

PJM Manual 27:

Open Access Transmission Tariff Accounting

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***Redlines not highlighted in yellow = M27 periodic review

***Redlines highlighted in yellow = Fuel assurance

Section 7: Black Start Service Accounting

Welcome to the *Black Start Service Accounting* section of the **PJM Manual for Open Access Transmission Tariff Accounting**. In this section, you will find the following information:

- An overview of the black start service accounting process (see “Black Start Service Accounting Overview”).
- How credits for black start service are calculated (see “Black Start Service Credits”).
- How charges for black start service are calculated for Network and Point-to-Point Transmission Customers (see “Black Start Service Charges”).

7.1 Black Start Service Accounting Overview

To ensure the reliable restoration following a shutdown of the PJM Transmission System, Black Start Service is necessary to facilitate the goal of complete system restoration. Black Start Service is the capability of generating units to start without an outside electrical supply or the demonstrated ability of a generating unit with a high operating factor to automatically remain operating at reduced levels when disconnected from the grid. Black Start Service enables the Transmission Provider in collaboration with Transmission Owners to designate specific generators (Black Start Units) whose location and capabilities are required to re-energize the transmission system following a system-wide blackout as further described in the PJM Manual 12: Balancing Operations, Section 4.

Black Start Service is provided by the Transmission Provider, and all Transmission Customers must purchase this service from the Transmission Provider, pursuant to the PJM Open Access Transmission Tariff Schedule 6A.

The credits for this service are billed on a monthly basis. The monthly credit is equal to one-twelfth (1/12) of the annual revenue requirement for each Black Start Unit.

The charges for this service are based on a formula rate that allocates generation owners' black start revenue requirements and applicable Day-ahead and Balancing Operating Reserve Credits to Network and Point-to-Point Transmission Customers based on their monthly transmission use on a megawatt basis. Customers serving zonal Network and Point-to-point load are allocated a ratio share of the total revenue requirements and applicable Day-ahead and Balancing Operating Reserve Credits in the applicable zone(s). Customers serving non-zone load (including Point-to-Point Transmission Customers not serving PJM load) are allocated a ratio share of the total revenue requirements and applicable Day-ahead and Balancing Operating Reserve Credits for PJM.

7.2 Black Start Service Credits

Black Start Units must meet specific PJM and NERC criteria to be deemed a Black Start Unit. These units also must follow testing protocols to verify the Black Start Capability. Both the criteria and testing are further described in the PJM Manual 12: Balancing Operations, Section 4. Annual revenue requirements are determined as described in Open Access Transmission Tariff, Schedule 6A and PJM Manual 15: Cost Development Guidelines, section 13. Revenue requirements for joint-owned black start units are allocated to the owners based on their ownership shares.

Existing Black Start Unit owner's monthly credits will be one-twelfth (1/12) of their annual revenue requirement.

New Black Start Unit owner's monthly credits will be held by PJM in a non-interest bearing account until PJM's acceptance of the owner's annual revenue requirement pursuant to section 17 of the Open Access Transmission Tariff Schedule 6A. After PJM's acceptance, new Black Start Unit owners will begin to receive monthly credits, including any monthly credits held by PJM, back to its in-service date and any required estimated annual revenue requirement true up in the monthly bill.

For Fuel Assured Black Start Units that are recovering Fuel Assurance Capital Costs, pursuant to section 17B of Schedule 6A, shall have its monthly credits reduced, but not less than zero, by the positive net value of the Day-ahead Energy Market and Real-time Energy Market revenues from being committed using the fuel assurance fuel minus the cost of running on that fuel. The Black Start Unit's monthly credits shall not be increased. The PJM energy revenues will only include revenues from the Day-ahead energy (Spot, Transmission Congestion, Transmission Losses), Balancing energy (Spot, Transmission Congestion, Transmission Losses), Operating Reserve (Day-ahead and Balancing) and Load Reconciliation associated with each. 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, monthly credits shall be reduced, but not less than zero, by the monthly capacity revenues for the increased ICAP. Monthly credits will only be reduced during the Fuel Assurance Capital Cost recovery period.

Monthly Black Start Service revenues are forfeited when a:

- Black Start Unit fails a black start test and does not successfully pass a test within a ten (10) day grace period immediately following a failed test;
- Black Start Unit without a successful black start test on record with PJM within the last thirteen (13) months;
- Fuel Assured Black Start Unit has a deficient fuel inventory below the run hour requirement unless such deficiency is a result of a regulatory requirement for an approved planned outage (full derate) or operating during a Performance Assessment Interval then monthly credits are not forfeited; or,
- Fuel Assured Black Start Unit has a deficient non-fuel consumables inventory below the run hour requirement unless such deficiency is a result of a regulatory requirement for an approved planned outage (full derate) or operating during a Performance Assessment Interval then monthly credits are not forfeited.

Zonal revenue requirements equal the total revenue requirements of all Black Start Units nominated as critical by the Transmission Provider in that zone regardless of zonal location and the share of annual revenue requirements of Black Start Units designated as critical across multiple zones (cross-zonal coordination). The current zonal revenue requirements are posted on the PJM website under Markets & Operations > Billing > Settlements & Credit - <http://www.pjm.com/markets-and-operations/billing-settlements-and-credit.aspx>.

7.3 Black Start Service Charges

Charges for Black Start Service are calculated for zone load (Network Customers and customers serving load with Point-to-Point Transmission Service) and for non-zone load (Non-

Zone Network Customers and Point-to-Point Transmission Customers) separately. The sum of all customers' monthly charges equal one-twelfth (1/12) of the total annual black start revenue requirements that are credited to Generation Owners of Black Start Units plus the applicable Day-ahead and Balancing Operating Reserve Credits that are credited to Generation Owners of Black Start Units for the month.

Each Transmission Customer's charge is calculated by determining the Transmission Customer's monthly zone and non-zone charge.

- Black Start Charge = Black Start Zone Charge + Black Start Non-Zone Charge

7.3.1 Black Start Zone Charge

Transmission Customers with monthly zone transmission use are charged a share of the applicable zonal black start revenue requirements (less the total share of revenue requirements recovered from non-zone transmission use) based on their portion of monthly transmission use in that zone(s). This is billed as the Black Start Zone Charge.

PJM calculates the Black Start Zone Charge by multiplying the sum of the zonal total monthly black start requirement plus the Day-ahead Operating Reserve Credits associated with Black Start plus the Balancing Operating Reserve Credits associated with Black Start by the Transmission Customer's ratio share of monthly zone transmission use and then applying an Adjustment Factor. The Adjustment Factor accounts for the share of the revenue requirement that is recovered from non-zone transmission use. This calculation is applied to each zone separately.

- Black Start Zone Charge = (PJM Zonal Monthly Black Start Revenue Requirement + PJM Black Start DA Operating Reserve Credit + PJM Black Start BAL Operating Reserve Credit) * (Transmission Customer's Monthly Zone Transmission Use / PJM Total Transmission Use) * Adjustment Factor
 - PJM Zonal Total Monthly Black Start Revenue Requirement = (existing Black Start Unit monthly revenue requirement + new Black Start Unit monthly estimated revenue requirement) / 12
 - New Black Start Unit Monthly Estimated Revenue Requirement = Black Start Unit owner's revenue requirement estimate at the time the unit enters Black Start Service until PJM's acceptance.
 - PJM Black Start DA Operating Reserve Credit = Day-Ahead Operating Reserve credits associated with scheduling and/or testing Black Start Units
 - PJM Black Start BAL Operating Reserve Credit = Balancing Operating Reserve credits associated with scheduling and/or testing of Black Start Units
 - Transmission Customer's Monthly Zone Transmission use = sum of daily Network Service Peak Load contributions to a PJM zone + daily average Point-to-Point energy reservations where the point of delivery is within a given PJM zone
 - PJM Total Zone Transmission Use = sum of all Transmission Customers' monthly zone transmission use
 - Adjustment Factor = total monthly zone transmission use for all PJM Zones / PJM Total Monthly Transmission Use

- Total Monthly Zone Transmission Use for all PJM Zones = sum of all Transmission Customers' monthly zone transmission use in all PJM Zones
- PJM Total Monthly Transmission Use = sum of all Transmission Customers' monthly zone transmission use + non-zone transmission use

7.3.2 Black Start Non-Zone Charge

Transmission Customers with monthly non-zone transmission use are charged a share of the total PJM monthly black start revenue requirement based on their portion of the total PJM monthly transmission use. This is billed as the Black Start Non-Zone Charge.

PJM calculates the Black Start Non-Zone Charge by multiplying the total monthly black start revenue requirement by the Transmission Customer's ratio share of non-zone transmission usage.

- Black Start Non-Zone Charge = (PJM Zonal Monthly Black Start Revenue Requirement + PJM Black Start DA Operating Reserve Credit + PJM Black Start BAL Operating Reserve Credit) * (Transmission Customer's Monthly Non-Zone Transmission Use / PJM Total Transmission Use)
 - PJM Zonal Total Monthly Black Start Revenue Requirement = (existing Black Start Unit monthly revenue requirement + new Black Start Unit monthly estimated revenue requirement) / 12
 - New Black Start Unit Monthly Estimated Revenue Requirement = Black Start Unit owner's revenue requirement estimate at the time the unit enters Black Start Service until PJM's acceptance.
 - PJM Black Start DA Operating Reserve Credit = Day-Ahead Operating Reserve credits associated with scheduling and/or testing Black Start Units
 - PJM Black Start BAL Operating Reserve Credit = Balancing Operating Reserve credits associated with scheduling and/or testing of Black Start Units
 - Transmission Customer's Monthly Non-Zone Transmission use = sum of daily Network Service Peak Load contributions in zone(s) that have no black start revenue requirement + (daily average Point-to-Point energy reserve where the point of delivery is within a given PJM zone (adjusted for PJM curtailments) / 24)
 - PJM Total Monthly Transmission Use = sum of all Transmission Customers' monthly zone transmission use + non-zone transmission use