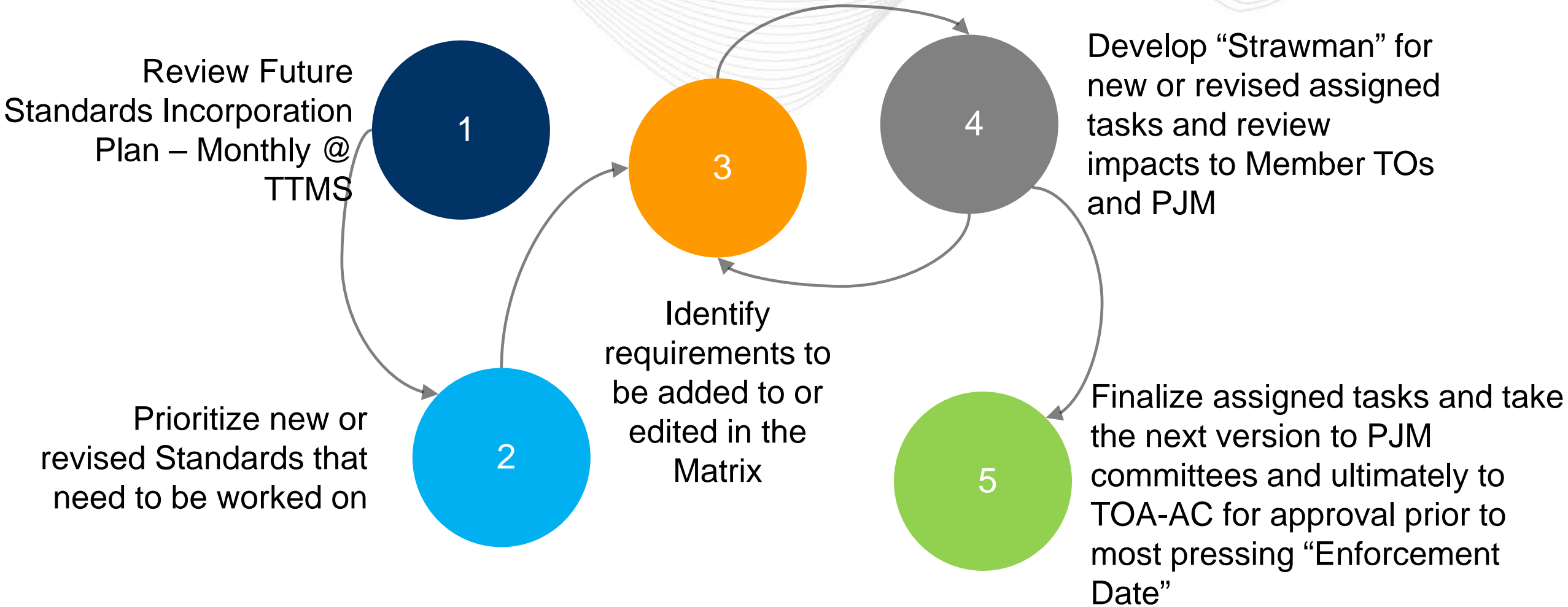


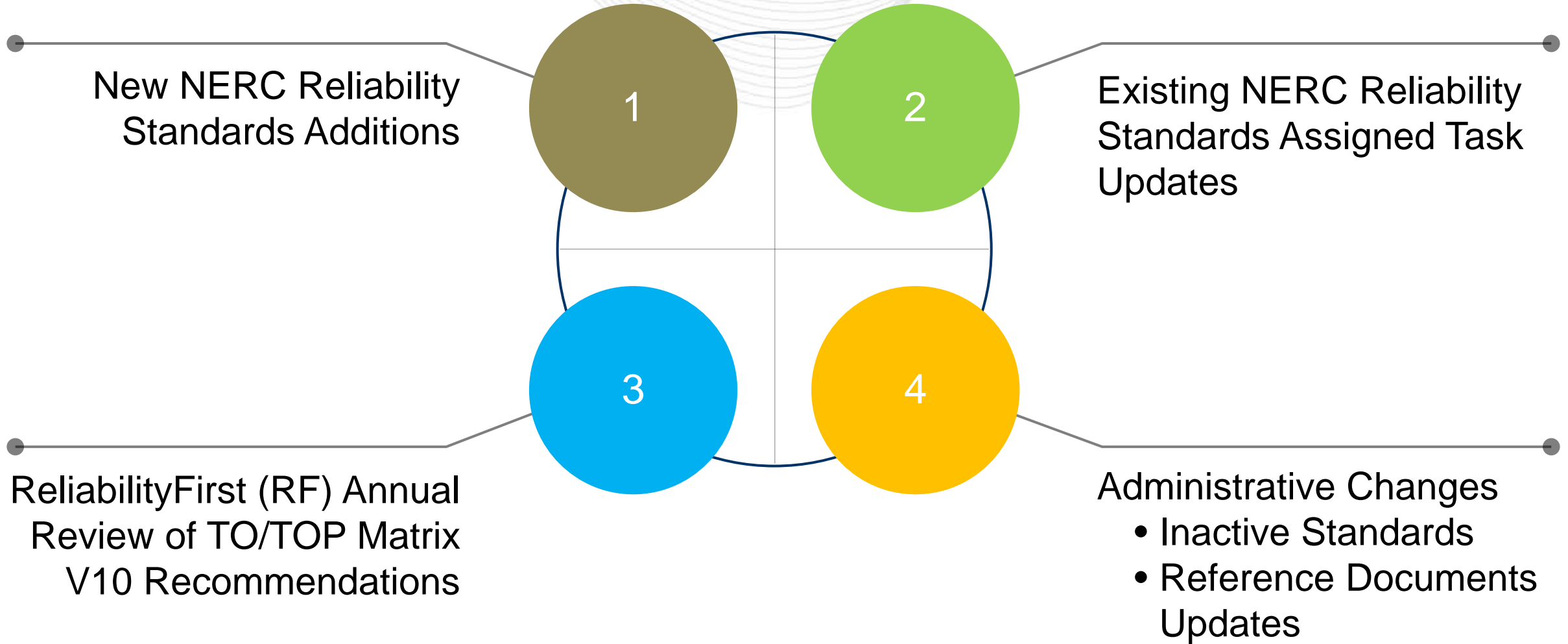
Draft TO/TOP Matrix V11

Srinivas Kappagantula
Chair, TO/TOP Matrix Subcommittee
Planning Committee
July 13, 2017



- Index between the PJM Manuals and the NERC Reliability Standards
- Delineates the Assigned/Shared Tasks between PJM and the Member TO for NERC Reliability Standards applicable to PJM as the TOP 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 Audit Program
- Developed and maintained by the TO/TOP Matrix Subcommittee that reports to the TOA-AC







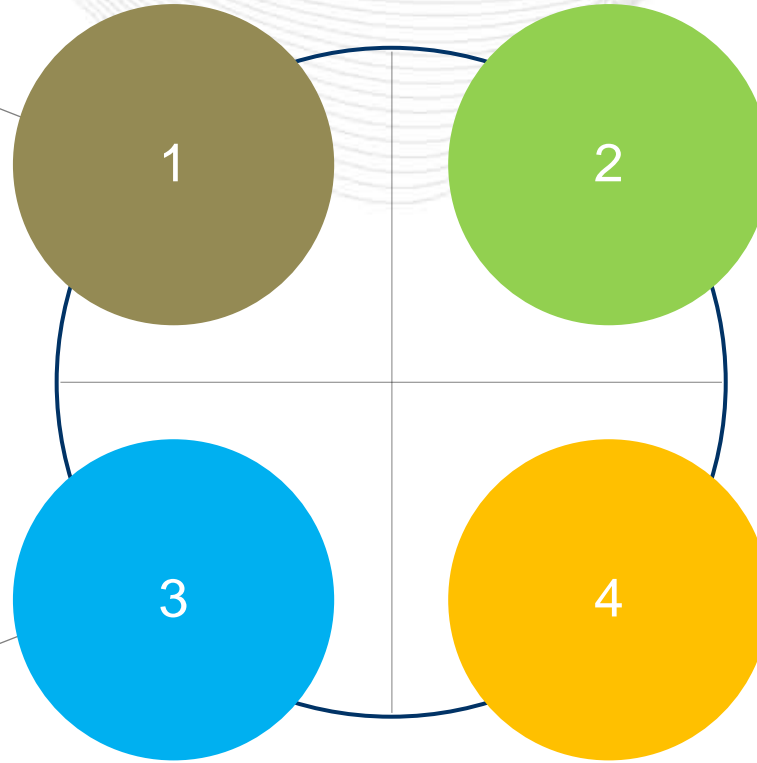
1 – New NERC Reliability Standards Added

	Standard	Requirement	Enforceable
1	COM-001-3	R12	10/1/2017
2	TOP-010-(i)	R1	4/1/2018
3	TOP-010-(i)	R1.2	4/1/2018
4	TOP-010-(i)	R1.3	4/1/2018
5	TOP-010-(i)	R3	4/1/2018
6	TOP-010-(i)	R3.2	4/1/2018
7	TOP-010-(i)	R3.3	4/1/2018
8	TOP-010-(i)	R4	4/1/2018

2 – Existing Standards Assigned Tasks Updated

	Standard	Requirement	Assigned Task Change
1	EOP-005-2	R1	Evidence of Compliance Updated
2	TOP-001-3	R9	Clarified that assigned tasks deal with data communication channels
3	TOP-001-3	R16	Clarified that assigned tasks deal with data communication channels
4	TOP-006-2	R6	Updated Manual 1 reference in the assigned task

Update TO/TOP Matrix regularly to ensure New or Revised NERC Reliability Standards becoming effective are incorporated in a timely manner



Include all NERC Reliability Standards in the Matrix, including those that do not have assigned tasks – two options suggested

Appendix A – specific recommendations for assigned tasks for some requirements in the Matrix

Appendix B – review of PJM governing documents to ensure that assigned tasks are included ensuring that Member TOs perform those tasks

3- RF Review of Matrix V10 Implemented Recommendations

- Updated reference documents where RF review indicated the assigned task was not mapped to a PJM governing document

	Standard	Requirement		Standard	Requirement
1	EOP-003-2	R2	6	EOP-005-2	R10.2
2	EOP-003-2	R4	7	EOP-005-2	R10.3
3	EOP-003-2	R7	8	EOP-005-2	R10.4
4	EOP-005-2	R1.6	9	EOP-008-1	R5
5	EOP-005-2	R5	10	EOP-008-1	R7

- Several other assigned task references being reviewed and will be addressed with potential changes to PJM Manuals

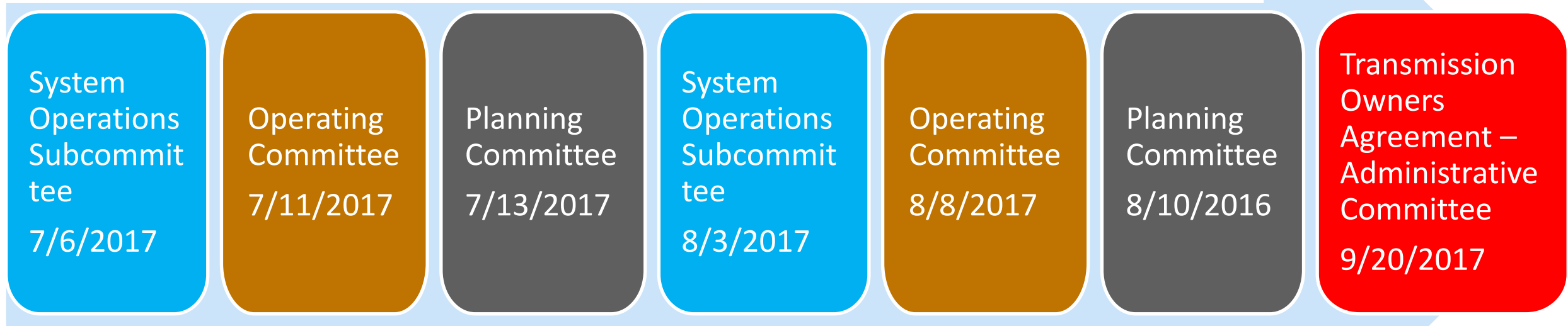
- Updated inactive dates for standards that became inactive on 3/31/2017
- Incorrect inactive dates for certain standards fixed
- Some reference documents added, some updated to current versions, and few sections updated

<u>Standards Inactive Since V10</u>		
<u>1</u>	<u>IRO-004-2</u>	<u>3/31/2017</u>
<u>2</u>	<u>IRO-005-3.1a</u>	<u>3/31/2017</u>
<u>3</u>	<u>PER-001-0.2</u>	<u>3/31/2017</u>
<u>4</u>	<u>TOP-004-2</u>	<u>3/31/2017</u>
<u>5</u>	<u>TOP-006-2</u>	<u>3/31/2017</u>
<u>6</u>	<u>TOP-007-0</u>	<u>3/31/2017</u>
<u>7</u>	<u>TOP-008-1</u>	<u>3/31/2017</u>

<u>Inactive Date Changes</u>		
<u>1</u>	<u>COM-001-2.1</u>	<u>9/30/2017</u>
<u>2</u>	<u>TOP-003-1</u>	<u>3/31/2017</u>

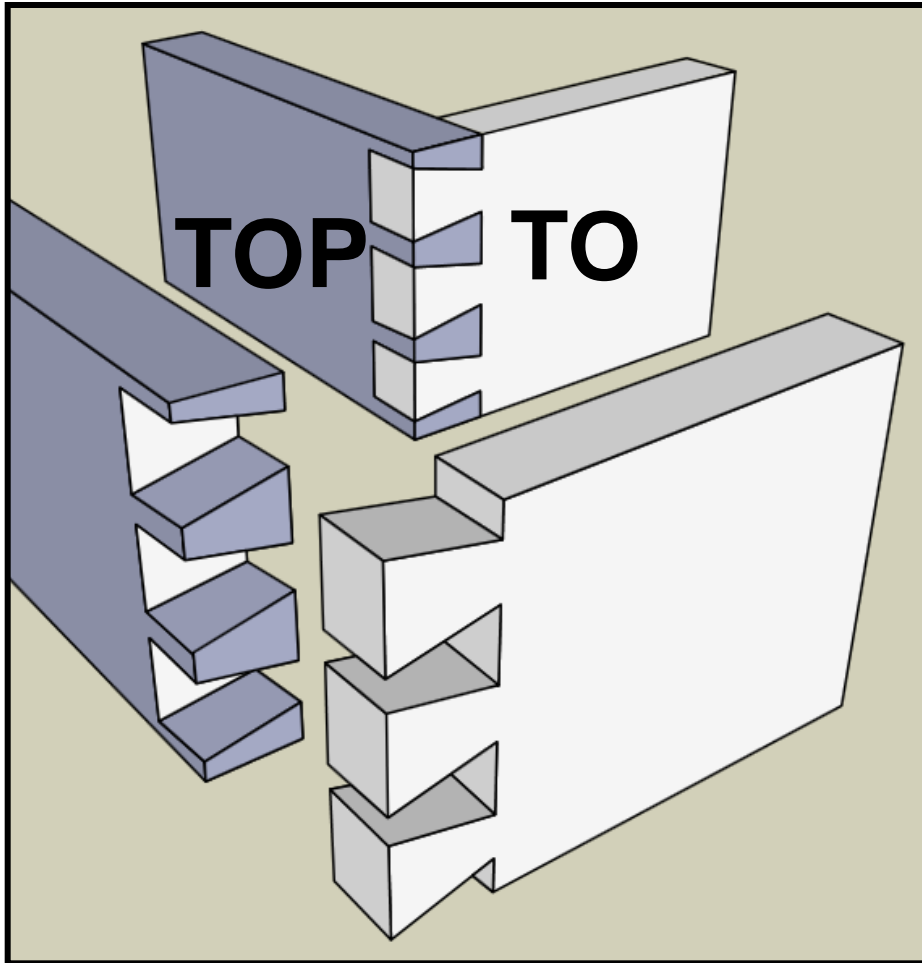
<u>Reference Changes</u>				
<u>1</u>	<u>BAL-005-0.2b</u>	<u>R12</u>	<u>17</u>	<u>PRC-010-0 R1</u>
<u>2</u>	<u>COM-002-2</u>	<u>R2</u>	<u>18</u>	<u>PRC-010-0 R1.1.1</u>
<u>3</u>	<u>COM-002-4</u>	<u>R2</u>	<u>19</u>	<u>PRC-010-0 R1.1.2</u>
<u>4</u>	<u>COM-002-4</u>	<u>R4</u>	<u>20</u>	<u>PRC-010-0 R1.1.3</u>
<u>5</u>	<u>COM-002-4</u>	<u>R4.1</u>	<u>21</u>	<u>TOP-001-3 R8</u>
<u>6</u>	<u>COM-002-4</u>	<u>R6</u>	<u>22</u>	<u>TOP-001-3 R10.1</u>
<u>7</u>	<u>EOP-001-2.1b</u>	<u>R2.3</u>	<u>23</u>	<u>TOP-001-3 R13</u>
<u>8</u>	<u>EOP-001-2.1b</u>	<u>R3</u>		
<u>9</u>	<u>EOP-001-2.1b</u>	<u>R4</u>		
<u>10</u>	<u>EOP-005-2</u>	<u>R1</u>		
<u>11</u>	<u>EOP-005-2</u>	<u>R4</u>		
<u>12</u>	<u>EOP-005-2</u>	<u>R4.1</u>		
<u>13</u>	<u>IRO-001-1.1</u>	<u>R8</u>		
<u>14</u>	<u>IRO-001-4</u>	<u>R2</u>		
<u>15</u>	<u>PER-005-1</u>	<u>R1</u>		
<u>16</u>	<u>PER-005-2</u>	<u>R1</u>		
<u>Administrative Changes</u>				
			<u>1</u>	<u>Updated all Reference Documents to current versions</u>
			<u>2</u>	<u>Added Reference Documents</u>
			<u>3</u>	<u>Spelling and Grammar updates where needed</u>

- Your recommendation to the TOA-AC to approve V11 of the Matrix as presented with an effective date of 10/1/2017



TO/TOP Matrix Background/Educational 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)



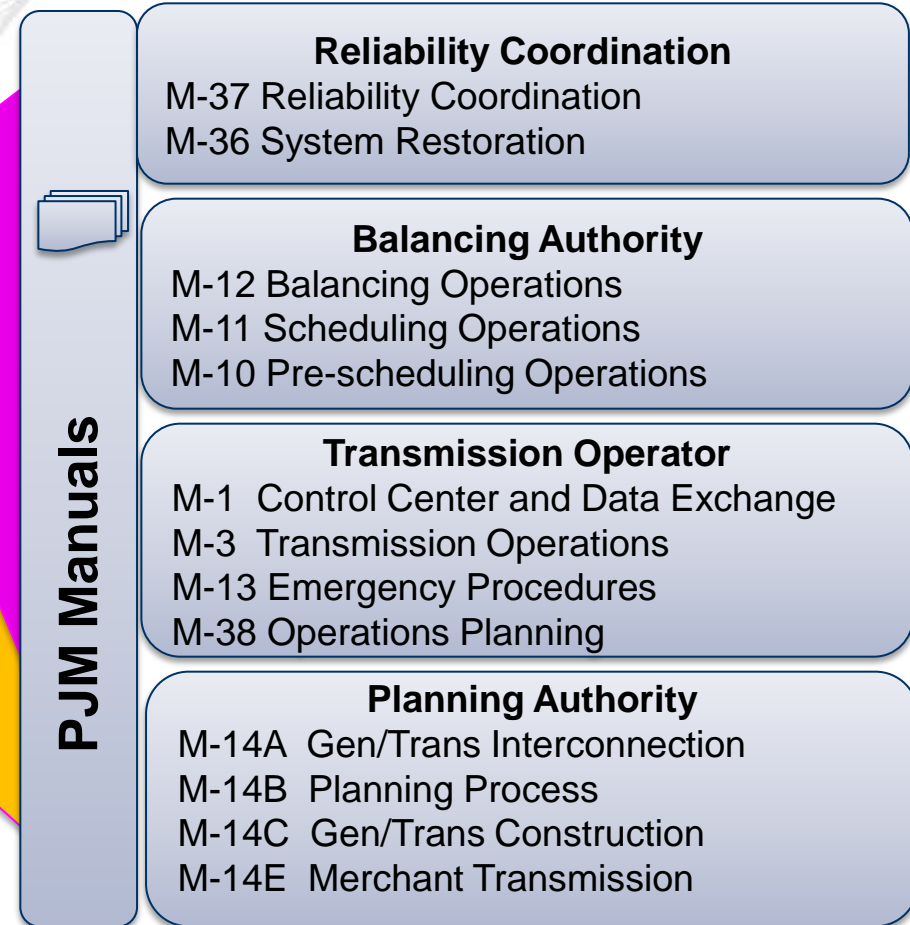
PJM Operating
Agreement
(OA)



PJM Consolidated Transmission
Owners Agreement
(TOA)



Filed with FERC



1 • Delineation of Reliability Tasks

Standard/ Requirement information

NERC Reliability Standard Requirement Text

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

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

Category	Standard Number	Requirement Number	Approved BOT/FERC Standards	A/S	Assigned or Shared Member TO Tasks	PJM Tasks
EOP	EOP-005-2	R1	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: <i>[Violation Risk Factor = High] [Time Horizon =Operations Planning]</i>	S	<ol style="list-style-type: none"> 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. 	PJM will review, recommend revision, and/or approve submitted Member TO Restoration Plans.

2

• TO/TOP Audit Phase

Questions asked to demonstrate compliance

Examples of evidence auditors look for

PJM documents that describe PJM/TO responsibilities

Enforcement and Inactive dates of the NERC Reliability Standard

Audit Questions	Evidence of Compliance (What auditors will be looking for)	Reference Documents	Enforcement Date	Inactive Date
<p>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?</p>	<p>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.</p>	<p>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</p>	<p>7/1/2013</p>	<p>None</p>

- 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

- 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

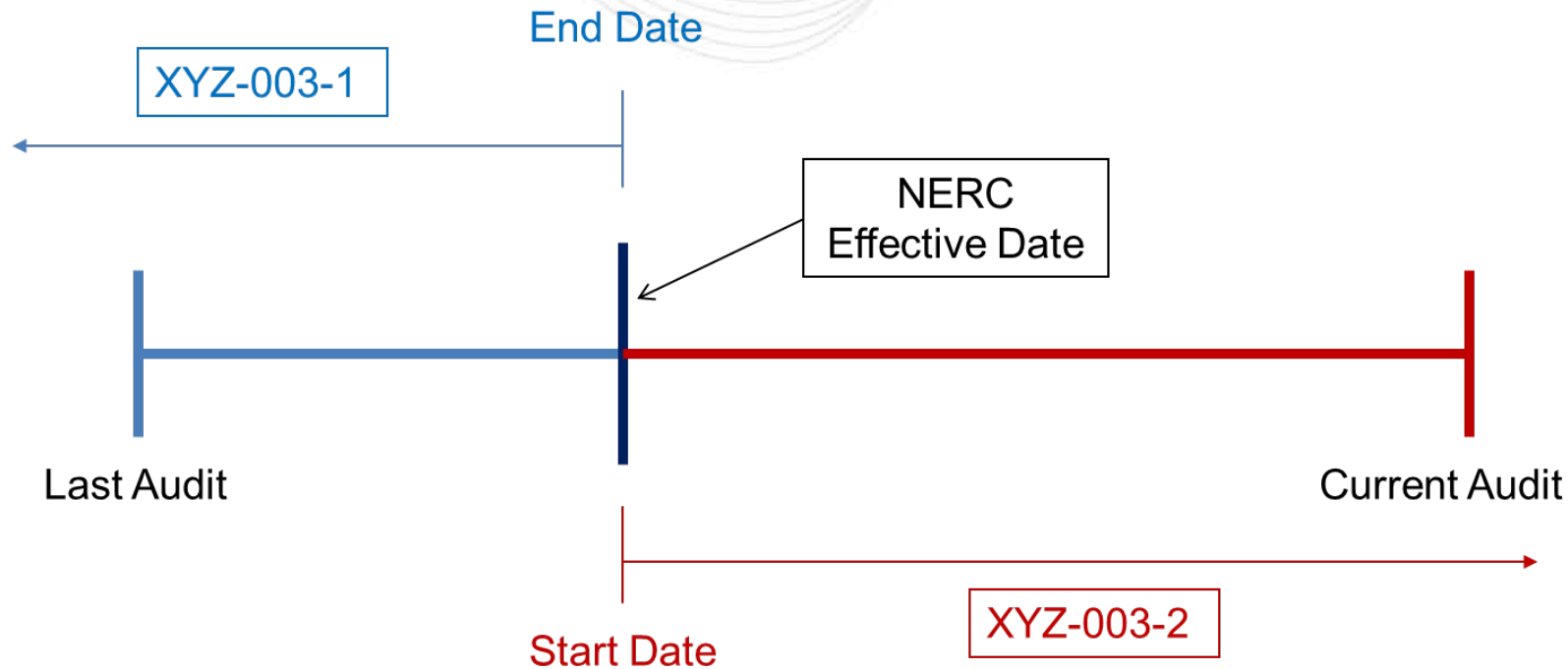
Develop Assigned and/or Shared Tasks for NERC Reliability Standard Requirements where PJM relies on Member TOs

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.

Rationale for Inactive Standards in the Matrix



- Once a Standard has been inactive in the TO/TOP Matrix for 3 or more years, it gets deleted from the next version