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UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Willie L. Phillips, Acting Chairman;
James P. Danly, Allison Clements,
and Mark C. Christie.

PJM Interconnection, L.L.C.

Docket Nos. ER23-1874-000
ER23-1874-001

ORDER ACCEPTING TARIFF REVISIONS SUBJECT TO CONDITION

(Issued October 6, 2023)

1. On May 12, 2023, pursuant to section 205 of the Federal Power Act (FPA),¹ PJM Interconnection, L.L.C. (PJM) filed revisions to Schedule 6A of its Open Access Transmission Tariff (Tariff) to mitigate the adverse impacts of Black Start Units potentially being unavailable during a restoration event due to fuel unavailability.² PJM requests that the proposed revisions be accepted, effective July 11, 2023. In this order, we accept PJM's proposed revisions, effective July 11, 2023, as requested, subject to condition, and a further compliance filing to be submitted within 30 days of the date of issuance of this order, as discussed below.

I. Background

2. PJM's Tariff, Schedule 6A, establishes the requirements for units to receive payment for Black Start Service, which is a service necessary to re-energize the transmission system following a system-wide blackout. A Black Start Unit is a generating unit that has equipment enabling it to start without an outside electrical supply source or a generating unit with a high operating factor (subject to PJM concurrence)

¹ 16 U.S.C. § 824d.

² PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A (14.1.0). PJM also submits a clean version of Tariff, Schedule 6A to merge previously accepted language that was accepted effective January 29, 2022, but did not include the pending Black Start language. PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A (13.0.1). PJM Proposal, Transmittal, n.121.

with the demonstrated ability to automatically remain operating, at reduced levels, when disconnected from the grid.³

3. As explained further below, Schedule 6A of the Tariff includes a formula for calculating a generator's annual Black Start Service revenue requirement,⁴ and requires Black Start Units that store liquefied natural gas, propane, or oil on site to calculate fuel storage costs based on a 16 hour run time (i.e., run hours) or as defined by the Transmission Owner restoration plan, whichever is less.⁵ Related, PJM's Manual 36 provides for Black Start Units to maintain fuel that enables 16 hours of run time or as defined by the Transmission Owner operation plan, whichever is less.⁶ Separately, PJM Manual 14D also outlines the Black Start Request for Proposal (RFP) process used to select Black Start Units.⁷ During this RFP process, PJM works with the Transmission Owners to evaluate proposals and select viable Black Start solutions.⁸ Resources that propose to offer Black Start Services are evaluated on the basis of critical load requirements, location, cost and operational considerations. The RFP evaluation criteria in Manual 14D outline a preference for: (1) Black Start Units that are located in close proximity to critical loads, and (2) natural gas Black Start Units that have dual fuel capability, secure onsite fuel storage for any fuel type, and/or primary firm gas

³ PJM Proposal, Transmittal at 1.

⁴ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § (13.0.0).

⁵ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § (13.0.0) (Fuel Storage Costs).

⁶ See PJM, *PJM Manual 36: System Restoration 69, Attachment A: Minimum Critical Black Start Requirement* (June 15, 2023), <https://www.pjm.com/-/media/documents/manuals/m36.ashx>. According to PJM, a relevant Transmission Owner's restoration plan can allow for a shorter runtime than 16 hours, but none currently allow that shorter time. See Transmittal at 7, n.19; Bennett Aff. ¶ 13.

⁷ PJM Proposal, Transmittal at 7.

⁸ According to Manual 14D, PJM will issue an RTO-Wide RFP for black start generation every five years, to align with PJM's obligation under NERC Standard Emergency Preparedness and Operations EOP-005. The Manual also provides for an Incremental RFP process, which shall be triggered by one or more triggering events, i.e., termination of certain Black Start Units or changed circumstances.

transportation contracts.⁹ The RFP evaluation criteria also state that proposals should meet technical feasibility operational restrictions, which include a requirement that a proposed Black Start Unit “is able to meet minimum run hour requirement per OATT Schedule 6A (16 hours or as indicated in the Transmission Owner Restoration Plan).” However, in the event that a proposal does not satisfactorily meet the fuel assurance criteria,¹⁰ “PJM will request that the resource owners resubmit proposals with adequate demonstration of dual fuel capacity and/or primary firm gas transportation contracts (for gas units).”¹¹

4. As referenced above, Schedule 6A of the Tariff includes a formula for calculating a generator’s annual Black Start Service revenue requirement,¹² and governs the rates, terms, and conditions for Black Start Units. The Black Start Service revenue requirement sets the overall compensation due to a provider of Black Start Service,¹³ which includes Fixed Black Start Service Costs, Variable Black Start Service Costs, Training Costs, and Fuel Storage Costs.¹⁴ Fixed Black Start Service Costs are for Black Start capital recovery, and there are three distinct rates available for a Black Start Unit to select: the Base Formula Rate, the Capital Cost Recovery Rate – NERC-CIP [Critical Infrastructure

⁹ PJM Manual 14D adds that these Black Start Units will be given a higher level of consideration in the existing RFP evaluation process.

¹⁰ The Fuel Assurance evaluation criteria includes questions regarding a proposed unit’s fuel type, fuel diversity, and dual fuel capability, including logistic assessments such as: 1) can the unit start on both primary or secondary fuel alone, 2) is start-up fuel required before running on primary or alternate fuel, and 3) are there special switching requirements between primary and alternate fuel. Respondents to the RFP must also state if the unit has primary firm gas transportation contract versus secondary firm or interruptible gas contracts, and if the proposed unit has single versus multiple gas pipeline access.

¹¹ PJM, *PJM Manual 14D: Generator Operational Requirements* § 10.1.2 (Dec. 21, 2022), <https://pjm.com/~media/documents/manuals/m14d.ashx>.

¹² PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 18 (13.0.0).

¹³ A Black Start resource also has the option to file its own desired capital recovery rate with the Commission for potential approval if different from that contained in Schedule 6A.

¹⁴ The formula for calculating a generator’s annual Black Start Service revenue requirement is: $\{(Fixed\ BSSC) + (Variable\ BSSC) + (Training\ Costs) + (Fuel\ Storage\ Costs)\} * (1 + Z)$.

Protection] Specific Recovery, and the Capital Cost Recovery Rate.¹⁵ As explained further below, the proposed revisions focus on the Base Formula Rate and the Capital Recovery Rate.

5. The existing Black Start Service annual revenue requirement also provides an incentive component, that is, a multiplier equal to 1 plus a decimal factor identified as “Z.” The incentive component may be applied to a unit’s fixed costs, variable costs, training costs, and fuel storage costs depending on the fixed cost rate formula selected. The current effective Tariff, Schedule 6A, section 18 establishes that the Z incentive component is equal to a rate of 10% and is applicable only to those Black Start Units that use the Base Formula Rate for fixed costs, that is, the Black Start Units that do not require capital equipment upgrades to provide Black Start Service.

6. PJM states that it identified a concern that the current Tariff does not provide for the procurement of Black Start Units that are Fuel Assured when such units are needed for system restoration in specific zones.¹⁶ To address this omission, PJM proposes revisions to mitigate the potential adverse impacts on system restoration time when Black Start resources are unavailable by defining and providing compensation for a new type of Black Start resource that is Fuel Assured (i.e., a Fuel Assured Black Start Unit). In support for the need for the proposed revisions, PJM performed an impact analysis which identified eight high impact Black Start sites in five zones.¹⁷ According to PJM, if Black Start resources are unable to perform due to fuel unavailability in these high impact sites, it would result in a greater than 10-hour increase in system restoration time.

¹⁵ The Base Formula Rate is for units that do not require capital equipment upgrades to provide Black Start Service. The NERC-CIP Specific Recovery Rate is for a Black Start Unit that already has all the equipment needed for Black Start Service other than capital upgrades to be NERC-CIP compliant. In the Capital Cost Recovery Rate, the unit can include all the capital upgrades needed for Black Start Service plus the NERC-CIP compliance costs. See PJM, *PJM Black Start RFP FAQs* 5 (Feb.15, 2017), <https://www.pjm.com/-/media/markets-ops/ancillary/black-start-service/black-start-rfp-faqs.ashx>.

¹⁶ To assess the concern of fuel supply availability in the PJM Region, PJM states that it analyzed the extent to which its current Black Start Units met reasonable minimum criteria for fuel assurance and the extent to which loss of fuel supply at non-Fuel Assured Black Start Units could adversely affect the system restoration process following an event that triggers a need for Black Start generation. PJM Proposal, Transmittal at 9-10.

¹⁷ A high impact Black Start site is a Black Start site which, when unavailable during a restoration scenario due to fuel unavailability, results in an incremental restoration time increase of 10 hours or more. *Id.*, Bennett Aff. ¶ 30.

II. Description of Filing

7. PJM proposes to revise Tariff, Schedule 6A to add provisions regarding a new category of Fuel Assured Black Start Units. In particular, PJM states that the revisions proposed herein are designed to: (a) establish a new category of Black Start resources (Fuel Assured Black Start Units); (b) set the minimum criteria for a variety of resource types to qualify as Fuel Assured Black Start Units; (c) establish compensation for Fuel Assured Black Start Units; and (d) establish minimum commitment periods, performance requirements, and testing requirements for resources selected as Fuel Assured Black Start Units.¹⁸

8. Below, we address the proposed Tariff revisions to implement the new provisions regarding Fuel Assured Black Start Units.

III. Notice of Filing and Responsive Pleadings

9. Notice of PJM's filing was published in the *Federal Register*, 88 Fed. Reg. 31,748 (May 18, 2023), with interventions and comments due on or before June 2, 2023.

10. Timely motions to intervene were filed by: American Electric Power Service Corporation; Calpine Corporation; Constellation Energy Generation, LLC; Delaware Division of the Public Advocate; Dominion Energy Services, Inc. (Dominion); Monitoring Analytics, LLC, as Independent Market Monitor for PJM (Market Monitor); Old Dominion Electric Cooperative; New Jersey Division of Rate Counsel; PJM Power Providers Group (PJM Power Providers); Public Citizen, Inc.; and Rockland Electric Company. On June 6, 2023, PJM Market Monitor filed Comments. On June 21, 2023, PJM filed an answer.

11. On July 7, 2023, Commission staff issued a deficiency letter seeking additional information related to various technical and implementation details, and on August 7, 2023, PJM filed its response to the deficiency letter (Deficiency Letter Response).

12. Notice of PJM's Deficiency Letter Response was published in the *Federal Register*, 88 Fed. Reg. 55,034 (Aug. 14, 2023), with interventions and protests due on or before August 28, 2023. On August 28, 2023, PJM Market Monitor filed comments (Market Monitor August 28 Comments). On September 12, 2023, PJM filed a motion for leave to answer and answer (PJM September 12 Answer).

¹⁸ PJM Proposal, Transmittal at 3, 8.

IV. Discussion

A. Procedural Matters

13. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure,¹⁹ the timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding.

14. 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 unless otherwise ordered by the decisional authority. We accept the answers of PJM, and PJM Market Monitor because they have provided information that assisted us in our decision-making process.

B. Substantive Matters

15. We find PJM's proposed Tariff revisions to be just and reasonable, and accept the Tariff revisions, effective July 11, 2023, subject to condition and a compliance filing, as discussed below.²⁰

1. Defining Fuel Assured Black Start Units

a. Proposal

16. PJM proposes to revise Schedule 6A to include a new category of "Fuel Assured Black Start Units,"²¹ and also proposes rules to allow intermittent resources and hybrid resources to qualify as Fuel Assured Black Start Units to help meet the needs of the PJM Region.²² Proposed Tariff, Schedule 6A, section 2 provides that:

¹⁹ 18 C.F.R. § 385.214.

²⁰ See *NRG Power Mktg., LLC v. FERC*, 862 F.3d 108, 114-15 (D.C. Cir. 2017) (discussing the Commission's authority to propose modifications to a utility's FPA section 205 rate proposal).

²¹ PJM Proposal, Transmittal at 2.

²² PJM states that it is not using this filing or the accompanying Tariff, Schedule 6A to revise the Tariff-defined term "Intermittent Resources" since that term is defined to include only Capacity Resources, and Black Start Units are not limited to Capacity Resources. Transmittal at 11, n.34. PJM identifies wind, solar, and run-of-river hydroelectric as intermittent, and hybrid resources as intermittent resources paired with storage. *Id.*, Bryson Aff. at ¶ 17.

A Fuel Assured Black Start Unit is a Black Start Unit that is capable of starting without an outside electrical supply and running 16 hours or more at full load and either stores at least 16 hours of fuel on site, can operate independently on 2 or more interstate pipelines, is directly connected to a natural gas gathering system or is an intermittent or hybrid resource that has been evaluated by the Transmission Provider to be capable of providing 16 hours of full load operation with 90% confidence and meets any other requirements specified in the PJM manuals. Unless otherwise specified as only applicable to Fuel Assured Black Start Units, all terms and conditions set forth in this Tariff, Schedule 6A applicable to Black Start Units shall be deemed to include Fuel Assured Black Start Units.²³

17. PJM explains that the 16 hours of full load operation aspect of proposal advances a resource-neutral approach to defining Fuel Assured Black Start Units, permits resource types that meet that objective technical standards to develop proposals, and encourages innovation and competition.²⁴ PJM adds that under its proposal, the choice to provide Fuel Assured Black Start Service is voluntary as with existing Black Start Service. Accordingly, PJM proposes that existing Black Start Units will be eligible to offer into an RFP to provide Fuel Assured Black Start Service. PJM notes that Black Start Service and Fuel Assured Black Start Service are two distinct services, and the existing Black Start category is not eliminated under this proposal. Black Start Units providing Fuel Assured Black Start Service are subject to additional fuel assurance requirements and risk forgoing all Black Start Service monthly revenues going forward, if they do not meet the added fuel assurance requirements. As PJM explains, this loss-of-revenue risk is not borne by Black Start Units that choose not to take on the additional requirement of fuel assurance.²⁵

b. Fuel Assurance for Natural Gas Generators

18. Under PJM's proposed revisions to Schedule 6A, section 2, a natural-gas-fueled generator will qualify as fuel assured if it has independent connections to two interstate pipelines, or if it has a direct connection to a gas gathering system. According to PJM, a single pipeline connection, standing alone, does not provide the level of assurance needed for a Black Start Unit's vital role of system restoration. The pipeline itself could be

²³ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 2 (14.1.0).

²⁴ PJM Proposal, Transmittal at 19.

²⁵ *Id.* at 27-28.

prone to service challenges or conflicting high priority demands during this type of event. PJM explains that one way to provide fuel assurance in such circumstances is through redundancy; it proposes that two independent pipeline connections meet that need. PJM further explains that direct connection to a natural gas gathering system “ahead of any interstate pipeline” also provides a higher level of fuel assurance, by avoiding or reducing the risk of pipeline-ordered curtailments.²⁶

i. Market Monitor’s Comments

19. The Market Monitor contends that the firmness of gas availability is not adequately defined and that not all firm gas supply is equivalent. The Market Monitor argues that PJM should be required to define the characteristics of gas necessary to provide Fuel Assured Black Start Service. The Market Monitor adds that the proposal needs to explain how Black Start resources will address notification issues related to gas nomination cycles.²⁷

ii. PJM’s Answer

20. PJM answers that such additional details in the Tariff are not necessary and as explained in the filing, a natural-gas-fueled generator, for which on-site fuel storage is not feasible, will qualify as fuel assured if it has independent connections to two interstate pipelines, or if it has a direct connection to a gas gathering system. PJM states that the revisions to Manual 12 include appropriate detailed provisions for PJM to validate contractual arrangements for natural gas supply and delivery.²⁸

iii. Commission Determination

21. We find that PJM’s proposed criteria to allow natural gas generators to provide Fuel Assured Black Start Service are just and reasonable. We find that PJM’s requirement for natural-gas-fueled generators to have independent connections to two interstate pipelines, or be directly connected to a gas gathering system, is a just and reasonable approach to mitigate the risk that a Black Start Unit will be unavailable if one fuel source is in short supply or otherwise unavailable at a Black Start Unit’s site. In particular, we find PJM’s assessment that a single pipeline connection would not provide an adequate level of assurance for PJM’s Fuel Assured Black Start service is reasonable because pipelines may experience service challenges (e.g., natural gas pipeline failure, or an equipment failure at a natural gas pipeline compressor station controlling gas pressure

²⁶ *Id.* at 20.

²⁷ Market Monitor June 6, 2023 Comments at 9.

²⁸ PJM June 21, 2023 Answer at 15 (citing PJM Manual 12).

on the pipeline, or, a cybersecurity incident on a natural gas pipeline system) or priority conflicts. We find that PJM's proposed means of redundancy is a reasonable approach to mitigating that risk. This risk is also mitigated by PJM's proposal to require a direct connection to a natural gas gathering system.²⁹ Further, we agree with PJM that the Tariff adequately defines how a gas resource may qualify as Fuel Assured. We also find that details of how Black Start resources will address notification issues related to gas nomination cycles need not be addressed in the Tariff but can be defined in the PJM Manuals.³⁰

2. Fuel Assurance for Intermittent and Hybrid Resources

a. Proposal

22. PJM states that it proposes to include in the Tariff the existing 16-hour runtime requirement that applies to all Black Start resources, currently stated in the PJM Manuals, and apply that requirement, as the minimum requirement for a Fuel Assured Black Start Unit because it ensures that a Black Start Unit can serve its essential purpose of getting the restoration process started. PJM explains that a 16-hour runtime helps ensure that Black Start Units are capable of multiple starts, can crank critical loads that include generators with hot start times of four hours or less, and that a 16-hour minimum run time capability reasonably provides sufficient time for the restoration process to be successful.³¹

23. PJM proposes to allow intermittent and hybrid resources to participate as Fuel Assured Black Start Units because they can add value to a restoration plan by increasing fuel diversity among the resources that are committed as Black Start Units,³² and because they can provide price competitive options to thermal Black Start resources for PJM in future Black Start and fuel assurance RFPs.³³ PJM adds that it will only rely on an intermittent and hybrid Fuel Assured Black Start Unit to provide the MW level of capacity that, based on the unit's historic operations, the unit is 90% certain to be able to sustain for 16 hours. PJM explains that it uses the Black Start Unit's historical data to determine the hourly MW value that the resource can provide each day in each month for

²⁹ PJM Proposal, Transmittal at 20.

³⁰ PJM June 21, 2023 Answer at 15 (citing PJM Manual 12).

³¹ PJM Filing, Transmittal at 18; Bennett Aff. ¶ 13; *see also* Bryson Aff. ¶ 16.

³² PJM notes that the majority of current Black Start Units are gas-fired plants. PJM Proposal, Transmittal at 11.

³³ *Id.* at 20.

16 hours. The hourly MW value is then lowered in iterative steps until a MW level is found such that the confidence level that the unit will operate at that MW level for 16 hours a day is 90%.³⁴ PJM explains that it proposed 90% value because it corresponds with the historic Equivalent Availability Factor (EAF) for combustion turbine generators in the PJM Region. PJM explains further that the EAF is the proportion of hours in a year when a unit is available to generate at full capacity, and that value has been approximately 90% in recent years for combustion turbine generators in PJM. According to PJM, this value means there is a 90% likelihood during each year that the average combustion turbine will operate at its full capacity.³⁵

b. Market Monitor's Comments

24. The Market Monitor contends that the use of a 90% confidence level as applied to intermittent and hybrid resources³⁶ is inconsistent with the goal of fuel assurance and the goal of reliable Black Start capability because the 90% confidence level is not based on analysis of outage rates of existing Black Start Units.³⁷ The Market Monitor asserts that PJM's analysis overstates the probability that an intermittent/hybrid unit will be available for at least 16 hours at the designated MW level at a 90% confidence level in specific Delivery Years. The Market Monitor contends that PJM inappropriately uses the mean of the distribution rather than the probability of the percentage of days with at least 16 hours of availability.³⁸ The Market Monitor also claims that PJM's proposal is flawed in treating every hour equivalent to every other hour when high-risk hours are the most likely to have a Black Start event. The Market Monitor further argues that PJM's analysis does not require that the resources produce output at the target level for 16 consecutive hours despite that Tariff requirement.³⁹

³⁴ *Id.* at 21; PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 18 (14.1.0).

³⁵ PJM Proposal, Transmittal at 21.

³⁶ The Market Monitor states that the term intermittent resources is not a defined term and adds that PJM does not capitalize the terms intermittent or hybrid and uses the undefined term intermittent hybrid, leading to the conclusion that these are not defined terms. The Market Monitor further states that PJM is apparently assuming discretion over the definition of these terms. Market Monitor Comments at 4 (citing *id.* at 34).

³⁷ *Id.* at 3-4.

³⁸ Market Monitor Comments to PJM Deficiency Response at 2-3.

³⁹ *Id.* at 4 (citing PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT

25. The Market Monitor also states that PJM does not permit other Black Start resources to be available with only 90% confidence and contends that intermittent resources should not be allowed to be Fuel Assured Black Start Units unless they can demonstrate the same level of reliability as other Black Start resources.⁴⁰ As such, the Market Monitor contends that, in adopting the approach for intermittent and hybrid resources, the proposed revisions discriminate against other types of Black Start resources. Last, the Market Monitor states that PJM failed to include the 90% confidence level in the Tariff, meaning that PJM can arbitrarily change the 90% threshold without stakeholder or Commission review.⁴¹

c. Deficiency Letter Response and Pleadings

26. The deficiency letter requested that PJM explain: (1) the process for calculating the 90% confidence interval for intermittent and hybrid resources and how the process ensures that the resource can operate for 16 consecutive hours; and (2) whether the 90% value is less stringent than the 110% critical load requirement from the PJM Manual 36 (Minimum Critical Black Start Requirement).

27. In response, PJM explains that in its qualification process for intermittent and hybrid resources, it analyzes whether a given MW output level satisfies the 90% confidence standard based on historical performance,⁴² and “if a given MW level fails the standard, PJM inserts a lower MW value and runs the test again.” Conversely, “PJM will also rerun the test if the result is above 90%, to assess if the resource may qualify for a higher MW level of fuel assurance.”⁴³ PJM explains that it will increase or decrease the MW value initially assumed in the first stage of the process, and repeat the analysis as often as necessary, to determine the input MW level that is the lowest necessary to result in a confidence interval of at least 90%.⁴⁴ PJM explains that for each year of the historical data, PJM: (1) calculates the MW that a Black Start Unit can produce for each hour of each day; (2) sums for each day the total number of hours with MW greater than or equal to the Black Start Unit’s MW ICAP; and (3) assigns a value of 1 for each day where the sum is greater than or equal to 16 hours and a value of 0 for days with less than

SCHEDULE 6A, § 18 (13.0.0)).

⁴⁰ *Id.* at 3-5.

⁴¹ *Id.* at 4.

⁴² In its example of the process, PJM used a weighted average of nine years.

⁴³ Deficiency Letter Response at 4 (citing Hauske Supplemental Aff.).

⁴⁴ *Id.*

16 hours. PJM states that it calculates the confidence level for the year as the sum of a simple weighted average, which is the product of the Equivalent Load Carrying Capability (ELCC) weather weight⁴⁵ and the percentages of days greater than or equal to 16 hours.⁴⁶ Through this process, PJM determines the level of MW that will qualify as Fuel Assured at the 90% confidence level that would contribute to meeting the critical load during a restoration event.

28. PJM answers that its proposal establishes objective technical requirements that intermittent and hybrid resources must meet to serve as Fuel Assured Black Start Units. PJM adds that those requirements ensure that intermittent and hybrid resources can provide reliable Black Start Service, while giving resource owners a clear standard that they can work to meet in order to be considered for providing this service. PJM reiterates that it derives the Black Start Unit capacity of an intermittent resource or hybrid resource unit by finding (based on historic operation) the output that the unit is 90% likely to sustain for 16 hours. PJM states that it does not expect a Black Start Unit to operate at full load continuously for 16 hours during a restoration event and that PJM relies on Black Start Units to be capable of conducting multiple attempts to start one or more critical loads. PJM answers that, contrary to the Market Monitor's arguments, its proposal establishes objective technical requirements that intermittent and hybrid resources must meet to serve as Fuel Assured Black Start Units.⁴⁷

29. PJM explains that its methodological approach of calculating availability is no different from what can happen with a Fuel Assured combustion turbine resource that stores 16 hours of fuel on site. A combustion turbine resource could be unavailable for months as the result of a major overhaul outage in a given year, and therefore would have an EAF of less than 90% for that specific year yet could still have an average EAF over 90% for an extended period of years that include years with EAF values higher than 90%.⁴⁸

30. PJM asserts that it has multiple existing run of river Black Start Units in the PJM Region and since there are no availability factor requirements to qualify them as Black

⁴⁵ PJM states that it obtains the weights for each year from the ELCC 2021 Report. Available at: <https://www.pjm.com/-/media/planning/res-adeq/elcc/elcc-report-december-2021.ashx>. The ELCC weather factor accounts for the likelihood that the weather experienced in each historic year of the analysis will recur. Deficiency Letter Response at 4.

⁴⁶ Deficiency Letter Response at 4-5.

⁴⁷ *Id.* at 5; PJM September 12, 2023 Answer at 9.

⁴⁸ PJM September 12, 2023 Answer at 8.

Start Units, it is reasonable to apply the 90% confidence level to determine whether such intermittent resources can qualify as Fuel Assured Black Start Services.⁴⁹ PJM explains that there are reasons that support using different methods to satisfy the requirement of providing 16 hours of Fuel Assured Black Start Service for different resource types, “based on inherent differences in those resource types, noting that intermittent and hybrid resources are significantly dependent on uncontrollable factors such as weather, while natural gas resources, particularly those connected to more than one pipeline, have more options such as purchasing firm service, making arrangements to access gas storage services and other strategies, each of which is more controllable than being subject to the vagaries of the weather.”⁵⁰

31. PJM asserts that the 110% critical load factor is used to help set the target MW level of black start service needed in the aggregate for a transmission owner zone, whereas the 90% confidence interval is used to set the MW level of Fuel Assured Black Start Service that an individual intermittent, hybrid, or run-of-river hydro resource can provide. PJM reiterates that the 110% critical load requirement on a locational basis for a Black Start Unit is to account for an average forced outage rate (5%) plus an allowance for additional, unexpected critical load (5%).⁵¹

32. Last, PJM argues that the Market Monitor relies on the incorrect equivalence between Black Start events and resource adequacy critical hours. PJM explains that the “high risk hours” for purposes of resource adequacy analysis are not “the only hours that matter” for Black Start analysis and planning because system blackouts can occur at any time and can be caused by many different circumstances and factors.⁵²

d. Commission Determination

33. We find PJM’s proposal regarding the determination of fuel assurance for intermittent and hybrid resources just and reasonable. PJM’s approach is designed to capture the probability that on any day within a historical period, such a resource will be able to operate for a total of 16 hours, not necessarily continuously, at a level at least as

⁴⁹ PJM June 21, 2023 Answer at 11-12.

⁵⁰ Deficiency Letter Response Answer at 11.

⁵¹ *Id.* at ¶ 4.

⁵² For example, PJM states that “there were no capacity shortages or emergency conditions in place prior to the start of the 2003 Northeast blackout. The confluence of multiple factors that might result in a Black Start event may or may not include the conditions that accompany a capacity shortage.” PJM September 12 Answer at 3.

high as the target MW level.⁵³ PJM's proposal to use a 90% confidence interval for intermittent and hybrid resources is intended to be comparable to the EAF for combustion turbine generators in the PJM Region.⁵⁴

34. As described above, PJM proposes an iterative process to analyze whether a given MW output level satisfies the 90% confidence standard, and "if a given MW level fails the standard, PJM inserts a lower MW value and runs the test again."⁵⁵ PJM will "rerun the test if the result is above 90%, to assess if the resource may qualify for a higher MW level of fuel assurance."⁵⁶ The Market Monitor contends that the PJM analysis overstates intermittent and hybrid resources' availability and is flawed because it does not properly capture (based on historical data) whether a Black Start resource will operate at a given capacity level for at least 16 hours each day over the course of any particular year at the 90% threshold.⁵⁷ We find this approach attempts to reflect the probability that on any day within a historical period, the resource will be able to operate for at least 16 hours.⁵⁸ We also agree with PJM that because there are currently no availability factor requirements to qualify run of the river resources as Black Start Units, it is reasonable to apply the 90% confidence level to determine whether such resources can qualify as Fuel Assured Black Start Units.

35. We find reasonable PJM's proposed method of establishing the confidence level for intermittent and hybrid resources as it reflects actual historical operation for those resources. Specifically, the level of MW that will qualify as Fuel Assured from such resources is adjusted to reflect historical performance, and the specific 90% confidence level is comparable to the calculation PJM uses for combustion turbines (the capacity available based on the Black Start Unit's historical operations).⁵⁹ While we note that in

⁵³ See *infra* § IV B.1.

⁵⁴ As PJM explains, a "combustion turbine resource could be unavailable for months as the result of a major overhaul outage in a given year, and therefore would have an EAF of less than 90% for that specific year, yet could still have an average EAF over 90% for an extended period of years that include years with EAF values higher than 90%." PJM September 12 Answer at 8.

⁵⁵ Deficiency Letter Response at 4 (citing Hauske Supplemental Aff.).

⁵⁶ *Id.*

⁵⁷ Market Monitor Comments to PJM Deficiency Response at 2-3.

⁵⁸ PJM Proposal, Transmittal at 20-21.

⁵⁹ *Id.* at 21.

any given year, the actual performance for a particular resource may fall above or below 90%, it is not clear why that is a basis for rejection, as argued by the Market Monitor, when PJM is evaluating the performance of such resources over the course of multiple years.⁶⁰ Moreover, while the Market Monitor contends that alternative approaches to the calculation of availability of intermittent and hybrid resources, PJM only need propose a just and reasonable approach, and the concerns raised by the Market Monitor are not a sufficient basis to reject the proposed revisions.⁶¹

36. We also agree with PJM that because Black Start events can occur at any time, it is reasonable to determine whether the resource is available 90% of the time over the entirety of the historical period.⁶² While the Market Monitor suggests that high risk hours are the appropriate benchmark for determining Black Start resource availability we agree with PJM that, while a focus on high risk hours may be appropriate for purposes of resource adequacy analysis, they are not “the only hours that matter” for Black Start analysis and planning because system blackouts can occur at any time and can be caused by many different circumstances and factors. For example, a blackout within PJM could be caused by many different events that are not correlated with traditional high risk hours such as a coordinated cyber-attack, physical attack, or cascading outage.⁶³

37. With regard to the Market Monitor’s concern that PJM’s analysis does not require that Fuel Assured Black Start Units produce output at the target level for 16 consecutive hours, we find that the proposed Tariff provision in question does not explicitly require

⁶⁰ As noted below, PJM proposes to revise Tariff, Schedule 6A, section 14 to provide that a Fuel Assured Black Start Unit that stores fuel on-site and fails in any month to store the fuel and non-fuel consumables needed to meet its fuel assurance run hour requirements except for allowable conditions specified in the PJM Manuals does not qualify to receive Black Start revenues in that month.

⁶¹ While there are different methodologies for calculating confidence levels, we find that PJM’s use of weighted average is not unjust and unreasonable. *See Entergy Arkansas, LLC v. FERC*, 40 F.4th 689, 701 (D.C. Cir. 2022) (“Rather, at bottom, Petitioners simply argue that, in its view, a better method exists. ‘But FERC is not required to choose the best solution, only a reasonable one.’”) (quoting *Petal Gas Storage, LLC v. FERC*, 496 F.3d 695, 703 (D.C. Cir. 2007)).

⁶² *See* PJM September 12 Answer at 3.

⁶³ *See Id.* (stating “there were no capacity shortages or emergency conditions in place prior to the start of the 2003 Northeast blackout. The confluence of multiple factors that might result in a black start event may or may not include the conditions that accompany a capacity shortage.”).

16 hours of consecutive service.⁶⁴ Instead, it states that Fuel-Assured Black Start Units are capable of providing 16 hours of full load operation with 90% confidence and meet any other requirements specified in the PJM Manuals.⁶⁵ In addition, we agree with PJM that its proposal is consistent with the expected conditions and the performance PJM will require of Fuel Assured Black Start Resources. PJM explains that it does not expect a Black Start Resource to operate at full load continuously for 16 hours during a restoration event.⁶⁶ Rather, as noted above, PJM states it relies on Black Start Units to be capable of conducting multiple attempts to start one or more critical loads, and during a restoration event, the actual output of a Black Start Unit is expected to vary from minimum load to some fraction of full load as critical loads are started.⁶⁷

38. Further, we do not agree that the determination of the availability of Fuel Assured Black Start Units based on the proposed revisions for intermittent and hybrid resources discriminates against other types of Black Start Resources.⁶⁸ As PJM explained, there are valid reasons that support using different methods to satisfy the requirement of providing 16 hours of Fuel Assured Black Start Service for different resource types, with differences being based on the inherent differences in those resource types.⁶⁹ As noted, the proposed revisions help address a legitimate need for additional diversity in the types of resources that can qualify as a Black Start Unit in PJM while reflecting their historical performance in the level of MW that will qualify as Fuel Assured for intermittent and

⁶⁴ Market Monitor Comments to Deficiency Response at 4 (citing OJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 18) (13.0.1).

⁶⁵ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 2 (13.0.0)).

⁶⁶ Deficiency Letter Response at 5 (citing Hauske Supplemental Aff.).

⁶⁷ *Id.* at 4-5.

⁶⁸ As PJM supports in its filing, the proposal is designed to enable a resource-neutral approach to defining eligibility to open the door for various resource types to meet the objective technical standards. PJM Filing, Transmittal at 19.

⁶⁹ See e.g., *PJM Interconnection L.L.C.*, 176 FERC ¶ 61,056, at P 35 (2021) (addressing PJM's Effective Load Carrying Capability framework for determining the capacity value of Variable Resources, Limited Duration Resources, and Combination Resources), stating "...it is erroneous to contend 'that PJM's markets must ensure 'comparable' outcomes for ELCC Resources and Unlimited Resources, despite the fact that these resources have different physical characteristics.'" (citing *PJM Interconnection, L.L.C.*, 175 FERC ¶ 61,084, at P 109 (2021))."

hybrid resources.⁷⁰ As discussed below, such resources would be required to meet the Fuel Assurance requirement of the proposed revisions to the Tariff.

39. With regard to the Market Monitor's concerns that PJM did not define the term intermittent resources in Schedule 6A,⁷¹ we do not find the filing unjust and unreasonable for failing to include the specific definition of intermittent resources in Schedule 6A. The use of the term intermittent, in the context of the Tariff, is sufficiently clear to identify the resources. The term intermittent means "not happening regularly or continuously; stopping and starting repeatedly or with periods in between."⁷² PJM's OATT similarly defines intermittent resources as resources "with output that can vary as a function of its energy source."⁷³

40. We find, however, that PJM's proposed description in the Tariff of the methodology for determining the eligibility of intermittent resources should be more explicit.⁷⁴ Therefore, we accept the filing, subject to the condition that PJM revise its Tariff, consistent with PJM's Deficiency Letter Response, to make clear that the requirement for intermittent and hybrid resources is to be capable of providing no less than 16 hours of operation per day (which need not be continuous) at a megawatt level that provides a confidence level of 90% based on an evaluation of the unit's historical operation over a representative period of time. Accordingly, we direct PJM to make a compliance filing within 30 days of the date of issuance of this order.

⁷⁰ See PJM Proposal, Transmittal at 11. Deficiency Letter Response, Bennett Supp. Aff. ¶ 15 (noting that for intermittent, run-of-river, and hybrid resources, "[a]s these types of resources become an increasing share of the region's generation fleet, resource owners that respond to this opportunity can help maintain or increase PJM's options for units that can meet the region's black start needs.

⁷¹ Market Monitor June 6, 2023 Comments at 4.

⁷² Cambridge Dictionary (Online), <https://dictionary.cambridge.org/us/dictionary/english/intermittent>. See Google Oxford Languages Dictionary ("occurring at irregular intervals; not continuous or steady").

⁷³ PJM, Intra-PJM Tariffs, I-J-K, OATT Definitions – I – J – K (14.1.0).

⁷⁴ See PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 2 (14.1.0).

3. Participation of Distributed Energy Resources

a. Market Monitor's Comments

41. The Market Monitor maintains that it is not clear whether Distributed Energy Resources (DERs) could participate as Black Start Resources, but if PJM wants to rely on DERs for Black Start Service, PJM should carefully define the requirements for DERs to participate rather than provide a general reference to the requirements for grid connected resources.⁷⁵

b. PJM's Answer

42. PJM answers that it proposes no change to the rules for the provision of Black Start Service by DERs and therefore, the Market Monitor's argument is out of scope. PJM reiterates that Fuel Assured Black Start Units can be thermal, hydro, energy storage, intermittent, hybrid, or distributed energy/demand resources with on-site generator resources, if they can meet PJM's Black Start Service requirements in the Tariff and manuals that apply to all Black Start Units.⁷⁶

c. Commission Determination

43. As PJM explains, the Tariff provides no restrictions on the type of resource that can provide Black Start Service.⁷⁷ To qualify, eligible resources must demonstrate that they meet the objective technical qualifications; those qualifications do not limit resources based on resource-type, but instead measure their expected capability.⁷⁸ However, to ensure clarity, we condition our acceptance of the filing on PJM revising its Tariff to clarify, consistent with its answer and Deficiency Letter Response, that DERs are eligible to qualify to provide Fuel Assured Black Start Service and that the requirements applicable Fuel Assured Black Start Units will apply to DERs.⁷⁹ Accordingly, we direct PJM to make a compliance filing within 30 days of the date of issuance of this order.

⁷⁵ Market Monitor June 6, 2023 Comments at 8.

⁷⁶ PJM June 21, 2023 Answer at 17 (citing PJM Manual 12); Deficiency Letter Response at 2.

⁷⁷ Deficiency Letter Response at 2.

⁷⁸ *Id.* at 12-13 (citing Bennet Supplemental Aff. at 6-9).

⁷⁹ *Id.* at 2-3.

4. Revisions to Compensation for Fuel Assured Black Start Units

a. Fixed Charge for Fuel Assured Units

i. Proposal

44. Pursuant to Schedule 6A, the annual Black Start Service revenue requirement for each designated Black Start Service generator is determined in accordance with the formula set forth in Schedule 6A, section 18. As noted above, the Schedule 6A formula includes an incentive factor designed to provide compensation for Black Start Service, including compensation for the actual costs of providing Black Start Service plus an incentive payment to encourage provision of such service. Under the existing Tariff, the Base Formula Rate for Black Start Units' Fixed Black Start Service Costs is the product of the Net Cost of New Entry (Net CONE), the Black Start Unit Capacity, and a cost allocation factor, X. The existing Black Start Service cost allocation factor is 0.02 for combustion turbine units and 0.01 for hydro units. PJM proposes a cost allocation factor of 0.02 for all Fuel Assured Black Start Units, regardless of resource type, using the Base Formula Rate. PJM explains that using a common minimum cost allocation factor for all Fuel Assured Black Start Units is just and reasonable because PJM is proposing a common standard for the fuel assurance all Fuel Assured Black Start Units are expected to provide.⁸⁰

ii. Market Monitor's Comments

45. The Market Monitor states that it supports the efforts to increase the reliability of Black Start resources by defining fuel assurance and believes that all Black Start resources should have an assured supply of fuel. However, the Market Monitor contends that PJM's proposal does not meet its own stated purpose of ensuring fuel adequacy and, therefore, will overcharge customers and fail to ensure reliable Black Start Service.⁸¹ The Market Monitor argues that PJM fails to explain the increase in a cost allocation factor (X) of 100% (i.e., from 0.01 to 0.02) for all Fuel Assured Black Start Units using the Fixed Black Start Service cost formula.⁸² The Market Monitor contends that the proposed Tariff revisions discriminate against existing units that meet the fuel assurance

⁸⁰ PJM Proposal, Transmittal at 24-26 (citing Hauske Aff.); PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 18 (13.0.0).

⁸¹ Market Monitor July 7, 2023 Comments at 1-2.

⁸² *Id.* at 6-7.

criteria and imposes unnecessary costs on customers, and, as a result, unjustly and unreasonably increases costs for Black Start Service.⁸³

iii. PJM's Answer

46. PJM answers that absent the proposed Tariff revision, some Fuel Assured Black Start Units would have an allocation factor of 0.01 while other Fuel Assured Black Start Units would have an allocation factor of 0.02. PJM states that approximately 13% of its existing Black Start Service Units are currently on the Base Formula Rate with an X Factor of 0.01 and all other Black Start Units in the PJM Region already have an X factor of 0.02. PJM argues that it is reasonable to afford all Fuel Assured Black Start Units the same allocation factor of 0.02, instead of reserving that higher factor for only a subset of fuel assured units.⁸⁴

iv. Commission Determination

47. We accept the proposed revisions to establish a 0.02 default allocation factor for all Fuel Assured Black Start Units. As PJM states, the purpose of its proposal is to address PJM's concern that the current Tariff does not provide for the procurement of Black Start Units that are Fuel Assured when such units are needed for system restoration in specific zones. To address this concern, PJM proposes to define and compensate a new type of Black Start resource that is fuel assured. As such, we find that expanding the default allocation factor to all Fuel Assured Black Start Units provides a common and resource-neutral basis for the fuel assurance for all Fuel Assured Black Start Units, recognizing that all such resources meet PJM's criteria for fuel assurance.⁸⁵ As noted by PJM, absent this Tariff revision, some Fuel Assured Black Start Units would have an allocation factor of 0.01 while other Fuel Assured Black Start Units would have an allocation factor of 0.02.⁸⁶ Because PJM is proposing to use the same allocation factor

⁸³ *Id.* at 2-3.

⁸⁴ PJM maintains that if it assumes all of the hydro units are picked to be Fuel Assured Black Start Units in the RFP, which is unlikely, the overall increase in PJM's annual Black Start revenues is estimated to be a very small increase of approximately 2.1%. PJM Answer at 12.

⁸⁵ As PJM acknowledges, this is the default allocation factor for Black Start Units that do not provide documentation of their actual costs. See Transmittal at 25; The allocation factor was included to provide the opportunity to recover capital expenditures made to provide Black Start Service. See PJM Proposal, Transmittal, Docket No. ER09-730-000, at 8 (filed Feb. 19, 2009).

⁸⁶ PJM June 21, 2023 Answer at 12.

for all Fuel Assured Black Start Units, regardless of resource type, we do not agree with the Market Monitor that the proposed revisions discriminate against existing fuel-assurance-capable Black Start Units. Rather, existing fuel-assurance-capable Black Start Units are provided the same opportunity as any other resource to offer through the Black Start RFP process to become Fuel Assured Black Start Units.

b. Incentive Factor

i. Proposal

48. A Black Start Unit's annual revenue requirement is a function of its specific fixed costs (Fixed Black Start Service Costs), variable costs, training costs, fuel storage costs, a multiplier equal to 1, and an incentive factor, Z.⁸⁷ According to PJM, if Z is zero, then the resulting multiplier is simply 1, which means it has no effect on the revenue requirement.⁸⁸ Under the current Tariff, Z is set at 0.10 for Black Start Units using the Base Formula Rate, and zero for Black Start Units that use the Capital Cost Recovery Rate.⁸⁹ PJM proposes to increase the Z factor for all Fuel Assured Black Start Units that use the Base Formula Rate from 0.10 to 0.20. Therefore, under the generic rate, the resulting multiplier (1+Z) is 1.20.⁹⁰

⁸⁷ Under the generic rate, a Black Start Unit's annual revenue requirement equals: {(Fixed Black Start Service Costs) + (Variable Black Start Service Costs) + (Training Costs) + (Fuel Storage Costs)} * (1+Z), where Z is equal to an incentive factor of up to 10%. PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 18 (13.0.0).

⁸⁸ PJM Proposal, Transmittal at 26.

⁸⁹ PJM states that unit owners have a choice to opt for: (1) a Capital Cost Recovery Rate and increase their fixed cost recovery by documented incremental Black-Start related capital costs; or (2) the Base Formula Rate, and receive a modest incentive multiplier to their fixed cost component. PJM Proposal, Transmittal at 27.

⁹⁰ Under the existing Tariff, the Capital Cost Recovery Rate equals: (FERC-approved rate) + (Incremental Black Start Capital Costs * CRF). Tariff, Schedule 6A (11.0.0), § 18. PJM is proposing to revise this formula as follows: Capital Cost Recovery Rate = (FERC-approved rate) + (Incremental Black Start Capital Costs * CRF) + (Fuel Assurance Capital Costs * CRF). PJM states that only units that voluntarily take on the risk of lost revenue that comes with the status of being a Fuel Assured Black Start Unit are eligible for this Fuel Assurance Capital Costs rate option. PJM Proposal, Transmittal at 33.

49. According to PJM, this multiplier of 1.20 is reasonable because it provides an incentive for unit owners to take on the added risks of committing their resources as Fuel Assured Black Start Units. Fuel Assured Black Start Units forfeit all Black Start Service revenues for a given period if the resource fails to meet the added testing or performance requirements that are specific to fuel assurance.⁹¹

50. PJM states that the increased Z factor can help offset the added risks of losing Black Start Service revenues for Fuel Assured Black Start Units that do not continuously maintain on site fuel and other consumables they need to ensure a 16-hour run-time.⁹² PJM adds that the Z factor ensures that PJM has sufficient offers into the RFP process to meet the Fuel Assured Black Start Unit requirement in every location that it is needed. Further, PJM noted that the stakeholder support for these Tariff revisions indicates that this is a cost PJM loads are willing to accept, to help mitigate the potential risk of adverse impacts on system restoration time from unavailability of Black Start Units that are not fuel assured.⁹³

ii. Market Monitor's Comments

51. The Market Monitor states that the Z factor is an incentive multiplier applied to all components of Black Start Service revenue requirements under Tariff, and that the entire cost of the resource, including the X factor, is increased by the Z factor. The Market Monitor contends that PJM fails to explain why it is reasonable to increase the Z factor by 100% for all such Black Start Units..⁹⁴

iii. PJM's Answer

52. PJM answers that because participation in a Black Start Service RFP is voluntary, it is necessary to provide the incentives as proposed. PJM also reiterates that the higher Z factor's 10% increase in annual revenue requirements is comparable to the revenue *loss* a unit owner faces if it forfeits one month of revenue, which is about 8% of the Black Start Unit's annual revenues, because it does not continuously maintain on site the fuel and other consumables it needs to ensure a 16-hour runtime.⁹⁵

⁹¹ PJM Proposal Transmittal at 27 (citing Hauske Aff. ¶ 7).

⁹² *Id.* at 27-28.

⁹³ *Id.* at 32.

⁹⁴ Market Monitor July 7, 2023 Comments at 6.

⁹⁵ PJM June 21, 2023 Answer at 13-14.

iv. Commission Determination

53. We accept the proposed revisions to increase the incentive mechanism for units that qualify as Fuel Assured. The proposed incentive factor, which was originally implemented to encourage Black Start Service participation,⁹⁶ recognizes the additional risk associated with being a Fuel Assured Black Start Unit. As PJM explains, Black Start Units providing Fuel Assured Black Start Service are subject to additional fuel assurance requirements and risk forgoing all Black Start Service monthly revenues going forward, if they do not meet the added fuel assurance requirements. As PJM explains, this loss-of-revenue risk is not borne by existing Black Start Units which choose not to take on the additional requirement of fuel assurance.⁹⁷ Therefore, we find the proposed Z factor increase is just and reasonable.⁹⁸

c. Fuel Assurance Capital Costs

i. Proposal

54. Under current Schedule 6A, the Capital Cost Recovery Rate includes a Capital Recovery Factor (CRF) that is applied to Incremental Black Start Capital Costs, and under the proposed revisions, the CRF is applied to Fuel Assurance Capital Costs. The CRF reflects a recovery period determined by the age of the Black Start Units, and PJM also proposes to revise Schedule 6A, section 6 to specify that Black Start Units electing to recover new or additional Fuel Assurance Capital Costs shall commit to provide Black Start Service for an initial capital recovery period based on the age of the unit and the remaining life of the Black Start equipment.⁹⁹ PJM states that the current Tariff's shortest recovery period is five years for units older than 16 years.¹⁰⁰ PJM explains that while that recovery period will remain five years for Incremental Black Start Capital

⁹⁶ See PJM Proposal, Transmittal, Docket No. ER09-730-000, at 8 (filed Feb. 19, 2009) (citing “[t]he incentive factor, as it exists currently, was contemplated to provide compensation for Black Start Service providers which includes reimbursement for the actual out of pocket costs of providing Black Start Service plus an adequate, but not excessive, incentive payment to encourage generators to provide such service.”).

⁹⁷ PJM Proposal at 28.

⁹⁸ *Id.*, Hauske Aff. at ¶ 24.

⁹⁹ PJM Proposal, Transmittal at 33-34; PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 6 (iii) (13.0.0).

¹⁰⁰ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 18 (13.0.0).

Costs on older units, PJM proposes to lengthen to 10 years for Fuel Assurance Capital Costs associated with units that are older than 16 years.¹⁰¹ PJM explains that the increase of the capital recovery period to 10 years for units older than 16 years was a compromise put forth in the stakeholder process to lessen the financial impact on Black Start Service customers (largely network transmission service loads) from fuel assurance conversions.

ii. Market Monitor Comments

55. The Market Monitor states that under this proposal, PJM would pay inflated and incorrect CRF values for additional investments associated with fuel assurance for units selected for Black Start Service prior to June 6, 2021.¹⁰² The Market Monitor contends that those CRF values are in excess of the correct values because they fail to account for the significant tax reduction provided for in the Tax Cuts and Job Act of 2017. The Market Monitor contends that despite the fact that the CRF rate is inflated as applied to investments already made, there is no reason to perpetuate the overpayment by using incorrect CRF values for new investment in fuel assurance.¹⁰³ The Market Monitor contends that PJM should be required to use the CRFs that reflect current tax laws for any additional investments in fuel assurance.¹⁰⁴

iii. PJM Answer

56. PJM contends that the Market Monitor's request to use the CRF formula rates for Black Start Service prior to June 1, 2021 is out of scope, and states that the CRF values to be applied to Fuel Assured Black Start Units selected for Black Start Service after June 1, 2021 use the formula rate in the existing Tariff.¹⁰⁵

¹⁰¹ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 18 (14.1.0).

¹⁰² Market Monitor June 6, 2023 Comments at 7.

¹⁰³ Market Monitor July 7, 2023 Answer at 7-8.

¹⁰⁴ Market Monitor June 6, 2023 Comments at 8.

¹⁰⁵ PJM states that the issue of approved CRFs that reflect current tax laws is limited to Black Start Units in service prior to June 1, 2021 and is currently pending before the Commission in Docket No. EL21-91-000 in settlement and hearing proceedings. See PJM Answer at 17. Additionally, proposed OATT Schedule 6A, section 18 provides that the "CRF applicable to Black Start Capital Costs and/or for Fuel Assurance Capital Costs, of Black Start Units selected for Black Start Service after June 6, 2021, shall be updated annually on March 1 for: (i) federal income tax rates as utilized by the U.S. Internal Revenue Service in effect at the time of the annual CRF update; (ii)

iv. Commission Determination

57. The Market Monitor is incorrect in stating that PJM has proposed to use an overstated CRF rate based on incorrect tax rates to compensate the owners of Black Start resources for new investment in fuel assurance. As PJM stated, the CRF value applied to Fuel Assured Black Start Units would be the formula rate in the Tariff. We note that the CRF values applicable to Black Start Capital Costs of Black Start Units selected for Black Start Service prior to June 1, 2021 also are pending in settlement and hearing proceedings, and PJM has proposed no revisions to the determination of CRF values in this proceeding. Accordingly, we dismiss the Market Monitor's comments as beyond the scope of this proceeding.

5. Environmental Permitting

a. Market Monitor's Comments

58. The Market Monitor contends that PJM's proposed revisions do not require Black Start owners to inform PJM about any environmental permits that could limit the ability of the units to provide Black Start Service when required.¹⁰⁶

b. PJM's Answer

59. PJM answers that the Market Monitor comments are outside the scope of this proceeding. PJM states that its revisions to Manual 12 state that Fuel Assured Black Start Units must provide details of their emissions permit limitations for review as requested by PJM. PJM adds that to provide additional flexibility during a restoration event, "Fuel Assured Black Start Units will make best efforts to obtain emission (e.g. Title V) and effluent (e.g., National Pollutant Discharge Elimination System) permit modifications and/or waivers to accommodate operations during a restoration situation (operating below normal economic min values), if available and feasible."¹⁰⁷ PJM states that it would include this additional flexibility as a factor in its evaluation that the Black Start Unit is viable to be selected as a Fuel Assured Black Start Unit.¹⁰⁸

average state tax rate; and (iii) debt interest rates and shall be posted on the PJM website by March 31 each year." See PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 18 (14.1.0).

¹⁰⁶ Market Monitor June 6, 2023 Comments at 8.

¹⁰⁷ PJM June 21, 2023 Answer at 18-19.

¹⁰⁸ *Id.*

c. Commission Determination

60. The proposed revisions to the Performance Standards and Outage Restrictions of Schedule 6A, section 7 require that a Fuel Assured Black Start Unit must meet the fuel assurance requirements as specified in the PJM Manuals.¹⁰⁹ While limitations related to environmental permits could affect the ability to meet Black Start resource availability and run time requirements, PJM Manual 14D requires that Fuel Assured Black Start Units provide details of their emissions limitations for review.¹¹⁰ As such, the information on limitations related to environmental permits is available to PJM.¹¹¹ Moreover, as noted, PJM would include permit modifications and/or waivers to accommodate operations during a restoration event in the evaluation process to be selected as a Fuel Assured Black Start Unit.¹¹² Accordingly, we do not find that the Market Monitor's concern renders the proposed revisions unjust and unreasonable.

6. Testing and Performance Criteria

a. Proposal

61. PJM's current Tariff requires that all Black Start Units be tested annually, in accordance with the Tariff and Manuals, to verify that they can be started without being connected to the Transmission System. PJM proposes to revise Tariff, Schedule 6A, section 12 to provide that a Fuel Assured Black Start Units that are dual fuel must conduct an annual test on both fuels.¹¹³ PJM also proposes to revise Tariff, Schedule 6A, section 14 to provide that a Fuel Assured Black Start Unit that stores fuel on-site and fails in any month to store the fuel and non-fuel consumables needed to meet its fuel assurance run hour requirements except for allowable conditions specified in the PJM Manuals does

¹⁰⁹ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 7(d) (14.1.0).

¹¹⁰ See PJM Manual 14D, § 7.3.5 (Fuel, Emissions and Operational Data Reporting).

¹¹¹ PJM Manual 14D, § 7.3.5 provides that PJM requires all generation resources to provide necessary operational data so that PJM can make the decisions that maintain system reliability. The Manual also states that prior to the start of each winter season, PJM will notify and request from all members with generation resources, a report of fuel and emission information by generating unit.

¹¹² PJM June 21, 2023 Answer at 18-19.

¹¹³ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 12 (14.1.0)

not qualify to receive Black Start revenues in that month.¹¹⁴ According to PJM, this provision is needed to ensure that the Fuel Assured Black Start Unit will always be in a position to meet its Black Start obligations, given that meeting those obligations depends on having on site all that it needs to meet the 16-hour run-time requirement.¹¹⁵

62. PJM states that all Black Start Units must meet the performance requirements set forth in Tariff, Schedule 6A, sections 7-9, as well as additional technical performance requirements specified in PJM Manuals. In particular, Tariff, Schedule 6A provides that a Black Start Unit must be able to: (a) maintain frequency and voltage under varying load; (b) close its output circuit breaker to a dead (deenergized) bus within the time specified in the PJM Manuals; and (c) maintain rated output for a period of time identified by each Transmission Owner's system restoration requirements, in conjunction with the Transmission Provider. PJM proposes to revise Tariff, Schedule 6A, section 7 to add, as a performance requirement, that a Fuel Assured Black Start Unit must meet the fuel assurance requirements as specified in the PJM Manuals.¹¹⁶

b. Market Monitor's Protest

63. The Market Monitor contends that the current testing and reporting protocols are not adequate because system restoration after a blackout will not be scheduled as determined by the unit owner, but the current testing approach allows the Black Start Unit owner to determine the time of the annual test. The Market Monitor contends that PJM should be required to add provisions to the Tariff that requires testing all Black Start resources multiple times a year, including summer and winter, with no advance notice to the owner. The Market Monitor also states testing for natural gas Black Start Units should include the testing for the availability of fuel from multiple pipelines, and the test should simultaneously include all pipelines relied on for fuel assurance status, and immediate reporting of failure to meet the standards for the levels of fuel and non-fuel consumables.¹¹⁷

¹¹⁴ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 14 (14.1.0).

¹¹⁵ PJM Proposal, Transmittal at 38.

¹¹⁶ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 7 (14.1.0).

¹¹⁷ Market Monitor June 6, 2023 Comments at 8-9.

c. PJM's Answer

64. PJM answers that the Market Monitor's proposal regarding testing and reporting protocols is outside the scope of this proceeding. PJM adds that the existing Tariff, Schedule 6A, section 12, plainly states that Black Start Units shall be tested annually in accordance with the Tariff and the PJM Manuals and the only change to that provision in the instant filing is to clarify that "Fuel Assured Black Start Units that are dual fuel must conduct an annual test on both fuels."¹¹⁸

d. Commission Determination

65. As discussed above, PJM's existing Tariff, Schedule 6A, section 12, provides that Black Start Units shall be tested annually in accordance with the Tariff and the PJM Manuals.¹¹⁹ We find PJM's proposed Tariff revisions to the annual testing protocols, including annual testing and forfeiture rules for Fuel Assured Black Start Units, are just and reasonable as they appropriately balance the need for testing against the costs to PJM and the resource owner of doing multiple tests.¹²⁰ As noted, to ensure that a Fuel Assured Black Start Unit that relies on dual fuel capability would be available to meet Black Start Service requirements, PJM revised Schedule 6A, section 12 to include that "Fuel Assured Black Start Units that are dual fuel must conduct an annual test on both fuels."¹²¹ We find that further revisions to the frequency and notification provisions of the testing protocols are beyond the scope of the proposed revisions.

7. Stored Water Levels

a. Market Monitor's Comments

66. The Market Monitor contends that PJM's proposal is unjust and unreasonable because it does not contain any stored water level requirements to apply either to reservoirs or pumped hydro for units that rely on water storage levels to meet the Black Start Service requirement. The Market Monitor argues that PJM should add requirements

¹¹⁸ PJM June 21, 2023 Answer at 17-18.

¹¹⁹ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 12 (13.0.0).

¹²⁰ PJM Proposal, Transmittal at 37-38. *See infra* § 6, addressing PJM's Testing and Performance Criteria.

¹²¹ PJM Proposal, Transmittal at 38.

and penalties related to required water levels that parallel the provisions for not maintaining required fuel storage levels.¹²²

b. PJM's Answer

67. PJM explains that under its proposal, Fuel Assured Storage Black Start Units are penalized in any month they fail to maintain 16 hours of stored water/fuel. PJM states that the penalties apply to thermal, pumped storage hydro, energy storage, and DER / Demand Response resources where onsite fuel, water level, stored energy, etc. is not maintained for run hour requirements.¹²³

c. Commission Determination

68. To qualify as a Fuel Assured Black Start Unit, a resource is required to be capable of starting without an outside electrical supply and running 16 hours or more within a 24 hour period at full load.¹²⁴ Resources relying on reservoirs and pumped hydro units are subject to the same penalty as other Fuel Assured Black Start resources if they “fail[s] in any month to store the fuel and non-fuel consumables needed to meet its fuel assurance run hour requirements.”¹²⁵ We find that this provision reasonably ensures qualifying resources will provide fuel assurance based on the established run time availability provisions, and we disagree with the Market Monitor’s argument that that PJM’s proposal unjust and unreasonable for not including a specific water storage level requirement for reservoirs or pumped storage.¹²⁶

8. Black Start Resource Planning and Cost Allocation

a. Market Monitor's Comments

69. The Market Monitor states that PJM has substantial flexibility in procuring Black Start resources and is responsible for Black Start resource selection, but Schedule 6A does not allow PJM to plan and recover the costs of Black Start Service in the most

¹²² Market Monitor June 6, 2023 Comments at 10.

¹²³ PJM June 21, 2023 Answer at 15-16 (citing Bennett Aff. at ¶ 12).

¹²⁴ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 2 (14.1.0).

¹²⁵ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A (14.1.0), § 14.

¹²⁶ PJM June 21, 2023 Answer at 15-16.

efficient and least discriminatory manner possible. The Market Monitor contends that current Black Start Service planning is done on a zonal basis, and that PJM should be directed to revise Schedule 6A so that Black Start Service planning is provided based on the needs of the PJM region and costs allocated regionally.¹²⁷ The Market Monitor maintains that a failure to address the zonal versus regional issue will result in customers paying unnecessary costs if PJM enforces the existing rule requiring for the procurement of at least one fuel assured resource in every zone.¹²⁸ The Market Monitor states that because fuel assurance may be provided across zonal boundaries, depending on the actual electrical details including cranking paths, proposed Tariff, Schedule 6A should clearly define the method for determining locational needs of Fuel Assured Black Start units.¹²⁹

b. PJM's Answer

70. PJM answers that the Market Monitor's proposal to change the provisions for allocating the costs of procuring Black Start Service on a Zonal basis is beyond the scope of this proceeding because PJM did not propose any changes in this proceeding. Further, PJM states that it performs a system restoration plan analysis in each Transmission Owner Zone, and the current restoration approach aligns with the concept of Black Start Service being allocated to the Transmission Owner Zone where the critical load is served.¹³⁰

c. Commission Determination

71. Schedule 6A, section 26 of the Tariff provides that revenue requirements for Black Start Units will be allocated to the receiving Transmission Owner's zone, and Black Start Units that serve multiple zones will have their costs allocated by critical load percentage.¹³¹ PJM has provided no revisions to these provisions.¹³² Therefore, the Market Monitor's contention that PJM should make changes to the allocation of costs for

¹²⁷ Market Monitor June 6, 2023 Comments at 11.

¹²⁸ According to PJM, the Market Monitor is referring to the existing Tariff, Schedule 6A, sections 25, 26, and 27 provisions for allocating the costs of procuring Black Start Service on a Zonal basis. *See* PJM June 21, 2023 Answer at 16.

¹²⁹ *Id.*

¹³⁰ PJM June 21, 2023 Answer at 16.

¹³¹ PJM, Intra-PJM Tariffs, OATT SCHEDULE 6A, OATT SCHEDULE 6A, § 2, § 28(14.1.0).

¹³² PJM June 21, 2023 Answer at 16.

either Fuel Assured Black Start Units or traditional Black Start Units is beyond the scope of this proceeding.¹³³

72. In addition, as noted above, PJM obtains Black Start Resources through an RFP evaluation process to ensure that critical load requirements, location, cost and operational characteristics are considered,¹³⁴ as detailed in the PJM manuals.¹³⁵ The Market Monitor has not supported its argument that the Tariff should be revised to include the planning details for Black Start Service with the additional procurement Fuel Assured Black Start Units beyond the manual provisions.¹³⁶

The Commission orders:

(A) PJM's proposed Tariff revisions in Docket No. ER23-1874-000 are hereby accepted, subject to condition and to the submission of a compliance filing, to be effective July 11, 2023, as discussed in the body of this order.

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

By the Commission.

(S E A L)

Debbie-Anne A. Reese,
Deputy Secretary.

¹³³ Market Monitor June 6, 2023 Comments at 11.

¹³⁴ See *infra* § I.

¹³⁵ PJM Manual 14D, § 10.2

¹³⁶ PJM June 21, 2023 Answer at 16.

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185 FERC ¶ 61,013
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.

Docket Nos. ER23-1874-000
ER23-1874-001

ERRATA NOTICE

(Issued October 6, 2023)

On October 6, 2023, the Commission issued an “Order Accepting Tariff Revisions Subject to Condition,” in the above-captioned proceeding. *PJM Interconnection, L.L.C.*, 185 FERC ¶ 61,013 (2023). The order inadvertently listed the effective date as July 11, 2023, instead of July 12, 2023. This errata notice hereby corrects the effective date in paragraphs 1, 15, and the ordering paragraph.

1. In P 1, the last line is revised to read as follows:

* * * In this order, we accept PJM’s proposed revisions, effective **July 12, 2023**, subject to condition, and a further compliance filing to be submitted within 30 days of the date of issuance of this order, as discussed below.

2. P 15 is revised to read as follows:

We find PJM’s proposed Tariff revisions to be just and reasonable, and accept the Tariff revisions, effective **July 12, 2023**, subject to condition and a compliance filing, as discussed below.²⁰

3. Ordering Paragraph (A) is revised to read as follows:

(A) PJM’s proposed Tariff revisions are hereby accepted, subject to condition and to the submission of a compliance filing, to be effective **July 12, 2023**, as discussed in the body of this order.

Debbie-Anne A. Reese,
Deputy Secretary.

²⁰ See *NRG Power Mktg., LLC v. FERC*, 862 F.3d 108, 114-15 (D.C. Cir. 2017) (discussing the Commission’s authority to propose modifications to a utility’s FPA section 205 rate proposal).

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