# PJM Manual M10 – Pre-Scheduling Operations

## Generator Outage Approval Rules

## Capacity vs. Energy Resources

RSCS Meeting

April 15, 2016



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# Background

- Key references to generation outage approval process for  Capacity vs. Energy Resources in NERC Standards and PJM governing documents identified.
- PJM outage reporting rules for Planned, Maintenance and Forced Outages per PJM Manual M10: Pre-Scheduling Operations, are applicable to both Capacity and Energy Resources, as supported by:
  - NERC Standards
  - OATT, OA, RAA
- Address any gaps identified by clarifying generation outage scheduling requirements for Energy Resources in PJM Manual M10 as needed.


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# Summary of Manual M10 Revisions

- Sections 1.2, 2.1, 2.2, & 2.3 - revised to clarify that outage scheduling and approval rules apply to all PJM generation resources, except where explicitly stated for Generation Capacity Resources (examples below)

### 2.1 Generation Outage Reporting Overview

All generation resources, ~~Both Capacity and energy only (Non-Capacity) resources~~ shall provide outage schedule information ~~generator outage data~~ to PJM via eDART per the timelines established in Sections 2.2, 2.3, and 2.4 of this manual to support PJM's obligations as a Reliability Coordinator and Transmission Operator under several NERC Standards including IRO-005, IRO-010, IRO-017, TOP-001, TOP-002, TOP-006, and TOP-003~~to report generator outage information required for reliability analysis (TOP-003-1, R1).~~

### 2.2.2 Planned Outage Rules

1. PJM may withdraw its approval for a Planned Outage by notifying the PJM Member owning or controlling the ~~Capacity Resource~~generation resource in advance of the planned commencement of the outage, in accordance with deadlines for such notice as specified by PJM. Currently the deadline is at least 24 hours in advance.


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# Summary of Additional Manual M10 Revisions

- Section 2.1, Generation Outage Reporting Overview – revised to include that if a generation resource is made unavailable due to a transmission facility outage, the Generation Owner should submit a corresponding outage request (related to pending M03 revision).

- Section 2.4, Unplanned Outages - revised to clarify the steps the Member should take following an immediate outage.


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# Manual M10 - Next Steps

- First Reads, Second Reads:
  - SOS: March 30, 2016, April 27, 2016
  - OC: April 5, 2016, May 10, 2016 (Endorsement)
  - RSCS: April 15, 2016
  - MRC: May 26, 2016, June 30, 2016 (Endorsement)


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# Appendix


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# Generator Outage Approval Rules
# Capacity vs. Energy Resources

OC Meeting

January 5, 2016



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# Background

Purpose:

- Identify key references to generation outage approval process for Capacity vs. Energy Resources in:
  - NERC Standards
  - OATT, OA, RAA
  - PJM Manuals
- Address any gaps identified by clarifying generation outage scheduling requirements for Energy Resources in PJM Manual M10 as needed.


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# NERC Standards

| PJM Manual M10 | Related NERC Standards (see Appendix 1) |
|---|---|
| **Section 1.2 - PJM Responsibilities**<br>*"PJM responsibilities to support pre-scheduling are to: process and respond to requests for Capacity and Non-Capacity Resource outages"* | IRO-017-1 - Outage Coordination – enforceable 4/1/2017<br>IRO-005-3.1a – Reliability Coordination – Current Day |
| **Section 1.3 – PJM Member Responsibilities**<br>*"The Market Seller pre-scheduling responsibilities are to: request approval from PJM for Capacity Resource outages and report outages for energy units (Non-Capacity Resources) within the PJM RTO."* | TOP-002-2.1b – Normal Operations Planning<br>TOP-001-1a – Reliability Responsibilities and Authorities |
| **Section 2.1 – Generation Outage Reporting Overview**<br>*"Both Capacity and energy (Non-Capacity) resources shall provide generator outage data to support PJM obligations as a Reliability Coordinator to report generator outage information required for reliability analysis (TOP-003-1, R1)."* | TOP-003-1 – Planned Outage Coordination<br>TOP-006-2 – Monitoring System Conditions<br>IRO-010-1a - Reliability Coordinator Data Specification and Collection |


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# NERC Standards

- Assessment of applicable NERC Standards
  - Current and pending NERC Standards support the obligation of PJM (in its role as RC, BA and TOP) to implement and maintain, and Generator Operators to support,  an outage coordination process, regardless of whether the generating unit is a Capacity Resource or Energy Resource


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# References in Agreements / Governing Documents

- Assessment of OATT, OA, RAA and PJM Manuals (See Appendix 2)
  - Capacity Resources
    - Multiple references to Capacity Resources in OATT, OA and PJM Manuals that refer to meeting the requirements for Capacity Resources established in the RAA
  - Energy Resources
    - References in OATT, multiple references in PJM Manuals
  - Definition sections of OATT and OA – Planned, Maintenance and Forced Outage definitions apply to all generating units
    - Provisions related specifically to Capacity Resources are identified


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# PJM Position & Next Steps

- PJM outage reporting rules for Planned, Maintenance and Forced Outages per PJM Manual M10: Pre-Scheduling Operations, are applicable to both Capacity and Energy Resources, as supported by:
  - NERC Standards
  - OATT, OA, RAA
- Other related points:
  - Capacity and Energy Resources are generally treated the same in the energy and ancillary services markets
  - Only Capacity Resources are subject to penalties as found in PJM Manual M18, PJM Capacity Market (EFORd, CP)
- A future Manual M10 revision will provide additional clarity around the generation outage scheduling requirements for Energy Resources


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# Appendix 1

Applicable NERC Standards


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- IRO-017-1 — Outage Coordination – enforceable 4/1/2017

Each Reliability Coordinator shall develop, implement, and maintain an outage coordination process for generation and Transmission outages within its Reliability Coordinator Area. The outage coordination process shall:

1.1. Identify applicable roles and reporting responsibilities including:

1.1.1. Development and communication of outage schedules.

1.1.2. Assignment of coordination responsibilities for outage schedules between Transmission Operator(s) and Balancing Authority(s).

1.2. Specify outage submission timing requirements.

1.3. Define the process to evaluate the impact of Transmission and generation outages within its Wide Area.

1.4. Define the process to coordinate the resolution of identified outage conflicts with its Transmission Operators and Balancing Authorities, and other Reliability Coordinators.


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# NERC Standards

- IRO-005-3.1a – Reliability Coordination – Current Day
  - R6. The Reliability Coordinator shall coordinate with Transmission Operators, Balancing Authorities, and Generator Operators as needed to develop and implement action plans to mitigate potential or actual SOL, CPS, or DCS violations. The Reliability Coordinator shall coordinate pending generation and transmission maintenance outages with Transmission Operators, Balancing Authorities, and Generator Operators as needed in both the real time and next-day reliability analysis timeframes.
- TOP-002-2.1b – Normal Operations Planning
  - R3. Each Load Serving Entity and Generator Operator shall coordinate (where confidentiality agreements allow) its current-day, next-day, and seasonal operations with its Host Balancing Authority and Transmission Service Provider. Each Balancing Authority and Transmission Service Provider shall coordinate its current-day, next-day, and seasonal operations with its Transmission Operator.
  - R14. Generator Operators shall, without any intentional time delay, notify their Balancing Authority and Transmission Operator of changes in capabilities and characteristics including but not limited to:
    - R14.1. Changes in real output capabilities.
  - R15. Generation Operators shall, at the request of the Balancing Authority or Transmission Operator, provide a forecast of expected real power output to assist in operations planning (e.g., a seven-day forecast of real output).


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# NERC Standards (cont'd)

- TOP-001-1a – Reliability Responsibilities and Authorities
  - R7. Each Transmission Operator and Generator Operator shall not remove Bulk Electric System facilities from service if removing those facilities would burden neighboring systems unless:
    - R7.1. For a generator outage, the Generator Operator shall notify and coordinate with the Transmission Operator. The Transmission Operator shall notify the Reliability Coordinator and other affected Transmission Operators, and coordinate the impact of removing the Bulk Electric System facility.
    - R7.3. When time does not permit such notifications and coordination, or when immediate action is required to prevent a hazard to the public, lengthy customer service interruption, or damage to facilities, the Generator Operator shall notify the Transmission Operator, and the Transmission Operator shall notify its Reliability Coordinator and adjacent Transmission Operators, at the earliest possible time.


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# NERC Standards (cont'd)

- TOP-003-1 – Planned Outage Coordination
  - R1. Generator Operators and Transmission Operators shall provide planned outage information.
    - R1.1. Each Generator Operator shall provide outage information daily to its Transmission Operator for scheduled generator outages planned for the next day (any foreseen outage of a generator greater than 50 MW). The Transmission Operator shall establish the outage reporting requirements.
    - R1.2. Each Transmission Operator shall provide outage information daily to affected Balancing Authorities and Transmission Operators for scheduled generator and bulk transmission outages planned for the next day (any foreseen outage of a transmission line or transformer greater than 100 kV or generator greater than 50 MW) that may collectively cause or contribute to an SOL or IROL violation or a regional operating area limitation.
    - R1.3. Such information shall be available by 1200 Central Standard Time for the Eastern Interconnection and 1200 Pacific Standard Time for the Western Interconnection.
    - R2. Each Transmission Operator, Balancing Authority, and Generator Operator shall plan and coordinate scheduled outages of system voltage regulating equipment, such as automatic voltage regulators on generators, supplementary excitation control, synchronous condensers, shunt and series capacitors, reactors, etc., among affected Balancing Authorities and Transmission Operators as required.


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# NERC Standards (cont'd)

- TOP-006-2 – Monitoring System Conditions
  - R1.1. Each Generator Operator shall inform its Host Balancing Authority and the Transmission Operator of all generation resources available for use.

- IRO-010-1a — Reliability Coordinator Data Specification and Collection
  - R3. Each Balancing Authority, Generator Owner, Generator Operator, Interchange Authority, Load-serving Entity, Reliability Coordinator, Transmission Operator, and Transmission Owner shall provide data and information, as specified, to the Reliability Coordinator(s) with which it has a reliability relationship.


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# Appendix 2

References from:

PJM OATT, OA, RAA, Manuals



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# Capacity Resource References

| OATT | OA | RAA | PJM Manuals |
|---|---|---|---|
| 1.3D Capacity Resource: Refers to meaning provided in the Reliability Assurance Agreement (RAA) | 1.6 Capacity Resource: Refers to meaning provided in the RAA | 1.8 Capacity Resources: refers to units that meet the requirements of Schedules 9 and 10 | M35: Capacity Resource Includes MW of net capacity from generation capacity resources or load reduction capability provided by Demand Resources or ILR in PJM |
| 1.13A.02 Generation Capacity Resource: Refers to meaning provided in the RAA | 1.14A Generation Capacity Resource: Refers to meaning provided in the RAA | 1.33 Generation Capacity Resource: refers to units that meet the requirements of Schedules 9 and 10 | Generation Capacity Resource: a generation unit that meets the requirements of Schedules 9 and 10 of the RAA |
| | | SCHEDULE 9: Procedures for Establishing the Capability of Capacity Resources | |
| | | SCHEDULE10: Procedures for Establishing the Deliverability of Generation Capacity Resources | |


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# Energy Resource References

| OATT | OA | RAA | PJM Manuals |
|---|---|---|---|
| 1.11A Energy Resource: A generating facility that is not a Capacity Resource. | | | M35: Non-Capacity Resource: A Resource that is not included as part of PJM's capacity. |
| Schedule 15: Non-Retail Behind The Meter Generation<br>Maximum Generation<br>Emergency Obligations – ¶2 indicates that the Network Customer for which the output of Non-Retail Behind the Meter Generation (which by definition is not a Capacity Resource) is netted for the purposes of determining its DCPZ shall report scheduled outages to PJM prior to the occurrence of such outage in accordance with the time requirements and procedures set forth in the PJM Manuals. | | | M38, Section 2.1, Generator Outage Coordination |


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**JH1** Jacqui, 12/22/2015

# Energy Resource References

| OATT, ATT. K-APP. | OA, SCHED. 1 | RAA | PJM Manuals |
|---|---|---|---|
| 1.3.7 Generator Forced Outage – the definition of this term makes reference to outages of “a generating unit” and is not limited to outages of Generation Capacity Resources. | 1.3.7 Generator Forced Outage – the definition of this term makes reference to outages of “a generating unit” and is not limited to outages of Generation Capacity Resources. | 1.35 Generator Forced Outage – the definition of this term makes reference to outages of “a generating unit” and is not limited to outages of Generation Capacity Resources. | M10, Section 2, Outage Reporting |


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**JH2** Jacqui, 12/22/2015

# Energy Resource References

| OATT, ATT. K-APP. | OA, SCHED. 1 | RAA | PJM Manuals |
|---|---|---|---|
| 1.3.8 Generator Maintenance Outage – the definition of this term makes reference to outages of “a generating unit” and is not limited to outages of Generation Capacity Resources. | 1.3.8 Generator Maintenance Outage – the definition of this term makes reference to outages of “a generating unit” and is not limited to outages of Generation Capacity Resources. | 1.36 Generator Maintenance Outage – the definition of this term makes reference to outages of “a generating unit” and is not limited to outages of Generation Capacity Resources. | M14D, 7.3 Critical Information and Reporting Requirements |
| 1.3.9 Generator Planned Outage – the definition of this term makes reference to outages of “a generating unit” and is not limited to outages of Generation Capacity Resources. | 1.3.9 Generator Planned Outage – the definition of this term makes reference to outages of “a generating unit” and is not limited to outages of Generation Capacity Resources. | 1.37 Generator Planned Outage – the definition of this term makes reference to outages of “a generating unit” and is not limited to outages of Generation Capacity Resources. | M3, Section 4.2.13 Coordinating Outage Requests with Planned Generation Outages |


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**JH3** Jacqui, 12/22/2015

# Energy Resource References

| OATT, ATT. K-APP. | OA, SCHED. 1 | RAA | PJM Manuals |
|---|---|---|---|
| 1.9.2 Planned Outages – subsection (a) provides that: "A Generator Planned Outage shall be included in Generator Planned Outage schedules established prior to the scheduled start date for the outage, in accordance with standards and procedures specified in the PJM Manuals."<br><br>This requirement applies to all types of generation resources, as there is no specific reference limiting it to Generation Capacity Resources.<br><br>The provisions of subsection (b) do apply only to Generation Capacity Resources. | 1.9.2 Planned Outages – subsection (a) provides that: "A Generator Planned Outage shall be included in Generator Planned Outage schedules established prior to the scheduled start date for the outage, in accordance with standards and procedures specified in the PJM Manuals."<br><br>This requirement applies to all types of generation resources, as there is no specific reference limiting it to Generation Capacity Resources.<br><br>The provisions of subsection (b) do apply only to Generation Capacity Resources. | | |


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# Energy Resource References

| OATT, ATT. K-APP. | OA, SCHED. 1 | RAA | PJM Manuals |
|---|---|---|---|
| 1.9.3 Generator Maintenance Outages – subsection (a) provides that: “A Generator Maintenance Outage may only be scheduled if approved by the Office of the Interconnection prior to the requested start date for the outage, in accordance with subsection (b) hereof and the standards and procedures specified in the PJM Manuals.”<br><br>This requirement applies to all types of generation resources, as there is no specific reference limiting it to Generation Capacity Resources.<br><br>The provisions of subsection (b) do apply only to Generation Capacity Resources. | 1.9.3 Generator Maintenance Outages – subsection (a) provides that: “A Generator Maintenance Outage may only be scheduled if approved by the Office of the Interconnection prior to the requested start date for the outage, in accordance with subsection (b) hereof and the standards and procedures specified in the PJM Manuals.”<br><br>This requirement applies to all types of generation resources, as there is no specific reference limiting it to Generation Capacity Resources.<br><br>The provisions of subsection (b) do apply only to Generation Capacity Resources. | | |


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# Energy Resource References

| OATT, ATT. K-APP. | OA, SCHED. 1 | RAA | PJM Manuals |
|---|---|---|---|
| 1.9.4 Forced Outages – subsection (a) indicates this provision applies to both pool-scheduled resources, or Generation Capacity Resources whether or not they are pool-scheduled resources, i.e. both Energy resources and Generation Capacity Resources.<br><br>The section also generally refers to “a generation resource” undergoing a Generator Forced Outage. | 1.9.4 Forced Outages – subsection (a) indicates this provision applies to both pool-scheduled resources, or Generation Capacity Resources whether or not they are pool-scheduled resources, i.e. both Energy resources and Generation Capacity Resources.<br><br>The section also generally refers to “a generation resource” undergoing a Generator Forced Outage. | | |


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**JH6** Jacqui, 12/22/2015

# Energy Resource References

| OATT, ATT. K-APP. | OA, SCHED. 1 | RAA | PJM Manuals |
|---|---|---|---|
| 1.7.4 General Obligations of the Market Participants – subsection (d) requires Market Participants to provide PJM with, among other things, information about "maintenance and other anticipated outages of generation or transmission facilities."<br><br>There is no limitation to providing outage information only for Generation Capacity Resources. | 1.7.4 General Obligations of the Market Participants – subsection (d) requires Market Participants to provide PJM with, among other things, information about "maintenance and other anticipated outages of generation or transmission facilities."<br><br>There is no limitation to providing outage information only for Generation Capacity Resources. | | |


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