



Manual 36, System Restoration

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System Operation Subcommittee
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- Annual Review per EOP-005-2, R3 and EOP-006-2, R3
- Minor formatting and clarifying changes throughout
- Consistency in title "Transmission Owner operator" and "Generation Owner dispatcher" throughout manual
- Section 3.1.2 Ascertain System Status
 - Clarification of responsibilities for report submittals and communications during restoration between TOs, GOs, and plant operators

- Section 3.1.7, PJM Assumes Balancing Authority Role
 - Clarification on load shedding during system restoration
- Section 4.1.1, Voice Communication and Logging Protocols
 - Additional detail on communication protocols during system restoration
- Section 6.2.1, Units Requiring Cranking Power
 - Clarification on responsibility for tabulation of unit status

- Section 7.2.1, Synchronizing Process Phases
 - Updated Exhibit 10, PJM Table of Major Synchronization Devices based on most recent TO Restoration plans
 - Added clarifying requirement on establishment of tie schedule between interconnected areas
- Section 8, System Restoration Plan Guideline
 - Minor clarifications and updated references

- Attachment A, Minimum Critical Black Start Requirement
 - Noted that critical nuclear safe shutdown power is defined in NPIRs
 - Updated dates for Black Start RTO wide RFP. Removed transitional verbiage
 - Added EOP-005-2, R-15 requirement for notification of change to Black Start unit ability to meet TO restoration plan within 24 hours
- Attachment B, Restoration Forms
 - Added SMECO to Exhibits 11 and 13
- Attachment D, Restoration Drill Guide
 - Change from System Restoration Coordinators Task Force to Subcommittee

- Attachment F, Transmission Owner and Black Start Supporting Documentation References
 - Updated Figure 1 – TO restoration document references
- Attachment G, Coordination of Restoration Plan with PJM Internal and External Neighboring Entities; PJM Approval Process for TO Restoration Plans
 - Clarification of eDART Restoration Plan coordination process
 - Clarification on completion of Attachment G-2
 - Added SMECO/ITC and updated EKPC on annual update timeline
 - Added new subsection G-4 *Dynamic Study and Restoration Plan Updates (see next slide)*
- Attachment H, Under Frequency Load Shed (UFLS) Tables – annual update



Attachment G-4 Dynamic Study and Restoration Plan Updates

Added in response to FERC/NERC Joint Review of Restoration and Recovery plans recommendation

PJM Black Start Study and Restoration Plan Update Guidelines

| Event # | Event Description | Dynamic Study Required | Restoration Plan Update Required |
|---------|--|--|--|
| 1 | New Black Start Unit - Incremental RFP - 5 Year RTO wide RFP - Interim Cross zonal solution | Yes - develop cranking paths and complete studies (prior to Black Start unit or cross zonal solution going into service) | Yes - prior to Black Start unit or cross zonal solution going into service |
| 2 | Replacement Black Start Unit (Same Site) | If needed due to different unit characteristics or connection bus (prior to BS unit going into service) | Yes - prior to replacement black start unit into service |
| 3 | Black Start Unit Retirement or Termination | Only if there is no other studied path to critical load (prior to retirement or termination) | Yes - prior to unit retirement or terminated |
| 4 | New Critical Load Unit | Yes - include in Restoration Plan Annual Update - develop cranking paths with TOs and complete studies | Yes - during Annual Update (1 month prior) |
| 5 | Critical Load Unit Retirement | Only if critical load unit is used to feed other critical load a.k.a. "daisy chaining" (prior to unit retirement) | Yes - prior to unit retirement |
| 6 | Unplanned Permanent Change impacting Restoration Plan | Only if it impact a cranking path (No later than 90 days after unplanned permanent change occurs) | Yes - updates need to be made within 90 days of unplanned permanent change |
| 7 | Planned BES Transmission Change | Yes - annual Restoration Plan Update or as-needed | Yes - if implementation of a planned BES modification changes the implementation of a restoration plan. To be complete prior to in-service. (Cut-in process) |
| 8 | Unplanned/Planned Temporary Change(i.e. maintenance outage) | No | No |

- SOS
 - First Read – March 30, 2016
 - Endorsement – April 27, 2016
- OC
 - First Read – April 5, 2016
 - Endorsement – May 10, 2016
- MRC
 - First Read – April 28, 2016
 - Endorsement – May 26, 2016