



## AspenTech University OSI Training Catalog

February 2023

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# monarch Courses

## M101: monarch System Overview I

**Course Name:** monarch System Overview I

**Course No:** M101

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, IT maintenance staff, hardware maintenance staff, managers, database/display maintenance staff, chief operator

**Prerequisites:** None

**Goal:** Understand general hardware, software and database architecture.  
Understand various SCADA functions.  
Gain an overall appreciation of the system, interfaces and architecture.

**Synopsis:**

An introduction to the monarch system. Topics covered include an overview of the hardware and software that make up the system, including how the client/server architecture works; the products that constitute the monarch system and how they interact; and a discussion of the SCADA functionality in the monarch system. The monarch database system is introduced, including database definition files, what the internal structure of a database looks like and what D.O.F.R.I.s and data links are and how they are used in the system to link to data.

The OpenView™ client is also discussed including an overview of the various applications that make up the client environment. Options for customizing the look of OpenView will be shown.

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## M102: monarch System Overview II

**Course Name:** monarch System Overview II

**Course No:** M102

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, IT maintenance staff, managers, database maintenance staff. This course is best suited for staff maintaining the monarch system.

**Prerequisites:** M101: monarch System Overview I

**Goal:** Understand the processes that comprise the monarch system.

Understand the initial configuration process for a monarch server.

Understand the different options for performing database maintenance and the pros and cons of each method.

**Synopsis:**

This course is a discussion of the components and configuration that make up a server in the monarch system. Server configuration is discussed including topics such as environment variables that are added, the OSI directory structure on a server, how the monarch system processes are started and stopped and how failover works. Several of the processes that make up the monarch system are discussed.

The different ways of performing database maintenance on the system are shown including the command line utilities for working with databases, the Database Editor tool in OpenView and the DataExplorer™ application. Some advanced options for interacting with databases are also discussed such as ODBC and Microsoft Excel.

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## M115: Voyager Fundamentals

**Course Name:** Voyager™ Fundamentals

**Course No:** M115

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Operators responsible for display building, chief operator, display maintenance staff, operators

**Prerequisites:** M101: monarch System Overview I

**Goal:** Understand general Voyager capabilities.  
Understand Voyager navigation.  
Understand the Voyager display editing tool.

**Synopsis:**

An introduction to the Voyager application in Web Platform™. Topics covered include overview of Voyager's function, navigation and Voyager Builder. Students will learn how to use Voyager Builder to create and maintain Web Tabluar displays for Voyager.

The course covers access to Web Platform and the Voyager application, as well as how to access different displays within Voyager. Navigation within displays and features available in each type of display are discussed. The different components and features of Voyager Builder are discussed, including examples of how to build summary, archive and dynamic displays for Voyager.

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## M116: Web Platform Administration

**Course Name:** Web Platform Administration

**Course No:** M116

**Duration:** One half day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Administrators, IT maintenance staff, system maintenance staff

**Prerequisites:** M101: monarch System Overview I, M102: monarch System Overview II

**Goal:** Learn to perform basic system maintenance for Web Platform.  
Understand how to monitor your system with System Monitor.  
Understand how to manage users, consoles, permissions and settings.

**Synopsis:**

An overview of the configuration and administration options of Web Platform. Administration topics covered include creating customized menu options for web applications, configuring settings applicable to all applications, creating and managing sessions and database audit retention. Additional topics include creating and management of API Keys, creating and monitoring processes through System Monitor, and creating and managing dashboards. Students will also learn to configure and manage users, groups, and consoles, and import users from monarch or LDAP.

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## M255: System Maintenance

**Course Name:** System Maintenance

**Course No:** M255

**Duration:** Two days

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, IT maintenance staff, system maintenance staff, development teams. For new customers, OSI recommends attending this course close to cutover.

**Prerequisites:** M101: monarch System Overview I, M102: monarch System Overview II, S130: SCADA Fundamentals, S250: System Administration Fundamentals

**Goal:** Gain a deeper understanding of how to perform maintenance on your system.

**Synopsis:**

This course will cover topics essential to supporting your system after cutover.

In-depth topics include:

- System maintenance best practices
- Failovers and system configuration
- Disk space and error messages
- Synchronizing data
- Maintaining multiple domains
- Log files
- Understanding reports
- Maintaining displays and calculations

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## M265: Enterprise ITK Fundamentals

**Course Name:** Enterprise ITK Fundamentals

**Course No:** M265

**Duration:** Half Day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, IT maintenance staff, system maintenance staff,

**Prerequisites:** M101: monarch System Overview I, M102: monarch System Overview II

**Goal:** Gain an understanding of Enterprise ITK and the different steps that can be performed.

**Synopsis:**

An overview of Enterprise ITK system settings. Task dataflow and steps are discussed. An overview of creating tasks with the Enterprise ITK application and examples of different tasks and steps. How to configure and use the Name Service and ID maps. Enterprise ITK permissions are also discussed.

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## M301: Advanced Development in monarch

**Course Name:** Advanced Development in monarch

**Course No:** M301

**Duration:** Three days

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, IT maintenance staff, system maintenance staff, development teams

**Prerequisites:** M101: monarch System Overview I, M102: monarch System Overview II, S130: SCADA Fundamentals, S261: Calculation Development Fundamentals.

Students should have a programming background and understanding of “C” programming.

This course does not teach fundamental “C” programming.

**Goal:** Gain an advanced understanding of monarch system development tools. Students wanting to develop their own applications should attend this course.

**Synopsis:**

This course covers creating custom applications that interface with the monarch environment. The monarch Database Management System (DBMS) is reviewed, including creation of custom tables and custom databases. Using the monarch “C” Programming API to interact with the databases and perform other functions within the monarch environment is discussed in detail. Students develop an example OpenView application, which includes a custom database and a custom display. The application includes logic for handling failover, heartbeating and writing messages to a custom log file. It is also added as a new process to the monarch system.

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## M701: monarch Security Fundamentals

**Course Name:** monarch Security Fundamentals

**Course No:** M701

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Administrators, IT maintenance staff, system maintenance staff, security staff, compliance staff

**Prerequisites:** M101: monarch System Overview I, M102: monarch System Overview II, S130: SCADA Fundamentals, S250: System Administration Fundamentals

**Goal:** Gain a deeper understanding of basic security procedures within monarch to ensure proper security measures are being utilized and security alerts are being monitored

**Synopsis:**

Topics covered in this course include:

- Active Directory Integration
- monarch authentication vs. Active Directory authentication
- Recommended password configuration
- Generating reports
- File permissions per OU
- System configuration baselining
- Web Platform authentication and permission setup
- SCM monarch permission groups
- Pulling reports of change
- monarch logging
- Product logs
- Operating system level logging
- Alarming in monarch
- NERC supporting documentation
- Patch management training

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# SCADA Courses

## S100: SCADA Operator Training

**Course Name:** SCADA Operator Training

**Course No:** S100

**Duration:** 1 day per session

**Course Format:** Classroom, Webcast

**NERC CE Credits:** Up to 6.0

**Who Should Attend:**

Operators, dispatcher, operations staff, maintenance support staff, trainers

**Prerequisites:** None

**Goal:** Provide end users of the system an operational understanding of the OSI SCADA applications. The course is targeted for operators of these applications.

**Synopsis:**

An in-depth review of the operational aspects of the OSI system as it relates to operators and end users. The course covers operational capability, detailed user interface, alarms and messages.

In-depth course topics include:

- Introduction to monarch software
- Understanding the operator console
- Understanding the user interface and summary displays

SCADA-specific topics:

- Applying tags
- Sending controls
- Displaying tags, limits and qualities
- Managing alarms with ViewPoint™
- Trending™
- EpiLog™

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# S111: Display Development Fundamentals

**Course Name:** Display Development Fundamentals

**Course No:** S111

**Duration:** Two days

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Administrators, engineers, IT maintenance staff, managers, display maintenance staff, operators responsible for display building

**Prerequisites:** M101: monarch System Overview I

**Goal:** Understand general display architecture, display structures and the display editing tool.  
Become proficient in display building.

**Synopsis:**

Students learn how to use Design Studio™ to create and maintain one-line displays. Topics discussed include adding and manipulating objects on displays, the design of one-line displays and some of the options for setting up a one-line display. Students also learn about general editing features such as cut and paste, group operations, snap grid, clipboard and undo.

The course covers linking dynamic data on a display to database points, using display linking aides, as well as information on group link, unlinked fields and station point lists. Device attributes such as fonts, line widths and dynamic line widths, TLQ linking, color linking and object attributes such as process execution and display call-up are also discussed. Students learn how to create custom symbols and symbol libraries as well as how to modify existing symbols on displays.

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## S112: Tabular Display Fundamentals

**Course Name:** Tabular Display Fundamentals

**Course No:** S112

**Duration:** Two days

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Administrators, engineers, IT maintenance staff, managers, display maintenance staff, operators responsible for display building

**Prerequisites:** M101: monarch System Overview I

**Goal:** Understand the general tabular display building process.  
Understand display customization and sorting options.  
Become proficient in building tabular displays.

**Synopsis:**

This course covers the basics of creating Advanced Tabulars™ displays. How to use the various layout components and other display customization options to organize data on displays effectively is discussed. Other topics covered include how to use sorting, filtering, command and color rules to modify how information is presented on a display.

Advanced features such as expression fields, calculated columns, configuring commands and embedded displays will also be covered. Students will learn how to configure and pass parameters into displays to filter or preselect the data displayed.

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## S120: CHRONUS Report Building

**Course Name:** CHRONUS Report Building

**Course No:** S120

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Administrators, engineers

**Prerequisites:** M101: monarch System Overview I

**Goal:** Learn how to build tabular and trend displays that access data stored in CHRONUS.

**Synopsis:**

This course covers the process of creating displays and analytics using several different products. Students will use OpenView Advanced Tabulars to create displays that present data in a familiar tabular format which can be integrated into their monarch system. Learn how to create formulas in Excel that pull data from CHRONUS to build reports and charts that can be saved and distributed throughout their organization. Power BI will illustrate how to use HSH Analytics to build dashboards and analytics that can be published to anyone's desktop.

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## S130: SCADA Fundamentals

**Course Name:** SCADA Fundamentals

**Course No:** S130

**Duration:** Four days

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, IT maintenance staff, managers, system maintenance staff, operators

**Prerequisites:** M101: monarch System Overview I, M102: monarch System Overview II

**Goal:** Understand general SCADA architecture.

Learn how the SCADA and related databases are organized.

Learn how the operator interacts with the SCADA system.

Learn the SCADA data model and SCADA database layout and structure in detail.

**Synopsis:**

This course shows students how to set up and maintain their SCADA system. SCADA points will be discussed in detail including configuring points, how point information is organized in the SCADA database, how the information is presented on displays, automatic and user calculations and configuring points for historical archiving. The process for setting standards for various SCADA parameters is also covered. Students create an example station and add new points to the system, which include a variety of different SCADA features and capabilities. They also perform a system build and data validation.

How to configure Areas of Responsibility (AORs), critical AORs, states and units are discussed. Tags, Limits and Qualities (TLQs) are covered, including tag types, general tagging functionality and the options for customizing TLQs. Advanced SCADA features such as alternate data sources, seasonal and dynamic limits and programmable SCADA controls are also covered.

Configuration of the alarming system is discussed, including setting up alarm groups, alarm classes and alarm help files. The ViewPoint application is also covered including acknowledging and processing alarms, alarm filtering, saving custom alarm views and querying historical alarm information.

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## S211: FEP Communications Fundamentals

**Course Name:** FEP Communications Fundamentals

**Course No:** S211

**Duration:** Two days

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Administrators, engineers, IT maintenance staff, system maintenance staff

**Prerequisites:** M101: monarch System Overview I, S130: SCADA Fundamentals

**Goal:** Understand general FEP architecture.

Learn how the FEP database is organized.

Review operational capability, user interface, database requirements, maintenance and tuning and error statistics.

**Synopsis:**

This course shows students how to configure FEP servers, communication channels, channel groups, serial line switches and RTUs. How to plan an optimum scanning strategy is also covered. Students set up and configure an OSIRIS™ RTU using the DNP protocol.

Adding points in FEP, the relationship between points in the SCADA and FEP databases and the available options for linking points between the two databases are discussed.

Information on tuning various FEP parameters, including channel delays, RTU delays and failure limits are also discussed. Options for diagnosing FEP problems including using the FEP statistics and the FEP protocol analyzer displays.

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## S212: ICCP Communications Fundamentals

**Course Name:** ICCP Communications Fundamentals

**Course No:** S212

**Duration:** Two days

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Administrators, engineers, IT maintenance staff, system maintenance staff

**Prerequisites:** M101: monarch System Overview I, S130: SCADA Fundamentals

**Goal:** Understand general ICCP architecture.

Learn how the ICCP database is organized.

Review operational capability, user interface, database requirements, maintenance and tuning, and error statistics.

**Synopsis:**

This course teaches students how to configure ICCP servers, transfer sets, Virtual Control Centers (VCC) and how to configure and add points to transfer sets for exchange. The relationship between the SCADA database and the ICCP database and how points are linked between the two is discussed.

Information on tuning the various ICCP parameters, configuring block transfers, quality codes and controls are discussed. Secure ICCP, ICCP Listen mode and alternative VCC are covered as licensable features.

Options for diagnosing ICCP problems and to use the ICCP error statistics are discussed. The ICCP protocol is covered in detail, including a basic ICCP overview, Block 1, Block 2, Block 4, Block 5 and so on.

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## S225: OpenHIS Archiving & Report Building

**Course Name:** OpenHIS Archiving & Report Building

**Course No:** S225

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Administrators, engineers, IT maintenance staff, system maintenance staff

**Prerequisites:** M101: monarch System Overview I, S130: SCADA Fundamentals

**Goal:** Learn the process for using OpenHIS to archive data.

Gain an understanding of the processes and RDBMS tables used by OpenHIS.

Learn how to build reports in Microsoft Excel and Advanced Tabulars to display OpenHIS data.

**Synopsis:**

The OpenHIS architecture and its relationship to RDBMS is covered including how OpenHIS writes data to the RDBMS, the structure of the RDBMS tables and how those tables are dynamically generated. The default OpenHIS archive groups for SCADA data, Alarms and SOE archival are discussed. Database replication and synchronization is also covered.

How to create SQL (Structured Query Language) commands and how to use them in retrieving information is covered. Students will create several reports containing historical data using Excel, Voyager tabulars and Advanced Tabulars.

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## S235: CHRONUS 3 Administration

**Course Name:** CHRONUS 3 Administration

**Course No:** S235

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Administrators, engineers, IT maintenance staff, system maintenance staff

**Prerequisites:** M101: monarch System Overview I, S130: SCADA Fundamentals

**Goal:** Gain an understanding of the process for using CHRONUS to archive data.

**Synopsis:**

Students learn how to configure CHRONUS to define collection sets, assign points to collection sets and define rules for collections. How to administer a CHRONUS system is also covered.

Topics covered in this course include:

- Overview of CHRONUS
- System capabilities
- Archival process
- CHRONUS processes
- HSH Manager
- System Configuration
- Collectors/Importers
- CDS Types
- Query Servers
- Historical Plugins
- Configuring Point Archival
- HSH Monitor
- Data Import
- HRS Importer
- Flat File Importer
- Cassandra Overview

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## S236: CHRONUS 4 Administration

**Course Name:** CHRONUS 4 Administration

**Course No:** S236

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Administrators, engineers, IT maintenance staff, system maintenance staff

**Prerequisites:** M101: monarch System Overview I, S130: SCADA Fundamentals

**Goal:** Gain an understanding of the process for using CHRONUS to archive data.

**Synopsis:**

Students learn how to configure CHRONUS to define collection sets, assign points to collection sets and define rules for collections. How to administer a CHRONUS system is also covered.

Topics covered in this course include:

- Overview of CHRONUS
- System capabilities
- Archival process
- CHRONUS processes
- HSH Manager
- System Configuration
- Collectors/Importers
- CDS Types
- Query Servers
- Historical Plugins
- HSH Administration Console
- Data Collection with DBMS Collector
- UID Management
- Rename stream and stream group UID
- Delete stream and stream group UID
- HSH Monitor
- Data Import
- HRS Importer
- Flat File Importer
- Cassandra Overview

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## S250: System Administration Fundamentals

**Course Name:** System Administration Fundamentals

**Course No:** S250

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, IT maintenance staff, system maintenance staff

**Prerequisites:** M101: monarch System Overview I, M102: monarch System Overview II, S130: SCADA Fundamentals

**Goal:** Learn how to perform basic system administration.

Understand how to monitor your system and perform failovers using Site Manager™.

Understand how to manage users, consoles, permissions and settings using System Configuration Manager™ (SCM).

**Synopsis:**

An overview of the configuration and administration of a monarch system. Administration topics covered include using OSI System Monitor to monitor the status of servers and other network devices, installing the OpenView client on workstations and the process for performing server and site failovers.

Additional configuration topics covered:

- OSI file directory structure and environment
- System setup, configuration and processes
- Using Site Manager to monitor processes and perform failovers

Administering the system with SCM is also covered. The process of setting up new users and consoles in OpenView is discussed. Other topics covered include configuring permissions for users and workstations as well as modifying product settings and configuration files.

Additional SCM topics covered include:

- Configuration and management of users, consoles and groups
- Permission and setting inheritance
- Working with configuration files
- Reporting options in SCM

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## S252: Database Maintenance Fundamentals: Data Explorer

**Course Name:** Database Maintenance Fundamentals: Data Explorer

**Course No:** S252

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, IT maintenance staff, system maintenance staff

**Prerequisites:** M101: monarch System Overview I, M102: monarch System Overview II

**Goal:** Understand database maintenance processes using the DataExplorer consolidated tools for editing and committing monarch database changes.

**Synopsis:**

An overview of performing database maintenance in the DataExplorer application. Maintaining databases in a multi-user environment is covered including committing changes, synchronizing databases across multiple monarch domains/systems as well as how to perform a roll back to undo changes in the event of a potential problem. Using Maintenance Center is also covered.

Additional DataExplorer topics covered include:

- Checking and locking records for editing
- Editing and finalizing modifications and implementing changes
- Organizing data in a customized format outside the standard database structure for streamlined editing
- Committing changes to production and development systems using the Rollout Wizard
- Task configuration and how to use tasks to perform various aspects of database maintenance across the system
- Permissions management for designating user authority for editing, change management, commitment and rollouts

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## S253: Database Maintenance Fundamentals: Maintenance Center

**Course Name:** Database Maintenance Fundamentals: Maintenance Center

**Course No:** S253

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, IT maintenance staff, system maintenance staff

**Prerequisites:** M101: monarch System Overview I, M102: monarch System Overview II

**Goal:** Understand the database maintenance process using the DataExplorer plugin for editing and the Maintenance Center application to commit changes.

**Synopsis:**

An overview of performing database maintenance in the Maintenance Center application. Maintaining databases in a multi-user environment is covered including committing changes, synchronizing databases across multiple monarch domains/systems as well as how to perform a roll back to undo changes if necessary. Using the DataExplorer plugin to make database edits is also covered.

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## S261: Calculation Development Fundamentals

**Course Name:** Calculation Development Fundamentals

**Course No:** S261

**Duration:** Two days

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, IT maintenance staff, system maintenance staff

**Prerequisites:** M101: monarch System Overview I, S130: SCADA Fundamentals

**Goal:** Understand how to develop custom calculations in monarch.

**Synopsis:**

This course is an introduction to the OpenCalc™ subsystem. Students learn how to create their own calculations using the OpenCalc language. The structure of a calculation is discussed including how to set the period, priority and type of a calculation. Interacting with your calculations both within and outside of OpenView is covered such as compiling and running calculations. The options for troubleshooting calculations are talked about including the log files created by OpenCalc and user-created log files. Calc formulas are also discussed.

The OpenCalc programming language is covered in detail. Many of the built-in functions are discussed and example calculations are shown to demonstrate how to use the built-in functions in calculations. The examples cover topics such as reading and writing data from monarch databases, issuing alarms and controls and using the various built-in electrical functions in a calculation. Options for propagating quality codes on SCADA points used in calculations is also discussed.

Students write several calculations to become familiar with creating, compiling and troubleshooting their own calculations. Sample calculations include calculations that run with a defined period as well as calculations that run on-demand through user input such as clicking a button on a display.

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## S262: Custom monarch Databases

**Course Name:** Custom monarch Databases

**Course No:** S262

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, IT maintenance staff, system maintenance staff.

**Prerequisites:** M101: monarch System Overview I, S130: SCADA Fundamentals, S261: Calculation Development Fundamentals

**Goal:** Understand the structure of a database schema file.  
Understand the process of creating a monarch database.  
Learn the methods for accessing a database within a calculation.

**Synopsis**

This course covers the creation of custom monarch databases and custom OpenCalc applications. The definition or schema file for a database is discussed in detail. The structure of the schema file, the data types available and the rules for proper data alignment in a database are covered in detail. The process of creating and configuring monarch databases is also discussed.

Students create a custom database and configure the database to be used in the monarch system. They then create a new display to present the information in the database and create calculations that access and modify the information in the database.

This course is intended for anyone interested in creating their own databases in the monarch system as well as anyone interested in creating custom applications using OpenCalc.

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## S270: Load Shed & Restoration

**Course Name:** Load Shed & Restoration

**Course No:** S270

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, IT maintenance staff, system maintenance staff, operators

**Prerequisites:** M101: monarch System Overview I, S130: SCADA Fundamentals

**Goal:** Gain an understanding of OSI's Load Shed and Restoration (OpenLSR™) product, and its configuration, administration and operation.

**Synopsis:**

Students receive an in-depth review of OpenLSR functionality and architecture as it relates to SCADA and other functions.

This course includes information on configuring OpenLSR and creating new load shed groups and load shed blocks. Database parameters and configurations are discussed. Students learn how the block load shedding and rotational load shedding operate. Students also learn about frequency-based load shedding. Interactions of OpenLSR and SCADA are to be covered in-depth. Students also learn how to implement an effective load shed strategy and how to build and verify the OpenLSR database tables. Underfrequency load shedding is also covered in detail.

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## S280: SOM Planner

**Course Name:** SOM Planner

**Course No:** S280

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, IT maintenance staff, system maintenance staff, operators

**Prerequisites:** M101: monarch System Overview I

**Goal:** Gain an understanding of OSI's Switch Order Management (SOM Planner™) product and its configuration, administration and operation.

**Synopsis:**

In this course, students receive an in-depth review of SOM Planner functionality and architecture as it relates to SCADA, eMap and other functions. The first half of this class focuses on an end-to-end use case starting from a request through the execution of a switch order. The second half focuses on how to configure each part of requests, switch orders and switch order steps.

- Reviewing active requests for work, active switch orders, changes to switch orders and workflow history for a switch order
- Submitting a request for work, approving a request for work and auto-generating a switch order
- Creating, opening and archiving switch orders
- Adding a section header or manual step to an existing/open switch order and modifying the header data of a switch order
- Adding a step that is linked to a device from monarch (select device in OpenView and export to SOM) to an existing or new switch order
- Adding a reverse set of steps or reordering steps in a switch order
- Executing a switch order in real time, simulating a switch order in study mode and reviewing results
- Associating, issuing and releasing a permit (safety document) to a switching order
- Adding a tag operation to a device that is already in the switch order
- Recording steps in study mode and adding to a new or existing switch order
- Exporting switching steps from FLISR
- Jump from a switch order document step to a display in OpenView, or from an OpenView tag to a switch order
- Configuring Custom Fields, Tables and Page Layouts
- Configuring calendar templates
- Configuring request and switch order workflows
- Configuring step common verbiage rules and multi-step templates
- Configuring permits and crews

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## S302: Advanced Display Building – Tabulars

**Course Name:** Advanced Display Building – Tabulars

**Course No:** S302

**Duration:** Two days

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Administrators, engineers, IT maintenance staff, managers, display maintenance staff, operators responsible for display building

**Prerequisites:** M101: monarch System Overview I, S112: Tabular Display Fundamentals

**Goal:** Learn some of the more advanced features available in Advanced Tabulars displays.

**Synopsis:**

This course shows you how to build complex displays using Advanced Tabulars. Students will learn more about using virtual and calculated fields within a display as well as using parameters to control the behavior of displays.

Building historical reports within Advanced Tabulars is also discussed. Reports using both CHRONUS and OpenHIS data will be created.

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# Generation Courses

## G100: Generation Operator Training

**Course Name:** Generation Operator Training

**Course No:** G100

**Duration:** One day per session

**Course Format:** Classroom, Webcast

**NERC CE Credits:** 8.0

**Who Should Attend:**

Operators, dispatcher, operations staff, maintenance support staff, trainers

**Prerequisites:** S100: SCADA Operator Training

**Goal:** Provide end users of the system an operational understanding of the OSI generation applications. The course is targeted for operators of these applications.

**Synopsis:**

An in-depth review of the operational aspects of the OSI system as it relates to operators and end users. The course covers generation management topics.

Generation-specific topics:

- Introduction to OpenAGC™
- Area Control Error (ACE)
- Unit control modes
- Unit limits
- Regulation factor
- Inadvertent interchange
- Time error correction

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# G201: Automatic Generation Control

**Course Name:** Automatic Generation Control

**Course No:** G201

**Duration:** Two days

**Course Format:** Classroom, Webcast

**NERC CE Credits:** 16.0

**Who Should Attend:**

Engineers, generation operators, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, S130: SCADA Fundamentals

**Goal:** Gain an understanding of OSI's Automatic Generation Control (OpenAGC) function, and its configuration, administration and operation.

**Synopsis:**

This course is an in-depth review of OpenAGC. It covers operational capability, theory of operation and algorithms, user interface, database requirements, maintenance, tuning, backup, recovery, performance, system interfaces, SCADA and other system modules.

In-depth course topics include:

- OpenAGC overview
- OpenAGC inputs and outputs
- OpenAGC user interface
- OpenAGC functions/features
- OpenAGC architecture and interfaces
- OpenAGC setup
- OpenAGC functional operation
- Load frequency control
- ACE control error processing
- Inadvertent Interchange and Time Error Correction
- Unit Generation Dispatch and Allocation
- Unit Control Processing
- Reserve Monitoring
- Economic Dispatch
- Production Costing
- NERC Performance Monitoring (CPS1/CPS2)
- AGC Extensive Modeling
- Study Economic Dispatch (Transaction Evaluation)
- Unit tuning
- Multi-area operation

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- Jointly Owned Units (JOUs)
- AGC API training

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## G220: Transaction Management System

**Course Name:** Transaction Management System

**Course No:** G220

**Duration:** One Day

**Course Format:** Classroom, Webcast

**Who Should Attend:** Engineers, generation operators, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, S130: SCADA Fundamentals, G201: Automatic Generation Control

**Goal:** Gain an understanding of OSI's Transaction Management System (OpenTMS™), OpenComposite™, OpenIA™ functions, and their configuration, administration and operation.

### Synopsis:

An in-depth review of the OpenTMS functionality and operation is covered in this course.

Students learn about operational capability, user interface, database requirements, maintenance and tuning, special backup and recovery, performance characteristics, interfaces with other applications, AGC and other system modules.

In-depth course topics include:

- OpenTMS overview
- OpenTMS inputs and outputs
- OpenTMS user interface
- OpenTMS functions/features
- OpenTMS architecture and interfaces
- OpenTMS setup
- OpenTMS functional operation
- Multi-party transactions
- Hourly, sub-hourly schedules
- Reading external schedules from ASCII
- AGC Schedule Composite
- Schedule templates
- Historical schedules
- RDBMS archival
- Inadvertent interchange accounting and reporting

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## G231: Real-time Generation Control – MISO

**Course Name:** Real-time Generation Control – MISO

**Course No:** G231

**Duration:** Half day

**Course Format:** Classroom, Webcast

**Who Should Attend:** Engineers, generation operators, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, G201: Automatic Generation Control

**Goal:** Gain an understanding of OSI's Market Operation System (OpenMOS™), Energy Control Algorithm (OpenECA™) and Automatic Generation Control (OpenAGC) function, configuration, administration and operation for the MISO market.

### Synopsis:

Students receive an in-depth review of OpenMOS, OpenECA and OpenAGC functionality pertaining to MISO. The course covers operational capability, user interface, database requirements, maintenance and tuning, special backup and recovery, performance characteristics, interfaces with other applications and system modules.

In-depth course topics include:

- OpenMOS overview including functions/features and configuration
- OpenMOS user interface and architecture
- OpenMOS interface with MISO market
- Interaction between OpenECA, OpenMOS and OpenAGC
- OpenECA configuration
- MISO displays in OpenECA and OpenAGC
- Unit Start/Stop dispatches
- OpenAGC MISO configuration
- Unit dispatch in MISO
- Unit status including effective unit status
- XML versus ICCP basepoint and control
- EDEF calculations

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## G232: Real-time Generation Control – ERCOT

**Course Name:** Real-time Generation Control – ERCOT

**Course No:** G232

**Duration:** Half Day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, generation operators, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, G201: Automatic Generation Control

**Goal:** Gain an understanding of OSI's Market Operation System (OpenMOS) Energy Market Control Algorithm (OpenECA) and Automatic Generation Control (OpenAGC) function, configuration, administration and operation for the ERCOT market.

**Synopsis:**

Students receive an in-depth review of OpenMOS, OpenECA and OpenAGC functionality pertaining to ERCOT. This course covers operational capability, user interface, database requirements, maintenance and tuning, special backup and recovery, performance characteristics, interfaces with other applications and system modules.

In-depth course topics include:

- ERCOT Terminology
- OpenMOS overview, functional description and interfaces
- OpenMOS client and operations
- OpenECA overview and interface with ERCOT market
- OpenECA configuration
- Resource status
- Unit configuration
- Combined cycle
- Renewable/battery resources
- OpenECA and OpenMOS interaction
- Current Operation Plan (COP)
- Unit Resource Status
- Ancillary Service dispatch
- Quick Start Generation Resources (QSGR)
- Unit participation factors (for fast, normal regulation and RRS)
- Handling of Market Ancillary Service notifications
- Generation Resource/Controllable Load Energy Deployment Performance (GREDP/CLREDP)

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## G233: Real-time Generation Control – SPP

**Course Name:** Real-time Generation Control – SPP

**Course No:** G233

**Duration:** Half day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, generation operators, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, G201: Automatic Generation Control

**Goal:** Gain an understanding of OSI's Market Operation System (OpenMOS), Energy Market Control Algorithm (OpenECA) and Automatic Generation Control (OpenAGC) function, configuration, administration and operation for the SPP Marketplace.

**Synopsis:**

Students receive an in-depth review of OpenMOS, OpenECA and OpenAGC functionality pertaining to SPP. This course covers operational capability, user interface, database requirements, maintenance and tuning, special backup and recovery, performance characteristics, interfaces with other applications and system modules.

In-depth course topics include:

- OpenAGC, OpenMOS and OpenECA overview
- Interaction between OpenAGC, OpenMOS and OpenECA
- OpenMOS SPP Notifications
- OpenMOS SPP commitment dashboard
- OpenECA configuration
- SPP displays in OpenECA and OpenAGC
- OpenAGC SPP unit configuration
- XML versus ICCP basepoint and control
- Resource Control Status, Effective Resource Status and Override
- Unit Dispatch in SPP
- Unit Ancillary Service dispatch in SPP

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## G234: Real-time Generation Control – PJM

**Course Name:** Real-time Generation Control – PJM

**Course No:** G234

**Duration:** Half day

**Course Format:** Classroom, Webcast

**Who Should Attend:** Engineers, generation operators, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, G201: Automatic Generation Control

**Goal:** Gain an understanding of OSI's Market Operation System (MOSPJM) Energy Market Control Algorithm (OpenECA) and Automatic Generation Control (OpenAGC) functions, configuration, administration and operation for the PJM market.

### Synopsis:

Students receive an in-depth review of MOSPJM, OpenECA and OpenAGC functionality pertaining to PJM. This course covers operational capability, user interface, database requirements, maintenance and tuning, special backup and recovery, performance characteristics and interfaces with other applications and systems.

In-depth course topics include:

- PJM interfaces and terminology
- MOSPJM overview, functional description, client and operations
- OpenECA overview and interface with PJM market
- MOSPJM, OpenECA and OpenAGC interaction and data flow
- OpenECA configuration for the PJM market
- Fleet definition, configuration and details
- Regulation A and D incoming data, calculations and outgoing data
- Total, current regulation calculations including regulation allocation
- Spinning Reserve (SR) event request, handling and monitoring
- Instantaneous Reserve Check (IRC) calculations
- Regulation Performance Score
- Unit Dispatch basepoint
- Simultaneous regulation A and D handling
- Multiple fleet definitions
- Fleet summary and unit details

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## G235: Real-time Generation Control – CAISO

**Course Name:** Real-time Generation Control - CAISO

**Course No:** G235

**Duration:** Half Day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, generation operators, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, G201: Automatic Generation Control

**Goal:** Gain an understanding of OSI's Market Operation System (OpenMOS), Energy Control Algorithm (OpenECA) and Automatic Generation Control (OpenAGC) function, configuration, administration and operation for the CAISO market.

**Synopsis:**

An in-depth review of OpenMOS, OpenECA and OpenAGC functionality pertaining to CAISO. The course covers operational capability, user interface, database requirements, maintenance and tuning, special backup and recovery, performance characteristics, interfaces with other applications and system modules.

In-depth course topics include:

- CAISO terminology
- OpenMOS overview including functions/features and configuration
- OpenMOS user interface, architecture and interface with CAISO market
- Interaction between OpenECA, OpenMOS and OpenAGC
- OpenECA CAISO configuration for EIM and non-EIM resources
- CAISO displays in OpenECA
- Unit Start/Stop dispatches
- Handling of Unit ADS dispatches from CAISO
- Handling of inter-tie resource for CAISO EIM
- Modeling Dynamic Schedules for CAISO EIM
- Options to control Dispatch Operating Target, Dispatch Operating Point or Base Schedule
- Unit Performance Tracking
- OpenAGC configuration for CAISO EIM

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## G310: Forecast

**Course Name:** Forecast

**Course No:** G310

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:** Engineers, operators, applications maintenance staff

**Prerequisites:** None

**Goal:** Gain an understanding of OSI's Forecast™ product and its configuration, administration and operation.

### Synopsis:

An in-depth review of the Forecast functionality and operation.

The course covers operational capability and benefit, theory of operation and algorithms, user interface, database requirements, maintenance and tuning, special backup and recovery, performance characteristics, interfaces with other applications, SCADA and other system modules.

In-depth course topics include:

- Overview
- Inputs and outputs
- User interface
- Functions/features
- Architecture and interfaces
- Setup / configuration
- Functional operation
- Historical weather / loads / Renewable resource generation
- Regression Algorithm
- Neural-Network Algorithm including configuration / training
- Forecast analysis
- Plan load and generation schedules
- Auto forecast

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## G320: Unit Commitment

**Course Name:** Unit Commitment  
**Course No:** G320  
**Duration:** One day  
**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, generation operators, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I; G201: Automatic Generation Control

**Goal:** Gain an understanding of OSI's Unit Commitment (OpenUC™) function, its configuration, administration and operation.

**Synopsis:**

Students receive an in-depth review of OpenUC functionality. The course covers operational capability and benefit, theory of operation and algorithms, user interface, database requirements, maintenance and tuning, special backup and recovery, performance characteristics, interfaces with other applications, AGC and other system modules.

In-depth course topics include:

- OpenUC overview
- OpenUC inputs and outputs
- OpenUC user interface
- OpenUC functions/features
- OpenUC architecture and interfaces
- OpenUC setup
- OpenUC functional operation
- Transaction Evaluation
- Priority-based algorithm
- Dynamic programming algorithm
- Mixed Integer Linear Programming (MILP) algorithm
- Hybrid algorithm
- Save cases

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## G330: Economic Dispatch

**Course Name:** Economic Dispatch

**Course No:** G330

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, generation operators, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, G201: Automatic Generation Control

**Goal:** Gain an understanding of OSI's Economic Dispatch function (in OpenAGC) and its configuration, data modeling, administration and operation.

**Synopsis:**

This course is an in-depth review of Economic Dispatch function in OpenAGC. It covers theory of operation and algorithms, unit costs and fuel data modeling, operational features, user interfaces, database requirements, maintenance and tuning, production costing, interfaces with other application and system modules.

In-depth course topics include:

- Economic Dispatch overview, functions/features
- Definitions and terminology
- Unit input/output curve
- Deriving Incremental Heat Rate (IHR) curve
- Modeling Incremental Heat Rate curve
- Configuring fuel types and prices
- Fuel data modeling including fuel mixing and fuel switching
- Emission cost curves modeling
- Operation and Maintenance (O&M) cost modeling
- Understanding Incremental Cost curve
- Equal Lambda Dispatch algorithm
- Economic Dispatch modes/configuration parameters
- System lambda and production cost calculations
- Economic Dispatch displays
- Transmission Constrained Dispatch (TCD)
- Interaction with AGC function
- Study Economic Dispatch
- Demand Dispatch
- Production Cost feature
- Incremental Heat Rate Curve API

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# Transmission Courses

## T100: Transmission Operator Training

**Course Name:** Transmission Operator Training

**Course No:** T100

**Duration:** One day per session

**Course Format:** Classroom, Webcast

**NERC CE Credits:** 6.0 for OpenNet, 2.0 for Switch Order Management

**Who Should Attend:**

Operators, dispatcher, operations staff, maintenance support staff, trainers

**Prerequisites:** S100: SCADA Operator Training

**Goal:** Provide end users of the system an operational understanding of the OSI Transmission applications. The course is targeted for operators of these applications.

**Synopsis:**

An in-depth review of the operational aspects of the OSI system as it relates to operators and end users. The course covers transmission management system topics.

Transmission specific topics:

- Introduction to OpenNet
- Network Topology Processor
- Power Flow
- State Estimator
- Study operation
- Save Case management
- Profiles
- Real-time Sequence

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# T201: Network Analysis

**Course Name:** Network Analysis  
**Course No:** T201  
**Duration:** Five days  
**Course Format:** Classroom, Webcast  
**NERC CE Credits:** 18.0

**Who Should Attend:**

Engineers, transmission operators, operations planners, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I

**Goal:** Gain an understanding of OSI's Network Analysis (OpenNet™) function, and its configuration, administration and operation.

**Synopsis:**

Students receive an in-depth review of OpenNet functionality and operation. The course covers operational capability and benefit, theory of operation and algorithms, user interface, database requirements, maintenance and tuning, upgrade and installation, performance characteristics, interfaces with other applications including SCADA and other system modules.

In-depth course topics include:

- OpenNet overview and user interface
- OpenNet inputs and outputs
- OpenNet reports, troubleshooting and tuning
- OpenNet functions/features
- OpenNet architecture and interfaces
- OpenNet setup and functional operation
- OpenNet data import and export
- Power system modeling
- Topology Processor
- Power Flow
- State Estimator including observability analysis, bad data detection and measurement error analysis
- Profiles
- Contingency Analysis and Contingency Screening
- Penalty factors
- Real-Time Sequence Control
- Short Circuit Analysis
- Available Transfer Capacity
- Conditional Action Schemes
- Sensitivity Analysis

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- Optimal Power Flow
- SCADA Interface
- Study Mode Operations
- Save cases

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## T202: Network Model Graphical Editor

**Course Name:** Network Model Graphical Editor

**Course No:** T202

**Duration:** Two days

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, operations planners, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, T201: Network Analysis

**Goal:** Viewing, editing and maintenance of power system network data in either a tree or graphical one-line view in CIM model editor (CIM Studio™).

**Synopsis:**

Students receive an in-depth review of CIM Studio features, functionality and operation. Students learn how to use a standalone CIM “sandbox” to edit/maintain and manipulate power system network model data in a CIM format. Students will also learn how to install and configure CIM Studio.

In-depth course topics include:

- Introduction to CIM model
- CIM Studio overview
- User interface and configuration
- Editor for Common Information Model (CIM) data
- Graphical editor for creating one-lines related to CIM data
- Auditing and error logging
- Model maintenance for monarch databases including bi-directional model transfer between CIM and monarch
- Revision control

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## T221: Voltage Stability Analysis

**Course Name:** Voltage Stability Analysis

**Course No:** T221

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, transmission operators, operations planners, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, T201: Network Analysis

**Goal:** Gain an understanding of OSI's Voltage Stability Analysis (OpenVSA™) function, and its configuration, administration and operation.

**Synopsis:**

Students receive an in-depth review of OpenVSA functionality and operation. Students learn how to determine system voltage stability margins and identify potential voltage instability problems in both real time and study mode. Students will also learn how to install and configure OpenVSA.

In-depth course topics include:

- Introduction to stability analysis
- OpenVSA overview
- OpenVSA features
- User interface and configuration
- Identification of loading regions and generation compensation
- Continuation Power Flow set up and tuning
- Plotting and data analysis
- Introduction to study mode and control devices
- Study mode functions
- Power Flow control flags

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## T222: Transient Stability Analysis

**Course Name:** Transient Stability Analysis

**Course No:** T222

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, transmission operators, operations planners, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, T201: Network Analysis

**Goal:** Gain an understanding of OSI's Transient Stability Analysis (OpenTSA™) function, and its configuration, administration and operation.

**Synopsis:**

Students receive an in-depth review of OpenTSA functionality and operation. Students learn to study and monitor the overall dynamic security of an electrical generation and transmission system. Students evaluate a designated set of power system events against both base case and contingent state and will be able to provide an indication of those that could cause generators to lose synchronism and separate from the system or cause undamped low-frequency oscillations.

In-depth course topics include:

- Introduction to transient stability analysis
- OpenTSA overview
- User interface and configuration
- Modeling
- Configuring scenarios
- Configuring a fault event
- Running analysis
- Running a simple scenario
- Scenario screening
- Pausing and resuming a scenario
- Viewing results
- Plotting result data

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# T301: Operator Training Simulator

**Course Name:** Operator Training Simulator

**Course No:** T301

**Duration:** Three days

**Course Format:** Classroom, Webcast

## Who Should Attend:

Engineers, power system engineers responsible for OTS modelling, setup and troubleshooting, transmission operators, operations planners, operators responsible for conducting OTS training, applications maintenance staff who will be responsible for a network model and OTS database maintenance.

**Prerequisites:** M101: monarch System Overview I, T201: Network Analysis (Highly recommended for operators who will conduct OTS training.)

**Goal:** Gain an understanding of OSI's Operator Training Simulator (OpenOTS™) function, and its configuration, administration and operation

## Synopsis:

An in-depth review of OpenOTS functionality and operation. The course covers operational capability and benefit, theory of operation and algorithms, instructor user interface, database requirements, maintenance and tuning, upgrade and installation, performance characteristics, interfaces with other applications, SCADA and other system modules.

In-depth course topics include:

- OpenOTS overview (simulation and training modes), purpose, usage and user interface
- OpenOTS key features/components
- OpenOTS inputs and outputs
- OpenOTS software functions/features
- OpenOTS architecture and interfaces
- OpenOTS setup and functional operation
- OTS steady state initialization
- Power system modeling
- Generator and frequency modeling
- Black start and islanding simulation
- Relay modeling
- EAGC modeling
- Load modeling
- Scenario building
- Simulation control
- Event generation and processing
- Control center modeling

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- Automatic generation control interface
- SCADA interface
- Save cases

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# Distribution Courses

## D100: Distribution Operator Training

**Course Name:** Distribution Operator Training

**Course No:** D100

**Duration:** 1 Day per session

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Operators, dispatcher, operations staff, maintenance support staff, trainers

**Prerequisites:** S100: SCADA Operator Training

**Goal:** Provide end users of the system an operational understanding of the OSI Distribution applications. The course is targeted for operators of these applications.

**Synopsis:**

An in-depth review of the operational aspects of the OSI system as it relates to operators and end users. The course covers distribution management topics.

Distribution-specific topics:

- Introduction to Spectra™
- Network Model/Topology Processing (Spectra eMap™)
- Distribution Power Flow (Spectra DPF™)
- Distribution State Estimator (Spectra DSE™)
- Study Mode operations
- Save Case management
- Power factor/voltage level management (Spectra VVC™)
- Planning and emergency switches (Spectra FLISR™ & Spectra FR™)
- Power outage/switch rotation management (Electra OMS™)

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## D201: Electronic Mapping

**Course Name:** Electronic Mapping  
**Course No:** D201  
**Duration:** One day  
**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, distribution operators, operations planners, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I

**Goal:** Gain an understanding of Spectra eMap.

**Synopsis:**

Students receive a high-level overview of Spectra as well as an in-depth review of Spectra eMap functionality and operation.

In-depth course topics include:

- eMap tabular displays
- eMap geographical displays
- Network model: Three-phase connectivity model, model build process, model validation process, installed vs. proposed model, distribution topology processing (DTP), DTP execution, Study Mode DTP and Spectra advanced applications
- Controls and tagging: Operations dialog, SCADA control, manual entry, tagging and study mode operations
- Tracing: Upstream/downstream tracing, interconnect tracing, trace statistics and clearing a trace
- Temporary conditions: Line cuts, jumpers, switches, sources and loads, ground and study mode temporary conditions
- ATO simulation: Main-main ATO, main-tie ATO, real-time simulation and study mode simulation
- Spectra Insight™: Violations and events
- Model update process: Full GIS import, incremental import, and model update process automation

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## D210: Distribution Power Flow

**Course Name:** Distribution Power Flow

**Course No:** D210

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, distribution operators, operations planners, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, D201: Electronic Mapping

**Goal:** Gain an understanding of Spectra DPF.

**Synopsis:**

Students will receive an in-depth review of Spectra DPF. This application performs a full ABC-domain calculation of the voltage, current and power flow in a distribution network based on the current topology, voltage at the substation source nodes and telemetered or estimated load injections. It is useful for estimating the state of the network where little or no telemetry exists and serves as an important network analysis support component for other Spectra applications.

In-depth course topics include:

- Goals of DPF
- DPF inputs: Direct, telemetry inputs, DTP and load allocation
- Controlling DPF in real time and study mode
- DPF detailed results: DPF devices – all, DPF devices – specific and DPF detail – feeder
- Load allocation: Running LA, using load forecasting data, and using nominal values
- Local regulation simulation: Tap changing regulation and capacitor regulation.
- Debug logging

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## D220: Feeder Reconfiguration

**Course Name:** Feeder Reconfiguration

**Course No:** D220

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, distribution operators, operations planners, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, D201: Electronic Mapping, D210: Distribution Power Flow

**Goal:** Gain an understanding of Spectra FR.

**Synopsis:**

Students receive an in-depth review of Spectra FR. This application can help you relieve loading problems, improve voltage levels, reduce system losses, and balance or reduce loading on equipment.

In-depth course topics include:

- Goals of FR
- FR results: Solution types, switching steps and solution detail logs.
- Influencing FR results: Constraints, component objectives, composite objective score, working model and available switches.
- Loading Violation Remediation (LVR): LVR operational flow, discovering the issue, finding an LVR solution and resolving the loading violation issue.
- Voltage Violation Remediation (VVR): VVR operational flow, discovering the issue, finding a VVR solution and resolving the voltage violation issue.
- Load Balancing (LB): LB operational flow, discovering the issue, finding a LB solution and resolving the load balance situation.
- Optimization (OPT): OPT operational flow, discovering the issue, finding an OPT solution and improving the system performance situation.
- Equipment Loading Reduction (EQL): EQL operational flow, discovering the issue, finding an EQL Solution and resolving the equipment loading issue.
- Fine-tuning Spectra FR solutions
- Automatic execution

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## D230: Voltage/VAR Control and Conservation Voltage Reduction

**Course Name:** Voltage/VAR Control and Conservation Voltage Reduction

**Course No:** D230

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, distribution operators, operations planners, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, D201: Electronic Mapping, D210: Distribution Power Flow

**Goal:** Gain an understanding of Spectra VVC.

**Synopsis:**

Students receive an in-depth review of Spectra VVC. This application monitors distribution system voltage levels and reactive power flows to determine and execute capacitor bank, voltage regulator and LTC control actions for improved system performance.

In-depth course topics include:

- Goals of VVC
- Influencing VVC Results: Constrains and available controls
- Spectra Control and System VVC Summary displays
- Conservation of Voltage Reduction (CVR)
- CVR Control and Execution Summary displays
- Voltage control: VC operational flow, discovering the issue, monitoring a voltage issue if no event exists, reviewing the VVC solutions for a voltage issue, changing the VVC parameters for a voltage issue, requesting VVC to re-solve a voltage issue, implementing a VVC solution for a voltage issue, and verifying whether implementing a VVC solution has resolved the issue.
- VAR control: QC operational flow, discovering the issue, monitoring a VAR/PF issue if no event exists, reviewing the VVC solutions for a VAR/PF issue, changing the VVC parameters for a VAR/PF Issue, requesting VVC to re-solve a VAR/PF issue, implementing a VVC solution for a VAR/PF issue and verifying whether implementing a VVC solution has resolved the issue
- Conservation of Voltage Reduction (CVR): CVR On demand and CVR scheduler

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## D240: Fault Location, Isolation & System Restoration

**Course Name:** Fault Location, Isolation & System Restoration

**Course No:** D240

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, distribution operators, operations planners, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, D201: Electronic Mapping, D210: Distribution Power Flow

**Goal:** Gain an understanding of Spectra FLISR.

**Synopsis:**

Students receive an in-depth review of Spectra FLISR - OSI's solution for fault mitigation, which allows you to monitor and manage fault and source outage issues in a distributed network.

In-depth course topics include:

- FLISR user interface
- Fault detection: Types and fault detection data
- Fault location: Fault location data and fault location settings
- FLISR validate: Hierarchy, FLISR devices, running FLISR validate and understanding FLISR validate output
- Process settings
- Isolation tags
- Restoration: Tags and solution tuning
- Configuration: Setting control modes and objectives, special conditions flags and trace mask
- Configuring hotline conditions
- Spectra Insight

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## D250: Integra DERMS

**Course Name:** Integra DERMS

**Course No:** D250

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, distribution operators, operations planners, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I

**Goal:** Gain an understanding of Integra DERMS.

**Synopsis:**

Students receive a high-level overview of Integra DERMS as well as an in-depth review of its functionality and operation.

In-depth course topics include:

- Integra DERMS tabular displays
- DERMS model: Solar, wind, battery and other DERs
- DER grouping and aggregation
- Real-time estimation of DER output: Meteorological, bellwether and forecast
- Monitoring and controls: Operations dialog, SCADA measurements, SCADA control, manual entry and group controls

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## D280: Electra OMS

**Course Name:** Electra OMS

**Course No:** D280

**Duration:** Two days

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, distribution operators, operations planners, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, D201: Electronic Mapping

**Goal:** Gain an understanding of Electra OMS™.

**Synopsis:**

Students receive an in-depth review of Electra OMS - OSI's outage management solution, which allows you to manage all areas of your outage restoration processes, minimize outage response times and improve your overall system reliability.

In-depth course topics include:

- Contact/trouble call management
- Outage analysis/ETR calculation
- Crew dispatch/work management
- Planned outage management
- Storm management
- Outage reporting and notification
- OMS system configuration

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# D301: Distribution Operator Training Simulator

**Course Name:** Distribution Operator Training Simulator

**Course No:** D301

**Duration:** One day

**Course Format:** Classroom, Webcast

**Who Should Attend:**

Engineers, distribution operators, operations planners, applications maintenance staff

**Prerequisites:** M101: monarch System Overview I, S130: SCADA Fundamentals, D201: Electronic Mapping, D210: Distribution Power Flow

**Goal:** Gain an understanding of Spectra OTS™.

**Synopsis:**

Students receive an in-depth review of Spectra OTS.

In-depth course topics include:

- Running events and scenarios
- Using events: Set switch state, set reclose/ground trip state, add/remove fault, set/scale system load, set load, set capacitor/capacitor controller state, set LTC/VR tap positions, set LTC/VR controller state/set LTC/VR controller voltage and set source voltage
- Typical scenarios: Simulating storms and system blackout
- Evaluation Report: Event reporting, control reporting, alarm reporting, database change reporting and sorting and filtering
- Advanced Spectra OTS: Dynamic cycle time and remedial action schemes
- Configuration and maintenance topics

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# Quick Start Training

**Course Name:** Quick Start Training  
**Course No:** M201, M202  
**Course Level:** Intermediate  
**Duration:** Five days each  
**Course Format:** Classroom, Webcast

**Who Should Attend:**

New customers implementing fast-track small or non-complex systems without any advanced applications as well as monarch lite systems. OSI's Project Manager will recommend Quick Start training if it is appropriate for your project or training needs. This Quick Start program may be supplemented later with standard training programs if knowledge deficiency exists, or more in-depth treatment of subjects are desired.

OSI is committed to providing training options for a range of system sizes. This program is intended to provide effective training to small systems that frequently have smaller staff and other constraints. This course moves at a fast pace to cover basic functionality of the main products in two weeks; students should be prepared for a fast-learning environment. In addition, this course is not meant to prepare students for all of the features of the system. If students are interested in creating advanced calculations, report building or using advanced applications, training at the full course will be required at a later date.

**Prerequisites:** A basic understanding of the utility industry, SCADA and fundamental IT skills. Contact [OSITraining@aspentech.com](mailto:OSITraining@aspentech.com) if you are interested in this course.

**Goal:** Understand the OSI monarch system and SCADA applications. This course prepares students to begin using the basic operations of an OSI system.

**Synopsis:**

This course covers basic operations of the SCADA system and functionalities. Week One includes a system overview, basic navigation of the system, display and database editing tools, SCADA operations, alarming and RTU communications. Week Two includes calculations, display editing, system maintenance and administrative tools. All topics include hands-on exercises to gain experience with the software. Advanced features will not be covered, to allow for the maximum amount of time to be spent on hands-on activities. Some portions of the class may be assigned as independent study for students to review after course completion.

Course topics include:

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## Quick Start Week 1:

### System and User Interface Basics

- Navigating and operating the main graphical user interfaces (OpenView, SystemExplorer™ and Advanced Tabulars)
- External and internal communications hardware overview
- Interactions and functionality of core monarch system communication processes
- Fundamentals of monarch product databases including redundancy, failover, and structure
- System communications architecture related to internal system interactions between workstations, servers and databases
- Overview of monarch file system configuration

### SCADA

- SCADA operations
- SCADA points and data tables
- Alarm groups (including alarm help)
- Configuring Tags, Limits and Qualities attributes of points (TLQ)
- Alarm priorities and alarm filtering
- Areas of Responsibility assignment and management
- Responding to alarms and organizing alarms (ViewPoint)

### SCADA and OpenFEP™

- Data collection and organization through communications and supervisory control and data acquisition software (OpenFEP and OpenSCADA)
- Methodologies of linking and validating telemetered points between RTUs, FEP and SCADA.
- Communications Products
- Features and tools of monarch communication products (OpenFEP and OpenICCP)
- Configuring communications channels and RTUs
- Capturing point data from RTUs and transferring data to user-readable values and viewable format
- Setting up a real-time data exchange with head-end systems (grid or markets) using an ICCP connection
- Sending controls through an ICCP connection (if applicable)
- Using available communication interface troubleshooting tools

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## Quick Start Week 2:

### Custom Calculations (OpenCalc)

- Introduction to the calculation subsystem
- Creating basic calculations
- Using built-in library functions
- Developing custom calculations
- Calc Formulas

### Historian Subjects (OpenHIS & CHRONUS)

- Configuring real-time data for archiving in OpenHIS
- Configuring real-time data for archiving in CHRONUS

### System Maintenance and Administration

- Editing and viewing data tables
- Performing database maintenance using DataExplorer
- Product specific maintenance strategies
- Configuring file replication and backup (SoftRAID)
- Redundant database and server failover topics
- Monitoring of monarch product processes
- System maintenance strategies and best practices
- System monitoring and health check processes
- Configuring users and workstations
- Setting permissions for users and workstations
- Configuring application and product settings

### Maintaining displays in Design Studio and Tabular Builder

- Building and maintaining displays including one-line diagrams and custom tabular displays
- Creating dynamic data linkages between display fields and database values
- Using graphical and visual enhancement tools to further customize displays
- Best practices and processes for display building and maintenance

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