Executive Summary
Manual 3A, Revision Changes

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>10/31/2019</th>
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**Impacted Manual #s/Manual Title(s):**

| Manual 3A: Energy Management system (EMS) Model Updates and Quality Assurance (QA) Revision 18 |

**Conforming Order(s):**

None

**Associated Issue Tracking Title:**

N/A

**Committee Approval Path - What committee(s) have already seen these changes?**

<table>
<thead>
<tr>
<th>Planned committee reviews/endorsements:</th>
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<tbody>
<tr>
<td>DMS: 09/04/2019, 09/30/2019</td>
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<tr>
<td>SOS: 09/05/2019, 10/10/2019 (Endorsement)</td>
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<tr>
<td>OC: 09/09/2019, 10/15/2019 (Endorsement)</td>
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<tr>
<td>MRC: 09/26/2019, 10/31/2019 (Endorsement)</td>
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**MRC 1st read date:**

09/26/2019

**MRC voting date:**

10/31/2019

**Impacted Manual sections:**

| Sections 1.2, 1.5, 1.6, 1.7 |
| Section 2 (in entirety) |
| Sections 3.2, 3.5 |
| Sections 4.3, 4.8, 4.9 |
| Section 5 (in entirety) |
| Exhibits 1, 10 |
| Appendices: F, G |

**Reason for change:**

The overall purpose and intent of changes included in Revision 18 of Manual 03A is to address:

- 2019 Cover-to-cover Periodic Review for M03A
  - Adopting new timeline for future revisions
- New section: Modeling Philosophy
- Phase I of an overall effort to update, reorganize, and streamline content

**Summary of the changes:**

...
Overall: Corrected all references to Pseudo-Ties to align with Tariff reference.

Section 1.2: Formatting changes; generator data descriptions removed; outdated procedure removed.

Section 1.5: Overall description of PJM's use of 'three concentric model' revised and updated.

Exhibit 1: Replaced with updated version; layers renamed for clarity.

Section 1.6: Formatting changes; updates made to text to reflect current procedures. New note added to specify PJM timelines for TOs to provide telemetry and, for members with ICCP connection, a full SCADA file.

Section 1.7: The words 'Real-Time' removed from title (now reads: PJM's Operations Transient Stability Model); section updated to reflect current procedures.

Section 2: Opening paragraph revised to reflect updated content. Entire section redesigned to reflect PJM's overall modeling philosophy. New sections added:
  o 2.2.1 Internal World Modeling Philosophy (BES Facility Modeling, Sub-transmission Modeling)
  o 2.2.2 Sub-transmission Modeling Criterion and Responsibilities
  o 2.2.3 PJM External World Modeling (External World Modeling, Model Exchange and Extraction, Pseudo Tie Modeling, Pseudo Tie Eligibility, Pseudo Tie EMS Modeling)
  o 2.2.4 Naming and Modeling Standards
  o 2.2.5 Unique Device Consideration in the PJM Model.

Section 2.2.3.1: Removed criteria to the extent of external BES equipment to be considered for modeling.

Section 3.2: The following content is moved from Section 4.9 to Section 3.2:
  o Prepare Initial BES Data to Denote BES Elements of the System
  o TO Staff Responsibilities – To Address BES Definitions
  o PJM Staff Responsibilities – To Address Revised BES Definitions
  o PJM Staff Responsibilities – Ongoing Sub-transmission Modeling Considerations
  o Exhibit 10: Updated screen shot added for Sample TO Facilities List

Section 3.4: Text revised to reflect updated procedures when changing transformers and shunts.

Section 3.5: Section removed; content moved to new Section 2.2.4 Naming and Modeling Standards

Section 4.3: Exhibit 6: One-line Diagram Symbols updated with clearer version (no change to content)

Section 4.8: DMS section updated to remove stipulation of SOS appointment of DMS members (per revised DMS Charter); requirements for access to DMS SharePoint added (active, signed NDA on file in eDART); content streamlined.

Section 4.9: Content relocated to Sections 2.2, Section 3.2, and (new) Appendix G (Examples of EMS Sub-transmission Modeling); Section removed

Section 5: Section updated, reorganized, and consolidated to reflect updated processes and procedures

Section 5.1: Formatting and updates made to content
• Section 5.2: Text moved, updated, or deleted to reflect current procedures

• Section 5.3:
  o Heading changed from ‘New EMS Models Validation and Benchmarking’ to ‘Real-time Contingency Analysis (RTCA) and Solution Quality’
  o Text addressing PJM’s Security Analysis (SA) Program and RTCA Data Quality moved to this section from existing Section 5.5

• Section 5.4:
  o Title changed from ‘Real-time Contingency Analysis (RTCA)’ to ‘New EMS Models Validation and Benchmarking’
  o Added text addressing changes to PJM EMS and ‘soak test’ prior to moving changes to production (moved from Section 5.3)
  o Added bullet list of criteria and note addressing readiness for installing new model added (moved from Section 5.3)

• Section 5.5:
  o Text realigned to Section 5.3 (at section addressing PJM’s Security Analysis (SA) Program and RTCA Data Quality)
  o Section removed

• Appendix F: New entry added for DER: Distributed Energy Resources

• Appendix G: New appendix added for Examples of EMS Sub-transmission Modeling