

Black Start RFP FAQs

PJM is initiating the second RTO-wide black start RFP process and is seeking proposals 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. 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.

The following list of questions includes inquiries documented at the February 6th, 2018 Operating Committee Special Session, as well as questions that PJM has received since then. In addition, relevant questions from the previous RTO-wide Black Start RFP are included for informational purposes. PJM will continue to periodically update this document throughout the remainder of the current market window period.

Questions are broken into the following categories:

- Process
- Technical
- Compensation

Process

P1. What is the timetable for the Black Start RFP Process?

After receipt of Level 1 proposals, PJM will work directly with Transmission Owners to determine if a Level 2 response would be warranted from a RFP respondent. Refer to slides 5 & 6 of the Special OC Session held on 2/6/18 for details. <http://www.pjm.com/-/media/committees-groups/committees/oc/20180206-special/20180206-rto-wide-black-start-request-for-proposal-overview.ashx>

P2. Who is the appropriate entity to submit the proposals? Can an entity other than the unit owner submit a proposal to the RFP?

The entity submitting the proposal must be either the Market Seller or the unit owner, and have the contractual authority to commit the unit to Black Start Service. Typically, the entity that submits the proposals is also the main point of contact for PJM through the RFP evaluation process. If the RFP respondent is an entity other than the unit owner, the entity with contractual authority to commit the unit to Black Start Service must submit to PJM a fully-executed Declaration of Authority using the form posted on the PJM website demonstrating the rights to submit the unit for Black Start Service.

P3. What considerations are there to determine whether a Level 1 bidder is allowed to move on and submit a Level 2 proposal? Having only 8 weeks for a detailed engineering estimate is a pretty short period of time – and we hate to start detailed design/estimating work before that if the Black Start unit is not needed at that particular location.

PJM implemented a two-tiered approach to the RTO Wide Black Start RFP process to minimize resource/cost impact for developing proposals that might be less favorable based on PJM's review. High level information for PJM to make an initial evaluation on Level 1 proposals is identified in the Level 1 proposal response sheet. Level 1 proposals are due 3/8/2018 and PJM responses on Level 1 proposals are due 3/30/2018. If possible, PJM will make every effort to provide feedback on Level 1 proposals prior to this 3/30/2018 target, in order to allow maximum time for development of Level 2 detailed proposals.

- P4. What is the difference between the Level 1 and Level 2 responses?**
When a Level 2 response to the RFP is submitted, detailed cost estimates need to be part of that response. Conversely, the Level 1 response only requires basic unit data, not requiring any engineering or cost estimates.
- P5. Can the estimate in the Level 2 response be an engineering estimate?**
Yes, a Level 2 response can include engineering estimates.
- P6. Would responses that have an availability date beyond 4/1/20 be considered? For example, what if the availability date would be sometime in the summer of 2020 or not until sometime in 2021?**
PJM would consider units that will be in service later than 4/1/2020 but an explanation of the potential delay should be included in the RFP response. The in service date is an important factor in PJM's proposal evaluation, but PJM may be more flexible for RFP responses that may take longer to finish if they are technically viable and are in key areas.
- P7. How does PJM manage unexpected delays and ensure that Black Start need is met?**
The targeted in-service date for all new Black Start units is 4/1/2020. In the event of unanticipated delays, PJM would work closely with the Black Start resource owner and Transmission Owner, as needed, to ensure adequate Black Start capability in the interim period.
- P8. The duration from the end of the PJM evaluation, award date, and the required in service date is approximately one year. Has PJM considered the time required for submitting and receiving the required construction and environmental permits? Will PJM work to accommodate these potential schedule impacts after notice of award and extend the required in service date accordingly?**
PJM suggests that if timing due to environmental permits is a concern, responders should include several scenarios such as the earliest possible in service date, the latest possible in service date, and the most likely in service date for project time line estimates.
- P9. Is isochronous mode operation specified in the Level 1 or Level 2 RFP response?**
Isochronous mode should be specified in the Level 2 RFP response. As described in section 5.1.2.6 of the RFP, all Black Start resources are required to have the ability to operate in isochronous mode which allows the unit to be very responsive to changes in system frequency.
- P10. Will PJM keep the responders data confidential?**
PJM will abide by the terms in the OA & Tariff but will have to share certain data with the IMM and the host zone Transmission Owner. In addition, any information provided to State Commissions would not include unit specific information.
- P11. Are there any penalties for withdrawing a black start service project proposal?**
There are no penalties for withdrawing a Black Start Service RFP proposal, other than loss of future black start revenues if the proposal is selected. PJM's intent for the dates indicated in the RFP Section 3.1 "Offer in Effect" wording was to ensure that offers remain in effect during the PJM proposal evaluation phase.
- P12. Are there a maximum number of units or modules, per site, for which we may submit proposals?**
No, there is no limit on the number of units or modules for which you may submit proposals.

P13. Are there a maximum number of units or modules, per site, that may be selected?

No. There is no limitation on the number of units or modules, per site, that may be selected. Based on the needs of the area, PJM will select units to fulfill that need.

P14. Is the Unit Market ID the same as the RPM Resource ID?

The Unit Market ID (what you see in Markets Gateway) may be the same as the RPM resource ID, but depending on what configurations you offer into each market, they won't necessarily be the same.

Technical

T1. Will Primary Frequency Response be a requirement or an evaluated factor as part of the RFP evaluation process?

As described in section 5.1.2.6 of the RFP, all Black Start resources are required to have the ability to operate in isochronous mode which allows the unit to be very responsive to changes in system frequency.

T2. After Level 1 evaluation, will details be provided to the organization offering about the line charging capabilities or will machine restraints be respected?

PJM evaluation will respect the physical capabilities of the unit, but PJM will not share line charging data with generator.

T3. A black start unit will need to start and operate initially at very low load covering only its auxiliaries. Most units can do that for an extended period of time. However, emissions can be poor at those loads and would not be in compliance with a unit's permit limits for normal operation. Can PJM offer any guidance regarding the time a black start unit will need to be able to operate at essentially no load?

While there are no requirements in the PJM manuals on duration of black start units at low loads, we are aware that there are environmental and operation concerns about operating for extending periods at minimal loads. Our rough estimate is that you should assume that the black start unit will be operating for approximately 2 hours until the TO has coordinated additional load pickup for you to move up your loading curve. Any environmental or operational concerns beyond this 2 hour marker, should be clearly indicated in your RFP response so that PJM and the TOs can ensure that your specific restrictions are considered in our analysis and included in the TO system restoration plans. An exception to the above statement is as follows: An RFP unit that is selected for use within a nuclear safe-shutdown power plan may need to operate at low loads well beyond the 2 hour mark. These specifics will vary among the particular cases, but these generally longer run-time expectations would be communicated to the RFP responder by PJM and the TOs.

T4. When offering Black Start service from a plant with a scheme that has a series of units, the most likely cases being A) diesels -> small CT -> large CT B) small CT -> large CT or C) diesels -> large CT, are all of these combinations acceptable? Can PJM comment on any black start specific preferences?

Yes, all of these combinations are acceptable, some are preferred on a case-by-case basis and the evaluation weighting will be assigned according to the specific TO needs. However, with respect to classification of which of the units in the schemes is designated as 'the black start unit', flexibility in approach is recommended. There will be cases where less black start is required to meet restoration plan needs (i.e. the small CT is the black start unit) and cases where more black start is required to meet restoration plan needs (i.e. the larger CT is the black start unit).

- T5. Can a configuration be offered that relies on a small unit cranking a larger unit to provide Black Start Service?**
Yes, a large unit can be cranked by a small CT. In the case where the small cranking unit's MW are not offered into either of PJM's Capacity or Energy Markets, the large unit would be considered the Black Start unit. However, in the case where the small CT is offered into either the Capacity or Energy Markets, then the small CT would be considered the Black Start unit. See section 6.5 of the RTO-Wide Black Start RFP for additional details.
- T6. How can the Black Start capability differ from the full plant capability?**
An example would be a combined cycle plant where only one of the CTs is being proposed as a Black Start unit. PJM wants to know the Black Start CT's capability along with the entire generating station's capability.
- T7. How does PJM define Black Start MW for Level 1 RFP responses?**
For the Level 1 response, usually Black Start MW is the ICAP that is submitted in the PJM RPM auctions. However, for a Combined Cycle unit, the Black Start MW would be the ICAP MW of only the CT(s) offered in the Black Start RFP. The steam turbine MW should not be included in the Black Start MW. PJM does not consider the steam turbine MW because it is typically not feasible to match load to the steam turbine MW during its startup and maintain a stable frequency during a restoration event.
- T8. What if a black start resource fails the annual black start test?**
If a unit fails a black start test, the unit is given a ten day grace period within which it may retest without financial penalty if within the thirteen month testing period. If the unit does not successfully pass a black start test within the ten day grace period immediately following notification of PJM 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.
- T9. Should the RFP responder coordinate with the Transmission Owner (TO) regarding any upgrades to the TO owned equipment which would be required to allow the plant to be black start capable, such as modifications to relays, etc. Should these TO costs be included in the RFP response?**
PJM would prefer that the responder coordinate with the TO if it is known that modifications to the TO equipment are required. The TO's estimated expenses should be included in the response but be clearly delineated as a TO expense. In addition to the TO expenses, information such as the scope of the modifications and timing of the TO work should be included in the response. The TO's expenses will not be included in responder's annual revenue requirements but will be used in the overall evaluation of the proposal. If the proposal is accepted, the TO will be responsible for the upgrades. If it is uncertain whether TO modifications are required, the responder is requested to make note of this in the RFP response and PJM will facilitate working with the TO to determine if any modifications will be required.
- T10. With respect to the 180-minute time to breaker close requirement, what assumption should be applied to a unit (hot, warm or cold start)?**
The 180-minute time requirement is absolute, irrespective of the unit temperature state condition.

Compensation

- C1. **After the capital recovery rate is complete, what is the compensation structure? For example, if a diesel generator is installed and the capital cost recovery mechanism is used for a certain term based on the age of the plant (i.e. 5 year term), if the plant remains a Black Start facility beyond that term, then is the plant then going to get the “formulaic rate” for the remainder of the time the plant is a Black Start beyond the initial term?**
At the end of the capital recovery period, unless a resource provides PJM the required 1-year termination notice, the Fixed Black Start Service Cost portion of the annual revenue requirement will be calculated using the Base Formula Rate.
- C2. **Please provide more details on the referenced capital recovery rate.**
The tariff rate referred to is the rate structure described in schedule 6A of the PJM OATT.
<http://www.pjm.com/directory/etariff/MasterTariffs/23TariffSections/4406.pdf>
- C3. **If a generator is not FERC regulated, what capital recovery rate is used?**
A generator's Fixed Black Start Service Costs are typically compensated on one of the two capital recovery rates in Schedule 6A of the Tariff. A generator, if selected for Black Start Service, has the option to file its own desired capital recovery rate with FERC for approval if it is different from that contained in Schedule 6A of the Tariff, irrespective of whether or not the generator is FERC-regulated. A generator that chooses to file for a FERC approved rate could not begin Black Start Service or receive compensation until the rate has been approved by FERC.
- C4. **Is Black Start Service provided under the RFP compensated according to TO rates or PJM rates?**
Black Start Service in PJM is compensated under rates in Schedule 6A of the Tariff.
- C5. **Can you provide additional information about the detailed revenue requirement calculations?**
Black Start unit owners are credited monthly an annual revenue requirement that has four basic components – Fixed Black Start Service Costs, Variable Black Start Service Costs, Training Costs, and Fuel Storage Costs.
- a) Fixed Black Start Service costs are for black start capital recovery. There are three different rates available – the Base Formula Rate, the Capital Cost Recovery Rate – NERC-CIP Specific Recovery, and the Capital Cost Recovery Rate. A Black Start unit owner can only choose one Fixed Black Start Service Cost rate to be used in the calculation of the unit's annual revenue requirement. The Base Formula Rate is for units that do not require capital equipment upgrades to provide Black Start Service. The NERC-CIP Specific Recovery Rate is for a black start unit already has all the equipment needed for Black Start Service other than capital upgrades to be NERC-CIP compliant. In the Capital Cost Recovery Rate the unit can include all the capital upgrades needed for Black Start Service plus the NERC-CIP compliance costs.
 - b) Variable Black Start Service Costs are for annual Black Start O&M costs (diesel monthly testing or maintenance) including annual NERC standard compliance costs.
 - c) Training costs are fixed at \$3,750 per black start plant per year.
 - d) Fuel Storage Costs if applicable are the annual carrying cost for maintain 16 hours of fuel on-site.
 - e) This spreadsheet can be used to estimate your annual revenue requirement. There is one tab for each Fixed Black Start Service Cost Rate. You can use the various tabs to assess which rate is the best for your situation.
<http://www.pjm.com/-/media/markets-ops/ancillary/black-start-cost-submittal-forms.ashx?la=en>

- C6. Please provide an estimate of what the ongoing annual black start revenue requirement would be for a combined cycle unit assuming it was already Black Start capable for the 2018/2019 delivery year.**
The annual revenue requirement of a unit providing Black Start Service would be calculated using the formula below:
$$\{(Fixed\ BSSC) + (Variable\ BSSC) + (Training\ Costs) + (Fuel\ Storage\ Costs)\} * (1 + Z)$$

The unit's Fixed Black Start Service (Fixed BSSC) would be calculated using the Base Formula Rate. The spreadsheet in the link below can be used to estimate your annual revenue requirement. There is one tab for each Fixed Black Start Service Cost Rate. You can use the various tabs to assess which rate is the best for your situation.
<http://www.pjm.com/-/media/markets-ops/ancillary/black-start-cost-submittal-forms.ashx?la=en>
- C7. Please clarify the Incentive Factor (Z) as used in the following sentence: "Units using the Base Formula Rate for Fixed Black Start Service Costs will be able to use an Incentive Factor (Z) of 10. For all other Fixed Black Start Service Rates the incentive Factor (Z) will be 0%."**
The Incentive Factor (Z) for Units using the Base Formula Rate for Fixed Black Start Service Costs is 10%. The Incentive factors for Units on the Capital Cost Recovery Rate or the Capital Cost Recovery Rate – NERC-CIP Specific Recovery will be 0%. 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 spreadsheet at this link.
<http://www.pjm.com/-/media/markets-ops/ancillary/black-start-cost-submittal-forms.ashx?la=en>
- C8. We have a plant with a small size CT (< 40 MW) and larger frame CTs (>100 MW). The small CT and the large CTs offer into the PJM Energy Market. Can the RFP response include the installation of a new diesel generator to be used to crank the small CT which in turn will crank the large CT, thus considering the large CT as the black start unit?**
Please refer to Section 6.5 of the [RFP](#). In the case of the above proposed configuration and assuming that the diesel generator does not offer into the PJM Energy Market, only the small CT would be considered as the black start unit. If the responder would like to offer in a large CT as the black start unit then a diesel generator(s) large enough to crank a large CT should be included in the proposal.
<http://www.pjm.com/-/media/markets-ops/ancillary/black-start-service/pjm-2018-rto-wide-black-start-rfp.ashx?la=en>
- C9. Assume that an RFP response was submitted that involves adding a small diesel (assume < 5MW) to an existing 100 MW plant. The developer has a choice of whether to (A) go through the interconnection process to make the new diesel a capacity resource in PJM or (B) limit its use to starting the existing 100MW plant. How would PJM analyze choices A and B in an RFP response?**
PJM's interpretation of both options is detailed below.
- Option A:**
1. Both the 5 MW diesel and the 100 MW existing unit would have to offer into RPM, and either or both could potentially clear.
 2. Only the 5 MW diesel would be considered a Black Start unit (if chosen by PJM), since it is both a capacity resource, and the only unit at the plant that can start by itself with no outside power.
 3. The existing 100 MW unit would NOT be considered a Black Start unit, even if the diesel's output could be used to get the existing unit started in less than 3 hours.
 4. If PJM decided to retain the diesel as a Black Start resource after its initial capital recovery period, the formula rate for compensation would be based on the <5MW capacity of the diesel.

Option B:

1. Only the 100 MW existing unit would have to (be able to) offer into RPM, since the diesel has no CIRs, and is accepted as being installed and maintained only to provide cranking power to the 100 MW unit so that the 100 MW unit can qualify as a Black Start unit for PJM.
2. The new <5 MW diesel would NOT be considered a Black Start unit, since it is not a capacity resource, and is not set up to provide energy outside the plant fence.
3. The existing 100 MW unit would be considered a Black Start unit, if chosen by PJM.
4. If PJM decided to retain the 100 MW unit as a Black Start resource after the initial capital recovery period for the starting diesel and related equipment, the formula rate for compensation would be based on the 100 MW capacity of the existing unit.

C10. What can be included in the projected annual Variable Black Start Service Costs (Variable BSSC)?

Operating and maintenance costs that are attributable to maintain the unit in a state of black start readiness, including the cost to maintain compliance with NERC Reliability Standards can be included in the projected annual Variable Black Start Service Costs (Variable BSSC). Documentation of these expenses is required and revised expenses can be submitted annually in May of each year for a June 1st effective date. Unless a higher or lower value is supported by the documentation, the resource owner can recover 1% of the Unit's O&M costs on the unit's cost-based energy schedule, calculated based on the Cost Development Guidelines in the PJM Manuals.

C11. How does an overhaul/upgraded unit that gets accepted for Black Start service get compensated if it participates in the Capacity Market?

PJM would evaluate the additional costs of the refurbishment and revenue would be netted against any revenues generated by participating in the capacity market.

C12. Can firm gas costs be included in Black Start service?

No. Firm-gas contract costs cannot be included in a Black Start annual revenue requirement. Firm-gas contract costs can be included in the ACR portion of a unit's capacity offer.

C13. Which portions of a combined cycle can be offered in for Black Start service?

At a combined cycle plant, any or all of the CTs can be offered to provide Blackstart Service. If not all CTs at a location are selected to provide Black Start service, the others can still test annually to verify they are black start capable. These are uncompensated but can be used as a substitute in the event that the Black Start unit becomes unavailable.

C14. Are monthly costs still paid if the Black Start resource is on an outage (planned or other)?

Yes. Revenues are only withheld if there is not a successful Black Start test on file from sometime in the previous thirteen months.

C15. Please clarify when payments will begin.

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 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.