



RTO-Wide Five-Year Selection Process Request for Proposal for Black Start Service and Black Start Fuel Assurance

PJM Interconnection

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1.0: Purpose / Statement

1.1. Purpose

PJM is initiating the third RTO-wide black start RFP process and is seeking bids for new black start capability in accordance with the Five-Year Black Start Selection Process as documented in [PJM Manual M14D](#), Generator Operational Requirements, Section 10, and in accordance with the PJM Tariff.

Black Start Units must have the minimum capabilities listed below during restoration events. These capabilities must be demonstrated in accordance with the criteria set forth in the PJM Tariff and Manuals and will remain in effect for the duration of the commitment to provide Black Start Service in accordance with requirements of the PJM Tariff Schedule 6A, as it may be amended from time to time.

- (a) A Black Start Unit must have the ability to start without an outside electrical supply.
- (b) A Black Start Unit must be able to close its output circuit breaker to a dead (de-energized) bus within 180 minutes (or less based on the characteristics of the specific critical load) of a request from the Transmission Owner or PJM.
- (c) A Black Start Unit must maintain the following:
 - i. Maintain frequency under varying load with the governor operating in automatic isochronous mode
 - ii. Maintain voltage under varying load with automatic voltage regulator in automatic and voltage control mode(excludes controlling with power factor or MVAR control mode)
A Black Start Unit is expected to maintain black start output for a period of time identified by each Transmission Owner's system restoration requirements (typically 16 hours).
- (d) Black Start Units recovering cost under Paragraph 5 of Schedule 6A of the Tariff have an initial two year commitment to provide Black Start Service.
- (e) Black Start Units that have elected to recover capital cost under Tariff, Schedule 6A, Section 6 and selected in this RFP have a Black Start Service commitment period for the lifetime of the Black Start equipment.

In addition to new Black Start Service proposals, PJM is also seeking proposals from new or existing Black Start Units to provide Fuel Assured Black Start Service. Fuel Assured Black Start Units must be capable of running 16 hours or more during a restoration event. Black Start Fuel Assurance is achieved by either:

- (a) storing at least 16 hours of fuel on site,
- (b) can operate independently on 2 or more interstate pipelines,
- (c) being directly connected to a natural gas gathering facility,
- (d) Capability to have 16 hours of pumped storage
- (e) or has been evaluated by PJM to be capable of providing 16 hours of full load operation with 90% confidence,
- (f) and meets all other requirements for Black Start Units.

Selection of Fuel Assured Black Start units and the fuel assurance business rules specified in this RFP are contingent on FERC accepting PJM's May 12, 2023 filing in Docket No. ER23-1874 establishing the terms and conditions for Fuel Assured Black Start Service in the PJM Tariff. PJM makes no representation or warranty as to the timing and the likelihood that FERC will accept the proposed Fuel Assured Black Start Service rules. PJM is not liable to RFP participants for any costs or expenses incurred by parties in anticipation of the new Fuel Assured Black Start Service Tariff revisions. Also please note that there may be variations in terms related to Fuel Assured Black Start Units throughout this RFP document and supplemental documents, but the terms are all in the context of the new Fuel Assured Black Start Service Tariff revisions included in PJM's May 12, 2023 filing in Docket No. ER23-1874.

FERC Docket link: https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20230512-5135&optimized=false

PJM is requesting that all interested and eligible parties respond to this RFP. The purpose of the RFP process is to investigate other black start options beyond what is currently being provided in order to refresh system restoration plans across the RTO, in conjunction with PJM's compliance obligation to perform updated reliability studies every five years in accordance with NERC restoration standard EOP-005 and to obtain Fuel Assured Black Start Units.

In order to be deemed feasible, designated potential Black Start Units and Fuel Assured Black Start Units must be physically located within the PJM RTO Region (i.e., within one of PJM's transmission zones). However, cross zonal black start solutions may also be considered, where a Black Start Unit in one PJM Transmission Owner zone may be considered to serve in the restoration of another zone or a Black Start Unit can be shared across more than one transmission zone. Examples of acceptable responses include:

- Existing Black Start Capable Units not currently providing Black Start Service and/or Fuel Assured Black Start Service.
- Conversion of existing generation unit(s) to become a Black Start Unit and/or a Fuel Assured Black Start Unit.
- New (or interconnection queue) generation under development or construction that can become a Black Start Unit or a Fuel Assured Black Start Unit.
- Existing industrial, manufacturing or cogeneration facilities capable of converting to a Black Start Unit Fuel Assured Black Start Service to support system restoration.
- Refurbishment of existing Black Start Units Black Start Service and other services without the refurbishment.

Existing Black Start Units that do not need additional capital to continue to provide Black Start Service or are not offering to qualify to provide Fuel Assured Black Start Service do not need to respond to this RFP (see Section 1.4). It is assumed that any Black Start Unit that does not respond to the request for proposal (unless required to respond) will continue to provide Black Start Service at the current rate (Formula Rate or Cost Recovery Rate). These Black Start Units are not guaranteed to be selected to provide Black Start Service going forward, if reductions in critical load or changes to the Black Start Fuel Assurance needs indicate that the Black Start Service or Fuel Assured Black Start Service is no longer needed.

For Fuel Assured Black Start Service, a unit must offer into an RFP and be selected by PJM to provide Black Start Fuel Assurance, so any existing Black Start Units that wish to be designated as Fuel Assured Black Start Units must offer as such into the RFP. Existing Black Start Units that are either fuel assured or not fuel assured, non-Black Start Units that are currently fuel assured or not fuel assured, along with future resources in the PJM interconnection queue can submit a proposal to become a Fuel Assured Black Start Unit in this current RFP process, which will be contingent on acceptance by FERC of PJM's Fuel Assured Black Start filing (Docket No. ER23-1874). This includes existing Black Start Units that may already have fuel assurance capabilities on a Black Start Capital Recovery Rate. If a unit is on a capital recovery rate at the time of the RFP, they must weigh the risk of not offering to Fuel Assured Black Start Service while on the capital recovery rate and forgoing the future incentive factor increase when the unit transitions to the Base Formula Rate.

In summary, PJM is seeking to consider RFP proposals for Black Start Service and Fuel Assured Black Start Service based on the following categories, and the proposal format for both Level 1 and Level 2 proposals as described in this RFP and related attachments, will generally be in the format below.

Black Start Resource Proposal Type:

- 1 | Existing PJM Black Start Resource
- 2 | Existing resource not providing PJM Black Start Service
- 3 | Future resource in PJM interconnection queue

Black Start Fuel Assurance Proposal Type:

- 1 | Black Start Fuel Assured - No Capital Investments Required
- 2 | Black Start Fuel Assured - Capital Investments Required
- 3 | Non-Fuel Assured Black Start Service

Potential bidders should be aware that if accepted, the proposed Black Start Unit will have to be included in the NERC Compliance Registry as a Generation Owner and Generation Operator, and as such, will be required to comply with all applicable NERC Reliability Standards. It is the sole responsibility of the Black Start Unit owner to ensure that its proposed Black Start Unit meets all applicable NERC Reliability Standards as necessary to support the provision of Black Start Service. PJM makes no representations or warranties regarding the ability of a Black Start Unit Owner to meet all applicable NERC Reliability Standards with regard to a specific proposed Black Start Unit upon acceptance of a submitted proposal.

See Section 7.9 of "Black Start Generator Reference Guide" for "NERC Reliability Standards."

1.2. Black Start Service Availability Date

Subject to the terms and conditions of the PJM Tariff and Manuals, offers should be for resources capable of providing new Black Start Service, and Fuel Assured Black Start Service where capital upgrades are required, by December 1, 2025. This includes completion of a successful black start test prior to providing Black Start Service. In addition, there is also time associated with updating restoration plans (by Transmission Owners), so PJM would prefer to have black start resources available and providing Black Start Service well in advance of the December 1, 2025 milestone. In certain cases, due to the time required to perform unit modifications, PJM will also consider proposals for Black Start Service later than the December 1, 2025 milestone date depending on location, black start and fuel assurance need, and evaluated cost.

1.3. Market Window

The market window for this RFP is from June 20, 2023, through November 1, 2023. See Section 4.0 “Proposal Guidelines” for details on two-tiered approach for RFP submittal.

1.4. Existing Black Start Resources

Existing Black Start Service providers that do not need additional capital to continue to provide Black Start Service or are not offering Fuel Assured Black Start Service do not need to respond to this RFP, as they are expected to provide continuing Black Start Service in accordance with the provisions of the PJM Tariff and applicable Manuals and any approved changes thereto.

In the event that an existing Black Start Unit owner desires to terminate its existing Black Start Service commitment, it must submit a one year termination notice in accordance with the black start termination process outlined in PJM Tariff Schedule 6A.

1.5. Informational WebEx Meeting

PJM will conduct a PJM Operating Committee Special Session WebEx Meeting on Tuesday June 27, 2023 from 9:00am-11:00am EDT. The purpose of this informational WebEx meeting is to review the RFP document and address questions. PJM will provide responses to questions asked during this WebEx meeting and post these responses under the Black Start Services heading on the PJM’s Ancillary Services webpage.

<http://www.pjm.com/markets-and-operations/ancillary-services.aspx>

2.0: Company Background

2.1. Statement

Company Background

PJM Interconnection, L.L.C. (“PJM”) ensures the reliability of the high-voltage electric power system serving 65 million people in all parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. PJM coordinates and directs the operation of the region's transmission grid, which includes over 85,000 miles of transmission lines and generating units with 185,442 megawatts of installed capacity.

PJM administers a \$33 billion annual competitive wholesale electricity market with more than 1,000 participants buying and selling electric energy, capacity, ancillary services and transmission rights. PJM plans regional transmission expansion improvements to maintain grid reliability and relieve congestion.

Founded in 1927, PJM Interconnection is an independent, federally regulated organization headquartered near Valley Forge, Pa.

PJM’s Operations

PJM's staff monitors the high-voltage transmission grid 24 hours a day, seven days a week. PJM keeps the electricity supply and demand in balance by sending price signals to supply resources, such as generators, to adjust how much energy they produce.

PJM operations are based on skilled knowledge workers and banks of powerful computers. Expert staff constantly monitor the grid at PJM's high-tech data, communication and control centers. As usage of electricity shifts up and down throughout the day, PJM balances supply and demand by telling power producers how much energy to supply.

In managing the grid, PJM's experts study hundreds of "what if" scenarios and prepare to deal with virtually any event. Each variable that might affect supply and demand for electricity is carefully considered – from extreme weather conditions, emergency situations and equipment failures to the more easily anticipated cycles of hours, days, weeks and seasons.

PJM's Markets

PJM administers competitive wholesale markets for large blocks of electricity – similar to the way the stock market works. Our markets are internet based. Utilities and other electricity suppliers use them to make short-term purchases of power for their customers. Our markets attract renewable power sources, such as wind, to the region.

PJM also administers demand response programs. Demand response allows customers to be paid for reducing their electricity usage during system emergencies or periods of higher power prices

PJM's Planning

Managing the future needs of the electric system is an integral part of PJM Interconnection's role as a regional transmission organization. PJM conducts a long-range Regional Transmission Expansion Planning process that identifies what changes and additions to the grid are needed to ensure reliability and the successful operation of the wholesale markets. PJM's open and extensive review process ensures that all interested parties, including state regulatory agencies, have an active role in planning for future electricity supply and reliability needs.

3.0: General Terms

By submitting a proposal to this RFP, you are agreeing to be bound by the rates, terms and conditions of service as set forth in PJM's Open Access Transmission Tariff, ("Tariff"), the Amended and Restated Operating Agreement of PJM Interconnection, L.L.C. ("Operating Agreement"), and/or all other applicable PJM Manuals or other governing agreements (collectively, the "Governing Agreements"), as they may be amended from time to time.

Acceptance of RFP proposals by PJM will be in the form of a notification letter. There will be no separate agreement for Black Start Service or Fuel Assured Black Start Service between the Black Start Unit Owner and PJM since all the terms and conditions are covered by the Governing Agreements and any FERC approved changes thereto.

In the event of a conflict between the terms and conditions of this RFP document and the terms and conditions of the Governing Agreements, the terms and conditions of the Governing Agreements shall control. The notification letter conveys no rights other than those specified in the Governing Documents.

3.1. Proposal in Effect

A proposal may not be modified by the respondent between November 1, 2023, and April 30, 2024, as defined in the RFP Timeline, and respondent so agrees in submitting the proposal. A proposal may be withdrawn or cancelled by written notice to PJM at any time prior to entering Black Start Service. A unit can only recover black start costs by entering Black Start Service or Fuel Assured Black Start Service.

3.2. Acceptance of Proposal

PJM reserves the right to reject any and all submitted proposals and any portion of a specific proposal, as well as the right to waive any informality or irregularity in any proposal received by PJM. PJM also reserves the right to accept or reject a proposal based on factors other than price. PJM assumes no obligation under this RFP and is not bound to procure goods or services from any respondent to this RFP. PJM assumes no obligation to provide a reason for rejection of a respondent's proposal. PJM reserves the right to amend or withdraw this RFP at any time.

Respondents assume the risk that PJM may reject proposals for any reason, may reject all proposals, may make no award, and may withdraw the RFP without incurring any liability.

If a submitted proposal is accepted, and after project award and commencement of work the Black Start Unit Owner projects either a significant delay in the original schedule or a significant increase in estimated costs, the Black Start Unit Owner will notify PJM as soon as possible of these significant changes. Refer to PJM Manual 12 Section 4.6 for other cost reporting requirements.

3.3. Retention of Respondent Material

PJM reserves the right to retain all proposals, including proprietary documentation regardless of which response is selected.

3.4. Confidential Matters – PJM Data

All data and information gathered by the respondent and its agents, including this RFP, shall be treated by the respondent and its agents as confidential and Critical Electric Infrastructure Information (CEII). ***The respondent and its agents shall not disclose or communicate the aforementioned matters to a third party, or use them in advertising, publicity, propaganda, and/or in another job or jobs, unless written consent is obtained from PJM.*** Respondent and its agents shall protect against the unauthorized disclosure of the Confidential Information to third parties.

Notwithstanding anything in the foregoing to the contrary, if respondent is required by applicable law, order, or in the course of regulatory, administrative or judicial proceedings, to disclose to third parties, information that is otherwise required to be maintained in confidence pursuant to this RFP, respondent or its designated agents, representatives, or contractors may make disclosure of such information; provided, however, that as soon as respondent learns of the disclosure requirement and prior to it or its designated agents, representatives, or contractors making disclosure, respondent shall notify PJM of the requirement and the terms thereof, and respondent shall, at its sole expense, to the maximum extent practicable minimize the disclosure of the information consistent with applicable law, including but not limited to seeking non-public status for confidential and CEII submitted to any such regulatory, administrative or judicial authorities. ***Respondent acknowledges that the status or planned status of any Black Start Unit to provide Black Start Service is CEII and should not be disclosed to any other parties without CEII restrictions including but not limited to signing a Nondisclosure Agreement and requesting that any governmental agency or regulatory authority to whom respondent is required to disclose CEII shall exempt the CEII from further disclosures under applicable Freedom of Information Act or similar legal requirements.***

4.0: Proposal Guidelines

4.1. Initial RFP Proposal Submission (Level 1)

PJM is implementing a two-tiered approach to the RTO-wide Black Start RFP process. Interested parties shall submit initial “Level 1” proposals for proposed black start solutions for one or more proposed Black Start Units, including sufficient basic information required for PJM to make initial determination on whether to proceed with requesting that resource owner submit a Level 2 proposal for further consideration.

Level 1 proposal information is detailed in the “PJM 2023 RTO Wide Black Start RFP Level 1 Response” form, posted separately, under the Black Start Services heading at <http://www.pjm.com/markets-and-operations/ancillary-services.aspx>, and generally includes the following:

- 1 | Type of Proposal (Black Start and/or Fuel Assurance)
- 2 | Unit identifying information (e.g., name/location/contact information, PJM Market unit ID, interconnection switchyard/voltage level, Transmission Owner zone)
- 3 | Unit characteristics (ICAP, black start MW, unit type, primary/secondary fuel, fuel type, fuel storage/firm gas contracts)
- 4 | Fuel Assured Black Start Service Information (basic fuel assurance details for respective fuel type)
- 5 | General operational characteristics (minimum load, emissions limitations, CC steam by-pass capabilities)

PJM is requesting that parties interested in submitting an initial Level 1 proposal in response to this Request for Proposal provide a non-binding response by email by 23:59 on July 25, 2023. The Black Start RFP Level 1 proposal response form should be downloaded from the PJM website, under the Black Start Services heading, <http://www.pjm.com/markets-and-operations/ancillary-services.aspx>, completed, and emailed to: BlackStart@pjm.com.

PJM will notify all Level 1 proposals (Target is August 22, 2023) on a determination of whether or not to proceed with a Level 2 proposal. PJM’s notification to a resource owner requesting a Level 2 proposal is not a guarantee that the RFP proposal will be selected; it is just an initial indication that PJM may be interested in pursuing further analysis and studies to determine the viability of the proposal.

For Level 2 proposals, bidders shall provide a full RFP proposal with detailed responses completed for identified units in accordance with Section 5.0.

4.2. RFP Proposal Submission (Level 2)

Level 2 RFP Proposals shall be submitted to PJM by 23:59 on November 1, 2023. The RFP Timeline (Section 4.5) outlines other relevant dates related to RFP Proposal submission and evaluation.

Delivery of Proposals

Proposals shall be submitted via email to BlackStart@pjm.com. Each proposal shall consist of answers to ALL questions as indicated in Section 5 “RFP Proposals.”

4.3. Evaluation and Acceptance of Proposals

PJM will work with its Transmission Owners (“TOs”) to evaluate proposals and select viable black start solutions based on the basis of Critical Load requirements, location, cost, operational considerations (cranking load, start time, etc.), and Black Start Fuel Assurance.

For Black Start Service, existing Black Start Units with a remaining term of commitment tied to a cost recovery rate would automatically be selected for the length of the recovery period. Existing Black Start Units on bilateral contracts with TOs would be automatically selected for use in those zones.

For Fuel Assured Black Start Service, a Black Start Unit must offer into RFP and be selected by PJM to provide Fuel Assured Black Start Service. A Black Start unit that is on a capital recovery rate at the time of this 2023 RTO Wide RFP may offer as a Fuel Assured Black Start Unit, or they may elect to not offer as a Fuel Assured Black Start Unit. However, in order to receive the increased Z Factor of 20% upon converting to the Base Formula Rate after the capital recovery period ends, they must offer in as a Fuel Assured Black Start Unit to this 2023 RTO Wide RFP, otherwise they would continue on the Base Formula Rate as non-fuel assured (with a 10% Z Factor), and would need to wait until the 2028 RTO Wide RFP to have the option again offer as fuel assured or continue as non-fuel assured in accordance with the proposed revisions to the PJM Tariff pending in Docket No. ER23-1874. PJM utilizes the following evaluation criteria in the RFP selection process, working in collaboration with the TOs to select black start solutions for each zone. Preferred black start solutions typically include units located in close proximity (from a transmission topology perspective) to PJM-defined critical loads, which are loads to support quicker starting steam units, CTs, Combined Cycle units, nuclear safe shutdown loads, and electric-powered gas compressor stations.

RFP proposals with dual fuel capability with on-site storage or gas units with multiple pipeline connections will be given a higher level of consideration in the RFP evaluation process. Resource owners submitting a proposal that does not meet PJM's fuel assurance evaluation criteria outlined below are strongly encouraged to submit various proposal options to meet PJM's Black Start Fuel Assurance criteria.

PJM proposal evaluation criteria includes:

1 | Technical Feasibility

(a) Reliability Analysis/NERC Standard EOP-005 Studies

- i. Feasibility of power flow study results, including operating within thermal and voltage limits, Black Start Unit has adequate reactive capability to handle line charging of cranking path and critical load requirements.
- ii. Feasibility of dynamic simulation study results, including operating within voltage, frequency and stability limits.

(b) Unit Location/Characteristics

- i. Geographically and electrically diverse from other black start resources in the TO zone.
- ii. Within TO zone or cross-zonal black start.
- iii. Interconnection voltage level.
- iv. Type of resource: CT, Combined Cycle (or CT that is part of a Combined Cycle plant), Hydro, Diesel, Storage, Hybrids (renewables with storage), etc.
- v. Unit can serve multiple transmission outlets or support redundant cranking paths.
- vi. Unit can provide black start to more than one TO zone
- vii. Age of unit

(c) Operational/Environmental Restrictions

- i. Limitations such as slow ramp to minimum load after synchronizing, minimum load requirements for stabilizing load, turn down ratio, other operational limitations.
- ii. Operational or procedural restrictions to Reactive MVAR Capability curve.
- iii. Environmental permit change needed to operate at emergency minimum output during restoration, other environmental limitations.
- iv. Unit is able to meet minimum run hour requirements per OATT Schedule 6A (16 hours or as indicated in TO Restoration Plan).
- v. Unit's historical availability (GADs).

(d) Black Start Testing Requirements

- i. Is unit able to meet PJM black start testing requirements, in accordance with the terms and conditions of the Tariff, and Manuals, as amended from time to time (e.g., ability to close to a dead bus in 180 min., ability to operate at reduced loads during testing while islanded).?
- ii. Or, are testing exemptions required (e.g., special switching, stabilizing loads, breaker closing to a live bus, load banks).

- (e) Fuel Assurance
- (f) Fuel Type/Fuel diversity
- (g) Dual fuel capability/availability, including logistics assessment such as:
 - i. Can unit start on both primary and secondary fuel?
 - ii. Is different start-up fuel required before running on primary or alternate fuel?
 - iii. Special switching requirements to move from primary to alternate fuel (or vice versa)
- (h) Analysis of the bidder's description of the level of onsite fuel storage, any permitting limitations (and challenges to obtain permits) associated with burning on-site fuel and a description of the planned arrangements to both obtain and replenish on-site fuel;
- (i) Primary firm gas transportation contract vs. secondary firm or interruptible gas contracts;
- (j) Analysis of the bidder's detailed description of planned or existing interconnections to one or more natural gas pipelines.
- (k) Zonal minimum black start fuel assurance criteria, pursuant to PJM Manual 36.
- (l) Incremental Restoration Time Increase of 10 hours or more as identified in a PJM zonal reliability analysis.

2 | Cost/Schedule

- (a) Annual Revenue Requirements (Capital Costs, Net Present Value comparison)
 - i. Capital Costs/Black Start MWs
 - ii. Net Present Value/Black Start MWs
- (b) Black Start cost recovery and commitment period
- (c) Any unit entering Black Start Service through this RFP and recovering capital costs will have a black start commitment period for the lifetime of the black start equipment subject to any approved future changes thereto. See additional detail in Section 6.1.2.
- (d) Cost recovery method – Base Formula Rate, NERC CIP Rate, Capital Recovery Factor Rate, FERC Rate.
- (e) Proposed Black Start Service date alignment with requested in service date (12/1/2025).

Opportunity for cross-zonal black start coordination

Note: PJM will consider cross-zonal black start / fuel assurance alternatives, where critical load in one TO zone is served by black start in an adjacent TO zone, as detailed in PJM Manual M36, if necessary to address black start needs.

4.4. PJM Contact Information

ALL communication regarding this RFP should be sent electronically to only the contact email address below.

PJM Contact for all RFP communications: BlackStart@pjm.com

4.5. RFP Timeline

RFP Process Milestone	Date
PJM posts RFP	June 20, 2023
PJM conducts Special OC Session WebEx Meeting	June 27, 2023
RFP interested parties submit Level 1 proposals to PJM	July 25, 2023
PJM provides response to Level 1 proposals	August 22, 2023
Bidders submit RFP Level 2 proposals to PJM	November 1, 2023
PJM evaluation and award of viable Black Start solutions	November 1, 2023 – April 30, 2024
In-Service Target for new Black Start Units and Fuel Assurance Upgrades	December 1, 2025

5.0: RFP Proposals (Level 2)

RFP Level 2 Proposals at a minimum will include responses to all information requested in Section 5.0. The technical details indicated by the section headings below for Sections 5.1 through 5.5 should be submitted in the format provided in the separate “PJM 2023 RTO Wide Black Start RFP Level 2 Proposal Data Collection” form. This form is located under the Black Start Services heading on the PJM’s Ancillary Services webpage.

<http://www.pjm.com/markets-and-operations/ancillary-services.aspx>

5.1. Purpose and Scope

Details for the following Purpose and Scope sections required in Level 2 proposals are provided in the “PJM 2023 RTO Wide Black Start RFP Level 2 Proposal Data Collection” form and should be submitted to PJM on that separate form. Bidders should populate the respective data fields for each black start and/or fuel assurance proposal. Additional columns can be added if needed.

5.1.1. Facility

5.1.2. Black Start Unit

5.1.3. Interconnection

5.1.4. Necessary Upgrade(s) for BS Capability

5.2. Generator Operational Details

Details for the following Generator Operational Details sections required in Level 2 proposals are provided in the “PJM 2023 RTO Wide Black Start RFP Level 2 Proposal Data Collection” form and should be submitted to PJM on that separate form. Bidders should populate the respective data fields for each black start and/or fuel assurance proposal. Additional columns can be added if needed.

5.2.1. One-Line Diagram

5.2.2. Start-Up Sequence Description

5.2.3. Reactive Capability

5.2.4. Start-Up Time

5.2.5. Existing or Planned Black Start Unit Fuel Assurance Details

5.2.6. Applicable minimum load, environmental, and black start testing restrictions

5.2.7. Refurbishment of Existing Black Start or Black Start Capable Resources

5.3. Project Schedule

Details for the following Project schedule sections required in Level 2 proposals should be provided to PJM on the separate “PJM 2023 RTO Wide Black Start RFP Level 2 Proposal Data Collection” form.

5.3.1. Estimated In-Service Date

Indicate the estimated in-service date as a black start capable unit. For the purpose of this RFP proposal, assume a Black Start In-Service date of December 1, 2025. Dates will be adjusted based on actual award date.

5.3.2. Project Schedule

Detail the project milestones in tabular and/or graphical form. Include the milestone description and projected start/finish dates.

5.3.3. Procurement Plan

Detail any work that is planned with vendors.

5.4. Total Estimated Capital Costs for Black Start Service and/or Fuel Assured Black Start Service

Details for the following Estimated Capital Costs for Black Start Service and/or Fuel Assured Black Start Service Costs sections required in Level 2 proposals should be provided to PJM on the separate “PJM 2023 RTO Wide Black Start RFP Level 2 Proposal Data Collection” form. Supplemental information is included in the sections below:

5.4.1. Total Estimated Upgrade Capital Cost

Costs in RFP Proposal are to consist of an estimate of projected actual costs, including contingency as appropriate. Cost recovery is based on actual costs. Actual project costs with supporting documentation will be submitted to the Independent Market Monitor (IMM) for review upon completion of project in accordance with PJM Tariff Schedule 6A. All capital cost estimates including contingencies will be evaluated by the Independent Market Monitor and PJM for consistency with the rates and terms set forth in PJM Tariff Schedule 6A. Proposals with cost estimates deemed by PJM to be inconsistent with those rates and/or terms may be rejected.

See RFP Section 6.1.1 for additional details on how to estimate a Black Start Unit’s Annual Black Start Revenue Requirements.

5.4.2. Estimated Annual Fixed Black Start Service Cost

Proposals shall include an indication of the desired cost recovery method for the unit’s Fixed Black Start Service Costs (Fixed BSSC) (Capital). Only one of the following rates should be selected:

- 1 | Proposed Black Start Units electing to not document Black Start Capital Costs or not requiring additional Black Start Capital Costs should select the Base Formula Rate.
- 2 | Proposed Black Start Units that choose to recover documented Black Start Capital Costs (including capital costs for NERC Standard Compliance) should select the Capital Cost Recovery Rate (CRF). For units that select the Capital Cost Recovery Rate, the Levelized CRF and Black Start Service Term of Commitment are based on the Age of the Black Start unit as of the In-Service Date. Black Start Units selecting the CRF Rate have a commitment period equal to the life of the Black Start equipment.
- 3 | Proposed Black Start Units electing to recover only the Black Start Capital Costs associated with compliance with applicable mandatory NERC CIP Reliability Standards should select the Capital Cost Recovery Rate – NERC-CIP Specific Recovery. For units that select the Capital Cost Recovery Rate – NERC-CIP Specific Recovery the Levelized CRF and Black Start Service Term of Commitment are based on the Age of the Black Start Unit as of the In-Service Date or the Capital Improvement Lifespan. Black Start Units selecting the NERC-CIP Specific Recovery Rate have a commitment period equal to the life of the Black Start equipment.
- 4 | Proposed Black Start Units electing to recover Black Start Capital Costs outside the Tariff guidelines will need FERC to approve the desired cost recovery. Black Start Units requesting cost recovery in accordance with a FERC-approved rate are required to file, and receive approval of, their cost recovery method with FERC upon acceptance for Black Start Service.

5.4.3. Estimated Black Start Service Annual O&M Cost

Proposals shall include the unit’s projected annual Variable Black Start Service Costs (“Variable BSSC”) (Black Start O&M including the cost to maintain compliance with NERC Reliability Standards) to provide the Service.

5.4.4. Estimated Black Start Service Annual Fuel Storage Cost

Proposal for units that use oil fuel shall include an estimate of the annual Fuel Storage Costs. Estimates should be based on a 16 hour run period and a Bond Rate of 5.52 percent.

5.5. Black Start Unit Owner Contact Information

Details for the following Contact Information sections required in Level 2 proposals should be provided to PJM on the separate “PJM 2023 RTO Wide Black Start RFP Level 2 Proposal Data Collection” form.

	Name	Title	Company	Phone Number	Email Address
Primary Contact					
Alternate Contact					

6.0: Black Start and Fuel Assured Black Start Business Rules Summary

6.1. Black Start Service Compensation

6.1.1. Black Start Service and/or Fuel Assured Black Start Service Annual Revenue Requirements

Selected Unit’s Black Start and Fuel Assured Black Start Annual Revenue Requirements will be calculated based upon actual costs submitted to the PJM Independent Market Monitor review and PJM for approval.

Details of the PJM Black Start and Fuel Assured Black Start Annual Revenue Rates available are contained in the PJM Tariff – Schedule 6A Black Start Service Section 18. Black Start Annual Revenue Requirements are calculated using the following equation:

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

Fuel Assured Black Start Service costs are included in Fixed BSSC, Variable BSSC, Fuel Storage Costs and the incentive factor (Z) as shown below. Fuel Assured Black Start revenue requirement rules are contingent on FERC approving PJM’s May 12, 2023 filing ER23-1874.

6.1.2. Black Start Service and Fuel Assured Black Start Service Compensation, Commitment, and Termination Rules

Changes have been made to the Tariff, Schedule 6A, Black Start Annual Revenue Requirement's Capital Recovery Factors, Black Start commitment periods, Black Start Annual Revenue Requirement Minimum Tank Suction Level Calculations and Black Start Termination rules since the last RTO Wide RFP as follows (the information below is provided for informational purposes only):

6.1.2.1. Black Start Annual Revenue Requirement Capital Recovery Factors (CRF)

Black Start Annual Revenue Requirement CRFs for units selected in this RFP will be revised during the unit's capital recovery period calculated annually in accordance with the PJM Tariff and Manuals

6.1.2.2. Black Start Capital Cost Recovery Commitment Period

Black Start Units that are selected under this RFP and choose to recover documented Black Start Capital Cost under a Capital Cost Recovery Rate shall commit to provide Black Start Service from such Black Start Units for an initial capital recovery period based upon the age of the Black Start Unit plus the remaining life of the Black Start equipment.

6.1.2.3. Minimum Tank Suction Level (MTSL)

Black Start Units with Fuel Storage Costs will only be eligible to recover the carrying cost for the portion of the MTSL volume that is directly related to Black Start.

6.1.2.4. Black Start Termination rules for units on a Capital Cost Recovery Rate

Black Start Units that are selected under this RFP and choose to recover documented Black Start Capital Cost under a Capital Cost Recovery Rate may terminate their lifetime Black Start Service commitment with one year advance notice and consent of PJM, provided the Black Start Unit's owner demonstrates to the satisfaction of PJM that at least one of the reasons stated in the Tariff for such termination apply.

Pending FERC approval of PJM's May 12, 2023 filing in Docket No. ER23-1874, Tariff Schedule 6A, will be revised to include rules related to Fuel Assured Black Start Service as follows (the information below is provided for informational purposes only):

6.1.2.5. Fuel Assured Black Start Unit Operating Requirements

A fuel assured Black Start Unit is a generating unit that is capable of starting without an outside electrical supply and running 16 hours or more at full load and stores at least 16 hours of fuel on site, is connected to multiple interstate pipelines, is connected to a fuel gathering facility, or is an intermittent or hybrid resource that PJM has evaluated as being capable of providing 16 hours of operation with 90% confidence.

6.1.2.6. Black Start Fuel Assurance Capital Costs

Fuel Assurance Capital Costs are the new or additional capital costs needed for the installation of equipment necessary for the unit to meet the fuel assurance criteria specified in the PJM manuals.

6.1.2.7. Fuel Assurance Capital Recovery Factors (CRF) and Recovery Periods

Black Start Annual Revenue Requirement CRFs for units selected in this RFP for fuel assurance and recovering Fuel Assurance Capital Costs will be the same CRFs used for units recovering Black Start Service Capital Costs that are revised during the unit's capital recovery period calculated annually in accordance with the PJM Tariff and Manuals. The minimum recovery period for a unit to recover Fuel Assurance Capital Cost is 10 years.

6.1.2.8. Fuel Assurance Capital Cost Recovery Commitment Period

Units that are selected under this RFP to provide fuel assurance and choose to recover documented Fuel Assurance Capital Cost under a Capital Cost Recovery Rate shall commit to provide Black Start Service from such Black Start Units for an initial capital recovery period based upon the age of the Black Start Unit plus the remaining life of the Black Start equipment.

6.1.2.9. Fuel Assurance Capital Cost Recovery Period Annual/Monthly Revenue Offsets

Fuel Assured Black Start Units that are recovering Fuel Assurance Capital costs will have energy revenues from operating on the added fuel assurance fuel minus the cost of running on that fuel debited from the monthly Black Start revenue during that month, but monthly credits will not be increased. For Fuel Assured Black Start units that are recovering Fuel Assurance Capital Cost and the Fuel Assurance Capital Costs increased the Installed Capacity Rating (ICAP) of the unit, Black Start monthly revenues will also be debited the monthly capacity revenues for the increased ICAP. Monthly Black Start revenues will not be less than zero.

6.1.2.10. Fuel Assured Black Start units recovering Fixed BSSC under the Base Formula Rate

Fueled Assured Black Start units recovering cost under the Base Formula Rate will have their annual revenues be calculated using an X factor equal to 0.02 and an Incentive Factor (Z) equal to 20%.

6.1.2.11. Fuel and Consumable Storage Requirements

Any Fuel Assured Black Start unit that stores fuel onsite and fails in any month to store the fuel and/or other consumable inventory needed to meet a 16 hour run hour requirement except for allowable conditions specified in the PJM manuals will not receive Black Start revenues for that month.

6.1.2.12. Dual Fuel Units that are Fuel Assured - Testing Requirements

Dual Fuel units that are Fuel Assured Black Start Units must conduct an annual test on both fuels.

6.1.2.13. Fuel Assured Black Start Termination rules for units on a Capital Cost Recovery Rate

Fuel Assured Black Start Units that are selected under this RFP and choose to recover documented Black Start Capital Cost under a Capital Cost Recovery Rate may terminate their lifetime Black Start Service commitment with one year advance notice and consent of PJM, provided the Black Start Unit's owner demonstrates to the satisfaction of PJM that at least one of the reasons stated in the Tariff for such termination apply.

6.1.3. Black Start Service Annual Revenue Components

Only one of the following rates should be selected for the unit's Fixed Black Start Service Costs (Fixed BSSC) (Capital) regardless of whether the unit is or is not recovering Black Start Service Costs and/or Fuel Assurance Capital Costs in accordance with the terms and conditions of the Tariff, Schedule 6A, and the PJM Manuals, as they may be amended from time to time.

- 1 | Proposed or existing Black Start Units electing to not document Black Start Capital Costs, Fuel Assurance Capital Cost, or not requiring additional Black Start Capital Costs should select the Base Formula Rate.

- 2 | Proposed or existing Black Start Units that choose to recover documented Black Start Capital Costs (including capital costs for NERC Standard Compliance) and/or Fuel Assurance Capital Costs should select the Capital Cost Recovery Rate (CRF). For units that select the Capital Cost Recovery Rate, the Levelized CRF and Black Start Service Term of Commitment are based on the Age of the Black Start unit as of the In-Service Date. Black Start Units selecting the CRF Rate have a commitment period equal to the life of the Black Start equipment.
- 3 | Proposed or existing Black Start Units electing to recover only the Black Start Capital Costs associated with compliance with applicable mandatory NERC CIP Reliability Standards and/or Fuel Assurance Capital Costs should select the Capital Cost Recovery Rate – NERC-CIP Specific Recovery. For units that select the Capital Cost Recovery Rate – NERC-CIP Specific Recovery the Levelized CRF and Black Start Service Term of Commitment are based on the Age of the Black Start Unit as of the In-Service Date or the Capital Improvement Lifespan. Black Start Units selecting the NERC-CIP Specific Recovery Rate have a commitment period equal to the life of the Black Start equipment.
- 4 | Unit's requesting cost recovery in accordance with a FERC-approved rate are required to file, and receive approval of, their cost recovery method with FERC upon acceptance for Black Start Service.

The unit's projected annual Variable Black Start Service Costs ("Variable BSSC") should include Black Start O&M and the cost to maintain compliance with NERC Reliability Standards necessary to provide the Service.

Black Start Unit's will be compensated for Training Costs at the level of \$3,750 per year per plant.

Units that use Oil Fuel shall estimate the annual Fuel Storage Costs based on a 16 hour run period and a Bond Rate of 4.56 percent.

Non-Fuel Assured Units using the Base Formula Rate for Fixed Black Start Service Costs will be able to use an Incentive Factor (Z) of 10 percent. Fuel Assured Units using the Base Formula Rate for Fixed Black Start Service Costs will be able to use an Incentive Factor (Z) of 20 percent. For all units recovering either Black Start Service Capital Costs, NERC-CIP Capital Costs, and/or Fuel Assurance Capital costs in Fixed Black Start Service Costs shall have an incentive Factor (Z) of 0 percent.

Additional guidance on the calculation of a Unit's Annual Black Start Service Revenue Requirements may be found in the [Black Start Cost Submittal Forms](#). Please select the tab associated with the Fixed Black Start Service Cost Rate chosen.

6.1.4. Submittal of Estimated Capital Cost, Actual Capital Cost and Annual Black Start Service Costs

6.1.4.1. Evidence of upgrade Cost

If selected, submittal of data supporting actual capital and annual black start service costs and Fuel Assurance Capital Costs to PJM and the PJM Independent Market Monitor ("IMM") in accordance with Paragraph 17B of Schedule 6A of the Tariff is required.

6.1.4.2. Timing of submittal of estimated costs

A selected Black Start Unit owner will submit a best estimate of the unit's projected actual upgrade for Black Start Service and/or Fuel Assured Black Start Service Capital Costs, variable Black Start Service costs, and fuel storage costs to PJM at the time the unit enters Black Start service, to serve as an interim annual revenue requirement until reconciliation and approval of final actual upgrade capital costs is complete.

6.1.4.3. Timing of review and final determination of actual costs:

A selected Black Start Unit owner must submit supporting data and documentation of actual upgrade Black Start Service and Fuel Assurance Capital Costs to PJM and the IMM no later than 90 days after entering Black Start Service. The supporting data and documentation can be submitted on a monthly basis as incurred or as a single submittal at the completion of the work, but all cost documentation must be submitted no later than 90 days after the unit enters Black Start service.

A selected Black Start Unit owner must submit documentation of other annual revenue costs including variable black start cost and fuel storage costs to PJM and the IMM within 90 days after entering Black Start Service. Annual variable black start service can include annualized capital costs, Black Start O&M costs, existing unit level annual VOM costs and NERC Standard compliance costs.

6.1.4.4. Timing of Black Start Service monthly credits

New Black Start Unit owner's monthly Black Start credits will be held by PJM in a non-interest bearing account until PJM or the Federal Energy Regulatory Commission accepts the owner's annual revenue requirement pursuant to Section 17B of Schedule 6A of the Tariff. Monthly Credits for the unit's annual revenue requirement including recovery of actual Black Start Service or Fuel Assurance Capital upgrade costs will begin after the Black Start Unit's annual revenue requirement is accepted by PJM and will include monthly credits held by PJM back to the unit's in-service date including any required estimated revenue true up.

6.1.4.5. Supporting Documentation

Supporting documentation for actual capital costs will include but not be limited to the following:

- 1) third party invoices supporting costs for contractor services and materials;
- 2) time sheets or other project tracking documentation for internal labor costs (components of labor rates) including rate sheets and applicable overheads;
- 3) when internal costs are charged to the project, they must include documentation supporting all costs that will be included and a breakdown of how the costs were developed;
- 4) when application and certificates for payment are used to confirm completion of any portion of the project, they must be signed and notarized. The signature and notarization must be visible on any copies provided.

Supporting documentation for variable black costs and fuel storage costs (if applicable) will include but not be limited to the following:

- 5) third party invoices supporting costs for contractor services and materials;
- 6) time sheets or other project tracking documentation for internal labor costs (components of labor rates) including rate sheets and applicable overheads;
- 7) if the unit can be fired on oil, additional required documentation for the claimed Minimum tank Suction Level(s), size of tanks, and burn rates. If the tank is shared with other resources, a complete explanation with all supporting data of how tank use is shared and the allocation factor(s) used is required.

6.1.4.6. Cost evidence disputes

The IMM will provide feedback and attempt to come to agreement on the level of each component in the Black Start Service revenue requirement within 90 days after the Black Start Unit owner's final submittal of cost documentation or other date as specified in Schedule 6A paragraph 17B.

If the IMM and the Black Start Unit owner are unable to come to an agreement on the project upgrade costs or any other annual costs to be reimbursed to the Black Start Unit owner, then the Black Start Unit owner must notify PJM that it disagrees with the IMM's determination of costs within seven days after the IMM submittal of the annual revenue requirement to PJM. The Black Start Unit owner shall also submit its proposed costs to PJM provided it has participated in good faith in the process and the Black Start revenue requirements are no higher than the level defined in any agreement reached by the Black Start Unit owner and the IMM. PJM will review the proposed costs submitted by Black Start Unit owner, and determine whether to accept the owner's proposed costs within 30 days after the Black Start Unit owner written disagreement. If the Black Start Unit owner and PJM are unable to reach agreement on the costs to be reimbursed, then the Black Start Unit owner may file its own proposed costs for reimbursement with the Federal Energy Regulatory Commission for approval.

6.1.4.7. Changes to revenue requirement

If a Black Start Unit owner incurs additional costs after the initial in-service date to maintain the Black Start Unit's black start capability, the Black Start Unit owner can submit data evidencing those costs to the IMM pursuant to Paragraph 17 of Schedule 6A and adjust its revenue requirement going forward to recover such costs, along with an applicable extension to the black start commitment term. However, the existing revenue requirement must be effective at least for 12 months prior to making such change. Per Paragraph 17 of Schedule 6A: "No change to a Black Start Service revenue requirement shall become effective until the existing revenue requirement has been effective for at least 12 months."

6.1.5. Compensation for Energy Output

6.1.5.1. Testing

The Black Start Unit will be tested annually and must have a successful annual test on record within the preceding 13 months in order to receive Black Start Service revenues in accordance with paragraphs 12 and 14 of Schedule 6A of the Tariff. Compensation for the energy output delivered by the Black Start Unit during annual testing will be provided at the higher of the Black Start Unit's cost-capped offer or real-time locational marginal price ("LMP") in accordance with paragraph 13 of Schedule 6A of the Tariff and Manual 28 Section 5.2.7. Typically, Black Start Units close to a dead bus during the test and do not provide energy to the grid. Test compensation for such a unit consists of the unit's start cost plus one hour of no-load.

6.1.5.2. Emergency black start dispatch

In the event of emergency black start dispatch, a Black Start Unit owner shall be compensated for the Black Start Unit's energy output at the unit's cost-capped offer, until such time that PJM is able to reestablish the energy markets and calculate a LMP.

6.1.5.3. Cost-capped offer

The unit's Cost based offer will be developed in accordance with the guidelines provided in Manual 15 "Cost Development Guidelines."

6.1.6. Service after Initial Commitment Term & Termination of Service

6.1.6.1. Service after Initial Commitment Term

Black Start Units recovering cost under Tariff, Schedule 6A, Section 5 have an initial two year commitment to provide Black Start Service.

Black Start Units that has elected to recover Black Start Service, NERC-CIP Capital Costs, and/or Fuel Assured Black Start Capital Cost under Tariff, Schedule 6A, Section 6 and selected in this RFP have a Black Start Service commitment for the initial capital recovery period based on the age of the unit plus the lifetime of the Black Start equipment. After the initial capital recovery period is completed a Black Start Unit will receive the compensation set forth in the Tariff for units under PJM Tariff, Schedule 6A, Section 5.

As set forth in PJM Tariff, Schedule 6A section 18, for purposes of such compensation for a Black Start Unit's with a term of commitment under Paragraph 5, "Black Start Unit Capacity" means the entire installed capacity of the current delivery year of Black Start Unit.

6.1.6.2. Termination by Black Start Unit

Black Start Unit selected in this RFP, pursuant to PJM Tariff, Schedule 6A, Section 5, foregoing documented capital cost recovery may terminate provision of Black Start Service with one year advance notice to PJM after the initial two year commitment.

Black Start Units selected pursuant PJM Tariff, Schedule 6A, Section 6, electing to recover documented Black Start Service, NERC-CIP, and/or Fuel Assured Black Start Service Capital Cost may terminate provision of Black Start Service with one year written advance notice to PJM and the consent of PJM, provided that it will forgo any existing entitlement to future black start revenues. Black Start Units that are selected under this RFP and choose to recover documented Black Start, NERC-CIP, and/or Fuel Assurance Capital Cost under a Capital Cost Recovery Rate may terminate their lifetime Black Start Service commitment provided the Black Start Unit's owner demonstrates to the satisfaction of PJM that at least one of the following reasons for such termination apply:

- (a) Black Start Unit retirement or deactivation with at least one year's notice;
- (b) Expiration of a state, federal, or other governmental agency permit(s) required for Black Start Service with at least one year's notice; or
- (c) Additional capital is required by the Black Start Unit owner to maintain Black Start Service capability. In which case, the Black Start Unit will submit a proposal in to PJM's Black Start Service RFP in accordance with the procedures set forth in Manual 12 and only continue to provide Black Start Service if selected by PJM in the RFP evaluation process.

6.1.6.3. Termination by PJM

Pursuant to of Schedule 6A of the Tariff, PJM may terminate provision of Black Start Service with one year advance notice to Black Start Unit owner (before or after actual in-service of the Black Start Unit), but the Black Start Unit owner will be reimbursed for any amount of unrecovered Fixed BSSC (as defined in the Tariff) for a period not to exceed five years.

If PJM terminates the contract before in-service date, the Black Start Unit owner will cease work on the project and submit all costs expended up to the date of termination to PJM (for reimbursement in accordance with the Tariff). Such costs will include but not be limited to payment for equipment completed (both received and completed but not shipped), cancellation payments and non-refundable advance payment.

If PJM cancels or terminates any portion of its Tariff and such cancellation or termination would affect the existing rights of the Black Start Unit owner to receive compensation for Black Start Service, then PJM shall nonetheless be required to reimburse the Black Start Unit owner for any amount of unrecovered Black Start Service revenues to which the Black Start Unit owner has an existing entitlement.

6.2. Testing

6.2.1. Annual Test

To receive Black Start Service revenues, the Black Start Unit must have a successful annual test on record with PJM within the preceding 13 months in accordance with Schedule 6A of the Tariff as amended from time to time. Fuel Assured Black Start Units with dual fuel must have a successful annual test on both fuels on record with PJM within the preceding 13 months. During its black start test, the Black Start Unit must be able to close to a dead bus and be able to maintain voltage in automatic voltage control mode and maintain frequency in automatic isochronous control for 30 minutes. A Black Start unit that is unable to maintain voltage or frequency for 30 minutes must have a state, federal, or other governmental agency permit limiting the run time.

6.2.2. Failed Annual Test

If a Non-fuel Assured Black Start Unit or Fuel Assured Black Start Unit fails any annual test, it may be re-tested within a 10 day period without financial penalty as long as the 10 day period does not cross over the 13 month requirement. If the Black Start Unit does not successfully pass a black start test within the 10 day period immediately following a failed test, monthly black start revenues will be forfeited from the time of the first day of the month in which the unsuccessful test occurred until the first day of the first month after the unit successfully passes a black start test.

If the Black Start Unit owner does not make the necessary repairs to enable the Black Start Unit to pass the annual test within 90 days of the due date for the annual test, the Black Start Unit will immediately cease to qualify as a Black Start Unit. Provided, however, the 90 day period may be extended up to one year with PJM approval. If the 90-day period is extended, the Black Start Unit owner will continue to forfeit all revenues starting from the first day of the month in which the unsuccessful test occurred until the first day of the first month after the unit successfully passes a black start test.

6.3. Black Start Unit/Transmission Owner Coordination

Black Start Unit and TO will coordinate the modification to the electrical protection system (transmission system and Black Start Unit Facility) to protect the Black Start Unit and grid during black start startup and operation. Each party will be responsible for the cost of any upgrades to its portion of the system (i.e., Black Start Unit owner will be responsible for upgrades to the Black Start Unit, TO will be responsible for upgrades to the Transmission System).

The Black Start Unit owner and TO will develop the communication protocol between TO and Black Start Unit to meet black start dispatch requirements.

The Black Start Unit owner and TO will develop the TO System Restoration Plan to include the Black Start Unit operational limitations.

The Black Start Unit owner and PJM will develop procedures for both the Black Start Unit acceptance test and annual test.

6.4. In-Service Date Delays

The Black Start Unit owner will make every reasonable effort to make the estimated in-service date indicated in their RFP proposal. Should the project be delayed, The Black Start Unit owner will immediately notify PJM of the delay and make every effort to minimize the impact. The Black Start Unit owner will not be required to pay any penalty for any such delays.

6.5. Black Start Unit Configurations

Note that configurations where the cranking unit offers into PJM's Capacity or Energy Markets and cranks another unit that offers into the Capacity or Energy Markets are unacceptable. In that case that the cranking diesel offers into PJM's capacity or Energy Markets, then the cranking diesel is the Black Start Unit and the cranked unit is critical load.

7.0: Black Start Generator Reference Guide

7.1. Index of Documents and Manuals

PJM Open Access Transmission Tariff Schedule 6A – Black Start Service – existing version and proposed future revisions

Provides the PJM Tariff requirements for black start generators.

Manual M-01, Rev 36 – Control Center and Data Exchange Requirements

Describes the control center and telecommunication requirements between PJM and its members.

Manual M-10, Rev 36 – Pre-Scheduling Operations

Describes the pre-scheduling process and information required from generation resources.

Manual M-12, Rev 37 – Balancing Operations - existing version and proposed future revisions

Describes the real time operations process.

Manual M-14D, Rev 42 – Generator Operational Requirements

Provides a general overview of generator operational requirements.

Manual M-27, Rev 88 – Open Access Transmission Tariff Accounting

Describes the accounting for transmission services within the PJM Open Access Transmission Tariff.

Manual M-36, Rev 24 – System Restoration

Describes how PJM and the PJM Members are expected to respond to system disturbance conditions or system blackout.

NERC Reliability Standards

7.2. PJM Open Access Transmission Tariff Schedule 6A – Black Start Service

Existing version:

<https://www.pjm.com/directory/merged-tariffs/oatt.pdf>

Black Start Fuel Assurance related revisions pending FERC approval of PJM 5/12/2023 filing:

<https://www.pjm.com/-/media/committees-groups/committees/mrc/2022/20221024/item-01---11-tariff-schedule-6a-revisions---redline.ashx>

- Black Start Service Provisions
- Performance Standards and Outage Restrictions
- Testing Requirements
- Revenue Requirements and Recovery Rates
- Credits
- Charges

7.3. Manual M-01, Rev 36 – Control Center and Data Exchange Requirements

<https://www.pjm.com/-/media/documents/manuals/m01.ashx>

- Member Control Center Requirements
 - Data and voice communications
 - Staffing
 - Facility requirements
 - Periodic testing of telecommunications

7.4. Manual M-10, Rev 36 – Pre-Scheduling Operations

<https://www.pjm.com/-/media/documents/manuals/m10.ashx>

Planned Outage Restrictions for Black Start Units

7.5. Manual M-12, Rev 37 – Balancing Operations

Existing version:

<https://www.pjm.com/-/media/documents/manuals/m12.ashx>

Black Start Fuel Assurance related revisions pending FERC approval of PJM 5/12/2023 filing:

<https://www.pjm.com/-/media/committees-groups/committees/mrc/2022/20221024/item-01---3-manual-12-revisions---redline.ashx>

- Black Start Service
- Definitions
- Minimum Critical Unit Requirements

- Product Description
 - Generator Owner’s Commitment
 - Performance Standards
 - Testing
 - Training Standards and Records
 - Non-performance
 - Termination of Black Start Service
- Attachment C: PJM Black Start Report Forms for:
 - Black Start Tests Generation and Transmission
 - Automatic Load Rejection Tests
 - Formulaic Cost Data
 - Actual Cost Data

7.6. Manual M-14D, Rev 42 – Generator Operational Requirements

Existing version:

<https://www.pjm.com/-/media/documents/manuals/m14d.ashx>

Black Start Fuel Assurance related revisions pending FERC approval of PJM 5/12/2023 filing:

<https://www.pjm.com/-/media/committees-groups/committees/mrc/2022/20221024/item-01---5-manual-14-d-revisions---redline.ashx>

- Black Start Generation Procurement
 - Black Start Selection Process
 - Black Start Incremental RFP Process
 - Generator reactive capability testing requirements for Black Start Units.

7.7. Manual M-27, Rev 88 – Open Access Transmission Tariff Accounting

Existing version:

<https://www.pjm.com/-/media/documents/manuals/m27.ashx>

Black Start Fuel Assurance related revisions pending FERC approval of PJM 5/12/2023 filing:

<https://www.pjm.com/-/media/committees-groups/committees/mrc/2022/20221024/item-01---7-manual-27-revisions---redline.ashx>

- Black Start Service Accounting
- Black Start Service Credits and Charges

7.8. Manual M-36, Rev 24 – System Restoration

Existing version:

<https://www.pjm.com/-/media/documents/manuals/m36.ashx>

Black Start Fuel Assurance related revisions pending FERC approval of PJM 5/12/2023 filing:

<https://www.pjm.com/-/media/committees-groups/committees/mrc/2022/20221024/item-01---9-manual-36-revisions---redline.ashx>

- Generation
 - Communications
 - Governor & Frequency Control
 - Cranking Paths
 - Cranking Power
- Transmission
 - Voltage Regulation and Control
 - Energization Guidelines
- System Restoration Plan Guidelines
- Cross Zonal Coordination
- Minimum Critical Black Start Requirement

7.9. NERC Reliability Standards

<https://www.nerc.com/pa/Stand/Pages/default.aspx>