New York ISO
Market Training

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About NYISO

The NYISO is an independent, not-for-profit organization responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, and conducting comprehensive long-term planning for the bulk power system.

We manage the flow of power on 11,000-plus miles of electric transmission lines on a continuous basis, 24 hours-a-day, seven days-a-week. As the administrator of the wholesale electricity markets, we conduct auctions that match the power demands of electric utilities and energy service companies with suppliers offering to sell power resources. The NYISO's market structure and grid operations are designed to dispatch the least costly power available to meet demand and maintain essential reliability requirements of the electric system.

The NYISO is dedicated to transparency in how we operate, the information we provide to the public, and our role as an impartial broker of New York's wholesale electricity markets. We are governed by an independent Board of Directors and a committee structure comprised of a diverse array of market participants and stakeholder representatives.

With Federal and State regulatory governing bodies, and our system of shared governance, all market participants have voice in the operation and evolution of the marketplace. Under NYISO's collaborative process, representatives of these market participants have voting power in exercising responsibilities that include preparing NYISO's annual budget; reviewing and recommending candidates for NYISO's board vacancies; developing and adopting technical guidelines for operation of the bulk power system; market design and system planning.

The mission and vision of the NYISO is to ensure power system reliability and competitive markets for New York in a clean energy future. Working together with stakeholders to build the cleanest, most reliable electric system in the nation.

Our role includes:

- Reliable operation of the bulk power grid
- Administration of open and competitive wholesale electricity markets
- Planning for New York's energy future
- Advancing the technological infrastructure

NYISO Market Training

The NYISO's Market Training Department offers education and training opportunities associated with various aspects of New York wholesale energy market administration and NYISO project implementations. We have introductory courses for new market participants or interested parties, and more in-depth courses to further develop market knowledge. Courses are updated and scheduled on a regular basis to keep participants abreast of new market features and products. Market Participants can use this e-catalog as a reference for selecting e-learning or instructor-led course. All course materials, including those for various topics not listed here, are posted on our Market Training page of the NYISO website.

Types of Market Training Course Offerings:

The following descriptions provide a high-level overview of the types of courses available to you. If you have questions about our training offerings or would like to schedule on-site training at your location, please reach out to the Market Training Department by sending an email to training@nyiso.com.

Online Learning

The Online Learning section of the NYISO Market Training webpage offers a comprehensive choice of self-paced narrated courses on the New York energy markets and products narrated courses that you can complete from home or work, on your own time. Begin your self-paced learning about the NYISO anywhere, anytime!

Instructor-Led Courses

Either held at a NYISO facility or via webinar, these instructor-led courses provide an opportunity to interact directly with NYISO staff, including subject matter experts.

> **Note:** Intermediate and in-depth courses may contain prerequisites: It is recommended that you complete one or all the prerequisites prior to the course to fully achieve objectives and maximize your learning experience.

Recommended Learning Tracks:

Recommended learning tracks were developed to better support and guide potential learning opportunities based on industry sector. These learning tracks are centered around following focus areas:

Power Supply
Load Serving Entity (LSE)
Demand Response
Energy Transactions
Transmission Owner (TO)
Non-Utility Entity
Finance

The following defined learning tracks are meant as suggestions; recommended courses are highlighted with a dashed box accompanied by the icon in each of the learning tracks. These recommended courses are listed in priority order based on business need.

Note that not all courses listed within your focus area learning track may be applicable. Additionally, there may be more courses in other locations of this e-catalog that may be of interest.

Power Supply

Recommended Courses in Priority Order

- NAESB Digital Certificate
- NYISO Standard Interconnection Process
- GMSUP - Generator Modeling Survey & Update Portal
- Market Overview Suite
- MT-201 NY Market Orientation Course (NYMOC)
- MT-306 LBMP In-Depth
- GADS Suite
- Outage Scheduling
- Outage Scheduler (OMS) for GOs
- MT-305 Intermediate Installed Capacity (ICAP) Course
- DSS Introductory Course Suite
- DSS Intermediate Course Suite
- MT-304 Accounting & Billing Workshop

Resource Type Specific Courses

- Behind-the-Meter: Net Generation (BTM:NG)
- Co-located Storage Resources (CSR)
  - Co-located Storage Resources (CSR) Participation Model
- Distributed Energy Resources (DER)
  - Distributed Energy Resources (DER) Onboarding Suite
  - Distributed Energy Resources (DER) Aggregation System Training
  - Distributed Energy Resources (DER) Onboarding Suite
  - Outage Scheduler (OMS): GOCP for Aggregators and Generator Owners
  - Distributed Energy Resources (DER) Participation Model
- Energy Storage Resources (ESR) Participation Model
  - Energy Storage Resources (ESR) Participation Model
- Wind & Solar Intermittent Power Resources (IPR)
  - Wind & Solar Intermittent Power Resources (IPR) Onboarding Suite
  - Wind & Solar Intermittent Power Resources (IPR) Participation Model

Load Serving Entity (LSE)

Recommended Courses in Priority Order

- NAESB Digital Certificate
- Market Overview Suite
- MT-201 NY Market Orientation Course (NYMOC)
- MT-306 LBMP In-Depth
- MT-305 Intermediate Installed Capacity (ICAP) Course
- DSS Introductory Course Suite
- DSS Intermediate Course Suite
- MT-304 Accounting & Billing Workshop

Demand Response

Recommended Courses in Priority Order

- NAESB Digital Certificate
- Market Overview Suite
- MT-201 NY Market Orientation Course (NYMOC)
- Reliability-Based Demand Response Course Suite
- MT-306 LBMP In-Depth
- MT-305 Intermediate Installed Capacity (ICAP) Course
- DSS Introductory Course Suite
- DSS Intermediate Course Suite
- MT-304 Accounting & Billing Workshop

Resource Type Specific Courses

- Behind-the-Meter: Net Generation (BTM:NG)
- Co-located Storage Resources (CSR)
  - Co-located Storage Resources (CSR) Participation Model
- Distributed Energy Resources (DER)
  - Distributed Energy Resources (DER) Onboarding Suite
  - Distributed Energy Resources (DER) Aggregation System Training
  - Distributed Energy Resources (DER) Onboarding Suite
  - Outage Scheduler (OMS): GOCP for Aggregators and Generator Owners
  - Distributed Energy Resources (DER) Participation Model
- GADS Suite
- Energy Storage Resources (ESR) Participation Model
  - Energy Storage Resources (ESR) Participation Model
- Wind & Solar Intermittent Power Resources (IPR)
  - Wind & Solar Intermittent Power Resources (IPR) Onboarding Suite
  - Wind & Solar Intermittent Power Resources (IPR) Participation Model

Energy Market Transactions

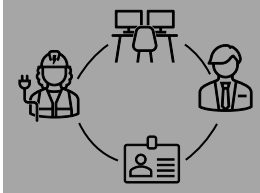
Recommended Courses in Priority Order

- NAESB Digital Certificate
- Market Overview Suite
- MT-201 NY Market Orientation Course (NYMOC)
- MT-306 LBMP In-Depth
- MT-305 Intermediate Installed Capacity (ICAP) Course
- DSS Introductory Course Suite
- DSS Intermediate Course Suite
- MT-304 Accounting & Billing Workshop

Transmission Owners (TO)

Recommended Courses in Priority Order

- NAESB Digital Certificate
- Market Overview Suite
- MT-201 NY Market Orientation Course (NYMOC)
- Outage Scheduling
- Outage Scheduler (OMS) for TOs
- Outage Scheduler (OMS): GOCP for TOs
- MT-304 A
- DSS Introductory Course Suite
- DSS Intermediate Course Suite
- MT-304 Accounting & Billing Workshop



Non-Utility Entity

Recommended Courses in Priority Order

- NAESB Digital Certificate
- Market Overview Suite
- MT-201 NY Market Orientation Course (NYMOC)
- MT-306 LBMP In-Depth
- TCC Basics
- Virtual Trading
- DSS Introductory Course Suite
- DSS Intermediate Course Suite
- MT-304 Accounting & Billing Workshop

Finance

Recommended Courses in Priority Order

- NAESB Digital Certificate
- Market Overview Suite
- MT-201 NY Market Orientation Course (NYMOC)
- MT-306 LBMP In-Depth
- TCC Basics
- Virtual Trading
- DSS Introductory Course Suite
- DSS Intermediate Course Suite
- MT-304 Accounting & Billing Workshop

Online Learning Course Offerings

Ancillary Services

Approx. Duration: 30 minutes

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This module explains the purpose, benefits and administration of NYISO's cost-based and market-based Ancillary Services. It highlights their essential role in assuring resource adequacy and maintaining grid reliability, along with identifying service suppliers and recipients.

****NOTE: This course can also be purchased and taken as part of the Market Overview offering****

Behind the Meter Net Generation

Approx. Duration: 45 minutes

Focus Area: Power Supply, Demand Response,

This E-Learning Module provides information on Behind-the-Meter: Net Generation (BTM:NG) Resources, including minimum participation requirements and details surrounding participation in the Energy, Ancillary Services and Capacity Markets.

Co-located Storage Resources (CSR) Participation Model

Approx. Duration: 90 minutes

Focus Area: Power Supply, Demand Response

This e-learning module provides a bid-to-bill overview on how qualifying resources can participate as CSRs in NYISO's markets and services. Topics covered include an introduction to the participation model, rules that pertain to the Interconnection process for resources participating as CSRs, key information surrounding qualifications and requirements for generators participating as CSRs in the Energy, Ancillary Services, and Installed Capacity Markets, as well as the Settlements associated with CSR market participation.

Distributed Energy Resources (DER) Onboarding Suite

Approx. Duration: 60 minutes

Focus Area: Power Supply, Demand Response

This suite details the NYISO's onboarding process for Distributed Energy Resources (DER) interested in participating in the NYISO markets. Included in this suite are the following resources:

- Introduction to Onboarding (eLearning module)
- Interconnection for DERs (PDF)
- NYISO Customer Registration and DER Aggregator Registration (eLearning module)
- Credit (PDF)
- DER Information Community Portal (DERIC) (PDF)
- End-to-End Communications Testing (PDF)
- Market Mitigation & Analysis (PDF)
- Outage Scheduling (PDF)
- Installed Capacity (ICAP) Enrollment for Participation (PDF)
- Metering Requirements (PDF)
- Metering Settlements (PDF)
- DER Settlements (PDF)
- Resource Appendix: Onboarding of DERs (PDF)

****NOTE: Onboarding Suite should be taken before taking the Participation Model****

Distributed Energy Resources (DER) Aggregation System Training

Approx. Duration: 120 minutes

Focus Area: Power Supply, Demand Response

This e-learning module provides step-by-step instructions for enrollment of Aggregations and DER facilities for participation in NYISO's markets and services, and management of enrollments of Aggregations, in the NYISO's Aggregation system, the online interface developed for the DER Participation model.

****NOTE: Onboarding Suite should be taken before taking the Participation Model****

Distributed Energy Resources (DER) Participation Model

Approx. Duration: 135 minutes

Focus Area: Power Supply, Demand Response

The distributed energy resources (DER) participation model e-learning suite provides a bid-to-bill overview on how DERs and Aggregations can participate in NYISO's markets and services. Topics being covered include an introduction to the participation model, an overview of the DER Onboarding processes, key information surrounding participation requirements for DERs and Aggregations in the energy market, ancillary services, and installed capacity markets, and participation model transitions to and from the DER participation model.

- Chapter 1: Introduction to the DER Participation Model
- Chapter 2: DER Onboarding Overview
- Chapter 3: Energy and Ancillary Services Market Participation
- Chapter 4: Installed Capacity Market Participation
- Chapter 5: Participation model transitions to and from DER

****NOTE: Onboarding Suite should be taken before taking the Participation Model****

Demand Response

Approx. Duration: 30 minutes

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This module provides an overview of NYISO's current economic-based and reliability-based Demand Response programs. Content spotlights features and participation requirements for each program, in addition to information on how and when these programs are implemented.

****NOTE: This course can also be purchased and taken as part of the Market Overview offering****

DSS Introductory Course Suite

Approx. Duration: 45 minutes

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This DSS Introductory level suite of courses explains the purpose and benefits behind DSS, identifies the various report types available, demonstrates how to access and navigate within the DSS environment and teaches users how to build a basic custom query.

DSS Intermediate Course Suite

Approx. Duration: 45 minutes

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This DSS Intermediate level suite of courses describes the steps to take in creating and editing custom queries, how to utilize multiple data providers, how to create a graphical representation of report data, as well as the steps to send and receive reports via the DSS inbox.

Energy Market Place

Approx. Duration: 45 minutes

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This module explains the function of the Energy Market Place, the purpose behind the two-settlement system, and the market process timelines.

****NOTE: This course can also be purchased and taken as part of the Market Overview offering****

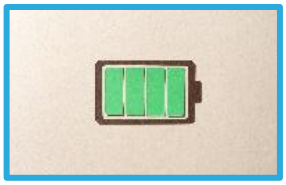
Energy Market Transactions

Approx. Duration: 30 minutes

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This e-Learning module explains the purpose behind Energy Market Transactions; the various transaction types; components of transaction bids; and the evaluation, scheduling, and settlement processes associated with Energy Market Transactions.

****NOTE: This course can also be purchased and taken as part of the Market Overview offering****



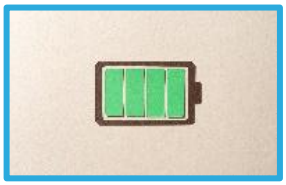
Energy Storage Resources (ESR) Onboarding Suite

Approx. Duration: 45 minutes

Focus Area: Power Supply, Demand Response

This suite details the NYISO's onboarding process for new Energy Storage Resources interested in participating in the NYISO markets. Included in this suite are the following resources:

- Introduction to Onboarding (eLearning module)
- Interconnection for ESRs (PDF)
- NYISO Customer Registration and Resource Registration (eLearning module)
- Resource Modeling and Start-Up Testing (PDF)
- Credit (PDF)
- Market Mitigation & Analysis (PDF)
- Outage Scheduling (PDF)
- Installed Capacity (ICAP)
- Metering Requirements (PDF)
- Metering Settlements (PDF)
- Settlements (PDF)
- Resource Appendix: Onboarding of ESRs (PDF)



Energy Storage Resources (ESR) Participation Model

Approx. Duration: 105 minutes

Focus Area: Power Supply, Demand Response

This e-learning module provides an overview of the Energy Storage Resources Participation model. Topics being covered include some background information leading up to this model's implementation, key information surrounding participation requirements for ESRs in the energy, ancillary services, and installed capacity markets, and important ESR mitigation measures.

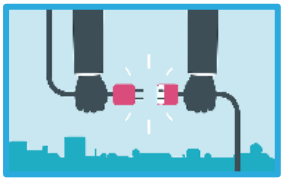
****NOTE: Onboarding Suite should be taken before taking the Participation Model****

GADS Suite

Approx. Duration: 135 minutes

Focus Area: Power Supply

This online learning suite on Generating Availability Data Systems (GADS) consists of seven chapters and a FAQ. The suite is geared towards Market Participants belonging to organizations that submit GADS data to the NYISO and who would like to understand how the NYISO uses GADS data in Unforced Capacity (UCAP) calculations for participation as a Supplier in the NYISO's Installed Capacity Market.



Generator Modeling Survey & Update Portal (GMSUP)

Approx. Duration: 30 minutes

Focus Area: Power Supply

The Generator Modeling Survey & Update Portal (GMSUP) is a secure, web-based portal that provides users an application for submitting required annual Generator Modeling Survey data. This eLearning module provides information on the project background and portal navigation. Topics include a walk through on how to update contact details, submit generator modeling updates, and steps to complete the Annual Generator Modeling Survey.

Installed Capacity (ICAP) Market

Approx. Duration: 60 minutes

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This module explains the primary benefits of the Installed Capacity (ICAP) Market and aids in differentiating between the terms ICAP and UCAP. Additionally, the module walks-through the various processes and activities associated with administering NYISO's Installed Capacity Market.

****NOTE: This course can also be purchased and taken as part of the Market Overview offering****

Locational Based Marginal Pricing (LBMP)

Approx. Duration: 60 minutes

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This e-Learning Module explains the basics of NYISO's pricing methodology known as Locational Based Marginal Pricing (LBMP). This includes defining and establishing LBMP, along with the three components of LBMP and the impact of system constraints.

****NOTE: This course can also be purchased and taken as part of the Market Overview offering****

Market Overview Suite

Approx. Duration: 270 minutes

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This Market Overview Suite provides an introduction to the NYISO markets and their functions. The suite spans 9 modules that review the history, formation, and governance of the NYISO, in addition to surveying New York grid operations and wholesale energy market administration.

- NYISO Introduction
  - This module provides an overview of the NYISO's formation, mission and responsibilities, along with its governance structure
- Power System Fundamentals
- Energy Marketplace
  - This module explains the function of the Energy Market Place, the purpose behind the two-settlement system, and the market process timelines.
- Locational Based Marginal Pricing (LBMP)
  - This e-Learning Module explains the basics of NYISO's pricing methodology known as Locational Based Marginal Pricing (LBMP). This includes defining and establishing LBMP, along with the three components of LBMP and the impact of system constraints.
- Transactions
  - This e-Learning module explains the purpose behind Energy Market Transactions; the various transaction types; components of transaction bids; and the evaluation, scheduling, and settlement processes associated with Energy Market Transactions.
- Transmission Services

- This module explains two transmission service charges associated with the use of Transmission lines within the New York Control Area (NYCA).

- Ancillary Services
  - This module explains the purpose, benefits and administration of NYISO's cost-based and market-based Ancillary Services. It highlights their essential role in assuring resource adequacy and maintaining grid reliability, along with identifying service suppliers and recipients.
- Installed Capacity (ICAP) Market
  - This module explains the primary benefits of the Installed Capacity (ICAP) Market and aids in differentiating between the terms ICAP and UCAP. Additionally, the module walks-through the various processes and activities associated with administering NYISO's Installed Capacity Market.
- Demand Response
  - This PDF details additional resources for more information on each of the topics within this onboarding suite and where to find them.

****NOTE: These modules can also be purchased and taken individually****

NAESB Digital Certificate Tutorial

Approx. Duration: 30 minutes

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This E-Learning Module is geared towards guiding market participants on how to obtain and implement the use of a digital certificate to access NYISO markets and applications.

NYISO Introduction

Approx. Duration: 30 minutes

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This module provides an overview of the NYISO's formation, mission and responsibilities, along with its governance structure.

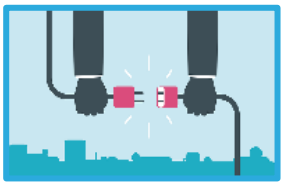
****NOTE: This course can also be purchased and taken as part of the Market Overview offering****

NYISO Standard Interconnection Procedures

Approx. Duration: 90 minutes

Focus Area: Power Supply, Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity

The purpose of the NYISO's Standard Interconnection Procedures training is to help existing and prospective Interconnection Customers understand the reforms and enhancements to the NYISO's Interconnection Process. This e-learning module will provide an overview of the NYISO's Standard Interconnection Procedures, the timeline of the Cluster Study Process, including the Transitional Cluster Study, the Interconnection Request (IR) application requirements, including Site Control, modeling and financial requirements, the process of submitting an IR application through the Interconnection Project portal, and overview of the two-phased Cluster Study Process.

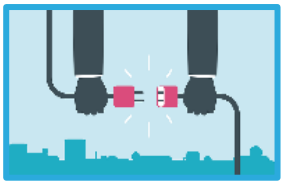


Outage Scheduling

Approx. Duration: 30 minutes

Focus Area: Power Supply, Demand Response, Transmission Owner (TO)

This eLearning module describes the NYISO's outage scheduling process and is intended for entities responsible for notifying the NYISO of planned and unexpected changes to the operational availability of their transmission and generating facilities. In this module users will discover the basis for outage scheduling and its associated reliability requirements. Additionally, this eLearning module explains outage request submission requirements, applicable timelines, NYISO's request assessment process, and the potential request results. This eLearning module also provides insight on available outage scheduling reports by user type and additional resources.

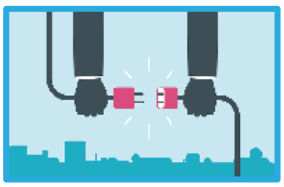


Outage Scheduling (OMS) for GOs

Approx. Duration: 30 minutes

Focus Area: Power Supply

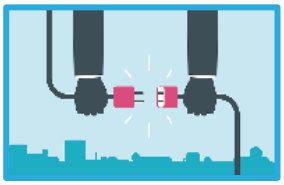
This e-Learning module provides a walk-through of the Outage Scheduler (OMS) System for Generator Owners. Topics covered include accessing and logging into the OMS System, environment navigation, creating a new outage request (Generation O.R.E), tracking a request, as well as modifying a request.



Outage Scheduling (OMS) for TOs

Approx. Duration: 30 minutes
Focus Area: Transmission Owner (TO)

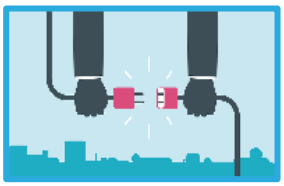
This e-Learning module provides a walk-through of the Outage Scheduler (OMS) System for Transmission Owners. Topics covered include accessing and logging into the OMS System, environment navigation, accessing the conflict calendar, creating a new outage request (Transmission O.R.E), tracking a request, as well as modifying a request.



Outage Scheduling (OMS): GOCP for Aggregators and Generator Owners

Approx. Duration: 15 minutes
Focus Area: Power Supply, Demand Response

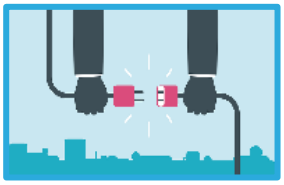
This e-Learning module provides Aggregators/Generator Owners (GO) a walk-through of the Grid Operations Coordination Portal (GOCP), within NYISO's Outage Management System (OMS). Topics include accessing and logging into the OMS System, navigating to the GOCP, and the various steps associated with creating, submitting, modifying and viewing an outage request.



Outage Scheduling (OMS): GOCP for Transmission Owners

Approx. Duration: 30 minutes
Focus Area: Transmission Owner (TO)

This e-Learning module provides Transmission Owners (TO) a walk-through of the Grid Operations Coordination Portal (GOCP), within NYISO's Outage Management System (OMS). Topics include accessing and logging into the OMS System, navigating to the GOCP, and the various steps associated with creating, submitting, modifying and viewing an outage and/or Supplemental Resource Availability (SRA) request. Additionally, the module steps through the process TOs will use to grant 'view only' GOCP privileges to Distribution System Operators (DSO).



Outage Scheduling (OMS): GOCP for Distribution System Operators

Approx. Duration: 15 minutes
Focus Area: Transmission Owner (TO)

This e-Learning module provides Distribution System Operators (DSO) a walk-through of the Grid Operations Coordination Portal (GOCP), within NYISO's Outage Management System (OMS). Topics include accessing and logging into the OMS System, navigating to the GOCP, and the steps associated with viewing an Aggregator outage and/or Supplemental Resource Availability (SRA) request.

Power System Fundamentals

Approx. Duration: 60 minutes
Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This module explains the basic fundamentals of the New York Control Area (NYCA) power system, including key operational terms and definitions. The module reviews the three primary components of the power system along with the operating relationship between the NYISO and its neighboring control areas.

****NOTE: This course can also be purchased and taken as part of the Market Overview offering****

Reliability-Based Demand Response Course Suite

Approx. Duration: 315 minutes
Focus Area: Demand Response

This e-Learning Module is designed to provide insight into the intended benefits of Demand Response, and to address the various processes and activities associated with both participation in and management of the Reliability-Based Demand Response programs.

- Introduction to Demand Response
- Metering Methodologies
- Special Case Resources
- Emergency Demand Response Programs
- Scarcity Pricing
- Targeted Demand Response

TCC Basics

Approx. Duration: 15 minutes

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This e-Learning Module explains the basic functions and processes associated with Transmission Congestion Contracts (TCC). More specifically it describes the hedging opportunities associated with TCCs, as well as applicable purchasing and settlements processes.

TCC Competency Exam

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

Per FERC Order 741, to have TCC bidding privileges turned on, a market participant must complete this TCC competency exam and attain a grade of 75% or greater to demonstrate competency.

Virtual Trading

Approx. Duration: 45 minutes

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This e-Learning Module explains Virtual Trading Basics, the corresponding bidding, and settlements processes, in addition to Virtual Trading credit requirements.

Virtual Trading Competency Exam

Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

Per FERC Order 741, to have Virtual Trading bidding privileges turned on, a market participant must complete this Virtual Trading competency exam and attain a grade of 75% or greater to demonstrate competency.

Wind & Solar Intermittent Power Resources (IPR) Onboarding Suite

Approx. Duration: 45 minutes
Focus Area: Power Supply, Demand Response

This suite details the NYISO's onboarding process for new Wind and Solar Intermittent Power Resources interested in participating in the NYISO markets. Included in this suite are the following resources:

- Introduction to Onboarding (eLearning module)
- Interconnection for Wind & Solar IPRs (PDF)
- NYISO Customer Registration and Resource Registration (eLearning module)
- Establishment of Wind & Solar Forecast (PDF)
- Resource Modeling, End-to-End Communications Testing and Pre-Commercial Testing (PDF)
- Credit (PDF)
- Market Mitigation & Analysis (PDF)
- Outage Scheduling (PDF)
- Installed Capacity (ICAP) (PDF)
- Metering Requirements
- Metering for Settlements (PDF)
- Settlements (PDF)
- Resource Appendix: Onboarding of New IPRs (PDF)

Wind & Solar Intermittent Power Resources (IPR) Participation Model

Approx. Duration: 60 minutes
Focus Area: Power Supply, Demand Response,

This module provides an overview of the participation model associated with Wholesale Wind and Solar Intermittent Power Resources. Topics covered include background information leading to the implementation of this model, along with information surrounding participation requirements.

****NOTE: Onboarding Suite should be taken before taking the Participation Model****

Instructor-Led Course Offerings

MT-201 NY Market Orientation Course (NYMOC)

Duration: 3.5 Days
Location: In-Person or Webinar
Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

Designed for those with more general NYISO market experience, but who may feel the need for a refresher, or to fill in the gaps they may have regarding specific areas of the market. It covers the same subjects as our Market Overview e-Learning course suite, but is more in-depth, and adds Virtual Trading, Transmission Congestion Contracts, Market Monitoring, Settlements and Invoicing, and Future Market Initiatives. As a bonus, if you opt to attend the in-person course offering, you will be given a "tour" of our new world-class control room from the viewing gallery.

Course Content:

Formation & Governance

- Transition from Power Pool to ISO
- Regulatory Oversight and the NYISO Tariffs
- How the NYISO works with its stakeholders
- Governance committee structure, the sector voting system

Power Systems Fundamentals

- How power flows on the high-voltage transmission network, the physical components of the New York Control Area (NYCA) power system
- Load distribution vs. location of generation
- Operational ancillary services
- Impact of generation and transmission outages

Locational Based Marginal Pricing (LBMP)

- How LBMP is established
- Differences between day-ahead and real-time markets
- The three components of LBMP-energy, loss, and congestion
- Contributing congestion factors

Energy Market Place

- Energy Market functions and features
- Commitment and dispatch of resources, market timelines, transmission charges
- Day-ahead vs. real-time markets and associated settlements

Energy Market Transactions

- The two types of contracts in the NYISO energy market
- Internal vs. external transactions
- Bidding options for evaluation by the market
- Settlement

Ancillary Services

- Cost-based AS such as voltage support and black-start capability service
- Market-based AS such as reserves and regulation
- Settlement and allocation of costs

Virtual Trading

- Mechanics of the virtual market, including virtual bidding scenarios and associated settlement
- Virtual supply vs. load bids, impact on
  Day-Ahead Market prices
- Hedging with VT

Transmission Congestion Contracts (TCC)

- TCC fundamentals and how to obtain TCCs
- TCCs cashflows, including the TCC auction process and congestion rents
- TCCs as a hedge against congestion costs…
  or as an investment
- Examples of gains and losses

Installed Capacity (ICAP)

- Role of ICAP, the 3 types of NYISO auctions and clearing prices, ICAP vs. Unforced Capacity
- Requirements for different NYCA entities-including retail providers
- Determining how much an ICAP supplier
  can sell

Additional NYISO Services

- The responsibilities of the external Market Monitoring Unit (MMU) and the internal Market Mitigation and Analysis Department (MMA)
- The purpose of the NYISO Credit Policy
- The processes associated with administering a Consolidated Invoice
- The roles and responsibilities of NYISO Stakeholder Services and Member Relations

Demand Response

- Rationale for Demand Response in NY
- The two categories of DR-Reliability-Based
  and Economic-Based
- DR participation requirements, settlement

NYISO Virtual Control Room Tour

NYISO staff will escort the attendees to the gallery overlooking our state-of-the art control room, where a member of NYISO Operations Training will
provide a detailed explanation of the technological features and capabilities of the facility

MT-304 Accounting & Billing Workshop

Duration: 5 Days
Location: In-Person or Webinar
Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response, Energy Transactions, Transmission Owner (TO), Non-Utility Entity, Finance

This course provides detailed knowledge of the settlements associated with Power Suppliers, Load Serving Entities, Transactions, Virtual Trading, Demand Response and Transmission Owners. Using the terminology and syntax of the NYISO Decision Support System (DSS), the structure of each training section starts with a listing of the most gran This course provides detailed knowledge of the settlements associated with Power Suppliers, Load Serving Entities, Transactions, Virtual Trading, Demand Response and Transmission Owners. Using the terminology and syntax of the NYISO Decision Support System (DSS), the structure of each training section starts with a listing of the most granular data inputs. Next, we show you how these raw inputs are used mathematically to develop the "intermediates," and we then complete the calculation by using the intermediates to produce the final settlement number.

Recommended Course Prerequisites:

- 6-month job experience
- Market Overview eLearning Suite
- MT-201 NY Market Orientation Course

What You Will Cover:

- The Consolidated Invoice
- DSS Reporting
- The Metering Process
- All Customer Settlement Types
- Coming Attractions

Course Content:

For each module, you will start with the basic billing determinants and progress through the intermediate calculations and settlement algorithms.

Customize Your Learning Experience:

Participants can choose which of the listed topics they would like to attend; in addition, they will have the option of scheduling one-on-one time with NYISO Settlement Experts

Building Your Learning Track:

Recommended For All:

- Course Kick Off
- The Consolidated Invoice and DSS Overview
- Metering
- Open Discussion Forum

Choose any or all from the following workshop topics:

- Power Supplier (PS) & Ancillary Services
- PS Supplemental Payments
- Load Serving Entity (LSE) Energy & Ancillary Services
- Transactions – Energy, Ancillary Services, Supplemental Transaction Payments & FIC
- LSE & Transaction Customer Allocations
- Transmission Owner & TCC Settlements
- Virtual Trading Settlements
- Demand Response Settlements
- ICAP Auction Settlements
- DSS Application Walk-Through

MT-305 Intermediate ICAP

Duration: 2 Days
Location: In-Person or Webinar
Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response

This course delves into the workings of the NYISO Installed Capacity Market and the benefits it provides. Both providers and consumers of ICAP will learn what is required to participate in this market, how auctions are conducted, and financial settlement elements.

Recommended Course Prerequisites:

- 6-month job experience
- Market Overview eLearning Suite
- MT-201 NY Market Orientation Course

Course Content:

Amount of Capacity Required

- How the amount of ICAP required for the New York Control Area (NYCA) is established
- The processes behind determining the NYCA Forecasted Peak Load and Installed Reserve Margin (IRM)

Amount of Capacity Available

- The definition and purpose of the Dependable Maximum Net Capability (DMNC) test
- Generators' DMNC data submittal process

Capacity Supply Qualified to Offer

- How ICAP is translated into UCAP
- Generator forced outages and derates
- External capacity resources; Import Rights vs Unforced Deliverability Rights
- ICAP supplier obligations in the energy market

Load-Serving Entities' (LSE) Obligation to Procure ICAP

- NYCA and Locational (New York City and Long Island) minimum Installed Capacity requirements for LSEs
- How Locational requirements can change each Capability Year
- ICAP to UCAP

NYISO's ICAP Market Auctions

- Pre-auction preparation
- Capacity Certification
- The different auctions
  - Capability Period Auction
  - Monthly Auction
  - Spot Market Auction
- Capacity settlements

Demand Curve

- Supply and demand curve basics
- Rationale behind the ICAP Demand Curve
- Basics on developing the Demand Curve
- The Demand Curve and ICAP Market clearing prices

In-City (NYC) Mitigation

- Supplier portfolio aspects
- Purpose of supply-side and buyer-side mitigation

Generator Performance Monitoring

- Bidding, scheduling, and notification requirements

Panel Discussion

- A time for your questions!
- A panel of NYISO experts on ICAP

MT-306 LBMP In-Depth

Duration: 3 Days
Location: In-Person or Webinar
Focus Area: Power Supply, Load Serving Entity (LSE), Demand Response

This course provides attendees with a more detailed understanding of the processes used to produce locational-based marginal prices in the NY wholesale market, in addition to a closer look at the various factors that impact NYISO's pricing methodology.

Recommended Course Prerequisites:

- 6-month job experience
- Market Overview eLearning Suite
- MT-201 NY Market Orientation Course

Course Content:

LBMP Intermediate Level Re-Cap

- Key Terms and Processes
- Why show all components?
- Examples

Inputs Determining LBMPs & Schedules

- Physical Supply Offers
- Determining NYCA Load
- Energy Market Transactions
- Market Based Ancillary Services
- Demand Response
- Virtual Trading

Bid & Offer Evaluation Process

- Intro to DAM & RT Software
  - Security Constrained Unit Commitment
  - Real Time Software
- Data Inputs
  - Includes DAM carry over and RT processes
  - Explain Potential for Scheduling & Pricing Differences DAM to RT
- RTC & RTD
  - Inputs & Process Timelines
- RTD-CAM
  - Various Modes
- SRE
  - Explain Purpose & Timeline
  - Identify Impact

Details of the Energy Price Component

- Energy Price Setting Unit
  - Process for determining
  - Marcy Reference Bus Role
  - Statewide Concept
- Application of "Next MW" Theory
  - Example (using real NYISO data)

Details of the Loss Price Component

- Concept Behind Physical Losses
  - Percentage of Total NYCA Losses
  - Introduction to Power Flow Model
- Physical Loss Translates to Financial Loss
  - Reason Behind Translation
- Tariff Loss Calculation
  - Generator Perspective
  - LSE Perspective
- Application of Loss Calculation
  - Examples (using real NYISO data)

Details of the Congestion Price Component

- Concept Behind Constraints
  - Common Congestion Points
  - Line Limitations
- Identify Factors that Impact Congestion
  - Outages
  - PARs
  - Re-Dispatching
  - Generator Shortages
  - Transmission Demand Curves
- Tariff Congestion Calculation
  - Generator Perspective
  - LSE Perspective
- Application of Congestion Calculation
  - Examples (using real NYISO data)

Three Components Summary

- Interactive Exercises using a variety of scenarios including:
  - Unconstrained and constrained system
  - Shift factors
  - Co-optimization of Energy, Operating Reserves, and Regulation Service
  - Generator Parameters

Additional Pricing Rules

- External Proxy Buses
  - When in effect & overall process
- Market Based Ancillary Services
  - Regulation & Frequency Response
    - Capacity & Movement
  - Operating Reserves
    - Cascading/Nested Prices
  - Shortage Pricing
    - When in effect & overall process
  - Scarcity Pricing
    - When in effect & overall process

Uplift & Residuals

- Cause & Effect
  - Supplemental Supplier Payments
  - LSE Allocations

Price Validation

- Purpose
- Timelines
- Process

LBMP-Putting It All Together

- Interactive Exercises
  - Variety of Scenarios
    - Using Real-World NYISO Data

Panel Discussion

- A time for your questions!
- A panel of NYISO experts on LBMP

New York ISO
Market Training