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# Black Start Issues: Review of Updated Matrix with PJM Proposed Package

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Operating Committee

September 3, 2020

- August 6 – Second first read of Black Start Problem Statement / Issue Charge
  - [Black Start Options Matrix](#)
  - [Black Start Options Matrix - Presentation](#)
- September 3 - A third first read is being conducted
  - includes material in PowerPoint to summarize the proposed changes, including updates from the August 6 Operator Committee Meeting - Reflecting numerous discussions with stakeholders and the IMM

Black Start Problem Statement / Issue Charge, [September 3, 2020 OC Meeting](#)

- **Black Start Testing**
  - *Clarifying language added to Open Access Transmission Tariff Schedule 6A Black Start Service Sections 12, 13 & 14; PJM Manual 12 Section 4.6.14 Non-performance*

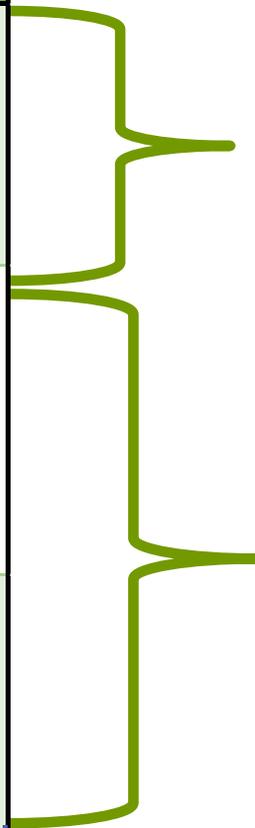
<b>Periodicity</b>	<b>Successful test within last 13 months</b> <i>(Units under Schedule 6A will not qualify to receive revenue without successful test within the rolling 13 month test window)</i>
<b>Black Start Units</b>	<b>Black Start Units providing Black Start Service under Schedule 6A or under a service agreement with Transmission Owner</b>

# Black Start Test Failure Termination

- Black Start Termination (following unsuccessful black start testing)
- Adding language to Schedule 6A Section 15 and M-12 Section 4.6.14
  - Ability to immediately terminate Black Start Service if Black Start Unit is unable to successfully black start test within 90 days following a failed test AND is not working on making the necessary repairs to enable the Black Start Unit to successfully black start test within a one year period.
  - PJM Performance Compliance Department to work directly with Black Start Unit owner to determine a schedule to complete repairs in order to return black start capability and successfully black start test.

# Black Start (next 90 days following unsuccessful testing)

Next 90 days following Black Start Testing	
Test Result	Schedule 6A Compensation
Pass	Reinstate next month (no retroactive compensation)
No Test Conducted + Black Start Unit owner working with PJM for future successful black start testing within a period of one year	Reinstate compensation the following month of successful test (no retroactive compensation)
No Test Conducted + No Plans to return to Black Start Service	Immediate Black Start Termination (no retroactive and no future compensation)



Existing Process, no proposed changes

Proposed changes to reflect failed testing and no successful test on record for the following 90 day period

## Black Start Unit Owner Test Scheduling

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- Coordinates with PJM
- Submit eDART ticket with three days advance notice
- Email [blackstart@pjm.com](mailto:blackstart@pjm.com) of test schedule

## Black Start Unit Owner Test Reporting

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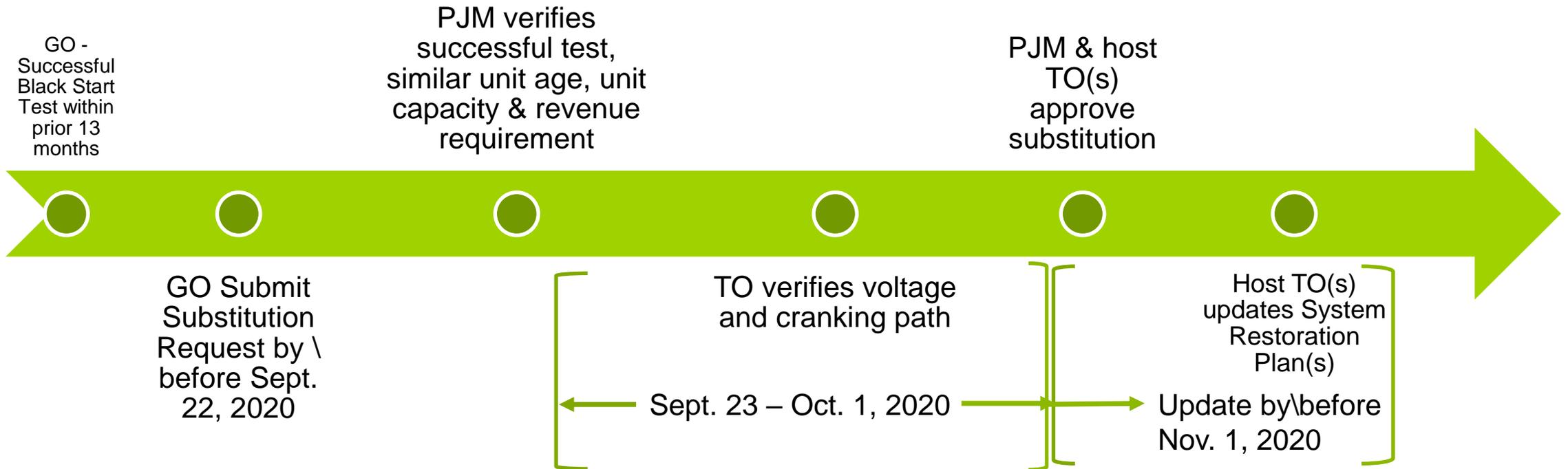
- Submit test results via eDART within 14 days of testing
- Provide supporting documentation of test procedure and training
- Request additional testing (if needed)

- **Black Start Unit Substitution**
  - Clarifying language added to Open Access Transmission Tariff Schedule 6A Black Start Service Section 10; PJM Manual 12 Section 4.6.14 Non-performance
  - Substitution Requirements:
    - PJM and host Transmission Owner(s) approval
    - Valid Black Start Test within previous 13 months
    - Connected at same voltage level and cranking path
    - Similar unit age
    - Provides equivalent Black Start Unit capacity
    - Cannot add new or additional capital recovery
    - No change to existing capital recovery period

# Black Start Unit Substitution Timeline

Timeline Example: Black Start Unit Owner (GO) scheduling overhaul on CT1 (current Black Start Unit) and is requesting substitution of CT2 during overhaul period. CT2 is black start capable and tested August 2020.

Substitution requested by\before November 1, 2020



# Black Start Capital Recovery Factor (CRF)

- Determining Black Start Unit Capital Recovery:
  - Two Methods at unit-owner election:
    - Use of Default Capital Cost Recovery Factor (CRF)
    - Unit-Specific rate approved by FERC
- CRF reflects proxy value for capital cost recovery elements
  - PJM recognizes that individual circumstances could compel unit owners to seek a unit-specific rate approved by FERC

# Black Start Capital Recovery Factor (CRF)

## Goal of Updating of CRF:

- Per 4/16/2020 Problem Statement:

*“Recent tax law and interest rate changes no longer reflect the multiple assumptions used in the current CRF. These changes include implementation periods in order to conform to the new tax laws, along with expected future changes that are not yet finalized. PJM is requesting to update the current CRF Table to meet current tax law and interest rates; and take this opportunity to explore a new process for automatically updating and documenting the CRF Table to remain consistent with tax law changes.”*

# CRF calculated at time of Black Start in-service date

- Depreciation as applicable under the tax code
- **Current Federal Tax Rate**
- **Average State Tax Rate**
- **Debt Interest Rate**
- Return on equity of 12 percent
- 50 Percent Equity
- 50 percent Debt
- 5, 10, 15 & 20 year capital recovery period based on unit age at the time of unit entering Black Start Service

Red text indicates these values will be updated annually

- Debt interest rate from the quadrennial Net CONE update as modified below:
- “Significant Change Protection” ---Results subject to adjustments within a bandwidth to reflect significant interest rate changes (up or down) if they occur between the quadrennial review period:
  - Annual adjustment using Moody’s Utility Bond Index for bonds rated Baa1
  - Adjustment only if interest rates increase or decrease by 2 percentage points greater than the 12 month bond index rate two years ago. The difference to be added to latest quadrennial review Net CONE debt interest rate.

## Capital Recovery Factor (CRF) for new Black Start Units

- CRF re-calculated annually (based on April 1<sup>st</sup> references and effective June 1<sup>st</sup> for new annual revenue requirement)
  - Changes to Federal Tax Rates
  - Average State Tax Rate
  - Interest rate – only changes if cumulative difference is 2 percentage points greater than the 12 month bond index rate two years ago for the Moody's Utility Bond Index for bonds rated Baa1

## Effect of CRF Changes on Units Already Designated as Black Start Units

- Current Black Start Units under a Capital Recovery Rate and Units selected in recent RFPs to continue with the commitment period and CRF rates provided in the current OATT, Schedule 6A
- New CRF Rates, including annual updates, will apply only to Black Start Units selected in RFPs after the effective date of the Tariff changes

## Black Start Service Commitment Period for New Units on CRF Rate

- Future selected Black Start Units shall continue to provide Black Start Service after the initial capital cost recovery period for the remaining life of the black start equipment unless:
  - Unit retirement / deactivation with at least one year's notice
  - Expiration of a state, federal, or other governmental agency permit(s) required for Black Start Service, with at least one year's notice
  - Additional capital is required to maintain Black Start Service (in this case, the unit will apply through the Black Start RFP process and only continue if selected)
  - PJM terminates Black Start Service (requires a one year advance notice if testing is up-to-date)

# Black Start Service Commitment Period for Transition Units and Units on the Base Formula Rate

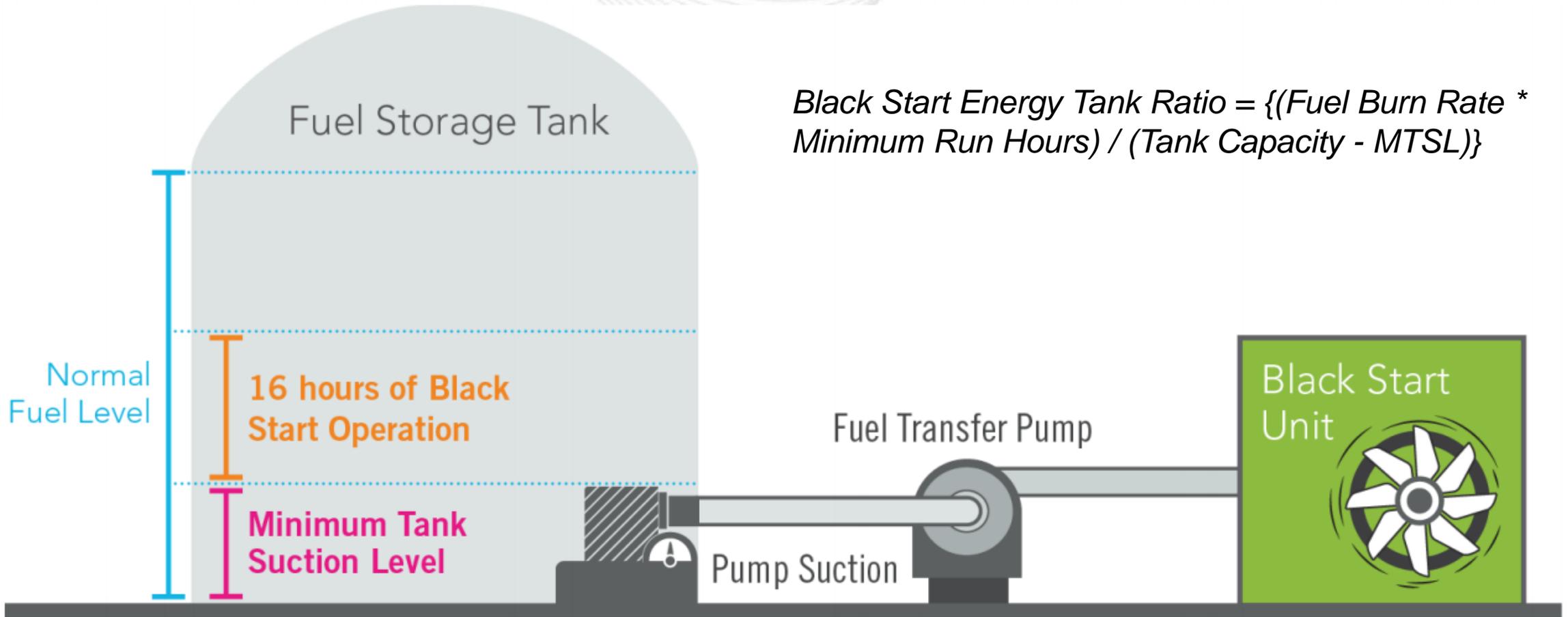
- Current and recently selected Black Start Units on the capital recovery rate continue service through current Schedule 6A termination rules.
- Units entering Black Start Service using the Base Formula Rate will maintain the ability to terminate with one year's notice.

# Capital Recovery Factor (CRF) Table Assumptions

- Capital Recovery Factor (CRF) Table to be removed from Open Access Transmission Tariff, Schedule 6A Black Start Service.
  - New Section in PJM Manual 15 for CRF calculation method and assumptions
  - Annual CRF Tables posted to PJM's website
  - Existing Black Start Units and units selected in recent RFP's , CRF Table will also be placed on PJM's website

# Minimum Tank Suction Level

$$\{(\text{Black Start Energy Tank Ratio} * \text{MTSL}) + [(\# \text{ Run Hours}) * (\text{Fuel Burn Rate})]\} * (\text{12 Month Forward Strip} + \text{Basis}) * (\text{Bond Rate})$$



$$\text{Black Start Energy Tank Ratio} = \{(\text{Fuel Burn Rate} * \text{Minimum Run Hours}) / (\text{Tank Capacity} - \text{MTSL})\}$$

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## Member Hotline

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# Appendix

- [Black Start Education](#) (presented at May 14, 2020 OC)
- [OATT Schedule 6A](#): Black Start Service
- [PJM Manual 12 Balancing Operations](#): Section 4.6 Black Start Service

# Black Start Testing / Compensation Reference

Black Start Testing		
Initial Test Result	Most recent Test result within 10 days of Initial Test	Schedule 6A Compensation
Pass	-	No Change
Fail	Pass	No Change
No Test	-	Forgone
Fail	Fail	Forgone
Fail	No Test Conducted	Forgone

*Existing process, no proposed changes – presented for reference purpose*