

# PJM Manual 40:

Training and Certification Requirements

Revision: 21

Effective Date: ~~January 24, 2019~~

Prepared by  
Systems Operations Division

PJM © 2019





**Table of Contents**

**Table of Exhibits..... 5**  
**Approval..... 6**

**Current Revision ..... 7**

**Introduction..... 8**  
 About PJM Manuals..... 8  
 About This Manual..... 8  
 Intended Audience ..... 8  
 References..... 9  
 Using This Manual..... 9  
 What You Will Find In This Manual ..... 9

**Section 1: Training Overview ..... 10**  
 1.1 Training Overview..... 10  
 1.1.1 Member Training Curriculum ..... 10  
 1.1.2 Training for Member Operating/Dispatch Personnel ..... 10  
 1.2 PJM Member Systematic Approach to Training (SAT) ..... 11  
 1.3 Training Staff ..... 11  
 1.3.1 Dispatcher Training Subcommittee Representatives ..... 12  
 1.3.2 Member Training Liaison..... 12  
 1.4 Analysis ..... 13  
 1.4.1 Job Analysis..... 13  
 1.4.2 Task Lists ..... 13  
 1.4.3 Reliability-Related Tasks..... 14  
 1.4.4 Task List Maintenance..... 14  
 1.4.5 Task Modification..... 15  
 1.5 Development of Training Programs ..... 15  
 1.5.1 Tasks and Objectives ..... 15  
 1.5.2 Initial Training Program (ITP) ..... 16  
 1.5.3 Continuing Training Program..... 16  
 1.5.4 Task Verification ..... 17  
 1.5.5 Certification ..... 18  
 1.6 Implementation of Program Activities..... 18  
 1.7 Evaluation of Program Activities ..... 18

**Section 2: Certification Overview ..... 20**  
 2.1 Purpose ..... 20  
 2.2 Administration of the Certification Program..... 21  
 2.2.1 Prerequisites ..... 21



- 2.2.2 Validity, Reliability and Defensibility .....21
- 2.2.3 Certification Oversight Group .....21
- 2.2.4 Dispute Resolution Procedure .....21
- 2.2.5 Disciplinary Actions .....21
  - 2.2.5.1 Grounds for Action.....21
  - 2.2.5.2 Review.....21
- 2.2.6 Financing the Certification Program.....22
- 2.2.7 Additional Resources.....22
- 2.3 Certification Requirements .....22
  - 2.3.1 Scope of the PJM TO Operator and Generation Dispatcher Certification Program .....22
  - 2.3.2 Requirements for Operators and Dispatchers.....22
  - 2.3.3 Term of Certification .....23
  - 2.3.4 Recertification.....23

**Section 3: Member Training and Certification Requirements ..... 24**

- 3.1 Overview.....24
- 3.2 Entity Training and Certification Requirements.....24
  - 3.2.1 Transmission Owner Operators.....24
  - 3.2.2 Market Operation Center Generation Dispatchers .....27
  - 3.2.3 Transmission Owner Operators/Generation Dispatchers .....29
  - 3.2.4 Small Generation [Plant Resource](#) Dispatchers.....30
  - 3.2.5 Demand Response Resources.....31
  - 3.2.6 Energy Storage [Device Resource](#) Operators.....32
- 3.3 Compliance Monitoring Process for Training and Certification Requirements.....33
- 3.4 Temporary Waiver of PJM Training and Certification Requirements .....36
- 3.5 NERC Training Requirements.....36

**Section 4: PJM Operator Training..... 37**

- 4.1 Overview.....37
- 4.2 Systematic Approach to Training .....37
  - 4.2.1 Analysis Phase.....38
  - 4.2.2 Design Phase.....39
  - 4.2.3 Development Phase .....39
  - 4.2.4 Implementation Phase.....39
  - 4.2.5 Evaluation Phase .....39
  - 4.2.6 PJM System Operator Testing Requirements .....40
- 4.3 PJM Trainer Qualifications .....41
  - 4.3.1 PJM System Operator Trainers .....41
  - 4.3.2 PJM OJT Trainers.....41
- 4.4 Master Coordinator Initial Training and Qualification Requirements.....42
- 4.5 Generation Dispatcher Initial Training and Qualification Requirements .....45
- 4.6 Power Director/Master Dispatcher<sup>1</sup> Initial Training and Qualification Requirements... 48
- 4.7 Reliability Engineer Initial Training and Qualification Requirements.....52
- 4.8 Shift Supervisor Initial Training and Qualification Program .....55



- 4.9 PJM System Operator Continuing Training Program .....58
- 4.10 Process for Ensuring Proficiency Following Extended Absence.....62
  - 4.10.1 Purpose .....62
  - 4.10.2 Illness, Military Service or Other Extended Leave Situations.....62
  - 4.10.3 Process for System Operators who have not worked shift for a consecutive period of 3-6 months .....62
  - 4.10.4 Process for System Operators who have not worked shift for a consecutive period of 6 months or longer .....62
  - 4.10.5 Project Work or Other Temporary Special Assignments .....63
- 4.11 Training for Operations Support Personnel .....63
- 4.12 PJM Human Performance Program .....64
  - 4.12.1 Purpose .....64
  - 4.12.2 Human Performance Tools.....64
  - 4.12.3 Good Catch Program .....66
  - 4.12.4 Human Performance Oversight Group Charter .....66
- Revision History .....69**



**Table of Exhibits**

Exhibit 1: Overview of PJM Member Systematic Approach to Training (SAT) ..... 19  
Exhibit 2: Compliance Monitoring Process ..... 35  
Exhibit 3: Target audience for Support Personnel training ..... 64  
Exhibit 4: PJM Crew Resource Management – Threat Error Management Skills ..... 66



**Approval**

Approval Date: ~~01/24/2019~~  
Effective Date: ~~01/24/2019~~

Richard Brown, Manager (Section 4)  
System Operator Training

Michael J. Sitarchyk, Manager (Section 1-3)  
State and Member Training



## Current Revision

### Revision 21 (??)

- Updated Small Generation Plant Dispatchers to Small Generation Resource Dispatchers
- Added lower MW threshold for training requirements to accommodate ESR as well as Small Gen Resources
- Updated Energy Storage Device to Energy Storage Resource
- Updated language for training requirements for ESR operators

### Revision 20 (01/24/2019):

- Cover to Cover Periodic Review
- Updated co-ownership to Richard Brown
- Section 3: Removed references to legacy training requirements

**Formatted:** Font: Arial Narrow

**Formatted:** List Paragraph, Bulleted + Level: 1 + Aligned at: 0.37" + Indent at: 0.62"

**Formatted:** List Paragraph, Space Before: 0 pt, Bulleted + Level: 1 + Aligned at: 0.37" + Indent at: 0.62", Tab stops: 0.62", Left + 0.62", Left



## Section 3: Member Training and Certification Requirements

Welcome to the Training and Certification Requirements section of the **PJM Manual for Training and Certification Requirements**. In this section you will find the following information:

- Overview
- Requirements outlined by entity:
  - o Training and certification requirements for TO Operators
  - o Training and certification requirements for MOC Generation Dispatchers
- Training and certification requirements for Transmission Owner Operators and Generation Dispatchers
  - o Training requirements for Small Generation Plant Dispatchers
  - o Training requirements for Demand Response Resources
  - o Training requirements for Energy Storage ~~Device Resource~~ operators
- Compliance monitoring process for training and certification requirements
- Process for requesting a temporary waiver of PJM training and certification requirements
- NERC training requirements

### 3.2.4 Small Generation ~~Plant Resource~~ Dispatchers

Small Generation ~~Plant Resource~~ Dispatchers are defined as dispatchers located at a generation ~~plant resource~~ who participate in ~~the~~ real time operations and meet the requirements of this classification. To be eligible for the Small Generation ~~Plant Resource~~ Dispatcher classification the company must meet the following criteria:

- Operates/dispatches a total of 75 MW or less of generation (nameplate capacity) within PJM.
- Does not operate a black-start unit

Requests for this classification should be sent to [TrainingSupport@pjm.com](mailto:TrainingSupport@pjm.com).

PJM will review all requests for this classification and notify the entity of its classification status and applicable requirements based on the entity's participation level in PJM and relative impact on the BES. If the request for Small Generation ~~Plant Resource~~ Dispatcher classification is denied, the entity is subject to the training and certification requirements outlined in Section 3.2.2 of this manual. If an entity is approved as a Small Generation ~~Plant Resource~~ Dispatcher, the following requirements apply.

#### 3.2.4.1 For entities operating between 20 MW and 75 MW on an aggregate basis:

##### **Initial Training:**

Small Generation ~~Plant Resource~~ Dispatcher must successfully complete the PJM sponsored Initial Training Program (ITP) and all open and required Just-in-Time training modules within six (6) months of being deemed qualified by their company to begin operating on the PJM system. Specific content covered in these courses may be adjusted based on the PJM generation dispatch tasks the entity is responsible for and the training needs of the individual company.

Formatted: Font: Bold

Formatted: Indent: Left: 0.5"





**Operator Readiness Exam:**

Small Generation Plant-Resource Dispatchers must successfully complete an operator readiness exam within six (6) months of being deemed qualified by their company to begin operating on the PJM system. This exam is based on the initial training program and assesses the dispatcher to ensure he/she has a baseline level of knowledge, awareness and familiarity of the content covered in this training.

Anytime during this six (6) month period, if a dispatcher is interacting with the PJM control room without having completed the requirements outlined above, he/she must work under the direct supervision of another dispatcher who has met the requirements, either in person or via an on-call arrangement.

For new entities, at least one dispatcher must pass the operator readiness exam prior to that entity beginning operations in PJM.

**Continuing Training:**

All Small Generation Plant-Resource Dispatchers with at least one full calendar year of shift responsibilities in real time PJM operations shall complete at least 8 hours per calendar year of refresher, operations and markets updates, or emergency preparedness training.

The following or its equivalent is satisfactory for meeting this requirement:

- Attendance at the annual PJM Operator Seminar (Note: The annual PJM Operator Seminar is a large component of the PJM Continuing Training Program. Since much of the content involves important updates and preparation for the summer peak season, it is highly recommended that Small Generation Plant-Resource Dispatchers attend this event.)
- Completion of PJM sponsored refresh, operations and markets updates, or emergency preparedness activities, including drills, table-top exercises, simulations and instruction
- Completion of company or vendor sponsored refresh, operations and markets updates, or emergency preparedness activities, including drills, table-top exercises, simulations and other training linked to the company specific tasks. (Note: This training should be documented in the PJM LMS utilizing the appropriate Training Activity Forms found on the Member Training Liaison webpage. This will allow the LMS to generate useful task to training reports that can be used by PJM and the member for the evaluation phase of the SAT).

Formatted: Indent: Left: 0.87"

**3.2.4.2 For entities operating less than 20 MW on an aggregate basis:**

**Initial Training:**

Small Generation Resource Dispatcher must successfully complete an initial training module on the requirements and business rules related to PJM markets and operations. Specific content covered in these courses may be adjusted based on the PJM generation dispatch tasks the entity is responsible for and the training needs of the individual company. This training module is available online, through the PJM Learning Management System (LMS), and must be completed, along with all open and required Just-in-Time training modules, within six (6) months of being deemed qualified by their company to begin operating on the PJM system.

Formatted: Indent: Left: 0.5"

Anytime during this six (6) month period, if a dispatcher is interacting with the PJM control room without having completed the requirements outlined above, he/she must work under



the direct supervision of another dispatcher who has met the requirements, either in person or via an on-call arrangement.

For new entities, at least one dispatcher must meet the above requirements prior to that entity beginning operations in PJM.

**Continuing Training:**

Small Generation Resource Dispatcher must annually complete a refresher training module on the requirements and business rules related to PJM markets and operations. This training is available online, via the PJM LMS.

**Company or Vendor Sponsored Equivalent Training:**

PJM recognizes that many Member Companies have rigorous training programs that provide similar training identified in the PJM sponsored training courses. Additionally, there may be third party suppliers of relevant, quality training. These training courses will be considered for equivalency if they meet the criteria of the NERC Continuing Education Program (CEP) and contain topics consistent with the PJM and company-specific Task List.

PJM reserves the right to review training documentation and the systematic approach to training used in the development of any learning activity prior to granting equivalency.

PJM initial training requirements cannot be met by equivalent training. Additionally, the annual continuing training program may include requirements to complete certain PJM online “Just in Time” (JIT) Training modules on important changes to operations. These requirements must be satisfied by completion of PJM sponsored training and associated assessments.

**3.2.6 Energy Storage ~~Device-Resource~~ Operators**

For the purpose of the training and certification requirements, Energy Storage ~~Resources~~~~Devices~~ are ~~equipment those facilities that may participate in various is not a PJM capacity resource but may participate in PJM's Regulation or Synchronized Reserve~~ markets. These ~~resources devices~~ may include, but are not limited to: batteries, plug-in hybrid electric vehicles (PHEV), flywheels and compressed air. Energy Storage ~~Device-Resource~~ Operators are those individuals who will interact with PJM Dispatch ~~on Regulation and Synchronized Reserve for any dispatch assignments or emergency procedures.~~

**Initial ~~and Continuing~~ Training:**

~~Energy Storage Device Resource Operators must complete an initial training module on the requirements and business rules of the Regulation and Synchronized Reserve various PJM markets and the PJM All-Call responses. This training module is available online, through the PJM Learning Management System (LMS) and must be completed, along with all open and required Just-in-Time training modules, within 3 months of the individual beginning participation in the PJM markets.~~

~~Anytime during this 3 month period that an Energy Storage Device Resource operator is interacting with the PJM control room without having completed the requirement outlined above, he/she must work under the direct supervision of another operator who has met the requirement, either in person or via an on-call arrangement.~~

~~For new entities, at least one individual must complete the initial training prior to that entity beginning participation in the PJM markets. For entities operating resources that aggregate to:~~



- Greater than 75 MW
  - Energy Storage Resource Operators are subject to the training requirements of the MOC Generation Dispatcher. Please refer to section 3.2.2 of this manual for details.
- 75 MW or less
  - Energy Storage Resource Operators are subject to the training requirements of the Small Generation Resource Dispatcher. Please refer to section 3.2.4 of this manual for details.

**Formatted:** Bulleted + Level: 1 + Aligned at: 0.42" + Indent at: 0.67"

**Formatted:** Bulleted + Level: 2 + Aligned at: 0.92" + Indent at: 1.17"

**Formatted:** Bulleted + Level: 1 + Aligned at: 0.42" + Indent at: 0.67"

**Formatted:** Bulleted + Level: 2 + Aligned at: 0.92" + Indent at: 1.17"

**Certification:**

~~At this time, PJM certification is not required for Energy Storage Device Resource Operators who are only participating in the Ancillary Service markets.~~

~~For entities operating resources that aggregate to:~~

- Greater than 75 MW
  - Energy Storage Resource Operators are subject to the certification requirements of the MOC Generation Dispatcher. Please refer to section 3.2.2 of this manual for details.
- 75 MW or less
  - At this time, PJM certification is not required.

**Continuing Training:**

~~Energy Storage Device Resource Operators must annually complete a brief refresher training module on the requirements and business rules of PJM Markets the Regulation and Synchronized Reserve markets and the PJM All Call responses. This training is available online, through the PJM LMS.~~

**Formatted:** Font: Not Bold

**Formatted:** Heading 2, Indent: Left: 0", Right: 0"