

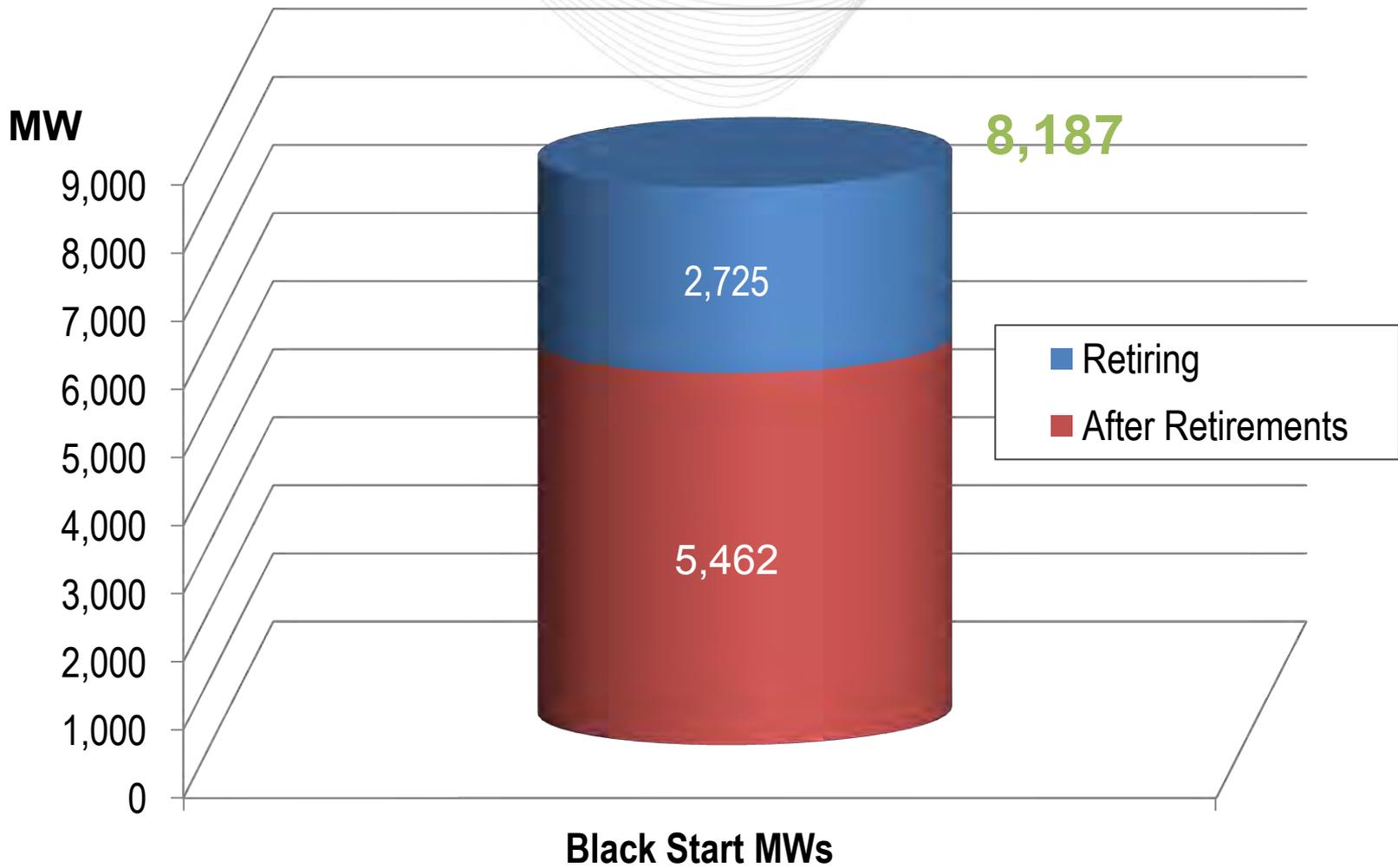


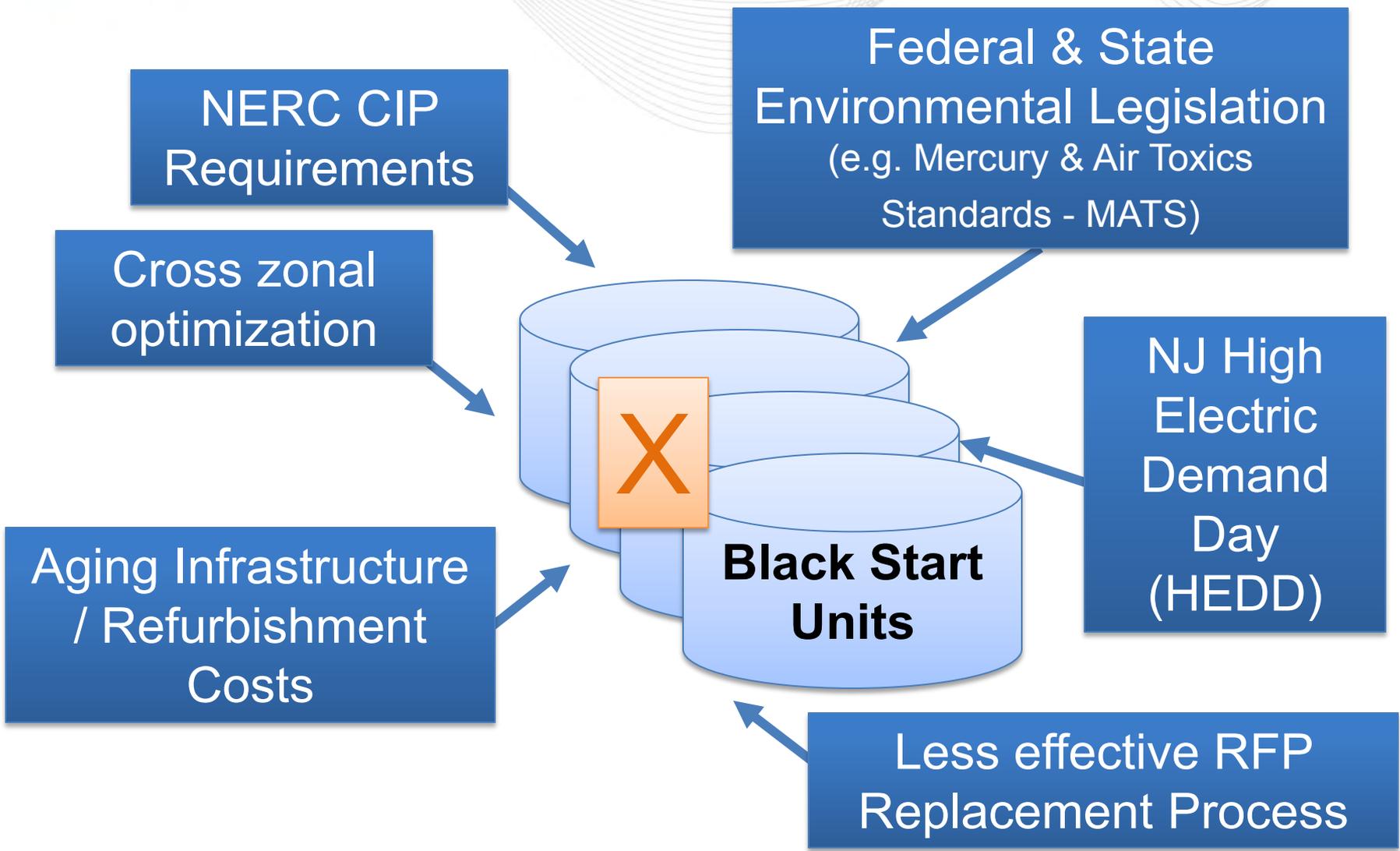
System Restoration Strategy Task Force Update

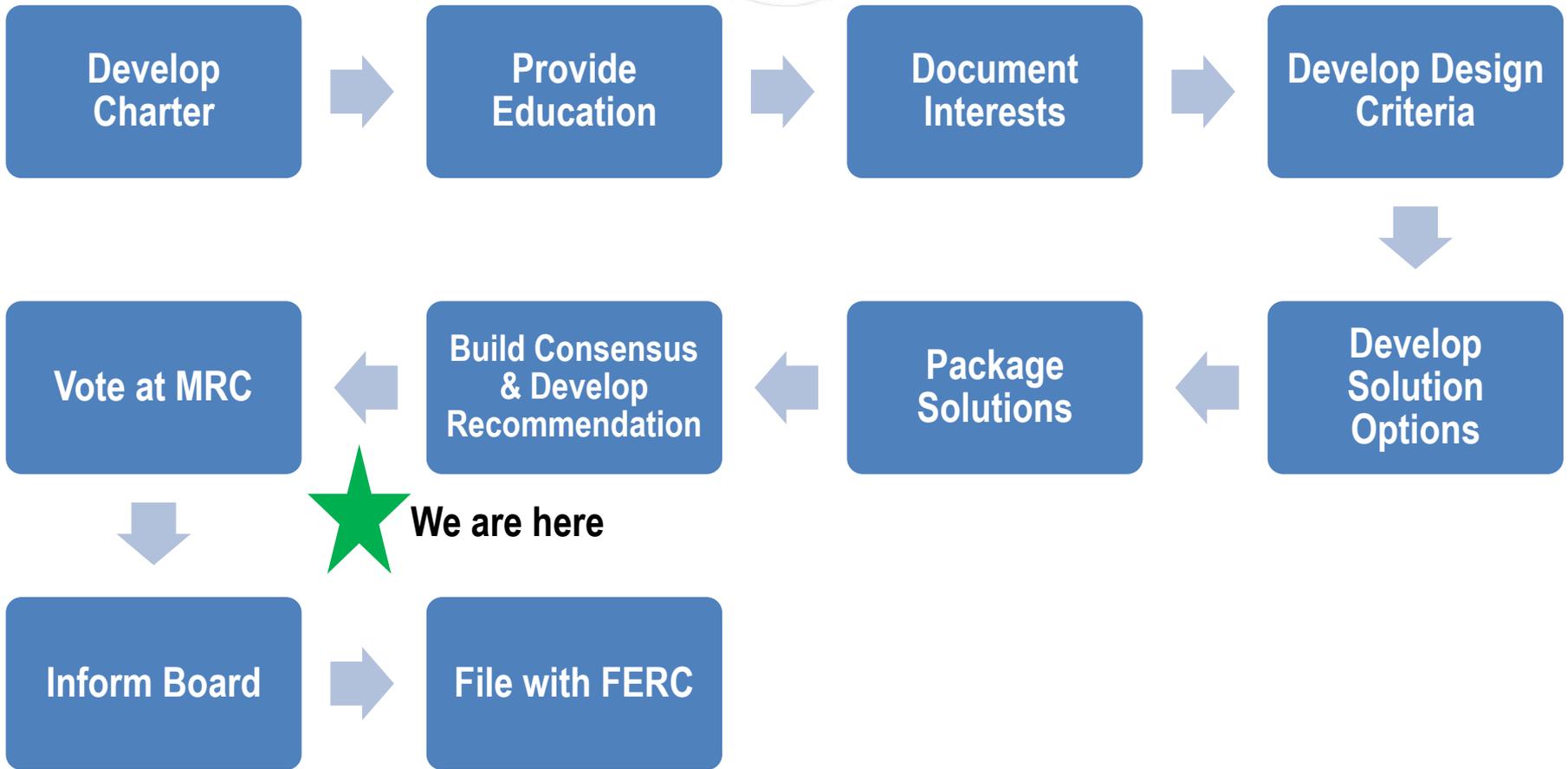
Chantal Hendrzak
Director Applied Solutions

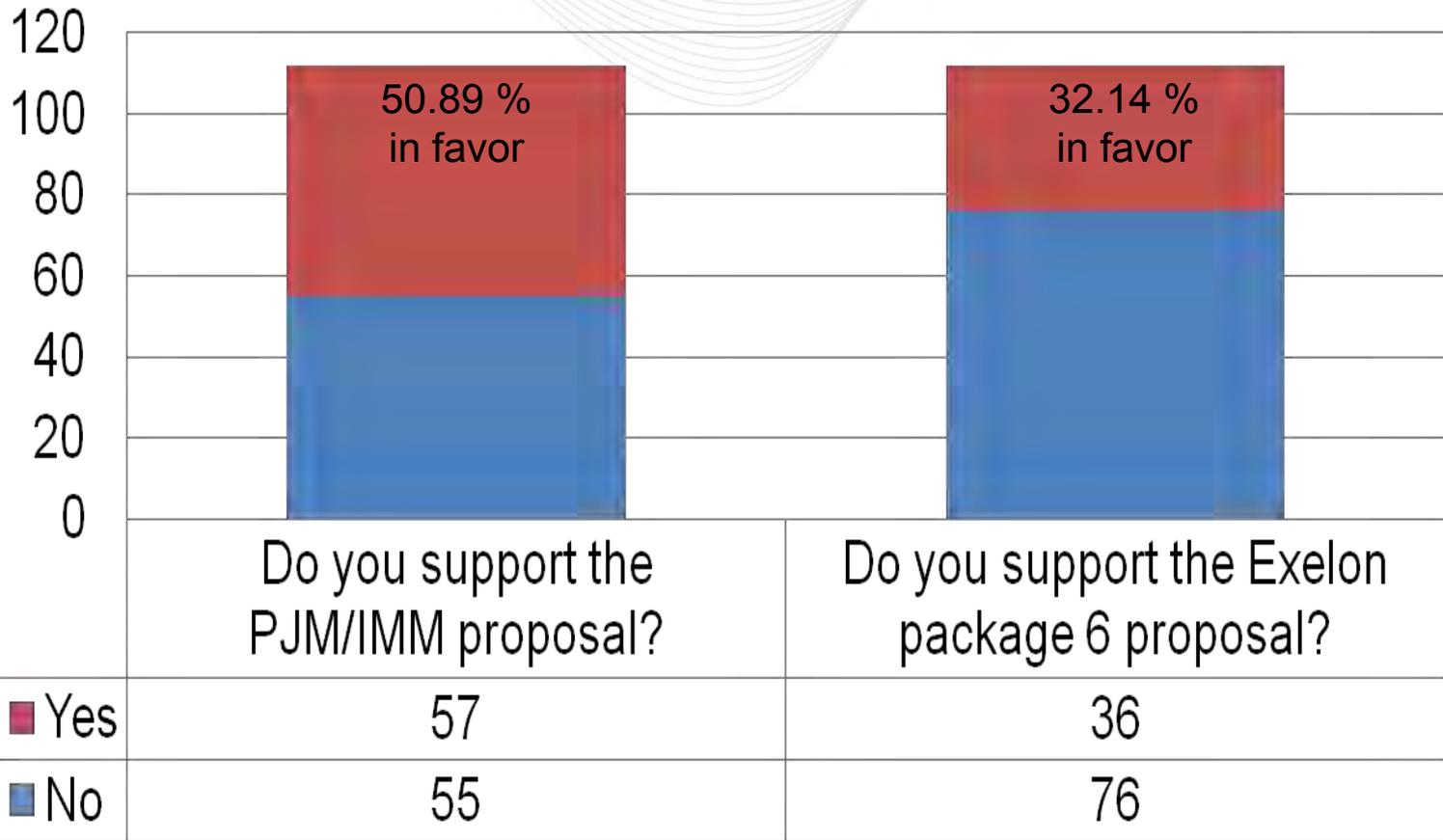
January 31, 2013

- Background
- Task Force Objective & Status
- Proposal Design Components
- Next Steps









Number of responses = 112

Design Component	Description	Recommendation
Restoration Time	24-Hour system restoration target time was identified in the manual, though not a NERC requirement.	Remove Time Targets from Manual 36

The recommendation and associated Manual 36 language change was approved through the committee process at the end of 2012.

Design Component	Description	Recommendation
Redundancy	<ul style="list-style-type: none"> •% added to Critical Load calculation •Minimum number of Black Start (BS) resources 	<ul style="list-style-type: none"> •10% Buffer to Critical Load calculation •Minimum of 2 BS resources / zone with a critical load

•**10% Buffer** - This will account for an average forced outage rate (5%) plus an allowance for additional, unexpected Critical Load (5%).

•**Minimum of 2 BS resources** – This is a minimum “allocation” are to each transmission zone with a Critical Load requirement.



Design Component	Description	Recommendation
Cross-zonal Coordination	Ability to share BS resources across TO zones to serve critical load	Proactive approach (at three levels) considering impact to reliability, technical feasibility, complexity, state considerations, cost savings, and increased efficiencies

All levels of cross-zonal coordination assessed in collaboration with TOs. If a TO disagrees, different options exist, depending on if it is to meet a reliability requirement or for an efficiency gain.

- **Level 1** – Supply Black Start from outside TO zone to meet TO critical load
- **Level 2** – Supply critical load and / or customer load pockets across TO zones
- **Level 3** – Aggregate TO zones (full or partial) into restoration regions

Design Component	Description	Recommendation
Entity Responsible for Black Start location	Entity responsible for selecting Black Start resource and location	PJM, as Transmission Operator (TOP) is responsible

In collaboration with TOs, PJM will select the Black Start units based on:

- Critical Load requirements
- Available Black Start resources
- Redundancy requirements
- Technical feasibility
- Cross-zonal opportunities

As with cross-zonal coordination, if TO does not agree, Black Start resources can be procured by the TO outside of the PJM Open Access Transmission Tariff (OATT).

Design Component	Description	Recommendation
Black Start Definition	The units eligible to be considered Black Start resources	Units that can start within 4 hours or less without external excitation (current definition is 90 min start time)

Critical Load time requirements will be met with the appropriate Black Start resources. Black start resources will be notified of timing requirements and tested annually.

Design Component	Description	Recommendation
Black Start Amount Required (Critical Load Definition)	How to determine the amount of Black Start resources required	Continue to determine by Critical Load requirements by TO zone, but redefine Critical Load, and include redundancy requirements (prior design component)

Critical Load (for each TO zone) :

- Cranking power to all units with a hot start time four hours or less
 - + Off-Site Nuclear Station Light and Power
 - + Critical Gas Infrastructure
 - + Exceptions or additions to the above criteria with PJM approval & SOS-T endorsement
- Sum (110%)**

Design Component	Description	Recommendation
Procurement Option	The process by which Black Start is acquired for the interconnection	<p>Every 5 years PJM issues an RFP for Black Start resources for the RTO region</p> <p>Incremental Procurement: for Black Start resources that issue a notice of termination in between the 5-year process</p>

- 5-Year Selection Process – RFP issued every 5-years for the RTO to reassess Critical Load and Black Start resource options.
- Providing Black Start service is voluntary
- 2-year commitment
- PJM OATT Schedule 6A applies (Formula or Capital Recovery Rate)
- 1-year notice of Black Start service termination

Design Component	Description	Recommendation
Initial Restoration Plan Assumptions	Assumptions about the state of the RTO at the beginning of the blackout where Black Start resources are required	<ul style="list-style-type: none"> •Retain existing assumptions of complete blackout with no outside assistance available •Retain existing assumptions about weather, load, asset health, and staff availability
Restoration Scenarios	Restoration scenarios considered initially and during training	Initial assumption is as stated above, but a variety of scenarios will be incorporated into training
Area for Restoration	Geographic & electrical boundaries considered during restoration	TO zones will persist unless there is an opportunity for cross-zonal coordination. Restoration plans will be based on restoration regions established.

Design Component	Description	Recommendation
Responsible for Restoration & Coordination	Entity responsible for implementing and coordinating restoration plans	<ul style="list-style-type: none"> • Retain system restoration at the TO zonal level (or aggregated zone, if implemented) with PJM coordination of area interconnection & EHV system restoration • Restoration plans developed by TO or TOs, if aggregated for BS
Maximum No. of BS units / site	The maximum allowable number of BS units at a generating plant	Remove the existing rule that allows only 3 BS units at a generating plant to provide Black Start
Units Eligible to be BS	Type of resource that can be considered a BS resource	Any unit capable of meeting the requirements of a BS unit is eligible for consideration (includes 4-hr start & new technology)

Design Component	Description	Recommendation
Procurements of BS outside of the OATT	Ability of a TO to procure BS outside of PJM’s OATT	<ul style="list-style-type: none"> •TO may procure additional or alternative BS through bilateral contracts, outside of the OATT
Analysis of BS resources	Technical considerations of BS resources offered in response to RFP	<ul style="list-style-type: none"> •Reactive and voltage capability •Thermal limits •Dynamic stability •Cranking path viability •Fuel diversity

- **PJM / IMM Proposal to go to MRC for a first-read, 1/31**
- **Task Force to develop manual and OATT language changes before February MRC**
- **Task Force to discuss cost-allocation and compensation changes required to support the strategy**
- **PJM / IMM Proposal to be voted on at February MRC**