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September 15, 2014

Via eTariff

Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Re: PJM Interconnection, L.L.C., Docket No. ER14-2883-000

Dear Secretary Bose:

Pursuant to Section 205 of the Federal Power Act¹ and part 35 of the rules and regulations of the Federal Energy Regulatory Commission (“Commission” or “FERC”),² PJM Interconnection, L.L.C. (“PJM”) hereby submits revisions to Schedule 6A of the PJM Open Access Transmission Tariff (“Tariff”) to (i) make minor modifications to the Black Start Service compensation provisions to clarify several aspects of Black Start Unit compensation and better align compensation provisions to the new five year RTO-wide request for proposal (“RFP”) process; and (ii) change the revenue requirement provision to accommodate a new category of Black Start Units that are selected through the new Black Start reliability backstop proposal provisions detailed in the PJM Manuals. PJM requests an effective date of November 15, 2014 which is more than 60 days from the date of this filing.

¹ 16 U.S.C. § 824d (2012).

² 18 C.F.R. Part 35 (2010).

I. BACKGROUND

The Tariff sets forth details necessary for generation units that provide Black Start Service³ -- Black Start Units -- that are included in Transmission Owner system restoration plans and are critical for restoration of the Transmission System in the case of a de-energizing event. Specifically, Schedule 6A provides for basic performance and testing criteria for identified Black Start Units, sets the annual Black Start Service revenue requirements for the PJM Region and establishes the appropriate cost recovery for Black Start Service providers. In turn, Transmission Customers are charged and pay for Black Start Service in accordance with allocation methodologies set forth in Schedule 6A. Details regarding the Black Start Unit procurement process are contained in PJM Manual 14D.

In July, 2013, PJM proposed revisions to Schedule 6A of the Tariff to implement enhancements made to PJM's Black Start Unit procurement process and system restoration planning, and alter PJM's Black Start Service cost allocation to support the provision of cross-zonal Black Start Service.⁴ In the July 2013 Filing, PJM noted that stakeholders had recently expanded the System Restoration Strategy Task Force ("SRSTF") stakeholder charter to include consideration of compensation methodologies and anticipated addressing such issues in a future filing.⁵ FERC accepted the July 2013 Filing, effective September 9, 2013.⁶

In this filing, PJM seeks FERC acceptance of minor revisions to the compensation provisions contained in Schedule 6A, including clarifications to:

³ Capitalized terms not otherwise defined herein have the meaning specified in the Amended and Restated Operating Agreement of PJM Interconnection, L.L.C. ("Operating Agreement") or the Tariff, as appropriate.

⁴ *PJM Interconnection, L.L.C.*, Transmittal Letter, Docket No. ER13-1911-000 (filed July 9, 2013) ("July 2013 Filing").

⁵ July 2013 Filing at n.5.

⁶ *PJM Interconnection, L.L.C.*, 144 FERC ¶ 61,191 (2013).

- allow Black Start Units which are Energy Resources to be compensated based on MWs awarded in an RFP;
- allow Automatic Load Rejection units to recover NERC compliance costs;
- add liquefied natural gas and propane to the types of stored fuel that are eligible for fuel storage costs;
- minimum tank suction level compensation when the fuel storage tank is jointly owned; and
- align review of compensation formula with the five-year RFP process.

Also, PJM seeks to add a revenue requirement provision related to a category of Black Start Units that are procured through a new reliability backstop procurement mechanism adopted in PJM's Manual 14D.

II. PROPOSED TARIFF REVISIONS

A. BLACK START COMPENSATION REVISIONS

PJM, along with its stakeholders developed minor revisions to clarify several aspects of Black Start Unit compensation and better align compensation provisions to the new five year RTO-wide RFP process resulting from the July 2013 Filing. These changes are described in more detail as follows.

1. Clarification To Recognize Compensation To Energy Resource Black Start Units

PJM's compensation structure for Black Start Units allows for collection of Fixed Black Start Service Costs under either the Base Formula Rate or the Capital Cost Recovery Method, as further detailed in paragraph 18 of Schedule 6A. As currently written, the Base Formula Rate compensation is determined based on the Black Start Unit's Installed Capacity – or "ICAP" – value. Not all Black Start Units have an ICAP value. That is, only those Black Start Units which are Generation Capacity Resources in PJM's markets will have an ICAP value. Currently, all Black Start Units in the PJM Region are Generation Capacity Resources; however, it is

possible for a Black Start Unit to be an Energy Resource without an ICAP value. Under the current Tariff language, determining compensation for an Energy Resource Black Start Unit would not be possible. In this filing, PJM proposes to revise Schedule 6A of the Tariff to provide that compensation under the Base Formula Rate for Black Start Units that are Energy Resources will be calculated using the value of the awarded megawatts (“MWs”) of Black Start Service to align with the amount of Black Start Service the unit will provide, as follows:

“Black Start Unit Capacity” is either: (i) the Black Start Unit’s installed capacity, expressed in MW, for those Black Start Units that are Generation Capacity Resources; or (ii) the awarded MWs in the Transmission Provider’s request for proposal process under the PJM Manuals, for those Black Start Units that are Energy Resources.⁷

2. Clarification to Allow Automatic Load Rejection Units To Recover NERC Compliance Costs

Currently, the Tariff sets the Variable Black Start Service Cost (“Variable BSSC”) to zero for units that are able to automatically remain operating at reduced levels when disconnected from the grid – automatic load rejection (or “ALR”) units. Such ALR units are on line continuously and costs are recovered as fixed operation and maintenance costs. As such, ALR units would not typically be eligible for variable costs. When the NERC compliance costs were subsumed in to the category of Variable BSSC, PJM intended all Black Start Units to be able to collect the variable costs of meeting NERC Reliability Standards,⁸ yet PJM inadvertently excluded ALR units. PJM believes that just as non-ALR units are able to include NERC compliance costs in their Variable BSSC, so should ALR units should be able to collect

⁷ See OATT SCHEDULE 6A, proposed Schedule 6A, Paragraph 18 under the definition of “Black Start Unit Capacity.”

⁸ See *PJM Interconnection, L.L.C.*, Docket No. ER09-703-000, Transmittal Letter at 7 (filed Feb. 19, 2009); *PJM Interconnection, L.L.C.*, 127 FERC ¶ 61,197, order on compliance filing, 128 FERC ¶ 61,249 (2009).

NERC compliance costs, so long as they are documented in accordance with the procedures contained in Paragraph 17 of Schedule 6A (providing for review by PJM's Independent Market Monitor, as well as by PJM). To accommodate this cost compensation, PJM proposes adding the following paragraph under the Variable BSSC compensation component Paragraph 18 of Schedule 6A.

Black Start Units with the demonstrated ability to automatically remain operating, at reduced levels, when disconnected from the grid may receive NERC compliance costs associated with providing Black Start Service in addition to the formula above, if approved in accordance with the procedures in Paragraph 17.⁹

3. Adding Liquefied Natural Gas and Propane To The Types Of Fuel For Which Fuel Storage Costs Can Be Compensated

Currently, under the Tariff, Black Start Units that operate using oil are the only Black Start Units that are eligible for compensation of fuel storage costs. Although this may have made sense in years past, there are now more fuel options available and the PJM Region is much larger than it was when this provision was first included in the Tariff (therefore sweeping in a greater variety of black start units). Accordingly PJM proposes the following modification to the existing rule:

~~Black Start Units that cannot use oil for fuel shall calculate Fuel Storage Costs or "FSC" as zero.~~ Black Start Units that store liquefied natural gas, propane, or oil~~can use oil for fuel on site~~ shall calculate Fuel Storage Costs in accordance with the following formula:

$$\{ \text{MTSL} + [(\# \text{ Run Hours}) * (\text{Fuel Burn Rate})] \} * (\text{12 Month Forward Strip} + \text{Basis}) * (\text{Bond Rate})^{10}$$

⁹ OATT SCHEDULE 6A

¹⁰ OATT SCHEDULE 6A

4. Clarification Regarding Eligibility For Recovery Of Minimum Tank Suction Levels

Under the Tariff, Black Start Units can include in their fuel storage costs the cost of maintaining a minimum tank suction level (“MTSL”) if the unit is not equipped with a direct current pump. The MTSL is necessary for the fuel pumps to function properly and comprises a level of unusable oil stored in the tank above the pump’s inlet lines (i.e., where the oil flows into the pump). In some instances, co-located Black Start Units use a common fuel storage tank. To address this issue, PJM proposes to revise its Tariff to clarify where Black Start Units share a common fuel storage tank, only one Black Start Unit will be eligible for recovery of MTSL in its fuel storage costs. These revisions add the following language to the description of MTSL in the fuel tank storage formula in Paragraph 18 of Schedule 6A.

“MTSL” is the “minimum tank suction level” and shall apply where no direct current pumps are available for the Black Start Unit. In the case where more than one Black Start Unit shares a common fuel tank, only one Black Start Unit will be eligible for the recovery of this volume in its fuel storage cost calculation. The MTSL for the other Black Start Unit(s) sharing the common fuel tank shall be zero.¹¹

5. Alignment Of PJM Review Of Compensation Formula With Request For Proposal Process

The Tariff provides that PJM will review the Black Start Service compensation formula and its cost components every two years and report on the results to stakeholders. While there is always an opportunity for PJM or its members to initiate a review of the Black Start Service compensation cost components at any time, PJM is seeking to realign the formal compensation cost review process with the RTO-wide Black Start Service procurement process accepted by the

¹¹ OATT SCHEDULE 6A

Commission as part of PJM's July 2013 Filing. That procurement process occurs every five years. Thus, PJM proposes to modify the compensation cost review process as follows:

~~At least~~ Every two-five years, PJM shall review the formula and its costs components set forth in this section, and report on the results of that review to stakeholders.¹²

B. REVISIONS TO CLARIFY REVENUE REQUIREMENT PROCESS CONCERNING THE BLACK START RELIABILITY BACKSTOP

Schedule 6A of the Tariff provides PJM "is responsible for developing a coordinated and efficient system restoration plan that identifies all of the locations where Black Start Units are needed. The PJM Manuals shall set forth the criteria and process for selecting and identifying the Black Start Units necessary to commit to providing Black Start Service at the identified locations."¹³ Under the current process, contained in Manual 14D, if there is inadequate response to the incremental RFP process (which is employed to replace Black Start Units that are retiring or seek to terminate provision of Black Start Service) or the five-year RTO-wide RFP process to address a Black Start Unit shortage, there is no further process for obtaining Black Start Units. These Black Start Unit shortages can lead to reliability issues such as delayed restoration of power to critical load. Recognizing the importance of having a plan in place in the event inadequate Black Start Service is procured, PJM worked with the SRSTF to develop a reliability backstop to ensure adequate Black Start Service is procured and available.

Pursuant to Section 10 of Manual 14D (endorsed by the Markets & Reliability Committee on July 31, 2014),¹⁴ the reliability backstop is triggered if PJM has a shortage of

¹² OATT SCHEDULE 6A

¹³ Schedule 6A of the Tariff, at Paragraph 4.

¹⁴ The redlined Manual 14D language as presented to and endorsed by, the Markets and Reliability Committee on July 31, 2014 is available at the following URL. <http://www.pjm.com/~media/committees->

Black Start Unit generation in a Zone or Zones following the RTO-wide RFP and/or failed incremental RFP(s) for Black Start Units. In addition there must be no cross-zonal solution available and no Regional Transmission Expansion Plan transmission solutions available (e.g., operational performance baseline upgrade). PJM would trigger the reliability backstop after discussions with the relevant Transmission Owner, affected state(s) and the PJM System Operations Subcommittee for Transmission Owners (known as the SOS-T).¹⁵ The reliability backstop would be procured through an incremental RFP in which the Transmission Owner would provide a Black Start Service proposal whereby the Black Start Unit may be owned by the Transmission Owner (e.g. procurement of a diesel generator), by a generation-owning affiliate of a Transmission Owner or by contracting with a third-party generation-owning company. Any Black Start Unit built through the reliability backstop process must meet all PJM Black Start Unit testing requirements and all NERC standards for Black Start Unit generation. The resulting reliability backstop Black Start Unit may only be used to provide Black Start Service. The unit may not participate in any other PJM markets such as energy or capacity.

The SRSTF engaged in discussions about Black Start Service compensation for a Black Start Unit procured through the reliability backstop process if such unit was owned by the Transmission Owner (and not a generation-owning affiliate or a third party generation-owning company). To ensure all interested parties have the ability to review and comment on the Transmission Owner proposed cost recovery for such unit, the SRSTF determined the Transmission Owner should seek cost-recovery through a filing with the Commission under

[groups/committees/mrc/20140731/20140731-item-03-srstf-phase-2-proposal-proposed-manual-14d-revisions-redline.ashx](https://www.ferc.gov/groups/committees/mrc/20140731/20140731-item-03-srstf-phase-2-proposal-proposed-manual-14d-revisions-redline.ashx)

¹⁵ See, id., Section 10.3 of Manual 14D

Section 205 of the Federal Power Act to recover capital costs, ongoing operation and maintenance costs, depreciation and fuel as transmission assets.¹⁶ In this way, the Commission can address any issues it has with black start cost recovery through a transmission Tariff in the context of a specific proposal from a Transmission Owner and a review of the facts and circumstances which gave rise to the need for such a filing. As a result, PJM proposes to modify paragraph 6A¹⁷ of Schedule 6A to include the following provision related to Transmission Owner-owned Black Start Units procured through the reliability backstop process:

6A. Black Start Units which are owned or contracted for by a Transmission Owner to provide Black Start Service as a result of the black start reliability backstop process defined in the PJM Manuals, shall be subject to cost recovery through such Transmission Owner's annual revenue requirement under such Transmission Owner's Attachment H of the Tariff, as filed with, and accepted by, FERC under Section 205 of the Federal Power Act and in accordance with Section 9 of the Tariff, or through such other cost recovery mechanism, provided that such cost recovery mechanism is filed with and accepted by FERC. The relevant Transmission Owner shall commit to provide, or effectuate the provision of, Black Start Service from such a Black Start Unit for the FERC-approved cost recovery period. The Transmission Provider may terminate the commitment with one year advance notice of its intention to the Transmission Owner. Provision of Black Start Service from a Black Start Unit obtained through the black start reliability backstop process defined in the PJM Manuals shall be subject to Sections 7 through 13 of this Schedule 6A. The Revenue Requirements, Credits, and Charges provisions contained in sections 16 through 27 of this Schedule 6A, shall not apply to Black Start Units obtained as a result of the black start reliability backstop process defined in the PJM Manuals.¹⁸

III. STAKEHOLDER PROCESS AND EFFECTIVE DATE

PJM worked through the SRSTF to develop the compensation and backstop proposals over the course of a year. On July 31, 2014, the Markets and Reliability Committee endorsed by

¹⁶ If the Black Start Service procured under the reliability backstop process is through a generation affiliate of the Transmission Owner, or through a third-party generation owner, it will recover costs through the compensation methodology – either the Base Formula Rate methodology or Capital Cost Recovery – provided under Schedule 6A of the Tariff.

¹⁷ PJM renumbered the existing Paragraph 6A to 6B, and made conforming change to cross references, as shown in the redlined Tariff sections submitted with this filing.

¹⁸ OATT SCHEDULE 6A

acclamation the Tariff proposal regarding compensation with two objections and two abstentions and the Tariff proposal regarding the reliability backstop with no objections and two abstentions. On August 21, 2014, the Members Committee endorsed by acclamation the Tariff proposal regarding compensation with two objections and no abstentions and the Tariff proposal regarding the reliability backstop with no objections or abstentions.

PJM requests an effective date of November 15, 2014 which is at least 60 days from the date of this filing.

IV. DOCUMENTS ENCLOSED

PJM encloses the following:

1. This transmittal letter;
2. Attachment A – Revised pages of the PJM Tariff (redlined version); and
3. Attachment B – Revised pages of the PJM Tariff (clean version).

V. COMMUNICATIONS

Correspondence and communications with respect to this filing should be sent to the following persons:

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VI. SERVICE

PJM has served a copy of this filing on all PJM Members and on all state utility regulatory commissions in the PJM Region by posting this filing electronically. In accordance

with the Commission's regulations, PJM will post a copy of this filing to the FERC filings section of its internet site, located at the following link: <http://www.pjm.com/documents/ferc-manuals/ferc-filings.aspx> with a specific link to the newly-filed document, and will send an e-mail on the same date as this filing to all PJM Members and all state utility regulatory commissions in the PJM Region alerting them that this filing has been made by PJM and is available by following such link. If the document is not immediately available by using the referenced link, the document will be available through the referenced link within 24 hours of the filing. Also, a copy of this filing will be available on the FERC's eLibrary website located at the following link: <http://www.ferc.gov/docs-filing/elibrary.asp> in accordance with the Commission's regulations and Order No. 714.

VII. CONCLUSION

PJM respectfully requests that the Commission accept this filing and grant an effective date of November 15, 2014.

Respectfully submitted,



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On behalf of
PJM Interconnection, L.L.C.

Attachment A

Revisions to the
PJM Open Access Transmission Tariff

(Marked / Redline Format)

SCHEDULE 6A

Black Start Service

References to section numbers in this Schedule 6A refer to sections of this Schedule 6A, unless otherwise specified.

To ensure the reliable restoration following a shut down of the PJM transmission system, Black Start Service is necessary to facilitate the goal of complete system restoration. Black Start Service enables the Transmission Provider to designate specific generators called Black Start Units whose location and capabilities are required to re-energize the transmission system following a system-wide blackout. The Transmission Provider shall administer the provision of Black Start Service. PJMSettlement shall be the Counterparty to the purchases and sales of Black Start Service.

TRANSMISSION CUSTOMERS

1. All Transmission Customers and Network Customers must obtain Black Start Service through the Transmission Provider, with PJMSettlement as the Counterparty, pursuant to this Schedule 6A.

PROVISION OF BLACK START SERVICE

2. A Black Start Unit is a generating unit that has equipment enabling it to start without an outside electrical supply or a generating unit with a high operating factor (subject to Transmission Provider concurrence) with the demonstrated ability to automatically remain operating, at reduced levels, when disconnected from the grid. A Black Start Unit shall be considered capable of providing Black Start Service only when it meets the criteria set forth in the PJM manuals. For the purposes of this Schedule 6A, the expected life of the Black Start Unit shall take into consideration expectations regarding both the enabling equipment and the generation unit itself.

3. A Black Start Plant is a generating plant that includes one or more Black Start Units. A generating plant with Black Start Units electrically separated at different voltage levels will be considered multiple Black Start Plants.

4. The Transmission Provider is responsible for developing a coordinated and efficient system restoration plan that identifies all of the locations where Black Start Units are needed. The PJM Manuals shall set forth the criteria and process for selecting or identifying the Black Start Units necessary to commit to providing Black Start Service at the identified locations. No Black Start Unit shall be eligible to recover the costs of providing Black Start Service in the PJM Region unless it agrees to provide such service for a term of commitment established under section 5, ~~or~~ 6, or 6A below.

5. Owners of Black Start Units selected to provide Black Start Service in accordance with section 4 and electing to forego any recovery of new or additional Black Start Capital Costs shall commit to provide Black Start Service from such Black Start Units for an initial term of no less than two years and authorize the Transmission Provider to resell Black Start Service from its

Black Start Units. The term commitment shall continue to extend until the Black Start Unit owner or the Transmission Provider provides written, one-year advance notice of its intention to terminate the commitment or the commitment is involuntarily terminated pursuant to Section 15 of this Schedule 6A.

6. Owners of Black Start Units selected to provide Black Start Service in accordance with section 4 and electing to recover new or additional Black Start Capital Costs shall commit to provide Black Start Service from such Black Start Units for a term based upon the age of the Black Start Unit or the longest expected life of the Incremental Black Start Capital Cost, as set forth in the applicable CRF Tables in Paragraph 18. For those Black Start Units that elect to recover new or additional Black Start Capital Costs in addition to a prior, FERC-approved cost recovery rate, the applicable commitment period shall be the longer of the FERC-approved recovery period or the applicable term of commitment as set forth in the CRF Tables in Paragraph 18. The Transmission Provider may terminate the commitment with one year advance notice of its intention to the Black Start Unit owner, but the Black Start Unit owner shall be eligible to recover any amount of unrecovered Fixed Black Start Service Costs over a period not to exceed five years. A Black Start Unit owner may terminate the provision of Black Start Service with one year advance notice and consent of the Transmission Provider (or its commitment period may be involuntarily terminated pursuant to the section 15 below). Such Black Start Unit shall forego any otherwise existing entitlement to future revenues collected pursuant to this Schedule 6A and fully refund any amount of the Black Start Capital Costs recovered under a FERC-approved rate (recovered on an accelerated basis pursuant to the provisions of section 17(i)) in excess of the amount that would have been recovered pursuant to section 18 during the same period. At the conclusion of the term of commitment established under this section 6, a Black Start Unit shall commence a new term of commitment under either section 5 or 6, as applicable.

6A. Black Start Units which are owned or contracted for by a Transmission Owner to provide Black Start Service as a result of the black start reliability backstop process defined in the PJM Manuals, shall be subject to cost recovery through such Transmission Owner's annual revenue requirement under such Transmission Owner's Attachment H of the Tariff, as filed with, and accepted by, FERC under Section 205 of the Federal Power Act and in accordance with Section 9 of the Tariff, or through such other cost recovery mechanism, provided that such cost recovery mechanism is filed with and accepted by FERC. The relevant Transmission Owner shall commit to provide, or effectuate the provision of, Black Start Service from such a Black Start Unit for the FERC-approved cost recovery period. The Transmission Provider may terminate the commitment with one year advance notice of its intention to the Transmission Owner. Provision of Black Start Service from a Black Start Unit obtained through the black start reliability backstop process defined in the PJM Manuals shall be subject to Sections 7 through 13 of this Schedule 6A. The Revenue Requirements, Credits, and Charges provisions contained in sections 16 through 27 of this Schedule 6A, shall not apply to Black Start Units obtained as a result of the black start reliability backstop process defined in the PJM Manuals.

~~6A~~**B.** In the event that a Black Start Unit fails to fulfill its commitment established under section 5 to provide Black Start Service, receipt of any Black Start Service revenues associated with the non-performing Black Start Unit shall cease and, for the period of the unit's non-

performance, the Black Start Unit owner shall forfeit the Black Start Service revenues associated with the non-performing Black Start Unit that it received or would have received had the Black Start Unit performed, not to exceed revenues for a maximum of one year.

In the event that a Black Start Unit fails to fulfill its commitment established under section 6 above, such unit shall forego any otherwise existing entitlement to future revenues collected pursuant to this Schedule 6A and fully refund any amount of the Black Start Capital Costs recovered under a FERC-approved rate (recovered on an accelerated basis pursuant to the provisions of section 17(i)) in excess of the amount that would have been recovered pursuant to section 18 during the same period, but such unit remains eligible to establish a new commitment under section 5 or 6.

Performance Standards and Outage Restrictions

7. In addition to the performance capabilities set forth in the PJM Manuals, Black Start Units must have the capabilities listed below. These capabilities must be demonstrated in accordance with the criteria set forth in the PJM manuals and will remain in effect for the duration of the commitment to provide Black Start Service.

- a. A Black Start Unit must be able to close its output circuit breaker to a dead (de-energized) bus within the time specified in the PJM Manuals.
- b. A Black Start Unit must be capable of maintaining frequency and voltage under varying load.
- c. A Black Start Unit must be able to maintain rated output for a period of time identified by each Transmission Owner's system restoration requirements, in conjunction with the Transmission Provider.

8. Each owner of Black Start Units or Black Start Plants must maintain procedures for the start-up of the Black Start Units.

9. If a Black Start Unit is a generating unit with a high operating factor (subject to Transmission Provider concurrence) with the ability to automatically remain operating at reduced levels when disconnected from the grid, this ability must be demonstrated in accordance with the criteria set forth in the PJM manuals.

10. No more than one Black Start Unit at a Black Start Plant may be subject to planned maintenance at any one time. This restriction excludes outages on common plant equipment that may make all units unavailable. A Black Start Unit not currently designated as critical and on the same voltage level may be substituted for a Black Start Unit that is subject to a planned outage to permit a concurrent planned outage of another critical Black Start Unit at the Black Start Plant to begin. The Black Start Unit used as a substitute must have had a valid annual test within the previous 12 months.

11. Concurrent planned outages at multiple Black Start Plants within a zone may be restricted based on Transmission Owner requirements for Black Start Service availability. Such restrictions must be predefined and approved by Transmission Provider in accordance with the PJM manuals.

Testing

12. To verify that they can be started and operated without being connected to the Transmission System, Black Start Units designated as critical shall be tested annually in accordance with the PJM manuals. The Black Start Unit owner shall determine the time of the annual test.

13. Compensation for energy output delivered to the Transmission System during the annual test shall be provided for the Black Start Unit's minimum run time at the higher of the unit's cost-capped offer or real-time Locational Marginal Price plus start-up and no-load costs for up to two start attempts, if necessary. For Black Start Units that are generating units with a high operating factor (subject to Transmission Provider's concurrence) with the ability to automatically remain operating at reduced levels when disconnected from the grid, an opportunity cost will be provided to compensate the unit for lost revenues during testing.

14. To receive Black Start Service revenues, a Black Start Unit must have a successful annual test on record with the Transmission Provider within the preceding 13 months.

15. If a Black Start Unit fails the annual test, the unit may be re-tested within a ten-day period without financial penalty. If the Black Start Unit does not successfully re-test within that ten-day period, monthly Black Start Service revenues will be forfeited by that unit from the time of the first unsuccessful test until such time as the unit passes an annual test. If the Black Start Unit owner determines not to make the necessary repairs to enable the Black Start Unit to pass the annual test, the Black Start Unit owner will have failed to fulfill its commitment pursuant to section 5 or section 6, whichever is applicable, of this Schedule 6A and will be subject to the additional forfeiture of revenues set forth in section 6BA.

Revenue Requirements

16. A Black Start Unit Owner's annual Black Start Service revenue requirement shall be the sum of the annual Black Start Service revenue requirements for each generator that is designated as providing Black Start Service and has provided the Transmission Provider with a calculation of its annual Black Start Service revenue requirements. A separate line item shall appear on the participants' Transmission Provider bill for Black Start Service charges and credits.

17. Black Start Service revenue requirements for each Black Start Unit shall be based, at the election of the owner, on either (i) a FERC-approved rate for the recovery of the cost of providing such service for the entire duration of the commitment term set forth in either section 5 or 6, as applicable, or (ii) the formula rates set forth in section 18 of this Schedule 6A for the commitment term set forth in Paragraph 5 or 6 as applicable. Each generator's Black Start Service revenue requirements shall be an annual calculation. Requests for Black Start Service

revenue requirements and for changes to the Black Start Service revenue requirements must be submitted to the Market Monitoring Unit for review and analysis, with supporting data and documentation, pursuant to section III of Attachment M – Appendix and the PJM Manuals, with a copy to the Office of the Interconnection, by no later than May 3 of each year. The Market Monitoring Unit and the Black Start Unit owner shall attempt to come to agreement on the level of each component included in the Black Start Service revenue requirements by no later than May 14 of each year. By no later than May 21 of each year, the Black Start Unit owner shall notify the Office of the Interconnection and the Market Monitoring Unit in writing whether it agrees or disagrees with the Market Monitoring Unit’s determination of the level of each component included in the Black Start Service revenue requirements. The Black Start Unit owner may also submit Black Start Service revenue requirements that it chooses to the Office of the Interconnection by no later than May 21 of each year, provided that (i) it has participated in good faith with the process described in this section and in section III of Attachment M - Appendix, (ii) the Black Start Service revenue requirements are no higher than the level defined in any agreement reached by the Black Start Unit owner and the Market Monitoring Unit that resulted from the foregoing process, and (iii) the Black Start Service revenue requirements are accepted by the Office of the Interconnection subject to the criteria set forth in the Tariff and PJM Manuals.

The Office of the Interconnection shall determine whether to accept the values submitted by the Black Start Unit owner subject to the requirements of the Tariff and the PJM Manuals by no later than May 27. If the Office of the Interconnection does not accept the values submitted by the Black Start Unit owner in such case, the Black Start Unit owner may file its proposed values with the Commission for approval. Pursuant to section III of Attachment M - Appendix, if the Office of the Interconnection accepts the Black Start Service revenue requirements submitted by the Black Start Unit owner in such case, the Market Monitoring Unit may petition the Commission for an order that would require the Black Start Unit owner to utilize the values determined by the Market Monitoring Unit or the Office of the Interconnection or such other values as determined by the Commission. The annual calculation of Black Start Service revenue requirements shall become effective on June 1 of each year, except that no change to a Black Start Service revenue requirement shall become effective until the existing revenue requirement has been effective for at least twelve months. Notwithstanding the foregoing, the deadlines set forth in this section 17 shall not apply to a Black Start Unit owner’s election to select a new method of recovery for its Fixed BSSC.

18. The formula for calculating a generator’s annual Black Start Service revenue requirement is:

$$\{(Fixed\ BSSC) + (Variable\ BSSC) + (Training\ Costs) + (Fuel\ Storage\ Costs)\} * (1 + Z)$$

For units that have the demonstrated ability to operate at reduced levels when automatically disconnected from the grid, the formula is revised to:

$$(Training\ Costs) * (1 + Z)$$

Where:

Fixed BSSC

Black Start Units with a commitment established under Paragraph 5 shall calculate Fixed BSSC or “Fixed Black Start Service Costs” in accordance with the following Base Formula Rate:

Base Formula Rate:

$$\text{Net CONE} * \text{Black Start Unit Capacity} * X$$

Where:

“Net CONE” is the then current installed capacity (“ICAP”) net Cost of New Entry (expressed in \$/MW year) for the CONE Area where the Black Start Unit is located.

“Black Start Unit Capacity” is either: (i) the Black Start Unit’s installed capacity, expressed in MW, for those Black Start Units that are Generation Capacity Resources; or (ii) the awarded MWs in the Transmission Provider’s request for proposal process under the PJM Manuals, for those Black Start Units that are Energy Resources.

“X” is the Black Start Service allocation factor unless a higher or lower value is supported by the documentation of the actual costs of providing Black Start Service. For such units qualifying as Black Start Units on the basis of demonstrated ability to operate at reduced levels when automatically disconnected from the grid, X shall be zero. For Black Start Units with a commitment established under section 5, X shall be .01 for Hydro units, .02 for CT units.

Black Start Units with a commitment established under Paragraph 6 above shall calculate Fixed BSSC or “Fixed Black Start Service Costs” in accordance with one of the following formulas, as applicable:

Capital Cost Recovery Rate – NERC-CIP Specific Recovery

$$(\text{Net Cone} * \text{Black Start NERC-CIP Unit Capacity} * X) + (\text{Incremental Black Start NERC-CIP Capital Costs} * \text{CRF})$$

Where:

“Net Cone” is the then current installed capacity (“ICAP”) net Cost of New Entry (expressed in \$/MW year) for the CONE are where the Black Start Unit is located.

“Black Start NERC-CIP Unit Capacity” is the Black Start Unit’s installed capacity, expressed in MW, but, for purposes of this calculation, capped at 100 MW for Hydro units, or 50 MW for CT units.

“Incremental Black Start NERC-CIP Capital Cost” are those capital costs documented by the owner or accepted by the Commission for the incremental equipment solely necessary to enable a Black Start Unit to maintain compliance with mandatory Critical Infrastructure Protection Reliability Standards (as approved by the Commission and administered by the applicable Electric Reliability Organization).

“CRF” or “Capital Recovery Factor” is equal to the levelized CRF as set forth in the applicable CRF Table set forth below.

A Black Start Unit may elect to terminate forward cost recovery under this Capital Cost Recovery Rate – NERC-CIP Specific Recovery at any time and seek cost recovery under the Capital Cost Recovery Rate, pursuant to the terms and conditions set forth below.

Capital Cost Recovery Rate

$(\text{FERC-approved rate}) + (\text{Incremental Black Start Capital Costs} * \text{CRF})$

Where:

“FERC-approved rate” is the Black Start Unit’s current FERC-approved recovery of costs to provide Black Start Service, if applicable. To the extent that a Black Start Unit owner is currently recovering black start costs pursuant to a FERC-approved rate, that cost recovery will be included as a formulaic component for calculating the Black Start Unit’s annual revenue requirement pursuant to this paragraph 18. However, under no circumstances will PJM or the Black Start Unit owner restructure or modify that existing FERC-approved rate without FERC approval.

“Incremental Black Start Capital Costs” are the new or additional capital costs documented by the owner or accepted by the Commission for the incremental equipment solely necessary to enable a unit to provide Black Start Service in addition to whatever other product or services such unit may provide. Such costs shall include those incurred by a Black Start Unit owner in order to meet NERC Reliability Standards that apply to Black Start Units solely on the basis of the provision of Black Start Service by such unit. However, Incremental Black Start Capital Costs shall not include any capital costs that the Black Start Unit owner is recovering for that unit pursuant to a FERC-approved recovery rate.

“CRF” or “Capital Recovery Factor “ is equal to the Levelized CRF based on the age of the Black Start Unit, which is modified to provide Black Start Service, as present in the CRF Table below:

Age of Black Start Unit	Term of Black Start Commitment	Levelized CRF
1 to 5	20	0.125
6 to 10	15	0.146
11 to 15	10	0.198
16+	5	0.363

Or:

Optionally, a Black Start Unit owner may elect to apply an alternative Capital Recovery Factor, in lieu of the age-based CRF Table listed above, which is based upon to the expected Capital Improvement Lifespan of the new or additional capital improvements (as determined by the applicable depreciation period of the capital improvement, as published from time to time by the US Internal Revenue Service). The Applicable Recovery Period and the term of Black Start Service Commitment shall be the same and determined by the expected Capital Improvement Lifespan. In the event that the Black Start Unit seeks recovery of capital improvements that are included in more than one category of Capital Improvement Lifespan (as set forth below), its Applicable Recovery Period and term of commitment to provide black start service for such Black Start Unit shall be the longest expected life of those new or additional capital improvements.

Capital Improvement Lifespan (years)	Applicable Recovery Period/Term of Commitment (years)	Levelized CRF
16-20	20	0.125
11-15	15	0.146
6-10	10	0.198
1-5	5	0.363

In those circumstances where a Black Start Unit owner has elected to recover Incremental Black Start Capital Costs, in addition to a FERC-approved recovery rate, its applicable term of commitment shall be the greater of: (i) the FERC-approved recovery period, or; (ii) the applicable term of commitment as established by the CRF Tables above.

After a Black Start Unit has recovered its allowable Incremental Black Start Capital Costs or Incremental Black Start NERC-CIP Capital Costs, as provided by the applicable Capital Cost Recovery Rate, and has satisfied its applicable commitment period required under Paragraph 6, the Black Start Unit shall be committed to providing black start in accordance with

Paragraph 5 of this Schedule 6A and calculate its Fixed BSSC in accordance with the Base Formula Rate.

Variable BSSC

All Black Start Units shall calculate Variable BSSC or “Variable Black Start Service Costs” in accordance with the following formula:

$$\text{Black Start Unit O\&M} * Y$$

Where:

“Black Start Unit O&M” are the operations and maintenance costs attributable to supporting Black Start Service and must equal the annual variable O&M outlined in the PJM Cost Development Guidelines set forth in the PJM Manuals. Such costs shall include those incurred by a Black Start Owner in order to meet NERC Reliability Standards that apply to the Black Start Unit solely on the basis of the provision of Black Start Service by unit.

“Y” is 0.01, unless a higher or lower value is supported by the documentation of costs. If a value of Y is submitted for this cost, a (1-Y) factor must be applied to the Black Start Unit’s O&M costs on the unit’s cost-based energy schedule, calculated based on the Cost Development Guidelines in the PJM Manuals.

For units qualifying as Black Start Units on the basis of a demonstrated ability to operate at reduced levels when automatically disconnected from the grid, there are no variable costs associated with providing Black Start Service and the value for Variable BSSC shall be zero.

Black Start Units with the demonstrated ability to automatically remain operating, at reduced levels, when disconnected from the grid may receive NERC compliance costs associated with providing Black Start Service in addition to the formula above, if approved in accordance with the procedures in Paragraph 17.

Training Costs:

All Black Start Units shall calculate Training Costs in accordance with the following formula:

$$50 \text{ staff hours/year/plant} * 75/\text{hour}$$

Fuel Storage Costs:

~~Black Start Units that cannot use oil for fuel shall calculate Fuel Storage Costs or “FSC” as zero.~~ Black Start Units that store liquefied natural gas, propane, or oil~~can use oil for fuel on site~~ shall calculate Fuel Storage Costs in accordance with the following formula:

$$\{ \text{MTSL} + [(\# \text{ Run Hours}) * (\text{Fuel Burn Rate})] \} * \\ (12 \text{ Month Forward Strip} + \text{Basis}) * (\text{Bond Rate})$$

Where:

Run Hours are the actual number of hours a Transmission Provider requires a Black Start Unit to run. Run Hours shall be at least 16 hours or as defined by the Transmission Owner restoration plan, whichever is less.

“Fuel Burn Rate” is actual fuel burn rate for the Black Start Unit.

“12-Month Forward Strip” is the average of forward prices for the fuel burned in the Black Start Unit traded the first business day on or following May 1.

“Basis” is the transportation costs from the location referenced in the forward price data to the Black Start Unit plus any variable taxes.

“Bond rate” is the value determined with reference to the Moody's Utility Index for bonds rated Baa1 reported the first business day on or following May 1.

“MTSL” is the “minimum tank suction level” and shall apply where no direct current pumps are available for the Black Start Unit. In the case where more than one Black Start Unit shares a common fuel tank, only one Black Start Unit will be eligible for the recovery of this volume in its fuel storage cost calculation. The MTSL for the other Black Start Unit(s) sharing the common fuel tank shall be zero.

For units qualifying as Black Start Units on the basis of a demonstrated ability to operate at reduced levels when automatically disconnected from the grid, there are no associated fuel storage costs and the value for FSC shall be zero.

Z

Z shall be an incentive factor solely for Black Start Units with a commitment established under section 5 above and shall be ten percent. For those Black Start Units that elect to recover new or additional Black Start Capital Costs under section 6 above, the incentive factor, Z, shall be equal to zero.

~~At least~~ Every ~~two~~ five years, PJM shall review the formula and its costs components set forth in this section, and report on the results of that review to stakeholders.

19. Transmission Provider or its agent shall have the right to independently audit the accounts and records of each Black Start Unit that is receiving payments for providing Black Start Service.

20. PJM shall notify its Members when a Black Start Unit seeks to recover new or additional Black Start NERC-CIP Capital Costs under Paragraph 18 no later than thirty (30) days prior to

the effective date of the recovery. At the written request of a PJM Member, made simultaneously to the Market Monitoring Unit and PJM, with notice to the Black Start Unit owner, the Market Monitoring Unit shall make available to the affected PJM Member for inspection at the offices of the Market Monitoring Unit, all data supporting the requested new or additional NERC-CIP specific Capital Costs. The Black Start Unit owner may elect to attend this review. In all cases, the supporting data is to be held confidential and may not be distributed.

21. The Market Monitoring Unit shall include a Black Start Service summary in its annual State of the Market report which will set forth a descriptive summary of the new or additional Black Start NERC-CIP Capital Costs requested by Black Start Units, and include a list of the types of capital costs requested and the overall cost of such capital improvements on an aggregate basis such that no data is attributable to an individual Black Start Unit.

Credits

22. Monthly credits are provided to generators that submit to the Transmission Provider their annual revenue requirements established pursuant to section 17 of this Schedule 6A. The generator's monthly credit is equal to 1/12 of its annual Black Start Service revenue requirement for eligible critical Black Start Units.

23. Revenue requirements for jointly owned Black Start Units will be allocated to the owners based on ownership percentage.

24. Transmission Provider shall not compensate generators for Black Start Service unless they meet the Transmission Provider criteria for Black Start Service and the criteria for Black Start Service in the Applicable Standards and provide Transmission Provider with all necessary data in accordance with this Schedule 6A and the PJM manuals.

Charges

25. Zonal rates will be based on Black Start Service capability or share of generation units designated by the Transmission Provider and allocated to network service customers and point-to-point reservations.

26. Revenue requirements for Black Start Units designated by the Transmission Provider as critical (regardless of zonal location) will be allocated to the receiving Transmission Owner's zone. Black Start Units that are shared and designated to serve multiple zones will have their annual revenues allocated by Transmission Owner designated critical load percentage.

27. Purchasers of Black Start Service shall be charged for such service in accordance with the following formulae.

Monthly Charge for a purchaser receiving Network Integration Transmission Service or Point-to-Point Transmission Service to serve Non-Zone Load = Allocation Factor * Total Generation Owner Monthly Black Start Service Revenue Requirement

Monthly Charge for a purchaser receiving Network Integration Transmission Service or Point-to-Point Transmission Service to serve Zone Load = Allocation Factor * Zonal Generation Owner Monthly Black Start Service Revenue Requirement * Adjustment Factor

Where:

Purchaser serving Non-Zone Load is a Network Customer serving Non-Zone Network Load or a Transmission Customer where the Point of Delivery is at the boundary of the PJM Region.

Zonal Generation Owner Monthly Black Start Service Revenue Requirement is the sum of the monthly share of Black Start Service revenue requirements for each generator nominated by the Transmission Owners in that zone.

Total Generation Owner Monthly Black Start Service Revenue Requirement is the sum of the Zonal Generation Owner Monthly Black Start Service Revenue Requirements for all Zones in the PJM Region.

Allocation Factor is the monthly transmission use of each Network Customer or Transmission Customer per Zone or Non-Zone, as applicable, on a megawatt basis divided by the total transmission use in the Zone or in the PJM Region, as applicable, on a megawatt basis.

For Network Customers, monthly transmission use on a megawatt basis is the sum of a Network Customer's daily values of DCPZ or DCPNZ (as those terms are defined in Section 34.1) as applicable, for all days of the month.

For Transmission Customers, monthly transmission use on a megawatt basis is the sum of the Transmission Customer's hourly amounts of Reserved Capacity for each day of the month (not curtailed by PJM) divided by the number of hours in the day.

Adjustment Factor is determined as the sum of the total monthly transmission use in the PJM Region on a megawatt basis, exclusive of such use by Network Customers and Transmission Customers serving Non-Zone Load, divided by the total monthly transmission use in the PJM Region on a megawatt basis.

In the event that a single customer is serving load in more than one Zone, or serving Non-Zone Load as well as load in one or more Zones, or is both a Network Customer and a Transmission Customer, the Monthly Charge for such a customer shall be the sum of the Monthly Charges determined by applying the appropriate formulae set forth in this Schedule 6A.

Attachment B

Revisions to the
PJM Open Access Transmission Tariff

(Clean Format)

SCHEDULE 6A

Black Start Service

References to section numbers in this Schedule 6A refer to sections of this Schedule 6A, unless otherwise specified.

To ensure the reliable restoration following a shut down of the PJM transmission system, Black Start Service is necessary to facilitate the goal of complete system restoration. Black Start Service enables the Transmission Provider to designate specific generators called Black Start Units whose location and capabilities are required to re-energize the transmission system following a system-wide blackout. The Transmission Provider shall administer the provision of Black Start Service. PJMSettlement shall be the Counterparty to the purchases and sales of Black Start Service.

TRANSMISSION CUSTOMERS

1. All Transmission Customers and Network Customers must obtain Black Start Service through the Transmission Provider, with PJMSettlement as the Counterparty, pursuant to this Schedule 6A.

PROVISION OF BLACK START SERVICE

2. A Black Start Unit is a generating unit that has equipment enabling it to start without an outside electrical supply or a generating unit with a high operating factor (subject to Transmission Provider concurrence) with the demonstrated ability to automatically remain operating, at reduced levels, when disconnected from the grid. A Black Start Unit shall be considered capable of providing Black Start Service only when it meets the criteria set forth in the PJM manuals. For the purposes of this Schedule 6A, the expected life of the Black Start Unit shall take into consideration expectations regarding both the enabling equipment and the generation unit itself.

3. A Black Start Plant is a generating plant that includes one or more Black Start Units. A generating plant with Black Start Units electrically separated at different voltage levels will be considered multiple Black Start Plants.

4. The Transmission Provider is responsible for developing a coordinated and efficient system restoration plan that identifies all of the locations where Black Start Units are needed. The PJM Manuals shall set forth the criteria and process for selecting or identifying the Black Start Units necessary to commit to providing Black Start Service at the identified locations. No Black Start Unit shall be eligible to recover the costs of providing Black Start Service in the PJM Region unless it agrees to provide such service for a term of commitment established under section 5, 6, or 6A below.

5. Owners of Black Start Units selected to provide Black Start Service in accordance with section 4 and electing to forego any recovery of new or additional Black Start Capital Costs shall commit to provide Black Start Service from such Black Start Units for an initial term of no less than two years and authorize the Transmission Provider to resell Black Start Service from its

Black Start Units. The term commitment shall continue to extend until the Black Start Unit owner or the Transmission Provider provides written, one-year advance notice of its intention to terminate the commitment or the commitment is involuntarily terminated pursuant to Section 15 of this Schedule 6A.

6. Owners of Black Start Units selected to provide Black Start Service in accordance with section 4 and electing to recover new or additional Black Start Capital Costs shall commit to provide Black Start Service from such Black Start Units for a term based upon the age of the Black Start Unit or the longest expected life of the Incremental Black Start Capital Cost, as set forth in the applicable CRF Tables in Paragraph 18. For those Black Start Units that elect to recover new or additional Black Start Capital Costs in addition to a prior, FERC-approved cost recovery rate, the applicable commitment period shall be the longer of the FERC-approved recovery period or the applicable term of commitment as set forth in the CRF Tables in Paragraph 18. The Transmission Provider may terminate the commitment with one year advance notice of its intention to the Black Start Unit owner, but the Black Start Unit owner shall be eligible to recover any amount of unrecovered Fixed Black Start Service Costs over a period not to exceed five years. A Black Start Unit owner may terminate the provision of Black Start Service with one year advance notice and consent of the Transmission Provider (or its commitment period may be involuntarily terminated pursuant to the section 15 below). Such Black Start Unit shall forego any otherwise existing entitlement to future revenues collected pursuant to this Schedule 6A and fully refund any amount of the Black Start Capital Costs recovered under a FERC-approved rate (recovered on an accelerated basis pursuant to the provisions of section 17(i)) in excess of the amount that would have been recovered pursuant to section 18 during the same period. At the conclusion of the term of commitment established under this section 6, a Black Start Unit shall commence a new term of commitment under either section 5 or 6, as applicable.

6A. Black Start Units which are owned or contracted for by a Transmission Owner to provide Black Start Service as a result of the black start reliability backstop process defined in the PJM Manuals, shall be subject to cost recovery through such Transmission Owner's annual revenue requirement under such Transmission Owner's Attachment H of the Tariff, as filed with, and accepted by, FERC under Section 205 of the Federal Power Act and in accordance with Section 9 of the Tariff, or through such other cost recovery mechanism, provided that such cost recovery mechanism is filed with and accepted by FERC. The relevant Transmission Owner shall commit to provide, or effectuate the provision of, Black Start Service from such a Black Start Unit for the FERC-approved cost recovery period. The Transmission Provider may terminate the commitment with one year advance notice of its intention to the Transmission Owner. Provision of Black Start Service from a Black Start Unit obtained through the black start reliability backstop process defined in the PJM Manuals shall be subject to Sections 7 through 13 of this Schedule 6A. The Revenue Requirements, Credits, and Charges provisions contained in sections 16 through 27 of this Schedule 6A, shall not apply to Black Start Units obtained as a result of the black start reliability backstop process defined in the PJM Manuals.

6B. In the event that a Black Start Unit fails to fulfill its commitment established under section 5 to provide Black Start Service, receipt of any Black Start Service revenues associated with the non-performing Black Start Unit shall cease and, for the period of the unit's non-

performance, the Black Start Unit owner shall forfeit the Black Start Service revenues associated with the non-performing Black Start Unit that it received or would have received had the Black Start Unit performed, not to exceed revenues for a maximum of one year.

In the event that a Black Start Unit fails to fulfill its commitment established under section 6 above, such unit shall forego any otherwise existing entitlement to future revenues collected pursuant to this Schedule 6A and fully refund any amount of the Black Start Capital Costs recovered under a FERC-approved rate (recovered on an accelerated basis pursuant to the provisions of section 17(i)) in excess of the amount that would have been recovered pursuant to section 18 during the same period, but such unit remains eligible to establish a new commitment under section 5 or 6.

Performance Standards and Outage Restrictions

7. In addition to the performance capabilities set forth in the PJM Manuals, Black Start Units must have the capabilities listed below. These capabilities must be demonstrated in accordance with the criteria set forth in the PJM manuals and will remain in effect for the duration of the commitment to provide Black Start Service.

- a. A Black Start Unit must be able to close its output circuit breaker to a dead (de-energized) bus within the time specified in the PJM Manuals.
- b. A Black Start Unit must be capable of maintaining frequency and voltage under varying load.
- c. A Black Start Unit must be able to maintain rated output for a period of time identified by each Transmission Owner's system restoration requirements, in conjunction with the Transmission Provider.

8. Each owner of Black Start Units or Black Start Plants must maintain procedures for the start-up of the Black Start Units.

9. If a Black Start Unit is a generating unit with a high operating factor (subject to Transmission Provider concurrence) with the ability to automatically remain operating at reduced levels when disconnected from the grid, this ability must be demonstrated in accordance with the criteria set forth in the PJM manuals.

10. No more than one Black Start Unit at a Black Start Plant may be subject to planned maintenance at any one time. This restriction excludes outages on common plant equipment that may make all units unavailable. A Black Start Unit not currently designated as critical and on the same voltage level may be substituted for a Black Start Unit that is subject to a planned outage to permit a concurrent planned outage of another critical Black Start Unit at the Black Start Plant to begin. The Black Start Unit used as a substitute must have had a valid annual test within the previous 12 months.

11. Concurrent planned outages at multiple Black Start Plants within a zone may be restricted based on Transmission Owner requirements for Black Start Service availability. Such restrictions must be predefined and approved by Transmission Provider in accordance with the PJM manuals.

Testing

12. To verify that they can be started and operated without being connected to the Transmission System, Black Start Units designated as critical shall be tested annually in accordance with the PJM manuals. The Black Start Unit owner shall determine the time of the annual test.

13. Compensation for energy output delivered to the Transmission System during the annual test shall be provided for the Black Start Unit's minimum run time at the higher of the unit's cost-capped offer or real-time Locational Marginal Price plus start-up and no-load costs for up to two start attempts, if necessary. For Black Start Units that are generating units with a high operating factor (subject to Transmission Provider's concurrence) with the ability to automatically remain operating at reduced levels when disconnected from the grid, an opportunity cost will be provided to compensate the unit for lost revenues during testing.

14. To receive Black Start Service revenues, a Black Start Unit must have a successful annual test on record with the Transmission Provider within the preceding 13 months.

15. If a Black Start Unit fails the annual test, the unit may be re-tested within a ten-day period without financial penalty. If the Black Start Unit does not successfully re-test within that ten-day period, monthly Black Start Service revenues will be forfeited by that unit from the time of the first unsuccessful test until such time as the unit passes an annual test. If the Black Start Unit owner determines not to make the necessary repairs to enable the Black Start Unit to pass the annual test, the Black Start Unit owner will have failed to fulfill its commitment pursuant to section 5 or section 6, whichever is applicable, of this Schedule 6A and will be subject to the additional forfeiture of revenues set forth in section 6B.

Revenue Requirements

16. A Black Start Unit Owner's annual Black Start Service revenue requirement shall be the sum of the annual Black Start Service revenue requirements for each generator that is designated as providing Black Start Service and has provided the Transmission Provider with a calculation of its annual Black Start Service revenue requirements. A separate line item shall appear on the participants' Transmission Provider bill for Black Start Service charges and credits.

17. Black Start Service revenue requirements for each Black Start Unit shall be based, at the election of the owner, on either (i) a FERC-approved rate for the recovery of the cost of providing such service for the entire duration of the commitment term set forth in either section 5 or 6, as applicable, or (ii) the formula rates set forth in section 18 of this Schedule 6A for the commitment term set forth in Paragraph 5 or 6 as applicable. Each generator's Black Start Service revenue requirements shall be an annual calculation. Requests for Black Start Service

revenue requirements and for changes to the Black Start Service revenue requirements must be submitted to the Market Monitoring Unit for review and analysis, with supporting data and documentation, pursuant to section III of Attachment M – Appendix and the PJM Manuals, with a copy to the Office of the Interconnection, by no later than May 3 of each year. The Market Monitoring Unit and the Black Start Unit owner shall attempt to come to agreement on the level of each component included in the Black Start Service revenue requirements by no later than May 14 of each year. By no later than May 21 of each year, the Black Start Unit owner shall notify the Office of the Interconnection and the Market Monitoring Unit in writing whether it agrees or disagrees with the Market Monitoring Unit’s determination of the level of each component included in the Black Start Service revenue requirements. The Black Start Unit owner may also submit Black Start Service revenue requirements that it chooses to the Office of the Interconnection by no later than May 21 of each year, provided that (i) it has participated in good faith with the process described in this section and in section III of Attachment M - Appendix, (ii) the Black Start Service revenue requirements are no higher than the level defined in any agreement reached by the Black Start Unit owner and the Market Monitoring Unit that resulted from the foregoing process, and (iii) the Black Start Service revenue requirements are accepted by the Office of the Interconnection subject to the criteria set forth in the Tariff and PJM Manuals.

The Office of the Interconnection shall determine whether to accept the values submitted by the Black Start Unit owner subject to the requirements of the Tariff and the PJM Manuals by no later than May 27. If the Office of the Interconnection does not accept the values submitted by the Black Start Unit owner in such case, the Black Start Unit owner may file its proposed values with the Commission for approval. Pursuant to section III of Attachment M - Appendix, if the Office of the Interconnection accepts the Black Start Service revenue requirements submitted by the Black Start Unit owner in such case, the Market Monitoring Unit may petition the Commission for an order that would require the Black Start Unit owner to utilize the values determined by the Market Monitoring Unit or the Office of the Interconnection or such other values as determined by the Commission. The annual calculation of Black Start Service revenue requirements shall become effective on June 1 of each year, except that no change to a Black Start Service revenue requirement shall become effective until the existing revenue requirement has been effective for at least twelve months. Notwithstanding the foregoing, the deadlines set forth in this section 17 shall not apply to a Black Start Unit owner’s election to select a new method of recovery for its Fixed BSSC.

18. The formula for calculating a generator’s annual Black Start Service revenue requirement is:

$$\{(Fixed\ BSSC) + (Variable\ BSSC) + (Training\ Costs) + (Fuel\ Storage\ Costs)\} * (1 + Z)$$

For units that have the demonstrated ability to operate at reduced levels when automatically disconnected from the grid, the formula is revised to:

$$(Training\ Costs) * (1 + Z)$$

Where:

Fixed BSSC

Black Start Units with a commitment established under Paragraph 5 shall calculate Fixed BSSC or “Fixed Black Start Service Costs” in accordance with the following Base Formula Rate:

Base Formula Rate:

$$\text{Net CONE} * \text{Black Start Unit Capacity} * X$$

Where:

“Net CONE” is the then current installed capacity (“ICAP”) net Cost of New Entry (expressed in \$/MW year) for the CONE Area where the Black Start Unit is located.

“Black Start Unit Capacity” is either: (i) the Black Start Unit’s installed capacity, expressed in MW, for those Black Start Units that are Generation Capacity Resources; or (ii) the awarded MWs in the Transmission Provider’s request for proposal process under the PJM Manuals, for those Black Start Units that are Energy Resources.

“X” is the Black Start Service allocation factor unless a higher or lower value is supported by the documentation of the actual costs of providing Black Start Service. For such units qualifying as Black Start Units on the basis of demonstrated ability to operate at reduced levels when automatically disconnected from the grid, X shall be zero. For Black Start Units with a commitment established under section 5, X shall be .01 for Hydro units, .02 for CT units.

Black Start Units with a commitment established under Paragraph 6 above shall calculate Fixed BSSC or “Fixed Black Start Service Costs” in accordance with one of the following formulas, as applicable:

Capital Cost Recovery Rate – NERC-CIP Specific Recovery

$$(\text{Net Cone} * \text{Black Start NERC-CIP Unit Capacity} * X) + (\text{Incremental Black Start NERC-CIP Capital Costs} * \text{CRF})$$

Where:

“Net Cone” is the then current installed capacity (“ICAP”) net Cost of New Entry (expressed in \$/MW year) for the CONE are where the Black Start Unit is located.

“Black Start NERC-CIP Unit Capacity” is the Black Start Unit’s installed capacity, expressed in MW, but, for purposes of this calculation, capped at 100 MW for Hydro units, or 50 MW for CT units.

“Incremental Black Start NERC-CIP Capital Cost” are those capital costs documented by the owner or accepted by the Commission for the incremental equipment solely necessary to enable a Black Start Unit to maintain compliance with mandatory Critical Infrastructure Protection Reliability Standards (as approved by the Commission and administered by the applicable Electric Reliability Organization).

“CRF” or “Capital Recovery Factor” is equal to the levelized CRF as set forth in the applicable CRF Table set forth below.

A Black Start Unit may elect to terminate forward cost recovery under this Capital Cost Recovery Rate – NERC-CIP Specific Recovery at any time and seek cost recovery under the Capital Cost Recovery Rate, pursuant to the terms and conditions set forth below.

Capital Cost Recovery Rate

$(\text{FERC-approved rate}) + (\text{Incremental Black Start Capital Costs} * \text{CRF})$

Where:

“FERC-approved rate” is the Black Start Unit’s current FERC-approved recovery of costs to provide Black Start Service, if applicable. To the extent that a Black Start Unit owner is currently recovering black start costs pursuant to a FERC-approved rate, that cost recovery will be included as a formulaic component for calculating the Black Start Unit’s annual revenue requirement pursuant to this paragraph 18. However, under no circumstances will PJM or the Black Start Unit owner restructure or modify that existing FERC-approved rate without FERC approval.

“Incremental Black Start Capital Costs” are the new or additional capital costs documented by the owner or accepted by the Commission for the incremental equipment solely necessary to enable a unit to provide Black Start Service in addition to whatever other product or services such unit may provide. Such costs shall include those incurred by a Black Start Unit owner in order to meet NERC Reliability Standards that apply to Black Start Units solely on the basis of the provision of Black Start Service by such unit. However, Incremental Black Start Capital Costs shall not include any capital costs that the Black Start Unit owner is recovering for that unit pursuant to a FERC-approved recovery rate.

“CRF” or “Capital Recovery Factor “ is equal to the Levelized CRF based on the age of the Black Start Unit, which is modified to provide Black Start Service, as present in the CRF Table below:

Age of Black Start Unit	Term of Black Start Commitment	Levelized CRF
1 to 5	20	0.125
6 to 10	15	0.146
11 to 15	10	0.198
16+	5	0.363

Or:

Optionally, a Black Start Unit owner may elect to apply an alternative Capital Recovery Factor, in lieu of the age-based CRF Table listed above, which is based upon to the expected Capital Improvement Lifespan of the new or additional capital improvements (as determined by the applicable depreciation period of the capital improvement, as published from time to time by the US Internal Revenue Service). The Applicable Recovery Period and the term of Black Start Service Commitment shall be the same and determined by the expected Capital Improvement Lifespan. In the event that the Black Start Unit seeks recovery of capital improvements that are included in more than one category of Capital Improvement Lifespan (as set forth below), its Applicable Recovery Period and term of commitment to provide black start service for such Black Start Unit shall be the longest expected life of those new or additional capital improvements.

Capital Improvement Lifespan (years)	Applicable Recovery Period/Term of Commitment (years)	Levelized CRF
16-20	20	0.125
11-15	15	0.146
6-10	10	0.198
1-5	5	0.363

In those circumstances where a Black Start Unit owner has elected to recover Incremental Black Start Capital Costs, in addition to a FERC-approved recovery rate, its applicable term of commitment shall be the greater of: (i) the FERC-approved recovery period, or; (ii) the applicable term of commitment as established by the CRF Tables above.

After a Black Start Unit has recovered its allowable Incremental Black Start Capital Costs or Incremental Black Start NERC-CIP Capital Costs, as provided by the applicable Capital Cost Recovery Rate, and has satisfied its applicable commitment period required under Paragraph 6, the Black Start Unit shall be committed to providing black start in accordance with

Paragraph 5 of this Schedule 6A and calculate its Fixed BSSC in accordance with the Base Formula Rate.

Variable BSSC

All Black Start Units shall calculate Variable BSSC or “Variable Black Start Service Costs” in accordance with the following formula:

$$\text{Black Start Unit O\&M} * Y$$

Where:

“Black Start Unit O&M” are the operations and maintenance costs attributable to supporting Black Start Service and must equal the annual variable O&M outlined in the PJM Cost Development Guidelines set forth in the PJM Manuals. Such costs shall include those incurred by a Black Start Owner in order to meet NERC Reliability Standards that apply to the Black Start Unit solely on the basis of the provision of Black Start Service by unit.

“Y” is 0.01, unless a higher or lower value is supported by the documentation of costs. If a value of Y is submitted for this cost, a (1-Y) factor must be applied to the Black Start Unit’s O&M costs on the unit’s cost-based energy schedule, calculated based on the Cost Development Guidelines in the PJM Manuals.

For units qualifying as Black Start Units on the basis of a demonstrated ability to operate at reduced levels when automatically disconnected from the grid, there are no variable costs associated with providing Black Start Service and the value for Variable BSSC shall be zero.

Black Start Units with the demonstrated ability to automatically remain operating, at reduced levels, when disconnected from the grid may receive NERC compliance costs associated with providing Black Start Service in addition to the formula above, if approved in accordance with the procedures in Paragraph 17.

Training Costs:

All Black Start Units shall calculate Training Costs in accordance with the following formula:

$$50 \text{ staff hours/year/plant} * 75/\text{hour}$$

Fuel Storage Costs:

Black Start Units that store liquefied natural gas, propane, or oil on site shall calculate Fuel Storage Costs in accordance with the following formula:

$$\{ \text{MTSL} + [(\# \text{ Run Hours}) * (\text{Fuel Burn Rate})] \} *$$

$$(12 \text{ Month Forward Strip} + \text{Basis}) * (\text{Bond Rate})$$

Where:

Run Hours are the actual number of hours a Transmission Provider requires a Black Start Unit to run. Run Hours shall be at least 16 hours or as defined by the Transmission Owner restoration plan, whichever is less.

“Fuel Burn Rate” is actual fuel burn rate for the Black Start Unit.

“12-Month Forward Strip” is the average of forward prices for the fuel burned in the Black Start Unit traded the first business day on or following May 1.

“Basis” is the transportation costs from the location referenced in the forward price data to the Black Start Unit plus any variable taxes.

“Bond rate” is the value determined with reference to the Moody's Utility Index for bonds rated Baa1 reported the first business day on or following May 1.

“MTSL” is the “minimum tank suction level” and shall apply where no direct current pumps are available for the Black Start Unit. In the case where more than one Black Start Unit shares a common fuel tank, only one Black Start Unit will be eligible for the recovery of this volume in its fuel storage cost calculation. The MTSL for the other Black Start Unit(s) sharing the common fuel tank shall be zero.

For units qualifying as Black Start Units on the basis of a demonstrated ability to operate at reduced levels when automatically disconnected from the grid, there are no associated fuel storage costs and the value for FSC shall be zero.

Z

Z shall be an incentive factor solely for Black Start Units with a commitment established under section 5 above and shall be ten percent. For those Black Start Units that elect to recover new or additional Black Start Capital Costs under section 6 above, the incentive factor, Z, shall be equal to zero.

Every five years, PJM shall review the formula and its costs components set forth in this section, and report on the results of that review to stakeholders.

19. Transmission Provider or its agent shall have the right to independently audit the accounts and records of each Black Start Unit that is receiving payments for providing Black Start Service.

20. PJM shall notify its Members when a Black Start Unit seeks to recover new or additional Black Start NERC-CIP Capital Costs under Paragraph 18 no later than thirty (30) days prior to the effective date of the recovery. At the written request of a PJM Member, made

simultaneously to the Market Monitoring Unit and PJM, with notice to the Black Start Unit owner, the Market Monitoring Unit shall make available to the affected PJM Member for inspection at the offices of the Market Monitoring Unit, all data supporting the requested new or additional NERC-CIP specific Capital Costs. The Black Start Unit owner may elect to attend this review. In all cases, the supporting data is to be held confidential and may not be distributed.

21. The Market Monitoring Unit shall include a Black Start Service summary in its annual State of the Market report which will set forth a descriptive summary of the new or additional Black Start NERC-CIP Capital Costs requested by Black Start Units, and include a list of the types of capital costs requested and the overall cost of such capital improvements on an aggregate basis such that no data is attributable to an individual Black Start Unit.

Credits

22. Monthly credits are provided to generators that submit to the Transmission Provider their annual revenue requirements established pursuant to section 17 of this Schedule 6A. The generator's monthly credit is equal to 1/12 of its annual Black Start Service revenue requirement for eligible critical Black Start Units.

23. Revenue requirements for jointly owned Black Start Units will be allocated to the owners based on ownership percentage.

24. Transmission Provider shall not compensate generators for Black Start Service unless they meet the Transmission Provider criteria for Black Start Service and the criteria for Black Start Service in the Applicable Standards and provide Transmission Provider with all necessary data in accordance with this Schedule 6A and the PJM manuals.

Charges

25. Zonal rates will be based on Black Start Service capability or share of generation units designated by the Transmission Provider and allocated to network service customers and point-to-point reservations.

26. Revenue requirements for Black Start Units designated by the Transmission Provider as critical (regardless of zonal location) will be allocated to the receiving Transmission Owner's zone. Black Start Units that are shared and designated to serve multiple zones will have their annual revenues allocated by Transmission Owner designated critical load percentage.

27. Purchasers of Black Start Service shall be charged for such service in accordance with the following formulae.

Monthly Charge for a purchaser receiving Network Integration Transmission Service or Point-to-Point Transmission Service to serve Non-Zone Load = Allocation Factor * Total Generation Owner Monthly Black Start Service Revenue Requirement

Monthly Charge for a purchaser receiving Network Integration Transmission Service or Point-to-Point Transmission Service to serve Zone Load = Allocation Factor * Zonal Generation Owner Monthly Black Start Service Revenue Requirement * Adjustment Factor

Where:

Purchaser serving Non-Zone Load is a Network Customer serving Non-Zone Network Load or a Transmission Customer where the Point of Delivery is at the boundary of the PJM Region.

Zonal Generation Owner Monthly Black Start Service Revenue Requirement is the sum of the monthly share of Black Start Service revenue requirements for each generator nominated by the Transmission Owners in that zone.

Total Generation Owner Monthly Black Start Service Revenue Requirement is the sum of the Zonal Generation Owner Monthly Black Start Service Revenue Requirements for all Zones in the PJM Region.

Allocation Factor is the monthly transmission use of each Network Customer or Transmission Customer per Zone or Non-Zone, as applicable, on a megawatt basis divided by the total transmission use in the Zone or in the PJM Region, as applicable, on a megawatt basis.

For Network Customers, monthly transmission use on a megawatt basis is the sum of a Network Customer's daily values of DCPZ or DCPNZ (as those terms are defined in Section 34.1) as applicable, for all days of the month.

For Transmission Customers, monthly transmission use on a megawatt basis is the sum of the Transmission Customer's hourly amounts of Reserved Capacity for each day of the month (not curtailed by PJM) divided by the number of hours in the day.

Adjustment Factor is determined as the sum of the total monthly transmission use in the PJM Region on a megawatt basis, exclusive of such use by Network Customers and Transmission Customers serving Non-Zone Load, divided by the total monthly transmission use in the PJM Region on a megawatt basis.

In the event that a single customer is serving load in more than one Zone, or serving Non-Zone Load as well as load in one or more Zones, or is both a Network Customer and a Transmission Customer, the Monthly Charge for such a customer shall be the sum of the Monthly Charges determined by applying the appropriate formulae set forth in this Schedule 6A.