Draft TO/TOP Matrix V12

Srinivas Kappagantula
Chair, TO/TOP Matrix Subcommittee
Changes Since First Read

• Schedule change (Slide 3)
  – First read at TOA-AC 4/25/2018
  – Approval by an email vote in May 2018

• Administrative changes
  – Updated reference documents (PJM Manuals) to most recent versions
PJM TO/TOP Matrix

- Index between the PJM Manuals and NERC Reliability Standards applicable to PJM as the TOP
- Delineates the Assigned/Shared Tasks between PJM and Member TOs for NERC requirements where PJM relies on its TOs to perform certain tasks
- Does not create any new obligations for PJM or its Member TOs
- An efficient and effective tool fundamental to a strong PJM Internal Control – the PJM TO/TOP Reliability Audit Program
TO/TOP Matrix Update Process

1. Review Future Standards Incorporation Plan – Monthly at TTMS

2. Prioritize new or revised Standards that need to be worked on

3. Identify requirements to be added to or edited in the Matrix

4. Develop “Strawman” for new or revised assigned tasks and review impacts to Member TOs and PJM

5. Finalize assigned tasks and take the next version to PJM committees and ultimately to TOA-AC for approval prior to most pressing “Enforcement Date”
Changes Incorporated in V12

1. New NERC Reliability Standard Additions
   - TOP-001-4 – July 1, 2018
   - VAR-001-4.2 – September, 26, 2017

2. Task Updates
   - Assigned/Shared Member TO tasks
   - PJM tasks

3. Attestation Removal
   - Assigned/Shared Member TO task(s)
   - Evidence of Compliance section

4. Administrative Changes
   - Inactive date changes for some standards
   - PJM reference document updates
   - Spelling and grammar check
New NERC Reliability Standards

**TOP-001-4 R10 Summary**
- Assigned tasks require Member TOs to obtain, utilize, and monitor several parameters (R10.1-R10.6) to determine SOL exceedances in their areas.
- R10.1-R10.3 require modeling and monitoring Facilities, RASs, and non-BES facilities within Member TO area.
- R10.3-R10.6 require modeling and monitoring Facilities, RASs, and non-BES facilities external to Member TO area.
- Modeling practices documented in PJM Manual 3A.

**VAR-001-4.2 Summary**
- New version fixed errata in VAR-001-4.1.
- No change to assigned/shared tasks.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Req.#</th>
<th>Enforceable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. TOP-001-4</td>
<td>R10</td>
<td>7/1/2018</td>
</tr>
<tr>
<td>2. TOP-001-4</td>
<td>R10.1</td>
<td>7/1/2018</td>
</tr>
<tr>
<td>3. TOP-001-4</td>
<td>R10.2</td>
<td>7/1/2018</td>
</tr>
<tr>
<td>4. TOP-001-4</td>
<td>R10.3</td>
<td>7/1/2018</td>
</tr>
<tr>
<td>5. TOP-001-4</td>
<td>R10.4</td>
<td>7/1/2018</td>
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<tr>
<td>6. TOP-001-4</td>
<td>R10.5</td>
<td>7/1/2018</td>
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<tr>
<td>7. TOP-001-4</td>
<td>R10.6</td>
<td>7/1/2018</td>
</tr>
<tr>
<td>8. VAR-001-4.2</td>
<td>R4</td>
<td>9/26/2017</td>
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<tr>
<td>Standard</td>
<td>Req.#</td>
<td>Rationale</td>
</tr>
<tr>
<td>------------</td>
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</tr>
<tr>
<td>1. BAL-005-0.2b</td>
<td>R1.2</td>
<td>• Assigned task now includes a reference to PJM Manual 3, Section 1.5.6</td>
</tr>
<tr>
<td>2. EOP-008-1</td>
<td>R7</td>
<td>• Added assigned task to provide documentation of testing Operating Plan for backup functionality required in PJM Manual 1, Attachment B</td>
</tr>
<tr>
<td>3. TOP-010-1(i)</td>
<td>R1</td>
<td>• Added methods used to transmit data to PJM (ICCP, DMP, etc.)</td>
</tr>
<tr>
<td>4. TOP-010-1(i)</td>
<td>R3</td>
<td>• Clarified Audit Questions and Evidence of Compliance sections and deleted extraneous text from assigned task(s)</td>
</tr>
<tr>
<td>5. TOP-010-1(i)</td>
<td>R3.2</td>
<td>• Revised assigned tasks to align with requirement and PJM Manual 3A</td>
</tr>
<tr>
<td>6. VAR-001-4.2</td>
<td>R5.1</td>
<td>• Revised assigned task #1 to include PJM in the list of entities to be notified of voltage schedules as required in PJM Manual 3, Section 5.6</td>
</tr>
<tr>
<td>Standard</td>
<td>Req.#</td>
<td>Rationale</td>
</tr>
<tr>
<td>---------------</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1. BAL-005-0.2b</td>
<td>R1.2</td>
<td>• Added a PJM task to update list of Transmission Facilities identified in PJM Manual 3: Transmission Operations, Section 1.5.6 as needed</td>
</tr>
<tr>
<td>2. TOP-001-4</td>
<td>R19</td>
<td>• Added a PJM task to perform Operational Planning Analyses</td>
</tr>
<tr>
<td>3. TOP-010-1(i)</td>
<td>R1.2</td>
<td>• Revised PJM task to indicate PJM shall use Member TO quality of Real-time data</td>
</tr>
<tr>
<td>4. TOP-010-1(i)</td>
<td>R3.2</td>
<td>• Revised PJM task to indicate that PJM shall maintain the process to address quality of analysis used in its RTA identified in PJM Manual 3A, Section 5.6</td>
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</tbody>
</table>
Attestation Removal & Administrative Changes

### Standard

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<table>
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<td>2. EOP-005-2</td>
<td>R5</td>
<td></td>
</tr>
<tr>
<td>3. EOP-008-1</td>
<td>R6</td>
<td></td>
</tr>
<tr>
<td>4. TOP-002-2.1b</td>
<td>R17</td>
<td></td>
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</tbody>
</table>

### Req.#

- BAL-005-0.2b
- EOP-005-2
- EOP-008-1
- TOP-002-2.1b

### Rationale

- Entities used attestations to prove a negative
- Auditing practices have evolved to not require attestations from entities being audited
- Removed all instances where attestations were required in assigned/shared Member TO tasks and Evidence of Compliance section in the Matrix

### Administrative Changes

- Deleted PRC-001-1.1 & VAR-001-3; three years past their enforcement dates
- BAL-005-0.2b, TOP-001-3, & VAR-001-4.1 updated with new inactive dates
- Updated all reference documents to their current versions. 40 instances of updates to “Reference Documents” section of the Matrix
• Your recommendation to the Transmission Owner’s Agreement-Administrative Committee to approve the TO/TOP Matrix V12
TO/TOP Matrix Educational/Background Slides
• Clear Responsibility and Authorities
  – Long Standing Relationship
  – Unity of Command and One Responsible Entity
  – Codified in PJM’s Agreements
• PJM Committees (OC, SOS, PC…)
• Strong and proven Internal Control
  – PJM Training
  – TO/TOP Matrix
  – PJM TO/TOP Reliability Audits
PJM & Member TO Relationship Document Hierarchy

- **PJM Open Access Transmission Tariff (OATT)**
- **PJM Operating Agreement (OA)**
- **PJM Consolidated Transmission Owners Agreement (TOA)**

**Filed with FERC**

**PJM Manuals**

- **Reliability Coordination**
  - M-37 Reliability Coordination
  - M-36 System Restoration

- **Balancing Authority**
  - M-12 Balancing Operations
  - M-11 Scheduling Operations
  - M-10 Pre-scheduling Operations

- **Transmission Operator**
  - M-1 Control Center and Data Exchange
  - M-3 Transmission Operations
  - M-13 Emergency Procedures
  - M-38 Operations Planning

- **Planning Authority**
  - M-14A Gen/Trans Interconnection
  - M-14B Planning Process
  - M-14C Gen/Trans Construction
  - M-14E Merchant Transmission
### Delineation of Reliability Tasks

<table>
<thead>
<tr>
<th>Category</th>
<th>Standard Number</th>
<th>Requirement Number</th>
<th>Approved BOT/FERC Standards</th>
<th>A/S</th>
<th>Assigned or Shared Member TO Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>EOP</td>
<td>EOP-005-2</td>
<td>R3</td>
<td>Each Transmission Operator shall have a restoration plan approved by its Reliability Coordinator. The restoration plan shall allow for restoring the Transmission Operator’s System following a disturbance in which one or more areas of the Bulk Electric System (BES) shuts down and the use of Blackstart Resources is required to restore the shut down area to service, to a state whereby the choice of the next load to be restored is not driven by the need to control frequency or voltage regardless of whether the Blackstart Resource is located within the Transmission Operator’s System. The restoration plan shall include: [Violation Risk Factor = High] [Time Horizon = Operations Planning]</td>
<td>5</td>
<td>1. Each Member TO shall have a restoration plan that supports restoring the Transmission Operator’s System following a disturbance in which one or more areas of the Member TO’s BES shuts down. 2. The Member TO shall send the Member TO restoration plan to PJM for approval.</td>
</tr>
</tbody>
</table>

**Tasks** PJM performs to ensure Reliability Requirement is met in combination with TO Assigned/Shared Tasks

**Tasks Assigned to Member TOs or Shared between PJM and Member TOs**

**Standard/ Requirement information**

**NERC Reliability Standard Requirement Text**
### TO/TOP Audit Phase

<table>
<thead>
<tr>
<th>Audit Questions</th>
<th>Evidence of Compliance</th>
<th>Reference Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Do you have a restoration plan that supports for restoring the Transmission Operator's System following a disturbance in which one or more areas of the Member TO's BES shuts down? 2. Is it approved by PJM?</td>
<td>Exhibit your restoration plan and show that it covers a plan to reestablish its electric system in a stable and orderly manner in the event of a partial or total shutdown of its system, including necessary operating instructions and procedures to cover emergency conditions, and the loss of vital telecommunications channels. 2. Show evidence of approval by PJM.</td>
<td>M-36 System Restoration, Section 8-System Restoration Plan Guidelines; Section 1.1- Policy Statements, PJM Member Actions, Attachment G: Coordination of Restoration Plan with PJM Internal and External Neighboring Entities</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Enforcement Date</th>
<th>Inactive Date</th>
</tr>
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<tbody>
<tr>
<td>7/1/2013</td>
<td>None</td>
</tr>
</tbody>
</table>
What the Matrix Is Not

- Evidence of compliance
- Formal delegation agreement
- Joint Registration Organization (JRO) or Coordinated Functional Registration (CFR)
- A means of creating new obligations for PJM or its Member TOs other than those specified in the PJM OATT, OA, CTOA, PJM Manuals and other governing documents
- A list of how all TOP requirements are met
Development and Maintenance of the TO/TOP Matrix

- TO/TOP Matrix Subcommittee (TTMS), a PJM subcommittee with participation limited to Member TOs, develops and maintains the TO/TOP Matrix.
- The TTMS reports to the Transmission Owners Agreement-Administrative Committee (TOA-AC), which approves the Matrix.
- Monthly meetings to collaborate on new or existing NERC Reliability Standards applicable to PJM as the TOP.
Typical Roadmap to a Version Approval

Review Future Standards Incorporation Plan and prioritize accordingly

Develop Assigned and/or Shared Tasks for NERC Reliability Standard Requirements where PJM relies on Member TOs

Conduct an annual review of the Matrix and agree to a final version for updates to various stakeholders

Take finalized version to PJM SOS, OC, and PC, seeking their recommendation to TOA-AC to approve the Matrix

Present finalized version to TOA-AC, that approves the Matrix. Publish the approved Version.
• Once a Standard has been inactive in the TO/TOP Matrix for 3 or more years, it gets deleted from the next version.