



*Working to Perfect the Flow of Energy*

# PJM Transmission Owner Reliability Audit Program

Revision: 03

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Prepared by:

Compliance Division

NERC & Regional Coordination  
Department

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# PJM Transmission Owner Reliability Audit Program

## Table of Contents

Table of Contents .....	2
Approval .....	3
Revision History .....	3
Section 1: Purpose.....	5
Section 2: Background.....	6
Section 3: Audit Criteria .....	6
Section 4: Audit Procedure .....	9
Section 5: Conduct of the Audit.....	11
Section 6: Typical Audit Schedule .....	12

Attachment A: PJM Operations Questionnaire

Attachment B: Neighboring Transmission Owner Questionnaire

<b>Approval</b>
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Patrick Brown  
Manager, NERC & Regional Coordination

<b>Revision History</b>
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Reviewer	Patrick Brown	
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Writer	Mark Kuras	
Reviewer	Patrick Brown	
Approver	Patrick Brown	
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Writer	Leanne Harrison	
Reviewer	Joe Willson	
Approver	Alicia Daugherty	
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## Section 1: Purpose

The purpose of the PJM Transmission Owner Reliability Audit Program is to verify that the Transmission Owners within the PJM region satisfy those reliability responsibilities that are shared with or assigned by PJM, as outlined in the latest approved version of the PJM TO/TOP Matrix.<sup>1</sup>

These responsibilities include implementation of Directives from PJM as the Transmission Operator, Balancing Authority, and Reliability Coordinator and include adherence to processes defined in the PJM Manuals<sup>2</sup> as required by the Transmission Owner and Operating Agreements.<sup>3</sup>

This document describes and defines the process that will be used to conduct PJM Transmission Owner Reliability Audits. The procedure is designed around the validation of assigned or shared tasks captured in the PJM TO/TOP Matrix that evaluate an entity's ability to comply with the applicable reliability standards and PJM-specific requirements.

The primary steps in the PJM Reliability Audit Procedure are as follows:

1. Formation of Audit Team
2. Data collection
3. Data review
4. Site visit
5. Report

The Procedure establishes a maximum allowable time of three months to complete the audit process for each individual audit.

<sup>1</sup> <http://www.pjm.com/markets-and-operations/compliance.aspx>

<sup>2</sup> <http://www.pjm.com/documents/manuals.aspx>

<sup>3</sup> <http://www.pjm.com/documents/agreements/pjm-agreements.aspx>

## Section 2: Background

The reliability of the interconnected system is assured when entities which make up the interconnection operate in accordance with good utility operating practices and satisfy the requirements of NERC and Regional Entity Reliability Standards.

Originally, beginning in 2006, these PJM-led audits were called Local Control Center (LCC) audits and were focused on readiness. As such, the LCC audits were conducted in conjunction with the NERC Readiness Evaluations. However, through discussions with NERC, *ReliabilityFirst*, and PJM Members, and in consideration of the potential penalties for non-compliances (effective June 18, 2007), the procedure has been revised to be a stand-alone process focused on compliance in lieu of readiness.

## Section 3: Audit Criteria

NERC and Regional standards address aspects of the operation and planning of the bulk power system such as: real-time transmission operations, balancing load and generation, emergency operations, system restoration and blackstart, voltage control, cyber security, facility ratings, disturbance reporting, connecting facilities to the grid, certifying system operators, and personnel training.

In addition, PJM Manuals contain requirements for Transmission Owners to adhere to in order to assure compliance by both the Transmission Owner and PJM in the role as the Transmission Operator, Reliability Coordinator and Balancing Authority.

The following criteria have been included in the PJM TO/TOP Matrix for use by the PJM Audit Team to assure important objectives are assessed;

- **Security:** The Transmission Owner shall have and implement adequate physical security plans.
- **Training:** The Transmission Owners shall train all their LCC system operators using adequate training programs.
- **Staff Certification:** The Transmission Owner shall be operated by appropriately certified LCC system operators 24 hours per day, seven days per week.
- **Responsibility and Authority:** The Transmission Owner LCC system operators must have the unilateral authority and responsibility to follow PJM Directives and instructions. Ultimate responsibility as the Transmission Operator, Reliability Coordinator and Balancing Authority lies with PJM.

- **Transmission Operations** – While the decisions are made by PJM, the Transmission Owner must be ready to execute PJM Directives or instructions unless there are concerns with safety or equipment damage.
- **Emergency Operations** – The Transmission Owner shall have plans for operations during emergencies.
- **Operations Planning:** The Transmission Owner shall perform sufficient operation planning studies to ensure the reliability of its local system for several different timeframes.
- **Real-time Monitoring (Meters):** The Transmission Owner shall have meters on all tie lines with adjacent Transmission Owners to record actual interchange (MW) in real time. Interchange meters shall be at a location common to both Transmission Owners, and provide identical values with opposite signs to both Transmission Owners.
- **Plans for Loss of the Primary Control Center:** The Transmission Owner shall have a plan to continue operation in the event its control center becomes inoperable.
- **System Restoration:** The Transmission Owner shall have a restoration plan to reestablish its electric system in the event of full or partial blackout.
- **Outage Coordination:** The Transmission Owner shall coordinate outages of all equipment on the Bulk Electric System, including protective relaying, with PJM through eDart and with any neighboring entities.
- **Capacity and Energy Emergency Plan:** The Transmission Owner shall have Capacity and Energy Emergency plans that are coordinated with PJM.
- **Nuclear Power Interaction:** The Transmission Owner shall have emergency and restoration plans that ensure the safe shut down and restart of nuclear generation as applicable to licensing requirements. In addition, the Transmission Owner shall have operating procedures for voltage control and off-site power source requirements at Nuclear Power Plant buses as required by licensing.
- **Communications Facilities:** The Transmission Owner shall have adequate and reliable communication facilities to assure the exchange of information necessary to monitor and maintain the reliability of the Bulk Electric System.
- **Operator Voice Communications** - The Transmission Owner shall have adequate and reliable communication facilities to assure the exchange of information necessary to monitor and maintain the reliability of the Bulk Electric System

- **Ratings Coordination** – Ratings must be communicated to PJM through TERM.
- **Modeling** – Modeling information for planning studies and operations must be communicated to PJM.
- **Voltage Control** – Transmission Owners must provide voltage schedules to generators within their area and monitor voltages and reactive flows.
- **Protection Coordination** – New and changed protection systems must be coordinated with neighboring entities internal and external to PJM.
- **Sabotage Reporting** – Report possible sabotage to PJM to enable PJM to report to DOE and NERC.

## Section 4: Audit Procedure

### Scheduling and Audit Team Makeup

1. Approximately once every three years PJM will perform an audit of each Transmission Owner within PJM.
2. The PJM NERC and Regional Coordination Department will be the contact group for all questions regarding PJM Transmission Owner Reliability Audits as well as maintenance of such program documents and staffing of the PJM audit teams.
3. The PJM Reliability Audit Team will be led by a representative of the NERC and Regional Coordination Department and team members will typically consist of the following:
  1. Representative from the PJM Operations Department
  2. Representative from the PJM Transmission Planning Division
  3. Representative from the PJM System Operator Training Department

In addition, the Audit Team may include a representative from another Transmission Owner, if authorized by the Transmission Owner being audited.

4. All PJM Reliability Audit Team members will be agreed to by the Transmission Owner being reviewed.
5. The Audit Team members will execute Confidentiality Agreements for any data that is made available to them through the audit review process. Confidentiality Agreements are coordinated through the PJM Legal Department.

### Pre-Audit

1. An initial audit notification letter will be sent to the Member TO being audited at least sixty days prior to the audit and will include a request for all evidence of compliance that can be made available to the Audit Team for review prior to the on-site audit. The entity will have thirty days to provide the requested information.
2. A questionnaire (Attachment A) will be completed by PJM Operations management.
3. A questionnaire (Attachment B) will be sent to the neighboring Transmission Owners with whom the audited entity routinely interacts sixty days prior to the PJM audit. These questionnaires are to be completed and returned within thirty days of receipt.

4. The Audit Team Lead will provide the team members with the following information upon receipt of the signed Confidentiality Agreements, and as soon as practical prior to the audit:
  - Electronic versions of any supporting documents sent by the entity to be audited
  - The completed neighboring Transmission Owners questionnaires
  - The completed PJM Operations questionnaire
  - The sample on-site audit agenda and an agenda for any pre-audit meetings
5. The Audit Team Lead will contact the Transmission Owner to be audited and the Audit Team as a reminder of the planned effort seven calendar days prior to the on-site audit.
6. Travel arrangements and confirmation of accommodation will be coordinated through the Audit Team Lead but ultimately is the responsibility of each Audit Team member.

### **On-Site Visit**

1. The Audit Team will meet the day before the on-site audit begins to review questionnaire responses, identify areas requiring further investigation, discuss concerns, coordinate the interview process, and assign responsibilities during the on-site visit. This meeting will take place at the audited Transmission Owner's facility or at a location agreed upon by the Audit Team.
2. During the on-site visit to the Transmission Owner, the Audit Team members will;
  - Review the data collected through the questionnaires with the Transmission Owner
  - Interview the Transmission Owner's operations and management personnel
  - Inspect the Transmission Owner's control center facilities and equipment
  - Review all necessary documents and data
  - Go through all shared and assigned tasks listed in the PJM TO/TOP Matrix
  - Review all audit questions included in the PJM TO/TOP Matrix
3. Upon completion of the on-site audit, the Audit Team will present the preliminary findings during the exit briefing.
4. An audit report will be prepared by the Team Leader and provided to the Audit Team for comments prior to being provided to the audited Transmission Owner. The audit report will not be publicly disclosed.
5. The Transmission Owner will be requested to provide comments on the draft report within four weeks upon receipt.
6. The PJM NERC and Regional Coordination Department will be responsible for following up on all instances of potential non-adherence with the PJM Manuals or with any

requirements of assigned tasks with the Transmission Owner, and for tracking the implementation of all mitigating actions.

7. Member TO should provide breakfast (suggestion coffee, bagels and Danish) and lunch.

## Section 5: Conduct of the Audit

### Audit Team Actions

The Audit Team will review the items mentioned in the Audit Criteria (see Section 3)

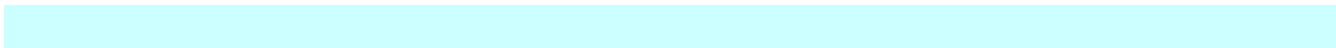
### Typical Demonstrations by Transmission Owner

- Data **Transmission Owner** transmits to PJM
  - Data **Transmission Owner** receives from PJM
  - **Transmission Owner** monitoring capability (EMS, map boards, security analysis applications, etc.)
  - Back-up Plans and/or Facility
  - Computer system security
  - Fire security
  - Communication systems
  - Training systems and processes
-



**Section 6: Typical Audit Schedule**

	Day 0	Day 1	Day 2	Day 3
8:00 – 8:30		Audit Team meets privately	Member TO presentation	Audit Team meets privately
8:30 – 9:00				
9:00 – 9:30		Audit Team Opening Presentation/ Member TO presentation		Member TO presentation
9:30 – 10:00				
10:00 – 10:30				
10:30 – 11:00				
11:00 – 11:30			Member TO presentation	
11:30 - 12:00				
12:00 – 12:30		Lunch	Lunch	Lunch
12:30 – 1:00				
1:00 – 1:30	Audit Team holds pre-audit session to review material and may hold brief Entrance Meeting with Member TO staff	Member TO presentation	Member TO presentation	PJM Audit Team meets privately
1:30 – 2:00				
2:00 – 2:30			Member TO presentation	PJM Audit Team meets privately
2:30 – 3:00				
3:00 – 3:30		Member TO presentation	Member TO presentation	Audit Team closing presentation
3:30 – 4:00				
4:00 – 4:30		Audit Team meets privately	Audit Team meets privately	
4:30 – 5:00				





**Attachment A**



**Attachment B**