161 FERC ¶ 61,295
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Kevin J. McIntyre, Chairman;
Cheryl A. LaFleur, Neil Chatterjee,
Robert F. Powelson, and Richard Glick.

PJM Interconnection, L.L.C. Docket No. EL18-34-000

ORDER INSTITUTING SECTION 206 PROCEEDING AND COMMENCING PAPER HEARING PROCEDURES AND ESTABLISHING REFUND EFFECTIVE DATE

(Issued December 21, 2017)

1. In this order, we find that PJM Interconnection, L.L.C.'s (PJM) practices regarding the pricing of fast-start resources may be unjust and unreasonable because the practices do not allow prices to reflect the marginal cost of serving load. Accordingly, pursuant to section 206 of the Federal Power Act (FPA),[1] we institute an investigation in Docket No. EL18-34-000 to examine PJM's Open Access Transmission Tariff (Tariff) and practices to determine whether PJM should be required to revise its Tariff to: (1) allow relaxation of fast-start resources' economic minimum operating limits by up to 100 percent;[2] (2) not limit its fast-start pricing practices to block-loaded resources;[3] (3) consider fast-start resources within dispatch in a way that is consistent with minimizing production costs, subject to appropriate operational and reliability

[1] 16 U.S.C. § 824e (2012).

[2] For purposes of this order, the economic minimum operating limit refers to the minimum amount of electric power a resource must be allowed to produce while under economic dispatch.

[3] While the PJM Tariff and other governing documents do not define block-loaded resources, PJM has stated that it identifies a block-loaded resource as a resource that has an economic minimum operating limit equal to its economic maximum operating limit (i.e., it has no dispatchable range). PJM, Report on Price Formation Issues, Docket No. AD14-14-000, at 2 (Feb. 17, 2016) (PJM Report).

constraints; (4) modify pricing logic to allow fast-start resources' commitment costs[4] to be reflected in prices; (5) include in the definition of a fast-start resource a minimum run time requirement; and (6) include in the definition of a fast-start resource a start-up time requirement.

I. Background

2. In June 2014, the Commission began evaluating issues related to price formation in the energy and ancillary services markets operated by regional transmission organizations and independent system operators (RTO/ISO).[5] As part of that effort, the Commission set forth a set of price formation goals, and directed each RTO/ISO to file a report on several price formation topics, including fast-start pricing.[6] Fast-start pricing allows an RTO's/ISO's software algorithms to incorporate the offers of fast-start resources into the market prices for energy and ancillary services. Fast-start resources are resources that are able to start quickly and are often dispatched to their inflexible economic minimum or maximum operating limits, and are thus not eligible to set prices absent this special RTO/ISO fast-start pricing logic.

3. On December 15, 2016, the Commission issued a notice of proposed rulemaking (NOPR) that preliminarily found that some existing RTO/ISO fast-start pricing practices, or lack of fast-start pricing practices, may not result in rates that are just and reasonable.[7] As a result, the Commission proposed establishing several requirements regarding the pricing of fast-start resources and sought comment on the need for reform discussed in

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[4] Commitment costs are a resource's start-up and no-load costs. PJM defines no-load costs as the "hourly costs required to create the starting point of a monotonically increasing incremental offer curve for a generating unit." PJM Manual 15: Cost Development Guidelines, Revision 29 (May 15, 2017), § 1.7.3.

[5] See *Price Formation in Energy and Ancillary Services Markets Operated by Regional Transmission Organizations and Independent System Operators*, Notice, Docket No. AD14-14-000 (June 19, 2014).

[6] See *Price Formation in Energy and Ancillary Services Markets Operated by Regional Transmission Organizations and Independent System Operators*, 153 FERC ¶ 61,221, at P 1 (2015) (Order Directing Reports).

[7] *Fast-Start Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 81 Fed. Reg. 96,391 (Dec. 30, 2016), FERC Stats. & Regs. ¶ 32,720, at PP 3, 36-37 (2016) (NOPR).

the NOPR and the proposed requirements.[8] Based on comments received, the Commission, in an order being issued concurrently with this order, is withdrawing the NOPR.[9] In that order, the Commission states, among other things, that it continues to believe that improved fast-start pricing practices have the potential to achieve the goals outlined in the NOPR but has been persuaded to not require a uniform set of fast-start pricing requirements that would apply to all RTOs/ISOs. Instead, the Commission is pursuing the goals of the NOPR through targeted section 206 actions focusing on specific concerns with each RTO's/ISO's implementation of fast-start pricing.[10]

4. While the PJM Tariff and other governing documents do not define fast-start resources, the PJM Report indicated that PJM identifies a fast-start resource as a combustion turbine that can start within two hours.[11] The PJM Report also indicated that PJM's day-ahead energy market and real-time energy market clearing algorithms allow online fast-start and block-loaded resources to set the Locational Marginal Price (LMP).[12]

5. PJM's day-ahead energy market clearing algorithm computes the pricing and dispatch solutions for all resources simultaneously. Conversely, PJM's real-time energy market clearing algorithm uses a real-time security-constrained economic dispatch application that executes a pricing run followed by a separate dispatch run in order to compute pricing and dispatch solutions for all resources.[13] We describe the pricing and dispatch methodology at a high level and will discuss how fast-start resources are treated for price-setting and dispatch below. In the pricing run, PJM's real-time energy market clearing algorithm achieves power balance and transmission constraint control while also determining real-time nodal LMPs for generation resources. In the dispatch run, PJM uses the solution from the pricing run and a resource's bid-in parameters to determine a resource's economic dispatch. PJM states that this dispatch run with the resource's bid-in parameters is performed because the initial solution performed in the pricing run includes additional logic, such as recent unit ramping performance and block-loaded resource

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[8] *Id.* PP 3, 44.

[9] *Fast-Start Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 161 FERC ¶ 61,293 (2017).

[10] *Id.* P 4.

[11] PJM Report at 2.

[12] *Id.* at 2-3.

[13] *Id.* at 3.

price-setting logic (discussed below), that would result in a resource's dispatch solution that is inconsistent with the resource's bid-in parameters.[14]

6. PJM currently applies special pricing rules to block-loaded resources that allow such resources to set prices in the pricing run. Block-loaded resources are typically ineligible to establish a clearing price because these resources are not dispatchable to serve the next MW of load. PJM has stated that, to enable block-loaded resources to set prices, it partially relaxes the economic minimum operating limit of online block-loaded resources by up to 10 percent.[15] Specifically, PJM has stated that its block-loaded pricing logic in its day-ahead energy market clearing algorithm relaxes the economic minimum operating limit for a block-loaded resource by up to 10 percent in order to allow the resource to set day-ahead prices. In the real-time energy market clearing algorithm, the real-time security-constrained economic dispatch application that computes dispatch and pricing solutions applies the block-loaded pricing logic in the pricing run to an online block-loaded resource for the duration of the resource's actual run time, until the resource is released from PJM dispatch.[16] PJM also allows resources with a limited operating range, other than block-loaded resources, to set prices when operating to control a specific transmission constraint. Otherwise, PJM has no special pricing rules for resources other than block-loaded resources.[17]

7. PJM explained that it uses a relatively small economic minimum operating limit relaxation (10 percent) because it seeks to limit the amount of imbalance between dispatched generation and load. Such imbalance occurs when the PJM dispatch run instructs a block-loaded resource to operate at its economic minimum operating limit after the PJM pricing run assumes the resource operates at less than its economic minimum operating limit. This real-time correction results in more generation than load, which is balanced during operation through deployment of frequency regulation resources.[18]

8. For example, under PJM's approach, to meet 100 MW of load, a 100 MW block-loaded resource could set the LMP as if it were running at 90 MW (via 10 percent

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[14] *Id.* at 3.

[15] *Id.* at 2-4.

[16] *Id.* at 5.

[17] *Id.* at 6, 14-15.

[18] *Id.* at 6-9, 12.

relaxation of the resource's economic minimum operating limit), and other resources would receive dispatch instructions to accommodate that 10 percent relaxation for the 100 MW resource. However, the 100 MW resource would receive a physical dispatch signal to run at its full 100 MW (the minimum amount that it is physically feasible for that resource to operate at), resulting in 10 MW of imbalance between dispatched generation and load. As a result, the block-loaded resource generates more power than anticipated by the pricing run, and PJM must correct for the extra generation, typically by using frequency regulation resources (specifically, regulation down).[19]

II. Discussion

9. The Commission preliminarily finds that some of PJM's practices related to the pricing of fast-start resources are unjust and unreasonable. These practices involve PJM: (A) not allowing the economic minimum operating limit of block-loaded resources needed to serve load to be relaxed more than 10 percent; (B) limiting the relaxation of the economic minimum operating limit to only block-loaded resources; (C) determining dispatch instructions in a manner that may be inconsistent with minimizing production costs when considering fast-start resources; (D) not allowing the commitments costs of fast-start resources to be reflected in prices; (E) not requiring fast-start resources to have a minimum run time; and (F) allowing resources with start-up times of more than one hour to be eligible for fast-start pricing treatment.

10. The Commission's preliminary finding that PJM's fast-start pricing practices are unjust and unreasonable is consistent with the goals of price formation.[20] As the Commission noted in the fast-start pricing NOPR,[21] the accurate pricing of fast-start

[19] *Id.* at 12.

[20] The Commission has stated that the goals of price formation are to: (1) maximize market surplus for consumers and suppliers; (2) provide correct incentives for market participants to follow commitment and dispatch instructions, make efficient investments in facilities and equipment, and maintain reliability; (3) provide transparency so that market participants understand how prices reflect the actual marginal cost of serving load and the operational constraints of reliably operating the system; and (4) ensure that all suppliers have an opportunity to recover their costs. *See, e.g.*, Order Directing Reports, 153 FERC ¶ 61,221 at P 2; Price Formation in Energy and Ancillary Services Markets Operated by Regional Transmission Organizations and Independent System Operators, Notice Inviting Post-Technical Workshop Comments, Post-Technical Conference Questions for Comment, Docket No. AD14-14-000, at 1 (Jan. 16, 2015).

[21] NOPR, FERC Stats. & Regs. ¶ 32,720 at P 35.

resources advances those goals by transparently reflecting the marginal cost of serving load and the value fast-start resources provide in meeting system needs, which will reduce uplift costs and improve price signals to support efficient investments in facilities and equipment.

11. A number of commenters expressed general support for the NOPR proposals.[22] Several commenters stated that, consistent with the goals of the NOPR, the inclusion of fast-start resources' costs in prices will produce more transparent prices, which would more accurately reflect the marginal cost of serving load.[23] Multiple commenters suggested that the Commission allow for implementation flexibility due to regional differences and the different types of resources operating in the RTOs/ISOs.[24]

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[22] American Petroleum Institute NOPR Comments at 2; Basin Electric Power Cooperative (Basin Electric) NOPR Comments at 2; Electric Power Supply Association, Independent Power Producers of New York, New England Power Generators Association, Inc., PJM Power Providers, and Western Power Trading Forum (Competitive Suppliers) NOPR Comments at 4-6; Environmental Defense Fund NOPR Comments at 4; Edison Electric Institute (EEI) NOPR Comments at 2; Exelon Corporation (Exelon) NOPR Comments at 3; IMG Midstream LLC (IMG Midstream) NOPR Comments at 1; Microgrid Resources Coalition NOPR Comments at 3; Nuclear Energy Institute (NEI) NOPR Comments at 2; PJM NOPR Comments at 2; Potomac Economics, Ltd. (Potomac Economics) NOPR Comments at 1-2; Powerex Corp. NOPR Comments at 7-8; Sunflower Electric Power Corporation and Mid-Kansas Electric Company, LLC (Sunflower and Mid-Kansas) NOPR Comments at 2; Westar Energy, Inc. (Westar) NOPR Comments at 2-3. Other commenters, however, disagreed with the NOPR proposals. *See* Department of Market Monitoring for the California Independent System Operator (CAISO Market Monitor) NOPR Comments at 1, 3; Electricity Consumers Resource Council (ELCON) NOPR Comments at 2-5; Monitoring Analytics, LLC (PJM Market Monitor) NOPR Comments at 2-3.

[23] Competitive Suppliers NOPR Comments at 2; R Street Institute NOPR Comments at 2; Westar NOPR Comments at 3.

[24] American Public Power Association and National Rural Electric Cooperative Association NOPR Comments at 5-7; California Independent System Operator Corporation (CAISO) NOPR Comments at 4; EEI NOPR Comments at 3; Exelon NOPR Comments at 4; ISO New England, Inc. (ISO-NE) NOPR Comments at 1; ISO/RTO Council NOPR Comments at 1-3; New England Power Pool Participants Committee NOPR Comments at 4-5; New York Independent System Operator, Inc. (NYISO) NOPR Comments at 19-20; Pacific Gas and Electric Company NOPR Comments at 2-3; Southern California Edison Company (SCE) NOPR Comments at 3-4.

12. After consideration of the record, the Commission has opted not to take generic action on fast-start pricing; however, we continue to believe that improved fast-start pricing practices have the potential to achieve the goals outlined in the NOPR. We remain concerned that PJM may not meet these goals because its existing fast-start pricing practices may result in market prices that fail to accurately reflect the marginal cost of serving load and fail to reflect the value of fast-start resources.

13. In addition, because PJM's fast-start pricing rules and practices significantly affect rates, terms, and conditions of service, we preliminarily find that PJM must file them as part of the Tariff.[25]

A. PJM Practice Regarding Relaxation of Economic Minimum Operating Limits

14. The fast-start pricing NOPR proposed to require each RTO/ISO to modify its fast-start pricing rules to relax the economic minimum operating limit of fast-start resources and treat them as dispatchable from zero to the economic maximum operating limit for the purpose of calculating prices.[26] In response to the NOPR, many commenters generally supported the proposal to relax the economic minimum operating limit of fast-start resources and treat them as dispatchable from zero to the economic maximum operating limit for the purpose of calculating prices.[27] Potomac Economics stated that this proposal is required in any feasible fast-start pricing approach because it is the minimum output constraint that prevents resources from being able to set prices.[28] Other commenters disagreed with the proposal and argued that, among other disadvantages, it

[25] *See infra* section II.G.

[26] NOPR, FERC Stats. & Regs. ¶ 32,720 at P 54.

[27] AES Companies NOPR Comments at 7; Competitive Suppliers NOPR Comments at 9; EEI NOPR Comments at 4;; Exelon NOPR Comments at 7; Golden Spread Electric Cooperative, Inc. (Golden Spread) NOPR Comments at 4, 10-11; IMG Midstream NOPR Comments at 5; ISO-NE NOPR Comments at 8-9; Midcontinent Independent System Operator, Inc. (MISO) NOPR Comments at 1-2, 11; NEI NOPR Comments at 4; NYISO NOPR Comments at 10; New York Transmission Owners NOPR Comments at 7; Sunflower and Mid-Kansas NOPR Comments at 6; Westar NOPR Comments at 9.

[28] Potomac Economics NOPR Comments at 12.

would create a disconnect between dispatch signals and prices[29] and could create an energy imbalance by producing physically infeasible results.[30]

15. We preliminarily find that PJM's practice of not allowing the economic minimum operating limit of block-loaded resources needed to serve load to be relaxed by more than 10 percent could restrict the set of dispatch circumstances in which such resources could set prices, and therefore may be unjust and unreasonable. We remain concerned that without allowing relaxation by up to 100 percent, prices will sometimes be set by the offers from lower-cost flexible units that are dispatched down in order to accommodate the output of fast-start resources. As a result, PJM's practices may not reflect the marginal cost of serving load when a fast-start resource is needed to quickly respond to unforeseen system needs, which may result in inaccurate price signals. Inaccurate price signals then fail to inform investment decisions, including where and when fast-start resources should be built or maintained. While some commenters raise concerns about the potential consequences of relaxing the economic minimum operating limit of fast-start resources by up to 100 percent, we note that there are methods to address these concerns that can and should be considered, as discussed later in this order.[31]

B. PJM Practice of Limiting Fast-Start Pricing to Block-Loaded Resources

16. The fast-start pricing NOPR proposed to require each RTO/ISO to apply fast-start pricing logic to all fast-start resources, regardless of whether they are block-loaded.[32] In response to the NOPR, several commenters supported applying fast-start pricing logic to dispatchable fast-start resources.[33] For example, some commenters stated that including dispatchable fast-start resources in fast-start pricing would allow resources that utilize different technologies and techniques beyond conventional generation to be eligible for

[29] ELCON NOPR Comments at 3.

[30] CAISO NOPR Comments at 8.

[31] *See infra* P 31.

[32] NOPR, FERC Stats. & Regs. ¶ 32,720 at P 47.

[33] Competitive Suppliers NOPR Comments at 7; Microgrid Resources Coalition NOPR Comments at 4; Sunflower and Mid-Kansas NOPR Comments at 4.

fast-start pricing.[34] NYISO, on the other hand, supported limiting fast-start pricing logic to only block-loaded resources.[35]

17. PJM's practices regarding the relaxation of the economic minimum operating limit are limited to only block-loaded resources.[36] Fast-start resources that are not block-loaded are not eligible to set prices when their economic minimum operating limit binds. We remain concerned that prices would not reflect the marginal cost of serving load when a non-block-loaded resource is needed but is not included in the fast-start pricing logic, and agree with commenters that a technology-neutral approach ensures that no resource that can perform the same service is unnecessarily excluded from fast-start pricing treatment. Therefore, we preliminarily find that such practices may be unjust and unreasonable.

C. PJM Approach to Considering Fast-Start Resources when Determining Real-Time Dispatch

18. PJM's approach to considering fast-start resources when determining real-time dispatch may be inconsistent with the objective of minimizing system production costs. An efficient dispatch can only be reliably determined by modeling the actual system costs and actual system constraints within a market run that minimizes production costs. That is, fast-start pricing logic would ideally not change the dispatch of resources away from the cost-minimizing dispatch, but would only alter the manner by which prices are established. PJM does not appear to develop real-time dispatch instructions in this way.

19. PJM initially solves a pricing run that allows block-loaded resources' economic minimum operating limits to be relaxed by up to 10 percent for the purposes of determining prices. The pricing run achieves a power balance between dispatched generation and load based on the assumed, but not actual, flexibility of these resources.[37] PJM then includes these resources in a dispatch run that honors the resources' economic

[34] American Wind Energy Association (AWEA) NOPR Comments at 2; Competitive Suppliers NOPR Comments at 7; Microgrid Resources Coalition NOPR Comments at 4.

[35] NYISO NOPR Comments at 5-6.

[36] PJM Report at 5-6. PJM does relax the economic minimum operating limit for certain non-block loaded resources when they are controlling constraints, but the extent of this practice is unclear. *See supra* P 6.

[37] PJM NOPR Comments at 11.

minimum operating limits, but does not necessarily honor the system power balance.[38] This differs from a practice in which the RTO/ISO first determines the cost-minimizing dispatch through a straightforward optimization that considers then full set of operating limitations on all generators, and then subsequently perform a pricing run to determine prices, while leaving the original cost-minimizing dispatch schedule unchanged. By not respecting the power balance constraint, PJM's process appears to result in dispatch solutions that are not cost-minimizing. As PJM points out,[39] determining dispatch in this manner may cause an imbalance between dispatched generation and load which may potentially cause system control problems,[40] and requires the use of frequency regulation resources to manage this imbalance.[41] This practice unnecessarily increases the cost of serving load and puts stress on the frequency regulation resources that are necessary for maintaining system reliability.

20. We preliminarily find that considering fast-start resources in this way when determining real-time dispatch instructions is inconsistent with the objective of minimizing system production costs, may create reliability issues, and may unnecessarily increase the cost of serving load, and therefore may produce rates that are unjust and unreasonable.

D. PJM Practice Regarding Commitment Costs

21. PJM's locational marginal pricing rules do not account for fast-start resources' commitment costs in its pricing logic.[42] We preliminarily find that this practice may be unjust and unreasonable, as discussed below.

22. The fast-start pricing NOPR proposed to require each RTO/ISO to incorporate a resource's commitment costs (i.e., start-up and no-load costs) in energy and operating reserve prices when the RTO/ISO commits a fast-start resource.[43] In response to the NOPR, many commenters supported the proposal to allow fast-start resources'

[38] PJM Report at 7.

[39] PJM NOPR Comments at 10-12. *See also* PJM Report at 6-9, 12.

[40] PJM NOPR Comments at 11.

[41] PJM Report at 12.

[42] PJM Report at 10.

[43] NOPR, FERC Stats. & Regs. ¶ 32,720 at P 49.

commitment costs (i.e., start-up and no-load costs) to be reflected in energy market prices.[44] Some commenters further stated that excluding these costs would result in inaccurate LMPs, risks to system reliability, and improper valuation of the services that fast-start resources provide.[45] Additionally, due to the differences in market design, some commenters supported giving RTOs/ISOs the flexibility to assess the need to include commitment costs and the appropriate method for doing so.[46] On the other hand, some of the RTOs/ISOs and market monitors expressed concern about the proposed requirement.[47]

23. We remain concerned that not including commitment costs for fast-start resources does not accurately represent the marginal cost of serving load. Because of their operating characteristics, fast-start resources are uniquely situated to respond to unforeseen real-time system needs that are short-term in nature. When fast-start resources are committed in real-time, it is often at short notice to meet some system condition or market need over a short time period. The costs of these commitment decisions are incurred to serve system needs in a similar way that marginal costs are incurred to serve system needs for a specific time period. Specifically, incorporating commitment costs of fast-start resources in prices more accurately represents the marginal cost of serving load, which will help inform investment decisions and reduce reliance on uplift payments. For these reasons, the Commission preliminarily finds that commitment costs of fast-start resources in PJM should be considered as marginal for purposes of setting prices in PJM. Thus, PJM's practice of not including commitment costs in the price-setting logic used for online fast-start resources may result in prices that do not reflect the marginal cost of serving load. Therefore, we preliminarily find that PJM's practice may produce rates that are unjust and unreasonable.

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[44] AES Companies NOPR Comments at 6; AWEA NOPR Comments at 1; Competitive Suppliers NOPR Comments at 8; Exelon NOPR Comments at 5; Golden Spread NOPR Comments at 9; IMG Midstream NOPR Comments at 4; MISO NOPR Comments at 8; NEI NOPR Comments at 4; Potomac Economics NOPR Comments at 10.

[45] Exelon NOPR Comments at 5; IMG Midstream NOPR Comments at 4; MISO NOPR Comments at 8-9; R Street Institute NOPR Comments at 4-5.

[46] NYISO NOPR Comments at 10, 14; SCE NOPR Comments at 3.

[47] CAISO NOPR Comments at 10; CAISO Market Monitor NOPR Comments at 1-2; NYISO NOPR Comments at 9; PJM NOPR Comments at 8; PJM Market Monitor NOPR Comments at 6.

E. Minimum Run Time Requirement

24. The fast-start pricing NOPR proposed to require each RTO/ISO to limit fast-start pricing logic to resources with a minimum run time of one hour or less.[48] In response to the NOPR, some commenters supported the proposed requirement that fast-start resources have a minimum run time of one hour or less.[49] These commenters stated that the minimum run time requirement would help ensure that fast-start resources are flexible, would send more accurate price signals by reflecting a more complete value for using the resources to address transient issues, and would encourage and reward resources that can provide optionality.[50] Other commenters supported including resources with longer minimum run times in fast-start pricing. They stated, for example, that imposing a minimum run time requirement of one hour or less could preclude otherwise applicable resources from full market integration and limit the benefits of price formation reform, and that longer minimum run times would not lead to pricing inaccuracies.[51]

25. PJM's Tariff does not include a minimum run time requirement for a resource to receive fast-start pricing treatment. Fast-start pricing treatment allows market prices to reflect the value fast-start resources provide the system, particularly the ability of fast-start resources to meet real-time system needs. We remain concerned that resources with minimum run times in excess of an hour may lack the flexibility to operate in a manner consistent with transient real-time needs. As a result, commitment and dispatch of resources with a minimum run time in excess of an hour does not appear analogous to a marginal decision, so applying fast-start pricing logic to such units could result in prices failing to reflect the marginal cost of serving load. Therefore, we preliminarily find that it may be unjust and unreasonable for resources with a minimum run time of greater than one hour to receive fast-start pricing treatment.

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[48] NOPR, FERC Stats. & Regs. ¶ 32,720 at P 46.

[49] Basin Electric NOPR Comments at 3; Golden Spread NOPR Comments at 7-8; IMG Midstream NOPR Comments at 3; MISO NOPR Comments at 6; NYISO NOPR Comments at 4, 8.

[50] Basin Electric NOPR Comments at 3; IMG Midstream NOPR Comments at 3.

[51] Potomac Economics NOPR Comments at 7-8; R Street Institute NOPR Comments at 4.

F. Start-up Time Requirement

26. The fast-start pricing NOPR proposed to require each RTO/ISO to limit fast-start pricing logic to resources with a start-up time of ten minutes or less.[52] In response to the NOPR, some commenters supported the proposed start-up time requirement.[53] Some commenters stated that the proposed requirement would encourage investment in fast-start resources, and differentiate the value of resources that start very quickly.[54] In addition, PJM requested that the Commission clarify the NOPR's intent regarding the start-up time requirement of a fast-start resource and whether notification time is included in a fast-start resource's start-up time.[55]

27. Other commenters supported including fast-start resources with start-up times of more than ten minutes in fast-start pricing.[56] They stated, for example, that including resources with longer start-up times would assist in more accurately reflecting the marginal cost of serving load, make additional flexible resources eligible for fast-start pricing treatment, and broaden the benefits associated with fast-start pricing.[57]

28. PJM allows resources capable of starting up within two hours of being notified to be eligible for fast-start pricing treatment.[58] We remain concerned that resources with start-up times in excess of an hour may lack the flexibility to operate in a manner

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[52] NOPR, FERC Stats. & Regs. ¶ 32,720 at P 46.

[53] Basin Electric NOPR Comments at 3; Golden Spread NOPR Comments at 7-8; IMG Midstream NOPR Comments at 2-3.

[54] IMG Midstream NOPR Comments at 2-3; Golden Spread NOPR Comments at 7-8.

[55] PJM NOPR Comments at 4.

[56] AES Companies NOPR Comments at 5; Competitive Suppliers NOPR Comments at 7; EEI NOPR Comments at 3; ISO-NE NOPR Comments at 4; MISO NOPR Comments at 5-6; NYISO NOPR Comments at 5; Potomac Economics NOPR Comments at 7; Sunflower and Mid-Kansas NOPR Comments at 4.

[57] AES Companies NOPR Comments at 5; ISO-NE NOPR Comments at 4; MISO NOPR Comments at 5-6; Potomac Economics NOPR Comments at 6-9; R Street Institute NOPR Comments at 4.

[58] PJM Report at 2.

consistent with unforeseen real-time needs.[59] As a result, commitment and dispatch of resources with start-up times in excess of an hour do not appear analogous to a marginal decision, so applying fast-start pricing logic to such units could result in prices failing to reflect the marginal cost of serving load. Therefore, we preliminarily find that PJM's practice may result in rates that are unjust and unreasonable.

G. PJM Tariff Language

29. The FPA requires all practices that significantly affect rates, terms, and conditions of service to be on file with the Commission, and these practices must be included in a Commission-accepted tariff.[60] PJM has stated that its Tariff currently lacks definitions for "fast-start resource" and "block-loaded resource," including any minimum run time or start-up time requirement for these resources.[61] PJM has also stated that, as of 2016, it regularly modified PJM market models to enable block-loaded resources to set prices.[62] In allowing block-loaded resources to set prices, PJM's practices materially affected electric power prices. Therefore, our preliminary review indicates that PJM's practices related to fast-start pricing significantly affect the rates, terms, and conditions of service and, as such, must be filed with the Commission as part of the PJM Tariff.

H. Institution of Section 206 Proceeding

30. Accordingly, we institute a proceeding in Docket No. EL18-34-000, pursuant to FPA section 206, to examine PJM's Tariff and practices. Upon initial review, we believe that implementing the following changes to PJM's Tariff would result in rates that are just and reasonable:

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[59] We clarify that, in the identified modification regarding the adoption of a start-up time requirement, a resource's start-up time includes notification time. *See infra* P 30.

[60] 16 U.S.C. § 824d(c) (2012); *Demand Response Coalition v. PJM Interconnection, L.L.C.*, 143 FERC ¶ 61,061, at P 17 (2013); *Cargill Power Markets, LLC v. Public Service Company of New Mexico*, 141 FERC ¶ 61,141, at P 14 (2012); *see generally Prior Notice and Filing Requirements under Part II of the FPA*, 64 FERC ¶ 61,139 (1993) (explaining Commission jurisdiction with respect to all rates and charges that are "for or connected with" and all agreements that "affect or relate to" jurisdictional activities).

[61] PJM Report at 2.

[62] *Id.* at 3.

A) Allow for relaxation of all fast-start resources' economic minimum operating limits by up to 100 percent, such that the resources are considered dispatchable from zero to their economic maximum operating limit for the purposes of setting prices;[63]

B) Apply the relaxation of a resource's economic minimum operating limit to all fast-start resources, not just block-loaded fast-start resources;[64]

C) Consider fast-start resources within dispatch in a way that is consistent with minimizing production costs, subject to appropriate operational and reliability constraints;[65]

D) Modify pricing logic to allow the commitment costs of fast-start resources to be reflected in prices;[66]

E) Include in the definition of fast-start resources a requirement that those resources have a minimum run time of one hour or less;[67]

F) Include in the definition of fast-start resources a requirement that those resources be able to start up within one hour or less (including notification time);[68] and

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[63] *See supra* section II.A.

[64] *See supra* section II.B.

[65] *See supra* section II.C.

[66] *See supra* section II.D.

[67] *See supra* section II.E. While the PJM Tariff and other governing documents do not define fast-start resources, PJM has stated that it identifies a fast-start resource as a combustion turbine that can start within two hours. PJM Report at 2. Upon initial review, we do not believe the concerns identified by the Commission would be addressed by PJM limiting its fast-start pricing practices to combustion turbines, because fast-start resources that are not combustion turbines (e.g., hydroelectric resources) would not be eligible to set prices or include commitment costs in all circumstances. *See supra* P 16.

[68] *See supra* section II.F.

G) Set forth its rules and practices regarding the pricing of fast-start resources.[69]

We expect that the proposed modifications will remedy PJM's current fast-start pricing practices that potentially lead to unjust and unreasonable rates. For instance, the identified modifications are intended to more accurately reflect the marginal cost of serving load in periods when dispatching a fast-start resource is the next action taken to meet load, and provide price signals that better inform investment decisions, including where and when fast-start resources should be built or maintained. The identified modifications will also provide more accurate and transparent price signals that better reflect the cost of serving load, minimize production costs, and reduce uplift. We also expect that allowing the market software to relax all fast-start resources' economic minimum operating limits by up to 100 percent would allow these resources to set prices under a broader range of dispatch conditions and therefore result in prices that more accurately reflect the marginal cost of serving load.

31. PJM has suggested that by relaxing economic minimum operating limits by up to 100 percent, its real-time security-constrained economic dispatch run will need to re-dispatch flexible resources down to accommodate the actual non-zero economic minimum operating limit of the fast-start resources that have been dispatched in order to manage over-generation and maintain power balance.[70] PJM has stated that, under this scenario, over-generation concerns may arise from those resources that have been dispatched down that now have an incentive to not follow dispatch instruction and "chase prices." To the extent that PJM finds over-generation from price-chasing resources to be a potential problem after considering the identified modifications, we encourage PJM to develop any necessary changes or additions to address this issue and include those changes in its compliance filing to ensure that its fast-start pricing logic does not cause over-generation nor lead to incentives for resources to deviate from PJM's dispatch instructions. PJM may consider approaches such as penalizing uninstructed deviations, settling over-generated MWh at only standard LMP (not at the higher prices determined through fast-start pricing), or providing for lost opportunity cost payments.[71] By implementing a mechanism to discourage over-generation, power imbalances and adverse effects on the regulation market can be avoided.

32. We find that a paper hearing, as ordered below, is the appropriate procedure to resolve this matter. As ordered below, any person desiring to participate in the paper

[69] *See supra* section II.G.

[70] PJM NOPR Comments at 11.

[71] *See, e.g.*, MISO NOPR Comments at 11; ISO-NE NOPR Comments at 11.

hearing must file a notice of intervention or timely motion to intervene, as appropriate, in accordance with Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2017).

33. We will require PJM and other interested parties to file initial briefs no later than 45 days after the publication of notice in the *Federal Register* of the Commission's initiation of this section 206 proceeding in Docket No. EL18-34-000. Parties also may file reply briefs in response to parties' initial briefs due within 30 days after the due date of initial briefs.

34. In cases where, as here, the Commission institutes a proceeding under FPA section 206, the Commission must establish a refund effective date that is no earlier than publication of notice of the Commission's initiation of the proceeding in the *Federal Register*, and no later than five months subsequent to that date.[72] Consistent with Commission precedent,[73] we will establish a refund effective date at the earliest date allowed, i.e., the date the notice of the initiation of the proceeding in Docket No. EL18-34-000 is published in the *Federal Register*. The Commission is also required by section 206 to indicate when it expects to issue a final order. We expect to issue a final order in this proceeding within six months of receiving reply briefs, or September 30, 2018.

The Commission orders:

(A) Pursuant to the authority contained in and subject to the jurisdiction conferred upon the Commission by section 402(a) of the Department of Energy Organization Act and by the FPA, particularly section 206 thereof, and pursuant to the Commission's Rules of Practice and Procedure and the regulations under the FPA (18 C.F.R. Chapter I), the Commission hereby institutes a proceeding in Docket No. EL18-34-000, as discussed in the body of this order.

(B) PJM and other interested parties may file initial briefs no later than 45 days after the publication of notice in the *Federal Register* of the Commission's initiation of the section 206 proceeding in Docket No. EL18-34-000. Reply briefs may be filed no later than 30 days thereafter.

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[72] 16 U.S.C. § 824e(b) (2012).

[73] *See, e.g.*, *PJM Interconnection, L.L.C.*, 90 FERC ¶ 61,137 (2000); *Cambridge Elec. Light Co.*, 75 FERC ¶ 61,177, *clarified*, 76 FERC ¶ 61,020 (1996); *Canal Elec. Co.*, 46 FERC ¶ 61,153, *reh'g denied*, 47 FERC ¶ 61,275 (1989).

(C) Any interested person desiring to be heard in Docket No. EL18-34-000 must file a notice of intervention or motion to intervene, as appropriate, with the Federal Energy Regulatory Commission, 888 First Street NE, Washington, DC 20426, in accordance with Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2017), within 21 days of the date of issuance of this order.

(D) The Secretary shall promptly publish in the *Federal Register* a notice of the Commission's initiation under FPA section 206 of the proceeding in Docket No. EL18-34-000.

(E) The refund effective date in Docket No. EL18-34-000 established pursuant to section 206 of the FPA shall be the date of publication in the *Federal Register* of the notice discussed in Ordering Paragraph (D) above.

By the Commission.

(S E A L)

Nathaniel J. Davis, Sr.,
Deputy Secretary.