



# Special OC Session: 2024 Incremental Black Start RFP for Fuel Assured Black Start Service

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- New Black Start (BS) Fuel Assurance (FA) business rules requires a minimum of one FA BS resource per Transmission Owner (TO) Zone
- FA BS must maintain a minimum of 16 hours of fuel and non-fuel consumables for system restoration
- 2023 RTO Wide Black Start RFP is the first RFP issued to meet the new FA requirements. Multiple TO zones did not receive FA proposals.
- 2024 Incremental Black Start RFP for Fuel Assurance will be issued for the RTO to procure BS to meet the minimum of one FA BS for TO zones without FA options



# Incremental Fuel Assurance RFP Milestone Schedule

Milestone	Date
PJM posts RFP	4/29/2024
PJM Conducts OC Special Session Meeting	5/02/2024
RFP interested parties submit Level 1 proposals	<b>5/28/2024</b>
PJM provides response to Level 1 proposals	6/18/2024
Bidders submit Level 2 proposals	<b>8/20/2024</b>
PJM evaluation and award of viable Black Start Solutions	8/20/2024 – 12/10/2024
In-Service Target for new BS Units and Fuel Assurance Upgrades	1/1/2027

Level 1 proposal = High level proposal requesting basic information such as unit name, location, MW, fuel type, fuel assurance information. Individual Level 1 forms should be submitted for each proposed Black Start site.

Level 2 proposal = Non-Binding detailed proposal requesting detailed information such as operational and emission limitations, fuel capabilities/refueling logistics, costs, project schedule, etc. Interested parties should submit one excel file using PJM's Level 2 response excel file for all proposals. Each proposal should be submitted as a separate columns within the Level 2 response excel file.

All proposals should be submitted to [BlackStart@pjm.com](mailto:BlackStart@pjm.com)



# PJM Ancillary Services – Black Start Service

Incremental RFP and Level 1 and 2 forms are located on PJM.com -> Market & Operations -> [Ancillary Services](#) webpage under Black Start Service -> Active Requests for Proposals

### Black Start Service

Revenue Requirements

▼ Active Requests for Proposals

	Date
<a href="#">2023 RTO-Wide Five-Year Selection Process Request for Proposal for Black Start Service and Black Start Fuel Assurance</a> PDF	6.20.2023
<a href="#">PJM 2023 RTO Wide Black Start RFP Level 1 Response Form</a> PDF	6.20.2023
<a href="#">PJM 2023 RTO Wide Black Start RFP Level 2 Proposal Data Collection Form</a> XLS	6.20.2023

▶ Expired Requests for Proposals

▶ Test & Cost Submittal Forms

▶ PJM Calculated Annual Capital Recovery Factor (CRF)

# Ways to meet the Zonal Minimum Fuel Assured BS Req't

Fuel Assurance Options Listed in Order of Preference in PJM [Manual 36 Attachment](#)

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- 1 • FA BS with on-site fuel storage
- 2 • FA BS capable of operating independently on two or more interstate gas pipelines
- 3 • FA BS directly connected to a natural gas gathering system ahead of any interstate pipeline
- 4 • Hydro BS that meets the criteria in PJM [Manual 12 Section 4.5](#)
- 5 • Non-Hydro Intermittent/Hybrid BS that meets the criteria in PJM [Manual 12 Section 4.5](#)
- 6 • A minimum of two gas-only Black Start units allocated to a TO zone that are connected to two separate interstate gas pipelines

## Fuel Assured Black Start Proposals

- Fuel Assured Black Start with on-site fuel storage
- Fuel Assured Black Start capable or operating independently on two or more interstate gas pipelines
- Fuel Assured Black Start directly to a natural gas gathering system ahead of any interstate pipeline
- Hydro Black Start
- Non-Hydro Intermittent/Hybrid Black Start

## Non-Fuel Assured Black Start Proposals

- Black Start Proposals from Gas/Dual Fuel units not behind and LDC

- Conforming manual language changes are required to align with Fuel Assurance package previously approved in the Stakeholder Process
  - Changes will be made using quick fix process at a future Operating Committee meeting
- Conforming changes
  - Loss of monthly revenues exceptions when falling below storage requirements
    - Low fuel inventory due to responding to a PAI
    - Tanks out of service due to regulatory inspections
  - Removing 6 month fuel assurance inventory notification requirement from M12
    - Annual verification requirement will be added to Black Start Test form

Fuel Assured or Non-Fuel Assured Black Start Service will be compensated through **one** annual revenue requirement per PJM's Open Access Transmission Tariff Schedule 6A Section 18

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

- Fuel Assured and Non-Fuel Assured Black Start Service recover capital cost via one of three Fixed Black Start Service Cost Rates
  - Base Formula Rate
    - *Net CONE \* Black Start Unit Capacity \* X*
  - Capital Cost Recovery Rate – NERC-CIP Specific Recovery
    - *(Net Cone \* Black Start NERC-CIP Unit Capacity \* X) + (Incremental Black Start NERC-CIP Capital Costs \* CRF) + (Fuel Assurance Capital Costs \* CRF)*
  - Capital Cost Recovery Rate
    - *(FERC-approved rate) + (Incremental Black Start Capital Costs \* CRF) + (Fuel Assurance Capital Costs \* CRF)*

Note: CRF changes annually



# For Units on the Base Formula Rate

	Thermal, Pumped Storage Hydro, Energy Storage, and DER / DR Resources		Run of River Hydro, Intermittent Resources, and Hybrid Resources	
	Non-Fuel Assured (Status Quo)	Fuel Assured	Non-Fuel Assured (Status Quo)	Fuel Assured
<b>Revenue Black Start MW</b>	ICAP	ICAP	ICAP	Monthly MW amount based on 90% confidence level (calculated by PJM every five years)
<b>Restoration Plan MW</b>	ICAP	ICAP	ICAP * % of year unit can provide ICAP for the 16 hours	Annual MW amount based on 90% confidence level (calculated by PJM every five years)
<b>Run Hour Requirement</b>	Thermal: 16 Hours PSH / ESR: Determined by TO Restoration Plan	16 Hours at ICAP	Determined by TO Restoration Plan	16 Hours at 90% Confidence MW
<b>X Factor</b>	Thermal: 0.02 PSH / ESR: 0.01	0.02	0.01	0.02 (Same as CT)
<b>Z Factor</b>	10%	20%	10%	20%
<b>Fuel Assurance Penalties</b>	None	Monthly revenues forgone in months where onsite fuel, water level, stored energy, etc. is not maintained for run hour requirements	None	No penalties because Revenue Calculation MW is determined by PJM calculation of confidence level



# For Units on the NERC-CIP Specific Recovery Rate

	Thermal, Pumped Storage Hydro, Energy Storage, and DER / DR Resources		Run of River Hydro, Intermittent Resources, and Hybrid Resources	
	Non-Fuel Assured (Status Quo)	Fuel Assured	Non-Fuel Assured (Status Quo)	Fuel Assured
<b>Revenue Black Start MW</b>	ICAP	ICAP	ICAP	Monthly MW amount based on 90% confidence level (calculated by PJM every five years)
<b>Restoration Plan MW</b>	ICAP	ICAP	ICAP * % of year unit can provide ICAP for the 16 hours	Annual MW amount based on 90% confidence level (calculated by PJM every five years)
<b>Run Hour Requirement</b>	Thermal: 16 Hours PSH / ESR: Determined by TO Restoration Plan	16 Hours at ICAP	Determined by TO Restoration Plan	16 Hours at 90% Confidence MW
<b>X Factor</b>	Thermal: 0.02 PSH / ESR: 0.01	0.02	0.01	0.02 (Same as CT)
<b>Z Factor</b>	0%	0%	0%	0%
<b>Fuel Assurance Penalties</b>	None	Monthly revenues forgone in months where onsite fuel, water level, stored energy, etc. is not maintained for run hour requirements	None	No penalties because Revenue Calculation MW is determined by PJM calculation of confidence level



# For Units on a Capital Cost Recovery Rate

	Thermal, Pumped Storage Hydro, Energy Storage, and DER / DR Resources		Run of River Hydro, Intermittent Resources, and Hybrid Resources	
	Non-Fuel Assured (Status Quo)	Fuel Assured	Non-Fuel Assured (Status Quo)	Fuel Assured
<b>Revenue Black Start MW</b>	N/A	N/A	N/A	N/A
<b>Restoration Plan MW</b>	ICAP	ICAP	ICAP * % of year unit can provide ICAP for the 16 hours	Annual MW amount based on 90% confidence level (calculated by PJM every five years)
<b>Run Hour Requirement</b>	Thermal: 16 Hours PSH / ESR: Determined by TO Restoration Plan	16 Hours at ICAP	Determined by TO Restoration Plan	16 Hours at 90% Confidence MW
<b>X Factor</b>	N/A	N/A	N/A	N/A
<b>Z Factor</b>	0%	0%	0%	0%
<b>Fuel Assurance Penalties</b>	None	Monthly revenues forgone in months where onsite fuel, water level, stored energy, etc. is not maintained for run hour requirements	None	No penalties because Revenue Calculation MW is determined by PJM calculation of confidence level

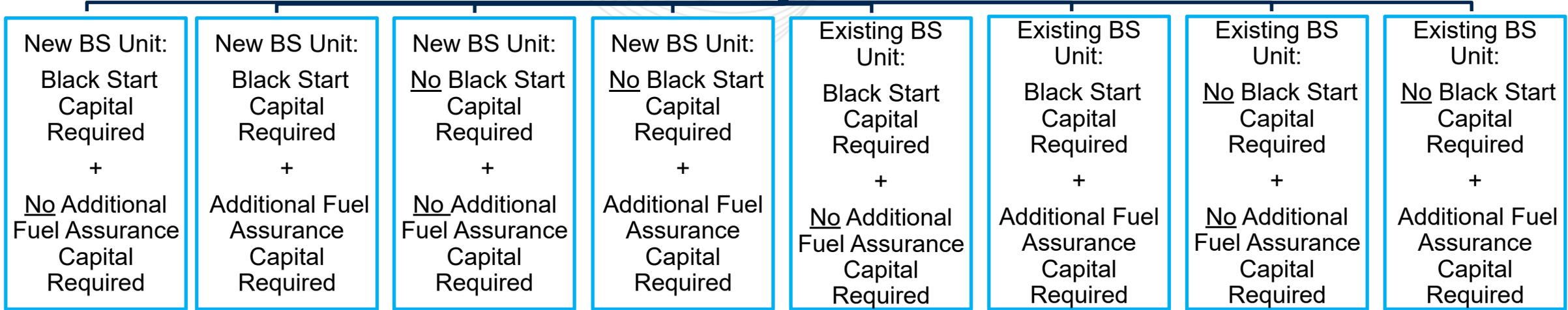
- Units selected in this RFP to provide Fuel Assured Black Start Service currently under the Base Formula Rate that do not require new capital to provide Fuel Assured Black Start Service **do NOT have a lifetime commitment for Black Start Service.**
  - Only requires one year advance notice to terminate Black Start Service
- Units selected in this RFP to provide Fuel Assured Black Start Service using one of the two capital recovery rates will have a lifetime commitment for Black Start Service. They will transition to the Base Formula Rate upon the completion of the capital recovery period.
  - Requires PJM approval to terminate Black Start Service

- The Black Start Capital Recovery Factor (CRF) for units selected in this RFP will be updated annually in March and effective June 1 through May 31 of the following year.
- Capital recovery periods are based on the age of the unit and vary from 5 to 20 years. The minimum recovery period for Fuel Assurance Capital Costs is 10 years.
- Black Start monthly revenues will be foregone for Fuel Assured resources when onsite fuel, water level, stored energy, etc. is not maintained for the 16 hour run requirement.

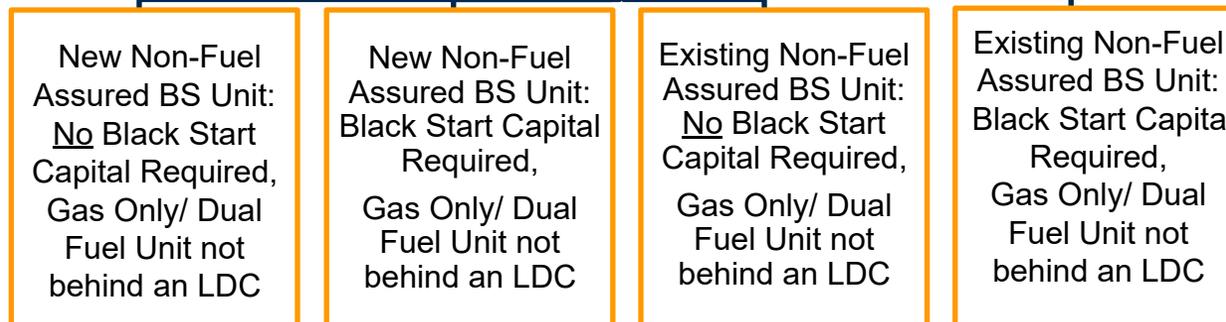
# Appendix: L1 and L2 Response Form Examples

# Requested Black Start Proposal Types

## Fuel Assured Black Start Proposals



## Non-Fuel Assured Black Start Proposals



$$\text{Black Start Unit} : \text{Black Start Capital} + \text{Fuel Assurance Capital}$$



New BS Unit



Black Start Capital Required



Additional Fuel Assurance Capital Required



Existing BS Unit



No Black Start Capital Required



No Additional Fuel Assurance Capital Required

Cherry Branch CC is:

- A Combined Cycle generator not providing Black Start Service
- It is connected to only one pipeline



# Key Takeaway: Level 1 and Level 2 Forms

## Level 1:

### PROPOSAL TYPE:

Fuel Assured Black Start Proposal Type (Check one):	
<input type="checkbox"/>	New BS Unit: Black Start Capital Required + No Additional Fuel Assurance Capital Required
<input checked="" type="checkbox"/>	New BS Unit: Black Start Capital Required + Additional Fuel Assurance Capital Required
<input type="checkbox"/>	New BS Unit: No Black Start Capital Required + Additional Fuel Assurance Capital Required
<input type="checkbox"/>	New BS Unit: No Black Start Capital Required + No Additional Fuel Assurance Capital Required
<input type="checkbox"/>	Existing BS Unit: Black Start Capital Required + No Additional Fuel Assurance Capital Required
<input type="checkbox"/>	Existing BS Unit: Black Start Capital Required + Additional Fuel Assurance Capital Required
<input type="checkbox"/>	Existing BS Unit: No Black Start Capital Required + Additional Fuel Assurance Capital Required
<input type="checkbox"/>	Existing BS Unit: No Black Start Capital Required + No Additional Fuel Assurance Capital Required

## Level 2:

### Select Fuel Assured or Non-Fuel Assured Black Start Proposal Type

- Fuel Assured - New BS Unit: Black Start Capital Required + No Additional Fuel Assurance Capital Required
- Fuel Assured - New BS Unit: Black Start Capital Required + Additional Fuel Assurance Capital Required
- Fuel Assured - New BS Unit: No Black Start Capital Required + Additional Fuel Assurance Capital Required
- Fuel Assured - New BS Unit: No Black Start Capital Required + No Additional Fuel Assurance Capital Required
- Fuel Assured - Existing BS Unit: Black Start Capital Required + No Additional Fuel Assurance Capital Required
- Fuel Assured - Existing BS Unit: Black Start Capital Required + Additional Fuel Assurance Capital Required
- Fuel Assured - Existing BS Unit: No Black Start Capital Required + Additional Fuel Assurance Capital Required
- Fuel Assured - Existing BS Unit: No Black Start Capital Required + No Additional Fuel Assurance Capital Required

### Example:

Cherry Branch CC is:

- A Combined Cycle generator not providing Black Start Service
- It is connected to only one pipeline



# Key Takeaway: Level 1 and Level 2 Forms

## Level 1:

### PROPOSAL TYPE:

Fuel Assured Black Start Proposal Type (Check one):	
<input type="checkbox"/>	New BS Unit: Black Start Capital Required + No Additional Fuel Assurance Capital Required
<input type="checkbox"/>	New BS Unit: Black Start Capital Required + Additional Fuel Assurance Capital Required
<input type="checkbox"/>	New BS Unit: No Black Start Capital Required + Additional Fuel Assurance Capital Required
<input type="checkbox"/>	New BS Unit: No Black Start Capital Required + No Additional Fuel Assurance Capital Required
<input type="checkbox"/>	Existing BS Unit: Black Start Capital Required + No Additional Fuel Assurance Capital Required
<input type="checkbox"/>	Existing BS Unit: Black Start Capital Required + Additional Fuel Assurance Capital Required
<input checked="" type="checkbox"/>	Existing BS Unit: No Black Start Capital Required + Additional Fuel Assurance Capital Required
<input type="checkbox"/>	Existing BS Unit: No Black Start Capital Required + No Additional Fuel Assurance Capital Required

## Level 2:

Select Fuel Assured or Non-Fuel Assured Black Start Proposal Type
Fuel Assured - New BS Unit: Black Start Capital Required + No Additional Fuel Assurance Capital Required
Fuel Assured - New BS Unit: Black Start Capital Required + Additional Fuel Assurance Capital Required
Fuel Assured - New BS Unit: No Black Start Capital Required + Additional Fuel Assurance Capital Required
Fuel Assured - New BS Unit: No Black Start Capital Required + No Additional Fuel Assurance Capital Required
Fuel Assured - Existing BS Unit: Black Start Capital Required + No Additional Fuel Assurance Capital Required
Fuel Assured - Existing BS Unit: Black Start Capital Required + Additional Fuel Assurance Capital Required
Fuel Assured - Existing BS Unit: No Black Start Capital Required + Additional Fuel Assurance Capital Required
Fuel Assured - Existing BS Unit: No Black Start Capital Required + No Additional Fuel Assurance Capital Required

### Example:

Tulip Garden CT is:

- A Combustion Turbine providing Black Start Service
- It can only store 8 hours of fuel onsite

Black Start Unit : Black Start Capital & Gas Only/Dual Fuel not behind a LDC



New BS Unit



Black Start Capital Required



Existing BS Unit



No Black Start Capital Required

Willow Branch CC is:

- An existing older gas-only BS unit not behind an LDC



# Key Takeaway: Level 1 and Level 2 Forms

## Level 1:

Non-Fuel Assured Proposal (Check one):	
<input type="checkbox"/>	New Non-Fuel Assured BS Unit: No Black Start Capital Required, Gas Only/ Dual Fuel Unit not behind an LDC
<input type="checkbox"/>	New Non-Fuel Assured BS Unit: Black Start Capital Required, Gas Only/ Dual Fuel Unit not behind an LDC
<input type="checkbox"/>	Existing Non-Fuel Assured BS Unit: No Black Start Capital Required, Gas Only/ Dual Fuel Unit not behind an LDC
<input checked="" type="checkbox"/>	Existing Non-Fuel Assured BS Unit: Black Start Capital Required, Gas Only/ Dual Fuel Unit not behind an LDC

## Level 2:

Select Fuel Assured or Non-Fuel Assured Black Start Proposal Type

- Fuel Assured - Existing BS Unit: Black Start Capital Required + No Additional Fuel Assurance Capital Required
- Fuel Assured - Existing BS Unit: Black Start Capital Required + Additional Fuel Assurance Capital Required
- Fuel Assured - Existing BS Unit: No Black Start Capital Required + Additional Fuel Assurance Capital Required
- Fuel Assured - Existing BS Unit: No Black Start Capital Required + No Additional Fuel Assurance Capital Required
- Non-Fuel Assured - New BS Unit: No Black Start Capital Required, Gas Only/ Dual Fuel Unit not behind a LDC
- Non-Fuel Assured - New BS Unit: Black Start Capital Required, Gas Only/ Dual Fuel Unit not behind a LDC
- Non-Fuel Assured - Existing BS Unit: No Black Start Capital Required, Gas Only/ Dual Fuel Unit not behind a LDC
- Non-Fuel Assured - Existing BS Unit: Black Start Capital Required, Gas Only/ Dual Fuel Unit not behind a LDC

### Example:

Willow Branch CC is:

- An existing older gas-only BS unit not behind a LDC

5.4.1 Capital Cost		
5.4.1.1.	Black Start Capital Recovery Rate(s)	Specify which Schedule 6A Fixed Black Start Service Cost (Fixed BSSC) Rate is being selected. If selecting the Base Formula Rate, enter 0 for the capital costs for Sections 5.4.1.2 and 5.4.1.3 below.
5.4.1.2.	Black Start Service Capital Cost (if applicable)	Capital Cost required to provide Black Start Service (excluding any Black Start Service Fuel Assured Cost)
5.4.1.3.	Black Start Service Fuel Assured Capital Cost (if applicable)	Capital Cost to become Black Start Fuel Assured (excluding any Black Start Service Cost)

**Black Start Unit** : Black Start Capital + Fuel Assurance Capital

- Capital cost estimates for Black Start Service should be independent from Fuel Assured capital cost estimates
- Example: Cherry Branch CC is a Non-BS unit looking to provide Fuel Assured Black Start Service
  - Cherry Branch CC would enter cost estimates to add Black Start Capability in 5.4.1.2, excluding FA costs
  - Cherry Branch CC would enter cost estimates for Fuel Assurance in 5.4.1.3

- [PJM Manual M14D Section 10: Black Start Generation Procurement](#)
- [PJM Manual M36 Attachment A: Minimum Critical Black Start Requirement](#)
- [PJM Manual 12 Section 4.5: Black Start Service](#)
- Open Access Transmission Tariff and PJM Manual revisions
  - RFP includes new Fuel Assurance business rules developed in Fuel Requirements for Black Start Resources stakeholder process and filed with FERC on 5/12/2023
    - FERC Docket: [https://elibrary.ferc.gov/eLibrary/filelist?accession\\_number=20230512-5135&optimized=false](https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20230512-5135&optimized=false)

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