

Generation Initial Training Program

Introduction to PJM

PJM State & Member Training Dept.

Safety and Housekeeping

Exit



Fire Alert



Mass Notification



Telephones



Medical CPR



Fire Extinguisher



Restrooms



Concierge



- Quiet Areas
- Printing
- Charging Station

Course Schedule

Daily Schedules

- 0800 Start Time
 - Open Discussion Format
 - Please use microphones provided on table so everyone can hear your questions and comments
- Lunch and Breaks
 - Schedule
 - Locations
- End of Class Day
 - Turn in badges daily



Logistics

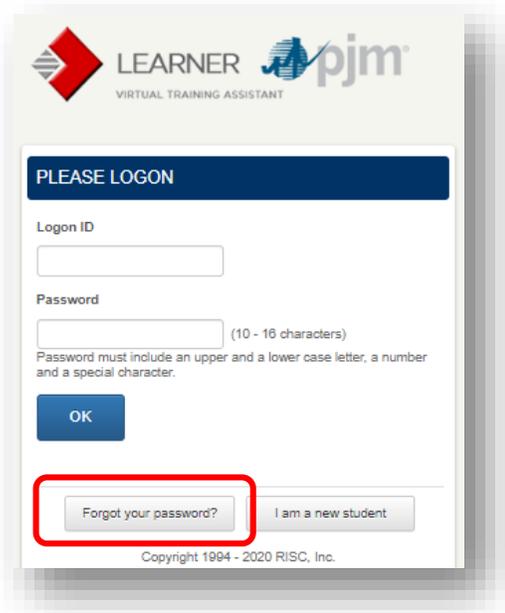
- Housekeeping
 - Evacuation procedure
 - Restrooms
 - Break/smoking locations
- Productivity
 - Phones on vibrate
 - Wireless printer available
 - Email document to pjmctc1@hpeprint.com
 - Quiet area (near wireless printer)



NERC CEH

- To earn NERC CEHs, you MUST:
 - Scan your badge/sign in at the start of each session
 - Attend all presentations and complete all activities
- Rules for quizzes
 - 75% or higher is required
 - Re-testing is available
- Rules for Simulations:
 - You must participate in the full Simulation activity
 - You must complete and sign the accompanying Activity Sheet
 - Simulation facilitator must sign off on your Activity Sheet

Please log into the Learning Management System



LEARNER pjm
VIRTUAL TRAINING ASSISTANT

PLEASE LOGON

Logon ID

Password
 (10 - 16 characters)
Password must include an upper and a lower case letter, a number and a special character.

OK

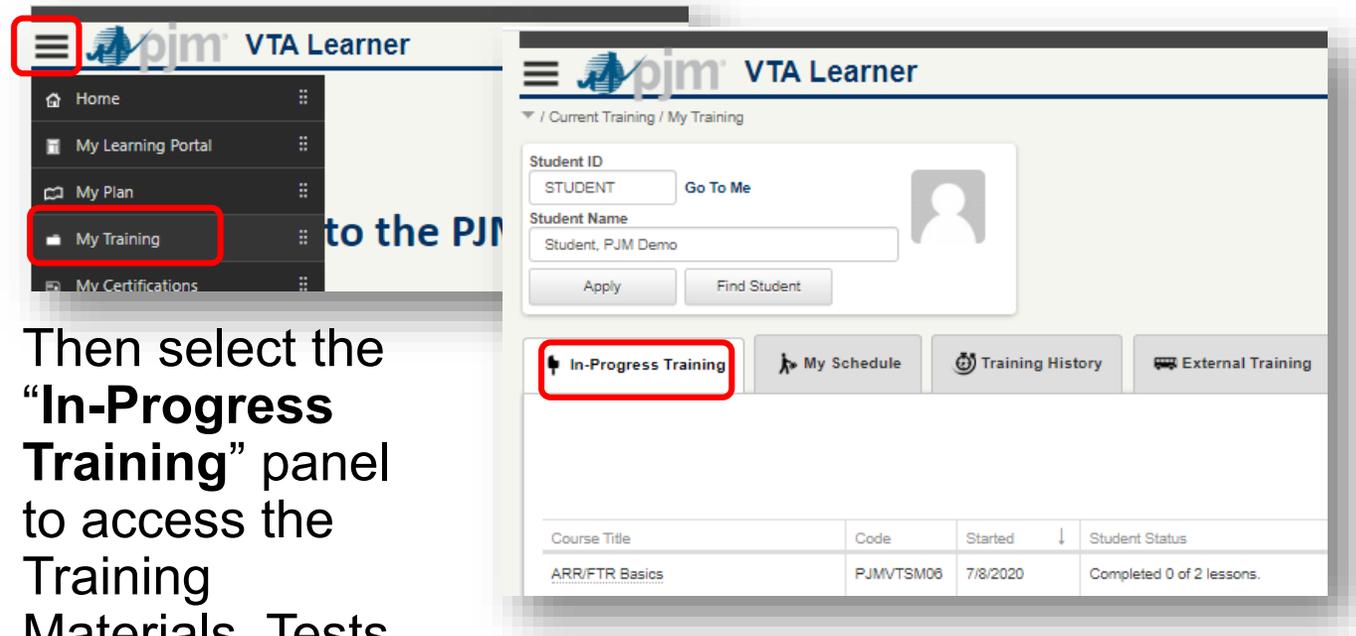
Forgot your password? I am a new student

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Your Logon ID is your **e-mail address**

If you need a password reset, please select **Forgot your password?**

From the main page, go to ☰ and select **“My Training”**



VTA Learner

- Home
- My Learning Portal
- My Plan
- My Training**
- My Certifications

to the PJM

Current Training / My Training

Student ID
STUDENT Go To Me

Student Name
Student, PJM Demo

Apply Find Student

In-Progress Training My Schedule Training History External Training

Course Title	Code	Started	Student Status
ARR/FTR Basics	PJMVTSM06	7/8/2020	Completed 0 of 2 lessons.

Then select the **“In-Progress Training”** panel to access the Training Materials, Tests and Evaluations

Learning Contract

- **Accuracy of Information**

- PJM has made all efforts possible to ensure accuracy of information. Information in course materials does not supersede any PJM governing document.

- **Terms of Use**

- All training material is copyright protected and intended for use by personnel involved in the operation of the BES. Materials may contain sensitive information related to operations and therefore may not be distributed without explicit consent from PJM.

- **Proprietary Interest**

- As a neutral, independent party, PJM is prohibited from having a financial interest in any products or materials used in this training.

- **Learning Activities**

- To qualify for continuing education hours for your participation in this learning activity, you must:
 - Attend all relevant training segments in their entirety
 - Participate fully in all learning activities
 - Uphold the integrity of any/all learning assessments in accordance with the guidelines of your company's Code of Conduct
- Upon successfully completing this learning activity, the relevant training hours will be credited to your account in the PJM Learning Management System (LMS).

By continuing, you indicate your agreement with this Learning Contract

- The goal of this course is to provide you with the knowledge you need to successfully execute any of the shared tasks on the Generation Dispatcher Task List
- This task list serves as the basis for the PJM Certification Exam
- The task list is continuously evaluated by the PJM Dispatcher Training Subcommittee (DTS)

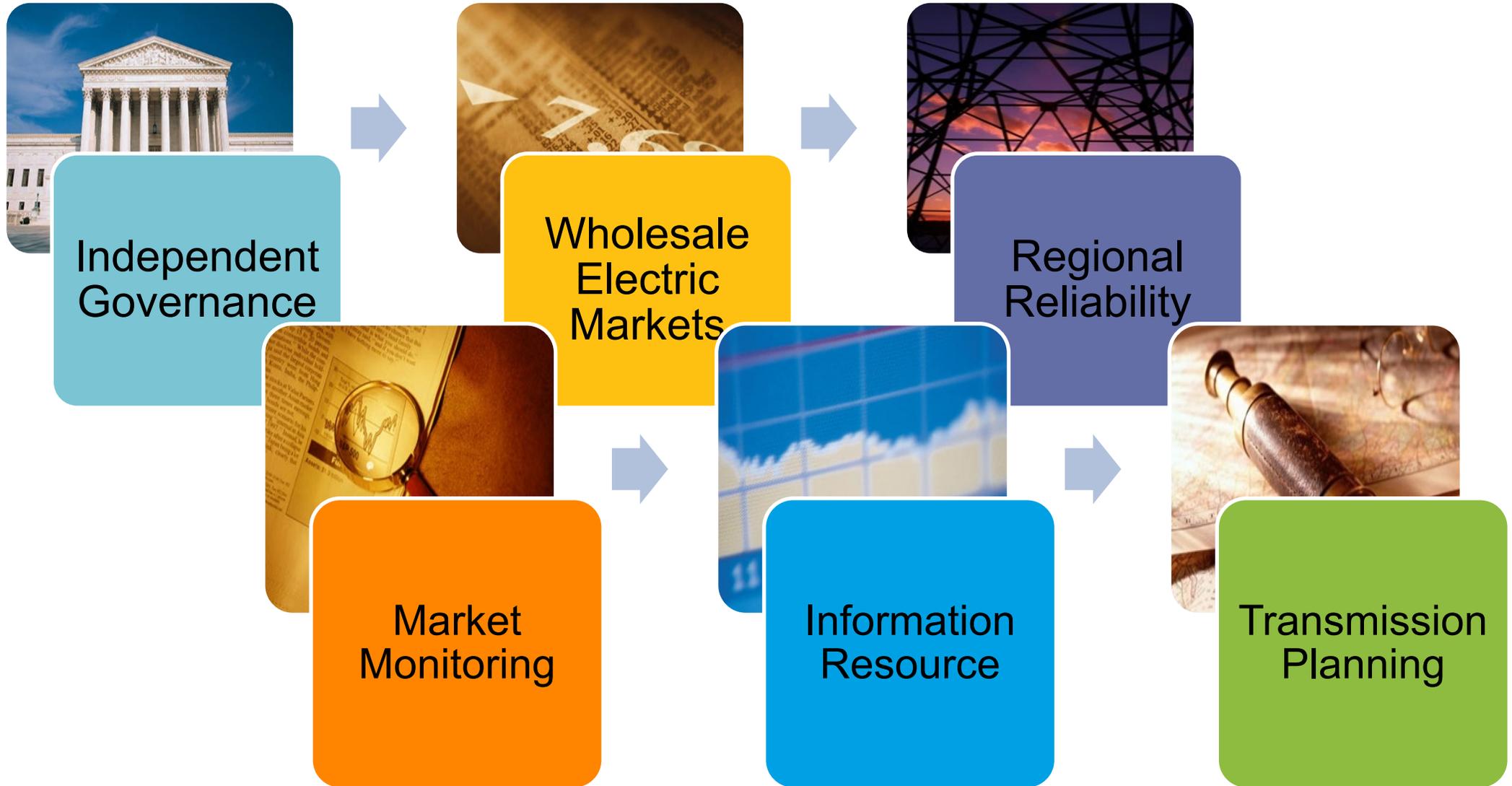
Objectives



Students will be able to:

- Identify the role and responsibilities of the PJM RTO
- Identify the PJM Member Training and Certification requirements

Elements of A Regional Transmission Organization



PJM as an RTO

Functions

- Administer tariff
- Administer regional wholesale electric markets
- Provide independent market
- Provide for comprehensive regional transmission expansion planning
- Manage congestions
- Supply ancillary services
- Operator OASIS
- Plan and coordinate transmission additions and upgrades



Nine Major North American RTOs/ISOs



How is PJM Different From Other Utility Companies?

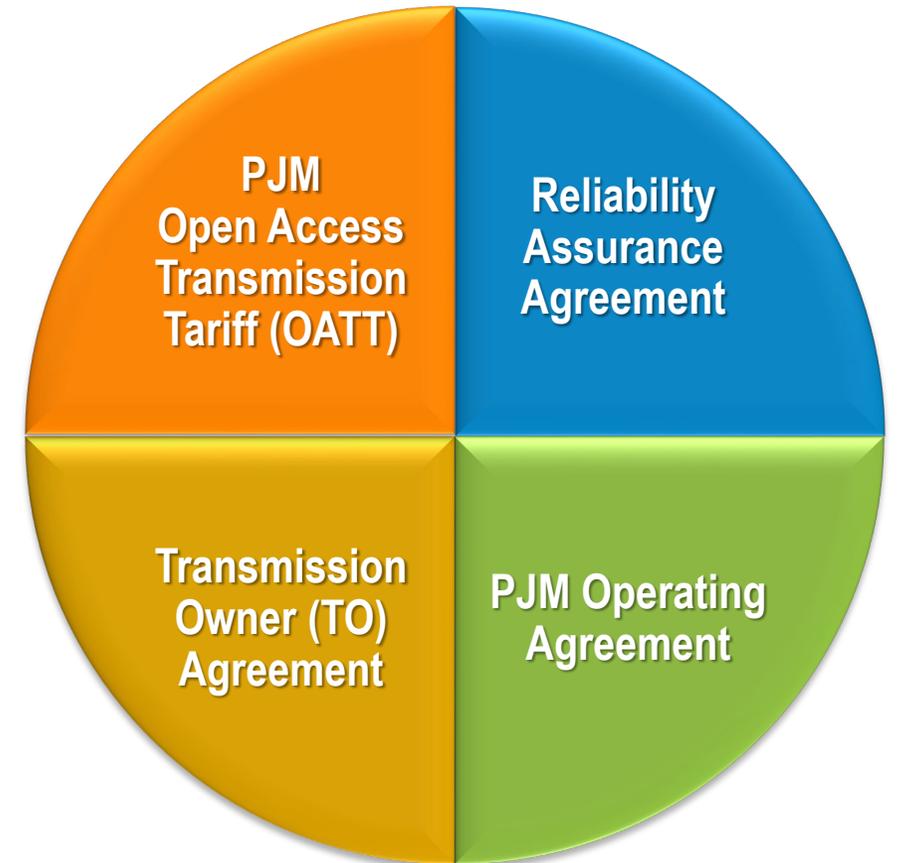
PJM Does:

- Direct operation of the transmission system
- Remain profit-neutral
- **Maintain independence from PJM members**
- Coordinate maintenance of grid facilities

PJM Does *NOT*:

- Own any transmission or generation assets
- Function as a publicly-traded company
- Take ownership of the system's energy
- Perform maintenance on generators or transmission systems (e.g. repair power lines)
- Serve or direct any end-use customers (retail)

PJM Authority Provided by Contract

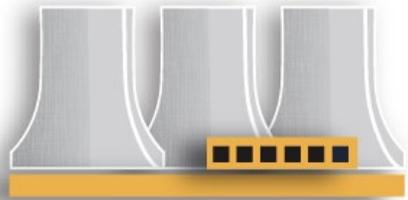


Independence and Governance Process

Independent Board of Managers

Market Monitor

Members Committee



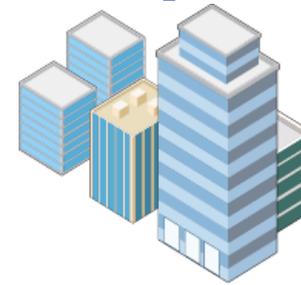
Generation Owners



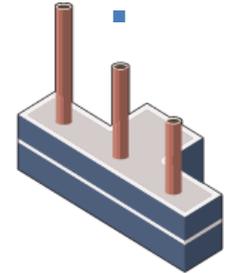
Transmission Owners



Competitive Retail Companies & Trading Companies



Utility Electric Distributor & Retail Business

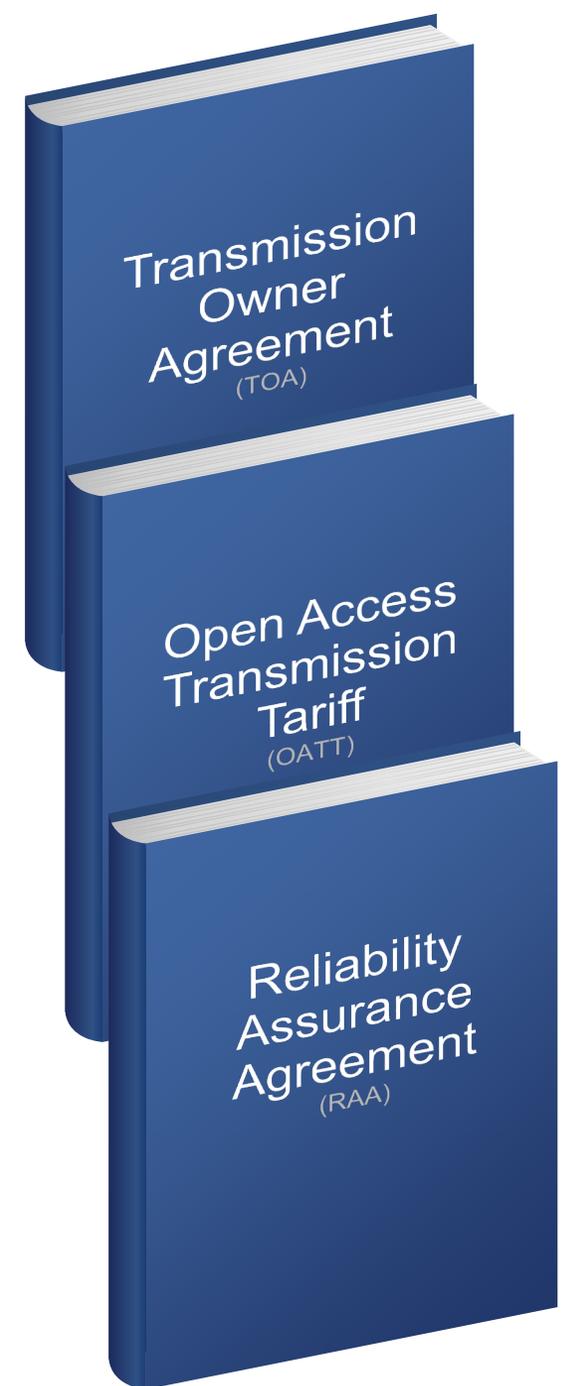


Wholesale End Use Customers (Industrial)

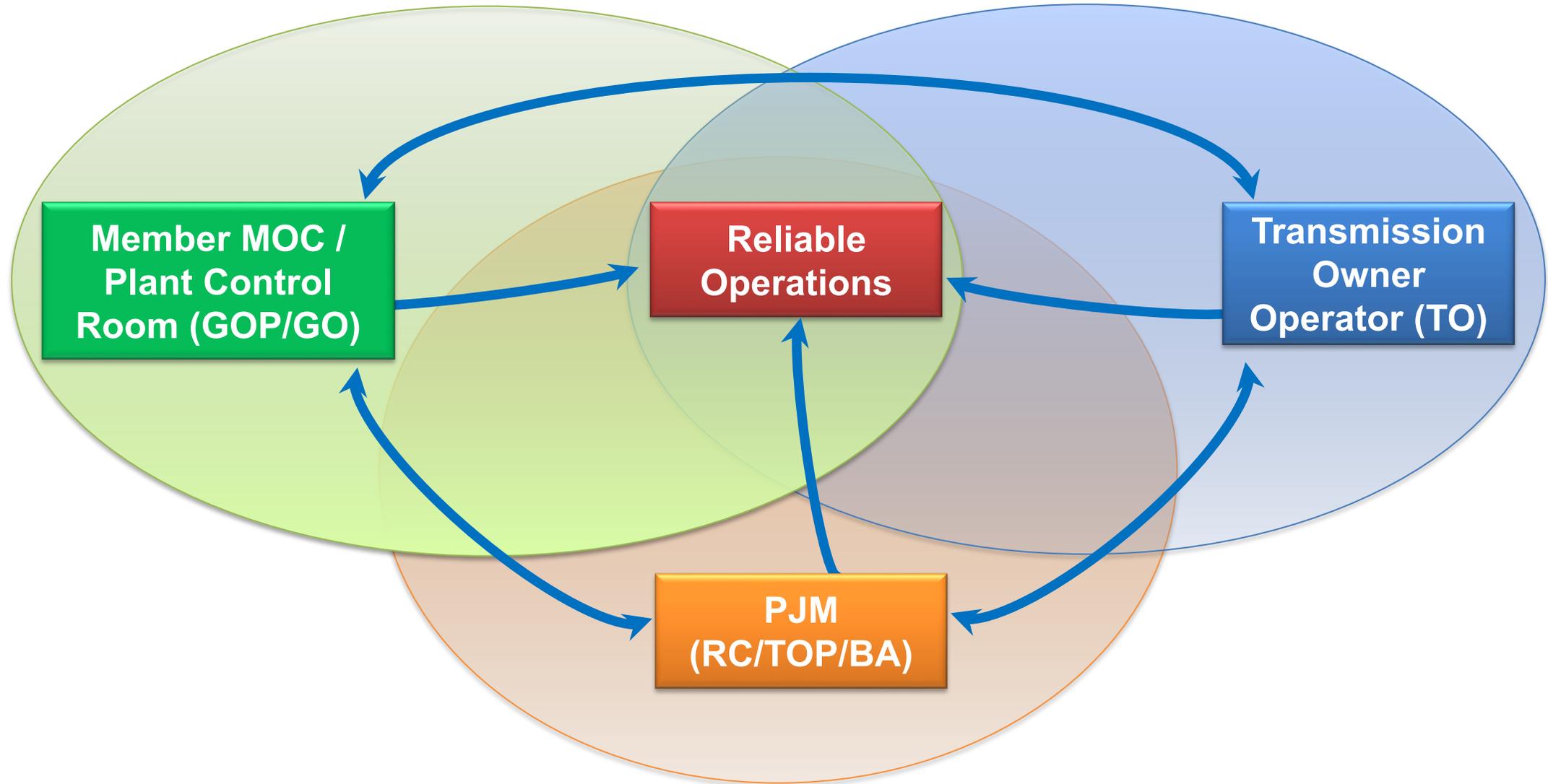
- Independent Board of Managers
- Stakeholder process – provide balanced stakeholder input
- Established process for discussion of market evolution

Working Together....

- Agreements are developed with stakeholders to ensure reliability of the electric power grid
- Stakeholders include:
 - Members
 - ISOs/RTOs
 - FERC
 - NERC
- ***PJM Operating Agreement***
 - Governs operation of PJM
 - Defines roles & responsibilities
 - PJM Membership requires signing of PJM Operating Agreement

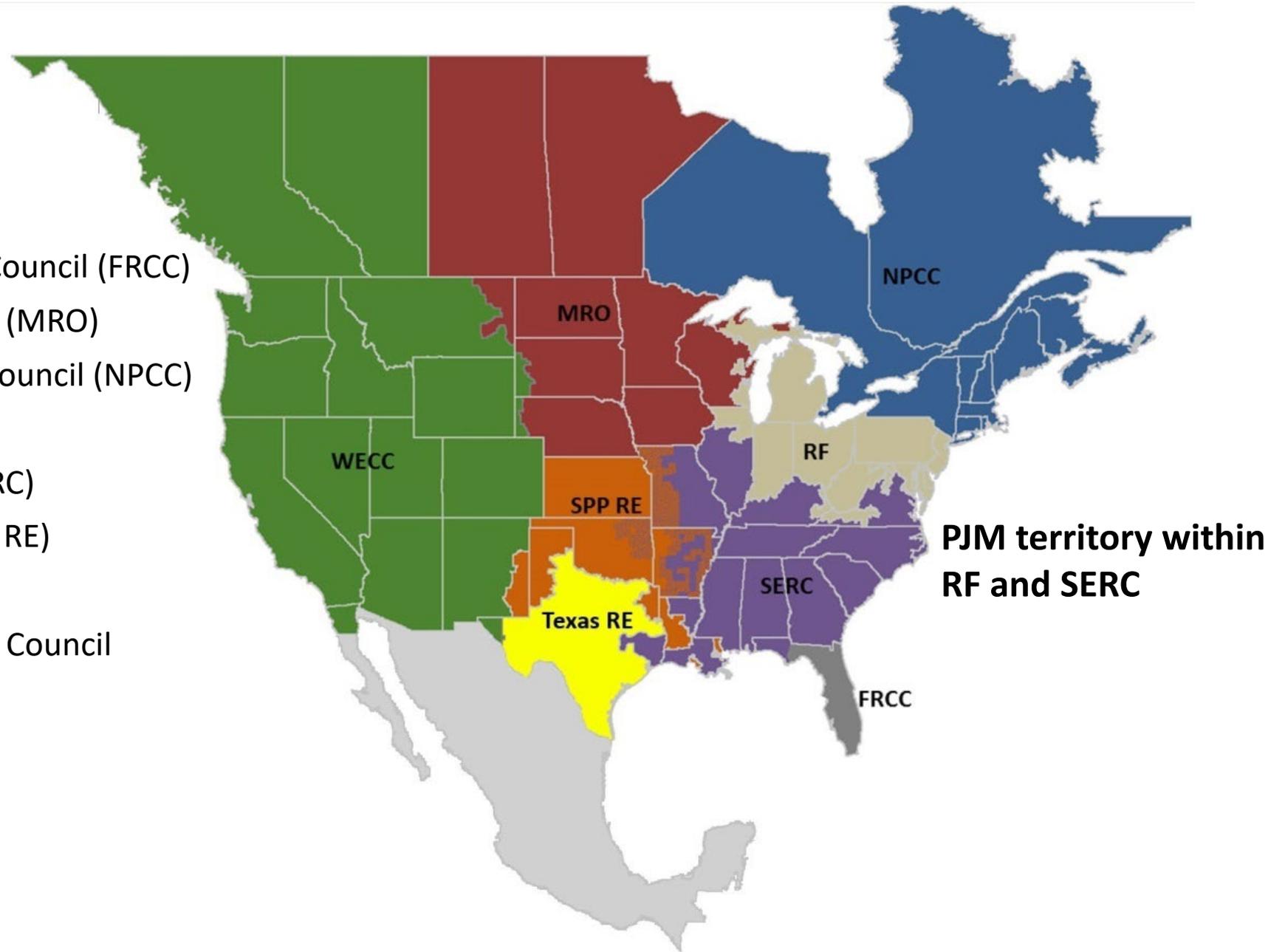


Interaction among Members & PJM



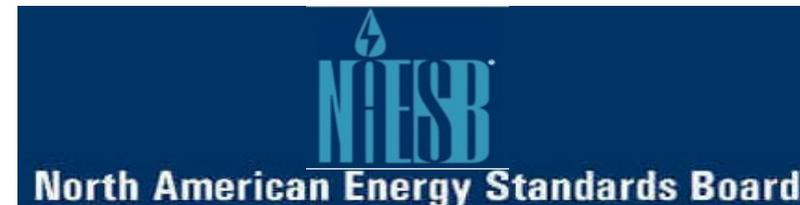
NERC Regions

- Florida Reliability Coordinating Council (FRCC)
- Midwest Reliability Organization (MRO)
- Northeast Power Coordinating Council (NPCC)
- Reliability First (RF)
- SERC Reliability Corporation (SERC)
- Southwest Power Pool, Inc. (SPP RE)
- Texas Reliability Entity (Texas RE)
- Western Electricity Coordinating Council (WECC)



Industry Standards

- PJM is committed to complete compliance with all applicable **NERC** and regional reliability standards as well as **NAESB** business standards
- On-going communication with Member companies concerning compliance status and on all related activities is through the “**Reliability Standards and Compliance Subcommittee**”



NERC Reliability Standards

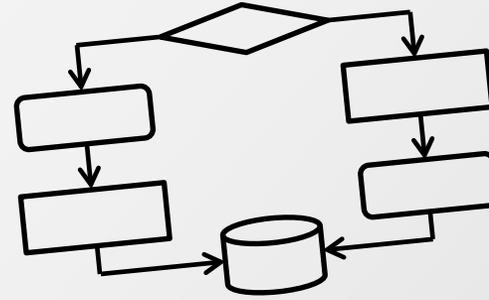
NERC Reliability Standards

Define the reliability requirements for planning and operating the North American Bulk Electric System

NERC Functional Model

Defines functions that need to be performed to ensure the Bulk Electric system operates reliably

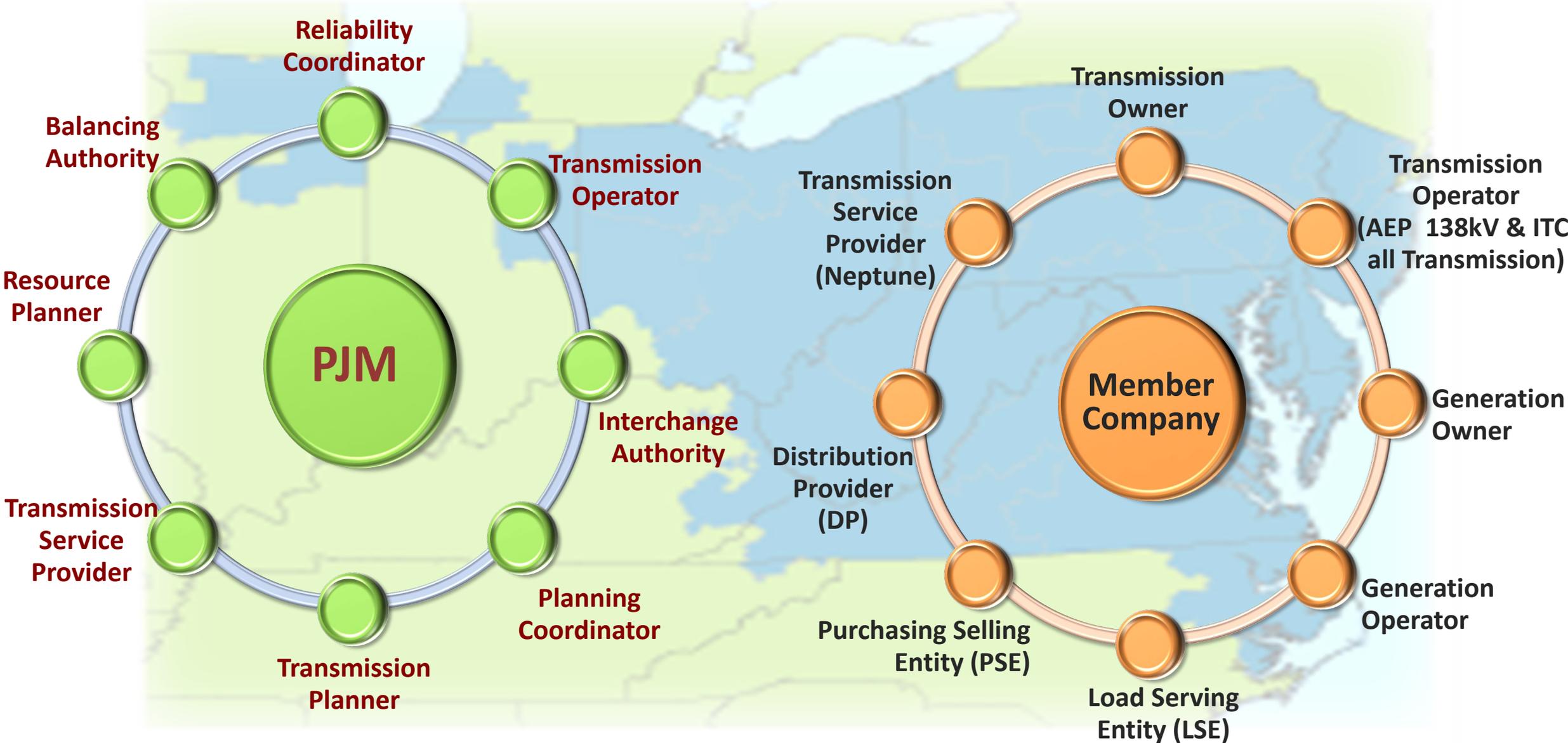
Explains relationships between entities responsible for performing tasks



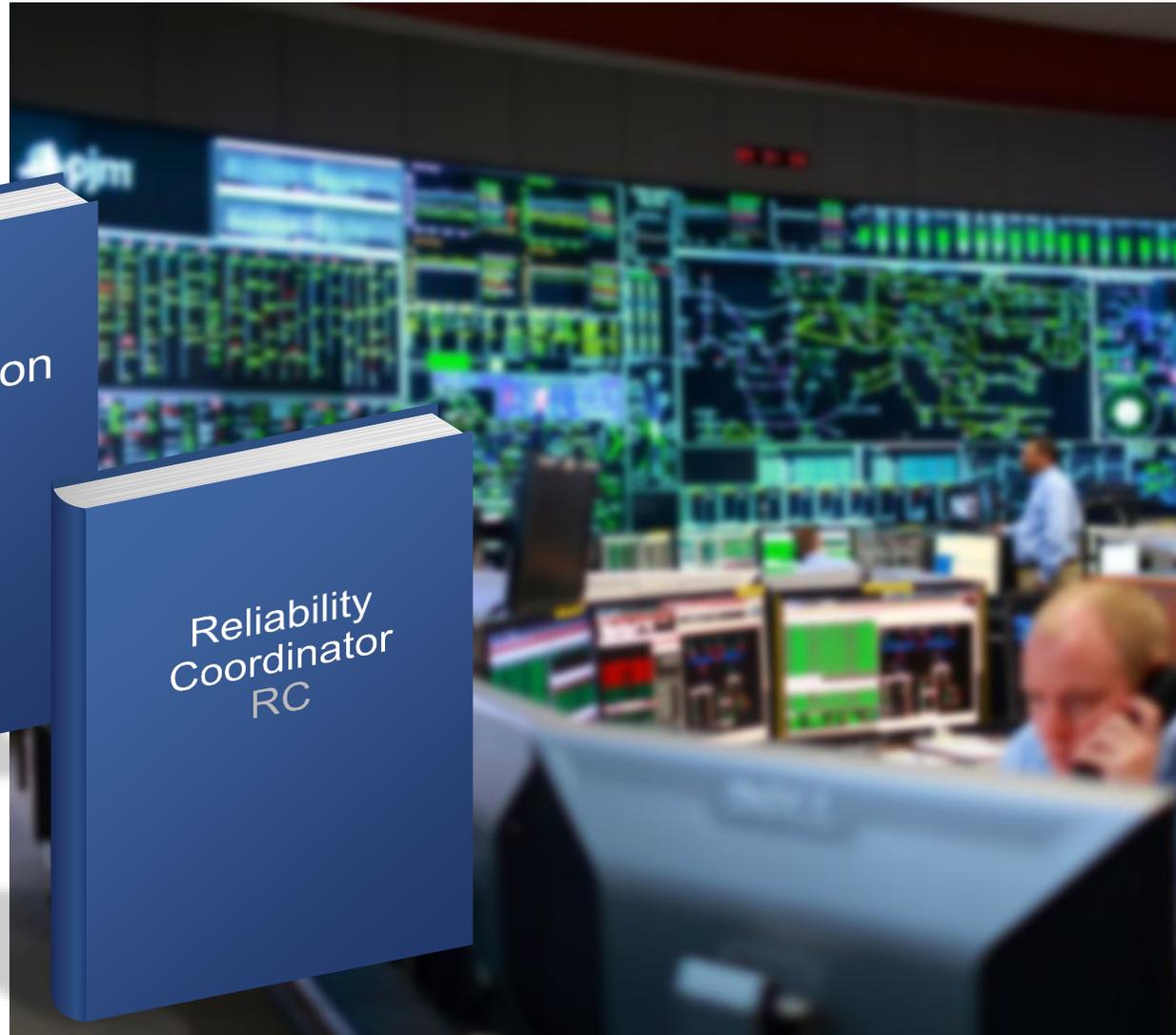
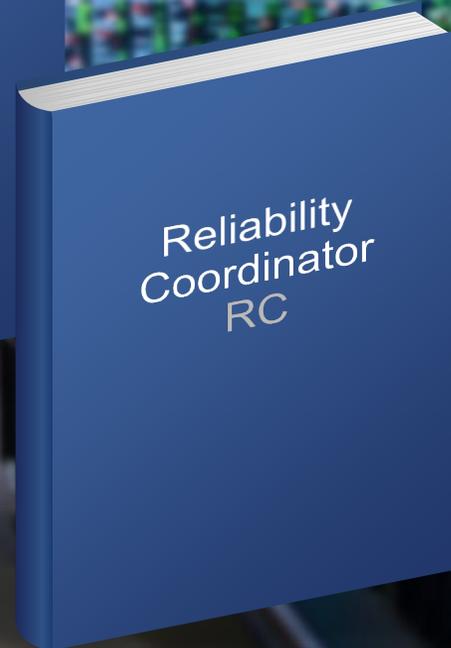
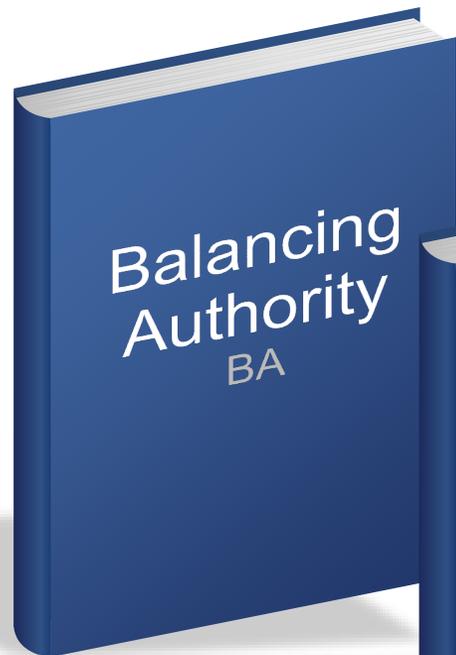
NERC Statement of Registry Criteria

FERC approved document that determines who must register and be accountable for those functions

NERC Functional Model



Three Key NERC Functional Model Definitions



NERC Functional Model – Generation Operator

Definition - The functional entity that operates generating unit(s) and performs the functions of supplying energy and reliability related services

Relationships with Other Functional Entities

Ahead of Time:

1. Provides generation commitment plans to the Balancing Authority
2. Provides Balancing Authority and Transmission Operators with requested amount of reliability-related services
3. Provides operating and availability status of generating units to Balancing Authority and Transmission Operators for reliability analysis
4. Reports status of automatic voltage or frequency regulating equipment to Transmission Operators

NERC Functional Model – Generation Operator

Ahead of Time (Con't.)

5. Provides operational data to Reliability Coordinator
6. Receives reliability analyses from Reliability Coordinator
7. Receives notice from Purchasing-Selling Entity if Arranged Interchange approved or denied
8. Receives reliability alerts from Reliability Coordinator
9. Receives notification of transmission system problems from Transmission Operators

Real Time

10. Provides Real-time operating information to the Transmission Operators and the required Balancing Authority
11. Adjusts real and reactive power as directed by the Balancing Authority and Transmission Operators

NERC Functional Entity – Generation Owner

Definition - The functional entity that owns and maintains generating units

Relationships with Other Functional Entities

1. Provides generator information to the Transmission Operator, Reliability Coordinator, Balancing Authority, Transmission Planner, and Resource Planner
2. Provides unit maintenance schedules and unit retirement plans to the Transmission Operator, Balancing Authority, Transmission Planner, and Resource Planner
3. Develops an interconnection agreement with Transmission Owner on a facility basis.
4. Receives approval or denial of transmission service request from Transmission Service Provider
5. Provides reliability related services to Purchasing-Selling Entity pursuant to agreement
6. Reports the annual maintenance plan to the Reliability Coordinator, Balancing Authority and Transmission Operator
7. Revises the generation maintenance plans as requested by the Reliability Coordinator

NERC Functional Model – Transmission Operator

- Definition
 - The functional entity that ensures the Real-time operating reliability of the transmission assets within a Transmission Operator Area
- Tasks
 - Monitor and provide telemetry (as needed) for all reliability-related parameters within the reliability area
 - Monitor the status of, and deploy, facilities classed as transmission assets, which may include the transmission lines connecting a generating plant to the transmission system, associated protective relaying systems and Special Protection Systems
 - Develop system limitations such as System Operating Limits and Total Transfer Capabilities, and operate within those limits

NERC Functional Model – Transmission Operator

- Tasks (*cont.*)
 - Develop and implement emergency procedures
 - Develop and implement system restoration plans
 - Operate within established Interconnection Reliability Operating Limits
 - Perform reliability analysis (actual and contingency) for the Transmission Operator Area
 - Adjust flow control devices within the transmission area to maintain reliability
 - Deploy reactive resources to maintain transmission voltage within defined limits

NERC Functional Model – Transmission Owner

- Definition
 - Owns and provides for the maintenance of transmission facilities
- Tasks
 - Develop interconnection agreements
 - Establish ratings of transmission facilities
 - Authorize maintenance of transmission facilities rights-of-way
 - Design and install owned facilities classified as transmission and obtain associated rights-of-way
 - Design and authorize maintenance of transmission protective relaying systems and Special Protection Systems

Member Generation Dispatcher Requirements

Initial Training Requirements

- PJM Generator Initial Training Program (ITP) Course
 - Training is linked to each shared task on the Generation Dispatcher Task List
 - PJM provides training on all shared tasks; member companies provide training on company-specific tasks

Member Generation Dispatcher Requirements

Certification Requirements

- PJM Generation Certification
 - Certificate good for 3 years
 - May be renewed in 2 ways:
 1. Re-test before the prior certificate expires
 2. Over the 3 year period, accrue 140 CE hours (of which 30 must be simulation related)



Member Generation Dispatcher Requirements

Continuing Training Requirements

- Each operator must complete **18 CE hours** annually

How can you meet these requirements?

1. PJM-provided training (in-person, online via LMS)
2. Company-provided NERC-approved CE training
3. Third-party, NERC-approved CE training (i.e., vendor supplied training)

Questions?

PJM Client Management & Services

Telephone: (610) 666-8980

Toll Free Telephone: (866) 400-8980

Website: www.pjm.com



The Member Community is PJM's self-service portal for members to search for answers to their questions or to track and/or open cases with Client Management & Services