. 831-A, 161 FERC ¶ 61,156 (2017).

³⁰ Order on Paper Hearing, 167 FERC ¶ 61,058 at P 130.

³¹ PJM Transmittal at 29.

³² See PJM Operating Agreement, Schedule 1, section 6.4.3. PJM Transmittal at 31. In compliance with Order No. 831, PJM implemented a formulaic screen to verify the reasonableness of incremental energy offers on a segment-by-segment basis. Verification of no-load costs are included in this formulaic screen. See *PJM Interconnection, L.L.C.*, 161 FERC ¶ 61,153, at P 18 &, n.34 (2017).

start-up cost based on Performance Factor,³³ Start Fuel,³⁴ Fuel Cost,³⁵ Start Maintenance Adder,³⁶ Additional Start Labor,³⁷ Station Service Cost,³⁸ and two nested adders.³⁹ With respect to these adders, PJM proposes to include a 10 percent adder in the Fuel Cost component (fuel variance adder) to account for the uncertainty involved in fuel price indices, transportation costs, and other costs not explicitly modeled. In addition, PJM proposes to retain the 10 percent adder that is currently allowed in cost-based incremental energy offers.⁴⁰

18. PJM explains that if the incremental energy offer plus no-load costs for any segment are found to be unreasonable based on the tests that already exist in the Tariff, PJM will exclude the entire no-load cost from all segments in the composite energy offer. PJM states that the incremental energy offer will then be capped at the greater of \$1,000/MWh or the offer price of the most expensive verified segment for the purposes of price-setting.⁴¹

³³ PJM states that the Performance Factor is the ratio of actual fuel burn to either design Heat Input or other currently tested Heat Input. PJM Transmittal at 34.

³⁴ PJM defines Start Fuel as the “[f]uel consumed from first fire of start process to breaker closing plus fuel expended from breaker opening of the previous shutdown to initialization of the (hot) unit start-up, excluding normal plant heating/auxiliary equipment fuel requirements.” *Id.* at 32.

³⁵ PJM states that it will use fuel prices from a geographically appropriate commodity trading hub to estimate a resource’s fuel cost input. *Id.* at 34.

³⁶ PJM defines Start Maintenance Adder as ““an adder based on all available maintenance expense history for the defined Maintenance Period regardless of unit ownership’ and is limiting the expenses to only those ‘incurred as a result of electric production.’” *Id.* at 33.

³⁷ PJM defines Additional Start Labor as “[a]dditional labor costs for startup required above normal station manning levels.” *Id.* at 32.

³⁸ PJM defines Station Service Cost as “station service usage (MWh) during start-up multiplied by the 12-month rolling average off-peak energy prices as updated quarterly by the Office of the Interconnection.” *Id.* at 33.

³⁹ Start-Up Cost (\$) = [[(Performance Factor) x (Start Fuel) x (Fuel Cost)] + Start Maintenance Adder + Additional Start Labor + Station Service Cost] x (1 + A). *Id.* at 32.

⁴⁰ *Id.* at 31-35.

⁴¹ *Id.* at 35.

Similarly, PJM states that if the start-up costs are found to be unreasonable based on the proposed formula, they will be excluded from all segments of the composite energy offer.⁴² According to PJM, the exclusion of start-up and no-load costs in these circumstances is necessary due to issues related to the integer relaxation method. PJM explains that the integer relaxation method requires the three parts of a composite energy offer – incremental energy offer, start-up cost, and no-load cost – to be modeled separately. PJM states that the cleared MWs and resulting composite energy offer value at that amount are determined simultaneously as part of the pricing run, and therefore, any capping of a composite energy offer can only be determined after the optimization is completed. PJM observes that to cap a composite energy offer, PJM would be required to do so administratively to bring it under the threshold, and then it would rerun the optimization. PJM explains that this cycle can go on repeatedly, producing different solutions where another resource would need to be capped. Because of this issue and complexity, PJM asserts that its proposal to eliminate the start-up or no-load costs would eliminate the risk of running multiple iterations of the optimization formulation.⁴³

19. For economic load response participant resources, PJM states that the Market Seller will certify to PJM its verification of the incremental and shutdown costs as part of its energy offer. In addition, PJM may require additional supporting documentation to explain such costs, and this documentation may be reviewed by PJM and/or the Market Monitor. PJM asserts this process is similar to its current processes for reviewing the incremental energy offers of such resources.⁴⁴

20. With respect to Eligible Fast-Start Resources that follow market-based schedules, PJM asserts that it must, consistent with the discussion above, individually address each component of composite energy offers. PJM explains that if the incremental energy offer of the market-based schedule exceeds that of its cost-based schedule, it will exclude start-up and no-load costs from the composite energy offer. According to PJM, this outcome is appropriate because, in cases such as this (where the market-based incremental energy offer is greater than the cost-based incremental energy offer), keeping in the start-up and no-load costs could result in a market-based composite offer greater than \$1,000/MWh, which would be greater than the cost-based energy offer. PJM states that this is contrary to the requirement of Order No. 831 that offers above \$1,000/MWh must be cost-supported to

⁴² PJM observes that this can result in an unverified composite energy offer greater than \$1,000/MWh being reduced to below \$1,000/MWh. According to PJM, this ensures that locational marginal prices (LMP) are not based on costs that fail the reasonableness test. *Id.* at 36.

⁴³ *Id.* at 30-31.

⁴⁴ *Id.* at 36-37.

set price.⁴⁵ In addition, PJM states that either start-up costs or no-load costs will be excluded from market-based offers resulting in a composite energy offer over \$1,000/MWh if either the start-up or no-load cost of the associated cost-based offer exceeds the reasonably expected cost, or if either the start-up or no-load cost of the market-based offer exceeds the start-up or no-load cost specified on the associated cost-based offer.⁴⁶

21. Finally, with respect to the requirements of Order No. 831 related to the hard cap of \$2,000/MWh, PJM states that if a verified composite energy offer exceeds \$2,000/MWh, it will first exclude start-up costs from the offer, and if the offer still exceeds \$2,000/MWh, then PJM will exclude no-load costs. PJM adds that if the incremental energy offer still exceeds \$2,000/MWh, then the existing rule of capping the incremental energy offer at \$2,000/MWh will apply. For economic load response participant offers that exceed \$2,000/MWh, PJM will exclude amortized shutdown costs from the determination of the composite energy offer and the incremental energy offer will be capped at \$2,000/MWh as necessary.⁴⁷

III. Notice and Responsive Pleadings

22. Notice of PJM's compliance filing was published in the *Federal Register*, 84 Fed. Reg. 46,948 (2019), with interventions and protests due on or before September 20, 2019. Timely motions to intervene were filed by Monitoring Analytics, LLC (Market Monitor), Old Dominion Electric Cooperative, Organization of PJM States, Inc. (Organization of PJM States), PJM Power Providers Group (P3), Exelon Corporation (Exelon), Electric Power Supply Association (EPSA), Dominion Energy Services, Inc. (Dominion), Calpine Corporation, NRG Power Marketing LLC, Vistra Companies,⁴⁸ American Municipal Power, Inc., American Petroleum Institute, LS Power Associates, L.P., Office of the People's Counsel for the District of Columbia, Public Service Electric and Gas Companies (PSEG Companies),⁴⁹ Illinois Citizens Utility Board, New Jersey Division of Rate Counsel, and North Carolina Electric Membership Corporation. Notices of intervention were filed by the New Jersey Board of Public Utilities and the Maryland Public Service Commission. East Kentucky Power Cooperative, Inc., FirstEnergy Utility

⁴⁵ *Id.* at 38 (citing Order No. 831, 157 FERC ¶ 61,115 at P 78).

⁴⁶ *Id.* at 37-39.

⁴⁷ *Id.* at 39.

⁴⁸ Vistra Companies consist of Vistra Energy Corp. and Dynegy Marketing and Trade, LLC.

⁴⁹ PSEG Companies consist of PSEG, PSEG Power LLC, and PSEG Energy Resources and Trade LLC.

Companies,⁵⁰ and American Electric Power Service Corporation (AEPSC)⁵¹ filed motions to intervene out-of-time.

23. Comments were filed by the Market Monitor, Indicated Parties,⁵² P3 and EPSA, Indicated State Commissions,⁵³ and Vistra Companies. Joint Customer Advocates⁵⁴ filed a protest out-of-time, and Organization of PJM States filed a motion for leave to file comments out-of-time and comments.

24. On September 27, 2019, the Market Monitor filed an answer to P3 and EPSA's comments. On October 9, 2019, PJM filed answer to the protests and comments. On October 17, 2019, P3 and EPSA filed an answer to PJM's answer. On October 18, 2019, Vistra Companies filed an answer to PJM's answer. On October 25, 2019, the New Jersey Board of Public Utilities and the Market Monitor each filed an answer to PJM's answer.

A. Pricing and Dispatch Data Misalignment

1. Comments

25. The Market Monitor and Joint Customer Advocates state that PJM's compliance filing lacks sufficient detail about the pricing and dispatch runs to ensure that PJM correctly implements fast-start pricing. Specifically, the Market Monitor and Joint

⁵⁰ FirstEnergy Service Company is intervening on behalf of the FirstEnergy Utility Companies, which consist of Ohio Edison Company, The Cleveland Electric Illuminating Company, The Toledo Edison Company, Pennsylvania Power Company, Pennsylvania Electric Company, Metropolitan Edison Company, West Penn Power Company, Jersey Central Power & Light Company, Monongahela Power Company, and The Potomac Edison Company.

⁵¹ AEPSC is intervening on behalf of Appalachian Power Company, Indiana Michigan Power Company, Kentucky Power Company, Kingsport Power Company, Ohio Power Company, Wheeling Power Company, and AEP Energy Partners, Inc.

⁵² Indicated Parties consist of Dominion, Exelon, and PSEG Companies.

⁵³ Indicated State Commissions consist of the New Jersey Board of Public Utilities and the Delaware Public Service Commission.

⁵⁴ Joint Customer Advocates consist of the Illinois Citizens Utility Board, Maryland Office of Peoples Counsel, New Jersey Division of Rate Counsel, People's Counsel for the District of Columbia, PJM Industrial Customer Coalition, and West Virginia Consumer Advocate.

Customer Advocates argue that PJM does not state whether it will use the input data from the reference dispatch case for the same five-minute interval to which the pricing run results are applied. The Market Monitor and Joint Customer Advocates state that to properly implement fast-start pricing, the only difference between the dispatch run and the pricing run should be the addition of integer relaxation in the pricing run. The Market Monitor and Joint Customer Advocates assert that using different inputs in the pricing and dispatch runs would create inaccurate LMP revenues for fast-start resources and incorrect dispatch deviation lost opportunity cost payments. The Market Monitor and Joint Customer Advocates contend that PJM currently uses mismatched inputs for calculating dispatch and prices for the same market interval, and that fast-start pricing will significantly exacerbate this market efficiency issue. The Market Monitor and Joint Customer Advocates argue that PJM should include Operating Agreement language that requires the dispatch run and the pricing run to use the same input data for a single dispatched and settled five-minute market interval.⁵⁵

26. Indicated State Commissions state that PJM uses different inputs for the pricing and dispatch runs, and these different inputs stem from a timing difference between PJM's Security Constrained Economic Dispatch and Locational Pricing Calculator. Indicated State Commissions state that implementing fast-start pricing will exacerbate the mismatched inputs because of the short notice and real-time characteristics associated with fast-start resources. Indicated State Commissions argue that the Commission should require PJM to explain further the input data used in the pricing run and the dispatch run and should use this information to ensure appropriate implementation of fast-start pricing. Indicated State Commissions state that, depending on the evidence provided, some delay may be appropriate.⁵⁶

2. Answer

27. In response to the Market Monitor, Joint Customer Advocates, and Indicated State Commissions, PJM argues that its proposal contains sufficient description of the dispatch and pricing runs. PJM claims that its proposal clearly establishes the sequences of events, the use of the same optimization problem case, and that both pricing and dispatch runs solve for the same objective, while only the pricing run employs integer relaxation. In response to claims that PJM does not specify the input data used in the runs, PJM argues that the PJM manuals will describe the input data. In response to arguments about mismatched data inputs, PJM explains that this issue is not specific to implementing fast-

⁵⁵ Market Monitor Comments at 7-8; Joint Customer Advocates Comments at 5-6.

⁵⁶ Indicated State Commissions Comments at 8.

pricing and is currently pending in PJM’s stakeholder process, where PJM argues the Commission should allow it to be addressed.⁵⁷

IV. Discussion

A. Procedural Issues

28. Pursuant to Rule 214 of the Commission’s Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2019), the notices of intervention and 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), we grant East Kentucky Power Cooperative, Inc., FirstEnergy Utility Companies, and AEPSC’s late-filed motions to intervene given their interest in the proceeding, the early stage of the proceeding, and the absence of undue prejudice or delay. The entities that filed protests or comments but did not file motions to intervene are not parties to the proceeding.⁵⁸

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

B. Substantive Issues

30. In response to PJM’s compliance filing, commenters identified that PJM currently computes dispatch instructions using a different market interval than it uses to calculate prices.⁵⁹ Based on these comments, it appears that resources in PJM may be compensated with prices that do not correspond to their dispatch instructions, a pricing and dispatch misalignment. This pricing and dispatch misalignment may occur because PJM uses different input data for calculating dispatch and pricing in a given interval. PJM appears to dispatch resources for a target interval that is roughly 10 minutes in the

⁵⁷ PJM Answer at 12-13.

⁵⁸ 18 C.F.R. § 385.211(a)(2). As part of Joint Customer Advocates’ protest, Maryland Office of Peoples Counsel, PJM Industrial Customer Coalition, and West Virginia Consumer Advocate filed protests but did not file motions to intervene. Although we do not grant party status to these entities, we will address their comments and protests.

⁵⁹ Market Monitor Comments at 7-8; Joint Customer Advocates Comments at 5-6; Indicated State Commissions Comments at 8.

future, but immediately assign the prices associated with that future dispatch interval to the *current* interval.⁶⁰

31. In the Order on Paper Hearing, the Commission directed PJM to alter its real-time energy market clearing process to consider fast-start resources in a way that is consistent with minimizing production costs.⁶¹ As part of this directive, the Commission required PJM to first execute a cost-minimizing dispatch run, followed by a pricing run where integer relaxation for fast-start resources allows them to set price.⁶² However, PJM may not be able to implement these separate dispatch and pricing runs in a way that is just and reasonable without first resolving the pricing and dispatch misalignment problem. If fast-start resources dispatched in a given market interval could be compensated with a price from a different market interval, prices may not accurately reflect the marginal cost of serving load. Moreover, implementing fast-start pricing as directed in the Order on Paper Hearing could exacerbate the pricing and dispatch misalignment issue because the lost opportunity cost payments directed in the Order on Paper Hearing may be calculated based on inaccurate prices and therefore, may not correctly compensate opportunity costs.⁶³ In addition, implementing fast-start pricing could cause lost opportunity cost payments to be ineffective because they may not provide correct incentives to follow dispatch.

32. Given this pricing and dispatch misalignment problem, as identified in the record, we will hold PJM's fast-start pricing proceeding in abeyance for a limited time. As commenters note, PJM has a stakeholder process underway to resolve the pricing and dispatch misalignment problem.⁶⁴ We understand that this stakeholder process is

⁶⁰ Market Monitor, *Dispatch and Pricing Issues* (Oct. 2, 2019), <https://www.pjm.com/-/media/committees-groups/committees/mic/20191002-fmdp/20191002-item-03a1-alignment-of-dispatch-and-pricing-issue-education.ashx>.

⁶¹ Order on Paper Hearing, 167 FERC ¶ 61,058 at P 17.

⁶² *Id.* P 70 (directing PJM to "implement its proposal of altering its real-time energy market clearing process to execute the cost-minimizing dispatch solution, which will produce the dispatch instructions that are sent to supply resources, and then perform a pricing run to determine prices that would not impact the dispatch instructions sent to supply resources.").

⁶³ According to PJM, the pricing and dispatch misalignment is not unique to fast-start pricing. PJM Answer at 13.

⁶⁴ Indicated State Commissions Comments at 8; PJM Answer at 13.

tentatively scheduled to conclude in May 2020.⁶⁵ Therefore, we will hold PJM's fast-start pricing compliance filing in abeyance until July 31, 2020, to allow PJM and its stakeholders the opportunity to fully consider necessary changes to address PJM's pricing and dispatch misalignment issue in conjunction with the compliance directives of the Order on Paper Hearing.

The Commission orders:

PJM's fast-start pricing proceeding is held in abeyance until July 31, 2020, as discussed in the body of this order.

By the Commission.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.

⁶⁵ PJM, *Five-Minute Dispatch & Pricing, Issue Charge* (May 15, 2019), <https://www.pjm.com/-/media/committees-groups/committees/mic/20190515/20190515-item-04b-five-minute-dispatch-and-pricing-issue-charge.ashx>.