

# Fuel Requirements for Black Start Resources

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IMM



Monitoring Analytics

# Zonal Levels of Fuel Assurance

- **Zonal boundaries are not core for a regional plan.**
- **PJM planning for black start and fuel assured black start should be on a regional basis.**
- **Fuel assurance can be provided across zonal boundaries.**
- **Cost allocation should be on a regional rather than a zonal basis.**
- **PJM: one fuel assured BS unit per zone, with exceptions.**

# Criteria for Fuel Assured

- **Intermittent resources**
  - **Intermittent resources should not be black start resources.**
  - **Run of river should be eligible to be black start resources.**
  - **PJM: Include intermittent resources as fuel assured black start resources. Ability to provide black start MW for the minimum run time duration with 90 percent confidence as calculated by PJM and meet all requirements and meet all requirements in Design Component Section B and PJM OATT Schedule 6A**
- **Storage resources**
  - **PJM: The storage level must be maintained to satisfy run hour requirements to meet the black start commitment.**

# Criteria for Fuel Assurance

- **Run Hour requirements should be 16 hours, including three starts, without exceptions, without 90 percent exception.**
  - **PJM: 16 hours, with 90 percent exception for intermittents, including run of river hydro, and hybrid resources.**



# Criteria for Fuel Assurance

- **Need clear rules:**
  - **Non fuel consumables availability must support black start duration requirement.**
  - **Bilateral compensated black start resource must meet fuel assurance requirements in order to be fuel assured.**



# Criteria for Fuel Assurance

- **Emission permits/limitations should be submitted and verified.**
- **Predefined waivers should be required to accommodate operations during restoration period.**
  - **PJM: best efforts to obtain emission and effluent permit modifications and or waivers.**
  - **PJM: All BS resources must provide details of their emissions permit limitations upon PJM request**

# Run of River Hydro

- **Run of river hydro should be set to most restrictive seasonal flow (MW). No facility costs should be assigned to black start service.**
  - **ELCC data not relevant**
  - **Actual historical data relevant**
  - **Relationship between CIRs and MW not specified.**
  - **Requirement to be capacity resource not specified**
  - **Confidence level not appropriate**
- **PJM: must be 16 hours for fuel assured, but only with 90 percent confidence in MW level/duration**

# DER/DR Resources

- **Rules for black start from DER/DR with onsite generator must be more specific.**
- **Need to wait for PJM's DER/DR rules to be defined.**
- **Same rules should apply to all black start resources.**



# Hybrid Resources

- **Hybrid resources must meet minimum run time duration requirements at all times. The 90 percent confidence level is not appropriate.**
  - **PJM: Ability to provide black start MW for the minimum run time duration with 90% confidence as calculated by PJM and meet all requirements in Design Component Section B and PJM OATT Schedule 6A.**

# Testing and Verification for Fuel Assured Resources

- **Black start resources connected to multiple pipelines should be tested for all relevant fuel sources on an annual basis.**
  - **PJM: No explicit requirement?**
- **Different fuel assured black start resources relied on for a zone and connected to different pipelines should be tested concurrently for all relevant fuel sources on an annual basis.**
  - **PJM: No explicit requirement?**

# Testing and Verification for Fuel Assured Resources

- **Fuel inventory verification at least weekly.**
- **Need explicit criteria for gas supply. Units need to demonstrate gas availability if called on, regardless of time of day or nomination cycle.**
- **Changes must be reported immediately and any inability to meet black start obligations.**
  - **PJM: Resources must provide fuel/energy verification to PJM every six months or upon request. Fuel / energy level telemetry to PJM is acceptable.**
  - **PJM will validate all contractual arrangements for gas supply**

# Testing and Verification for Fuel Assured Resources

- **Inability to meet black start requirements for starting and meeting run time requirement and all related status changes must be reported immediately.**
- **PJM: Fuel Assured units must communicate starting system limitations as soon as possible but within one hour of recognition to PJM if starting systems not able to meet the run time requirement**

# Testing and Verification for Fuel Assured Resources

- **Inability to meet black start obligations based on availability of non fuel consumables must be reported immediately.**
- **PJM: Fuel Assured units must communicate non fuel consumables inventory limitations as soon as possible but within one hour of recognition if consumables fall below the run time requirement**



# Fuel Assurance Compensation

- **Capital costs solely associated with fuel assurance recoverable following the process in schedule 6A. Only the portion of a fuel assurance capital investment solely needed for black start service (16 hour run time) will be capitalized.**
- **PJM: Only the portion of capital cost needed to make unit fuel assured. Definition of this amount not based on actual costs and not clearly defined?**

# Fuel Assurance Compensation

- **Offset to capital costs solely associated with fuel assurance recoverable following the process in schedule 6A.**
- **Net revenues from operating on backup fuel netted from black start revenues.**
  - **Energy**
  - **Ancillary services**
  - **Capacity market**
- **PJM:**

# Fuel Assurance Penalties

- **If any requirements of fuel assured black start service not met, PJM must be notified immediately and monthly black start revenues will be forfeited for each such month.**
  - **PJM: If the onsite fuel inventory, water level, stored energy, etc. of a Fuel Assured black start resource falls below the run hour requirements for any length of time during any period, PJM dispatch must be notified within 24 hours. Black start monthly revenues will be foregone for months in which the fuel inventory is deficient. If the fuel inventory, water level, stored energy falls below the run hour requirement as the result of a regulatory requirement for approved planned outage (full derate), monthly Black Start revenues will not be withheld.**



# Fuel Assurance Compensation

- **The base formula rate incentive factor for fuel assured units should remain at 10 percent.**
  - **PJM: For fuel assured resources selected via RFP Z factor = 20 percent**
  - **PJM: For all other resources, Z factor = 10% (Status Quo)**

# Fuel Assurance Compensation

- **The base formula rate for storage resources that meet the requirements of fuel assurance black start should have an allocation X factor of 0.01 and an incentive factor of 10 percent.**
  - **PJM: Fuel assured run of river black start sites Allocation X factor = 0.02 and Black Start MW equal to monthly 90% percent confidence value**
  - **PJM: Fuel assured pumped hydro black start sites Allocation X factor = 0.02**

# Implementation

- **Existing black start resources can bid to provide fuel assured black start service.**
- **Existing black start units should not be terminated until after the cost recovery term has been completed and after the obligation to provide service for the life of the asset.**
  - **PJM: Existing non-fuel assured black start sites can participate in future RFPs with fuel assured proposals.**
  - **PJM: PJM will conduct outreach to black start units to validate fuel assurance status ahead of each RTO-wide RFP. Participating as a fuel assured black start unit is voluntary and non-fuel assured resources can continue to provide black start service.**

# Definition of Black Start MW

- **Black start MW capability used for procurement and compensation should be based on:**
  - **ICAP for non intermittent resources**
  - **ICAP/ELCC/CIR for storage resources**

# Definition of Black Start MW

- **PJM: Black start MW used for restoration planning and procurement:**
  - **For Fuel Assured and Non-Fuel Assured Non-Intermittent Resources: ICAP**
  - **For Non-Fuel Assured Intermittent Resources: ICAP \* (% of year unit can provide ICAP for 16 hours)**
  - **For Fuel Assured Intermittent Resources: MW the unit can provide for 16 hours with 90% confidence based on an annual calculation**

# Implementation

- **The reliability back stop in PJM Manual M14D allows TO ownership. TOs should not own generation.**
  - **PJM: Existing Reliability Backstop Process in PJM Manual M14D Section 10.3 to be implemented in the event of insufficient response to RTO wide RFP or future incremental RFP (2 failed RFP processes), to meet minimum of one black start site per zone meeting fuel assurance criteria and reliability (PLUS) criteria beyond minimum criteria for high impact black start sites.**
  - **PJM: For Reliability Backstop RFP, TO required to submit RFP proposal.**

**Monitoring Analytics, LLC**

**2621 Van Buren Avenue**

**Suite 160**

**Eagleville, PA**

**19403**

**(610) 271-8050**

**[MA@monitoringanalytics.com](mailto:MA@monitoringanalytics.com)**

**[www.MonitoringAnalytics.com](http://www.MonitoringAnalytics.com)**

