Maximize Your Investment with Well-Trained Personnel

Emerson Educational Services
2020 Middle East and Africa Training Offering

EMERSON

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Exceed Expectations with Well-Prepared Personnel

Skilled personnel anticipate needs; they solve tough problems; they make an operation run smoothly. That's why training is the cornerstone of maximum availability, sustainability and operational excellence.

A well-trained team knows their tools and knows how to use them to meet short-term and long-term goals. Work with a partner — Emerson Educational Services can bring your entire team the expertise they need to face each challenge.

Whether your team must configure and calibrate valves, predict machinery faults or develop a control strategy, Emerson Educational Services has the coursework to prepare your team and secure these benefits:

Train and keep high-quality team members. What if you train personnel and they leave? Worse yet, what if you don't train them and they stay? Train personnel and improve not only operations, but a sense of ownership in the operation's results – a proven ingredient in employee satisfaction and retention.

Learn best practices to meet profitability goals. Emerson instructors reach deep into their decades of product experience and industry best practices. Profit from their experience to meet your business goals.

Choose a hands-on learning platform and train for real-life challenges. Emerson instructors combine hands-on training with real-life examples to prepare your personnel to find solutions in the midst of challenging situations.

Sources of Skill Shortages

- Fewer Incoming Workers
- Retiring Workforce
- Fewer Specialists
- Inexperienced Workers
- More Technology
- Larger, More Complex Processes

"32% of O & G industry survey respondents said skills shortage was among the largest threats particularly in sub-sea and LNG operations where the shortage is felt in terms of project costs and delays. This threat rated second only to economic instability at 34%."

Oil and Gas Workforce Report Published by oilcareers.com and Air Energi, March 2013

Train and Keep High-Quality Team Members

Consider Emerson training as the effective short- and long-term solution to maximize the return on your most significant investment: your employees.

Through Emerson coursework, employees obtain the knowledge they need to not only perform their jobs, but seek efficient solutions to daily issues. They will perform with a real sense of ownership and satisfaction — resulting in increased retention.

Whether you choose individual classes or a complete education program designed specifically for your organization, Emerson can be your single expert training source and offer flexibility to work within your schedules and shifts.

Your facility will benefit from these options:

- Accelerated boot camp developed for your new recruits.
- Assessments for skill gap analysis specific to your facility.
- Efficiently delivered blended learning approach.

Competency Development Program

To create a competency development program, Emerson follows a proven process that starts with Educational Services consultants leading your management team to identify items such as job-role definitions and skills gap analysis. We will also guide the team to discuss methods of assessing the training success.

A competency development program assists in attaining your unique goals

"The training exceeded my expectations. I wanted information on sizing control valves and I got that plus, much other useful information."

Operations/Production Worker in the Oil and Gas Industry

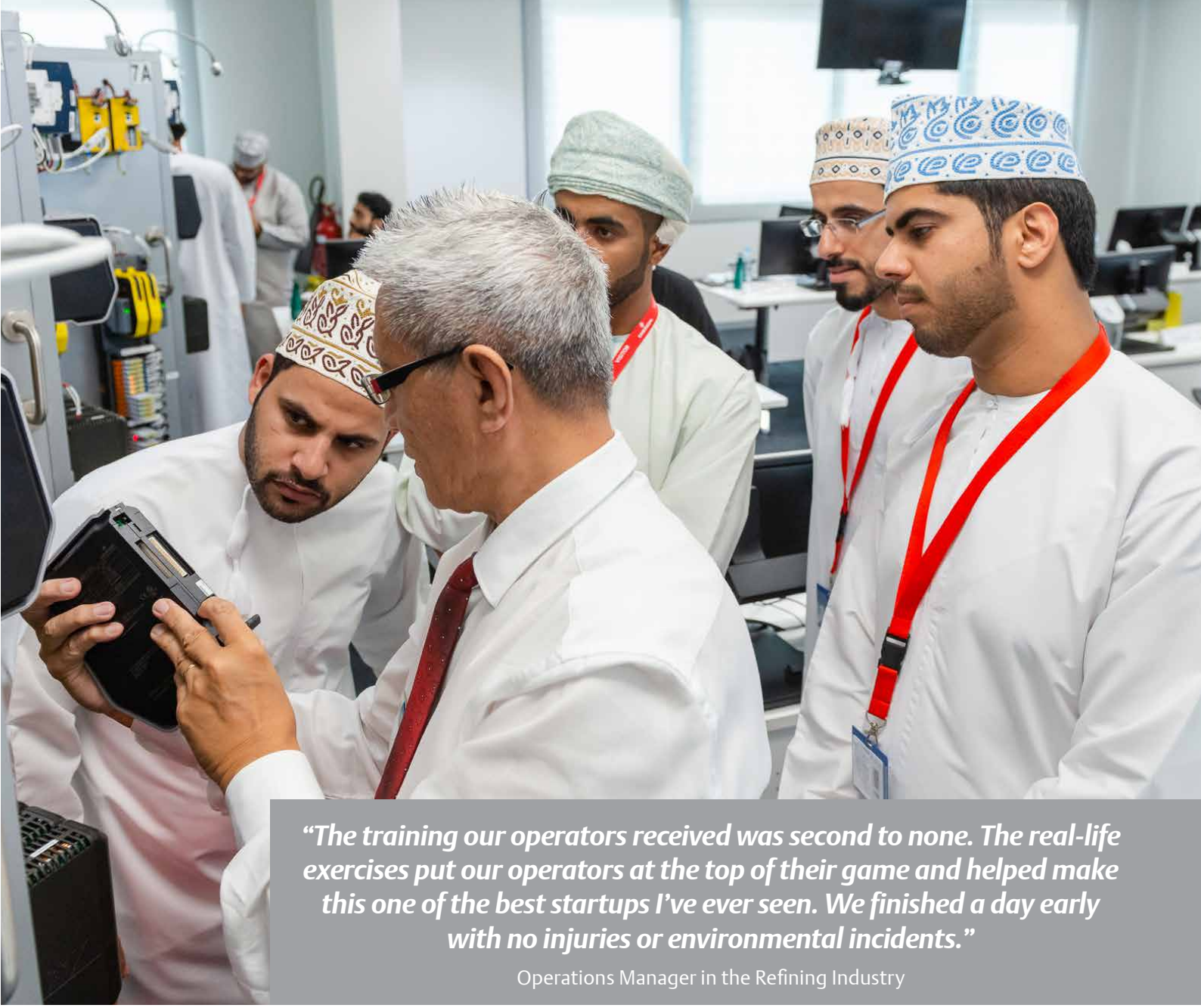
Learn Best Practices to Meet Profitability Goals

Your personnel want to perform high-quality work that shows positive results. Learning best practices, your personnel will avoid inadvertent operator errors and improper maintenance that lead to energy waste, contamination, unplanned shutdowns and off-spec product.

"The material was good. I needed the review of the PID, the instructor explained it in a way that really helped me to understand it much better that I previously did."

Maintenance Worker in the Refining Industry

With world-class training, your personnel will apply best practices to Emerson products and applications throughout your facility.



"The training our operators received was second to none. The real-life exercises put our operators at the top of their game and helped make this one of the best startups I've ever seen. We finished a day early with no injuries or environmental incidents."

Operations Manager in the Refining Industry

Increased Productivity

Emerson instructors' application expertise and practical field experience dramatically boost students' skills and performance. And evergreen training keeps your people updated on the latest technologies, enabling them to uncover new process improvements.

Broad Emerson Offerings

In developing courses and education paths, we draw from multiple disciplines: control, measurement, regulation and automation. In this way, your personnel will get the most from the Emerson products and applications at work in your operations.

IACET Authorized Provider

Emerson Educational Services has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET) Students enjoy a consistent high-quality class experience.

Choose a Hands-on Learning Platform and Train for Real-life Challenges

Learning styles vary as widely as people do. Proof shows, however, that hands-on training and experiential learning bring out questions and solidify ideas for students.

Emerson delivers comprehensive, hands-on blended training programs — including on-site instructor led, virtual, eLearning and more. Hands-on training provides practical application skills with dedicated hardware at regional training centers or locally.

Because your facility's requirements extend beyond Emerson products, we offer classes in best practices such as process control design.

"The workshop was great! I liked having the hands-on training. It is what made everything really come together."

Maintenance Worker in the Chemical Industry

Your Choice of Learning Platforms

Your Emerson training plan is designed and developed toward your objectives. For any learning situation - on-site, virtual learning or eLearning - you can choose to include facility scenarios, student testing, student scoring and reports of student progress.

"Experiential learning is a philosophy and methodology in which educators purposefully engage with students in direct experience and focused reflection in order to increase knowledge, develop skills and clarify values."

Course Types

On-site Traditional

Through our onsite training services, we provide customers a Certified Instructor, courseware literature and all the hardware associated with supporting hands-on workshops. In North America, we deliver onsite training courses sponsored through our Local Business Partners' Education Program. This allows our customers the opportunity to access our Training Courses through their local business partner.

Virtual Learning

Emerson's Virtual Classroom delivers real-time value-based Instructor-Led Training to customers' desktop with full access to software systems. Students connect directly to classroom based machines for the entire class! There is no travel required which means fewer expenses for our customers. Class takes place in a live online training room using a teleconference bridge.

eLearning

Emerson eLearning offerings are professionally developed, engaging, flexible and up to date. Emerson online learning programs provide a convenient opportunity to study about our technologies and solutions at any time. Our goal is to provide our customers a competitive advantage by empowering them with the latest knowledge in a growing range of topics.

Blended Learning

Blended Learning is a contemporary approach to training that "blends" different teaching methods and deploys them via digital and online media to maximize the effectiveness and convenience of learning. The Emerson's Blended Learning approach combines various learning methods using a variety of digital media. Blended Learning is Emerson's unique approach to delivering quality education while reducing learner time away from the facility.

Worldwide Satisfaction

Train Personnel to Be Confident. Capable. Interested. READY.

We hope you will invite Emerson to instill confidence and develop capabilities in your personnel. We will guide them to be interested in potential solutions — ready to move your facility to greater efficiency and profitability.

Whether for a new project or for ongoing operations and maintenance, Emerson provides consulting services, skills assessments and the right training solutions at the right time.

- Project consultants identify targeted business results where training solutions can improve plant operations.
- A skills assessment identifies skills gaps that can be addressed with training and prescribes the proper training solution.
- Your staff will be prepared when your project comes on line and throughout continuing operations and maintenance.

Across the world over several decades, Emerson has developed and dedicated substantial resources to training operators, engineers, technicians and maintenance personnel. We are ready for you anywhere and anytime.

TRAINING CENTERS:
Bahrain
Iraq
Qatar
Saudi Arabia
South Africa
UAE

Training centers and certified instructors in more than 40 countries.

"Course material greatly increased my understanding of control valves and will improve my ability to troubleshoot issues and design control valves when needed. I like the labs and having valve internal parts available for hands-on inspection."

Engineer in the Chemical Industry

Global Educational Services-Providing the training you need, when and where you need it.

We are pleased to provide you with our Educational Services course catalogue. Our instructor led courses and eLearning offerings are designed to help you run your plant operations with greater efficiency and productivity. Whether you are looking for specific industry application expertise or product knowledge, we have courses to help you engineer, operate, maintain and manage industrial process control devices and systems to achieve peak plant and process performance, as well as greater uptime and profitability.

Educational Services has been training personnel for over 65 years and we remain committed to providing quality training to our customers, when and where they need it. We provide training that you can count on. As an IACET accredited training organization, our certification program for instructors, courseware, and training hardware ensures you of knowledgeable and skilled trainers delivering current information on state-of-the-art equipment.

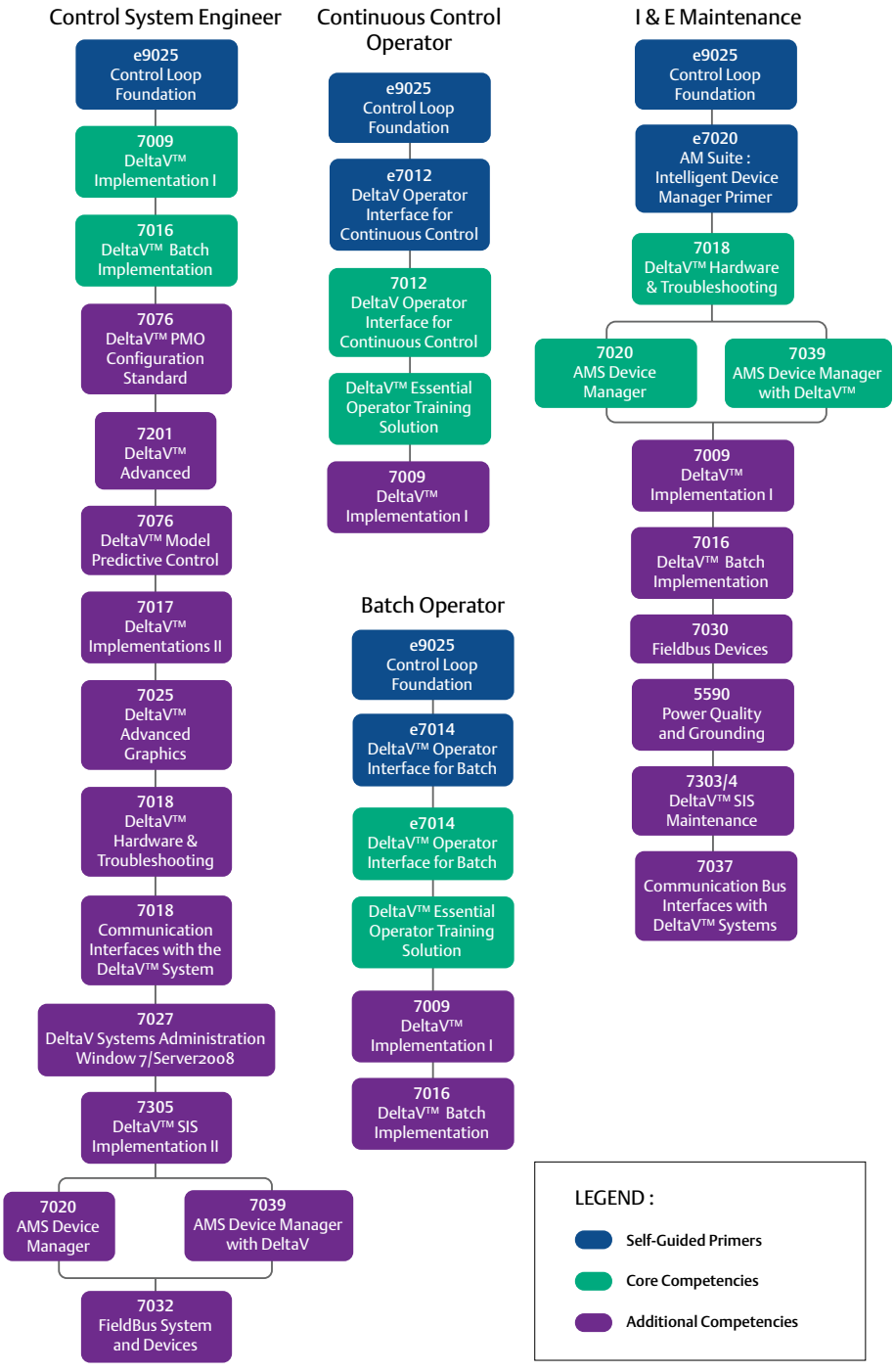
We can provide training either in one of our training centers listed in this catalogue or on-site at your premises.

In addition to this catalogue, we encourage you to use our website as a resource for announcements on new offerings, current listings of courses with locations and dates, and information on all our worldwide training centers. Please contact us for further information or assistance in helping you define the programs to best address your training needs.

We also provide customized training courses tailored to best suit your needs.

PlantWeb™ LEARNINGPATH

Emerson Automation Solutions PlantWeb digital plant architecture is today's cutting-edge automation technology, bringing together the diverse components of process control systems in a unique way to benefit end-users in many ways. This architecture is designed to take full advantage of the communications capabilities of the FOUNDATION™ fieldbus technology and its capacity for the open, continuous communication of large volumes of digital information generated by intelligent field devices. This information is accessed by the AMS Device Manager software and used for a variety of time and money-saving functions. The DeltaV™ digital automation system serves as an ideal automation system host in this environment.



Today's plant is a myriad of process control hardware and software. Everything from valves to compressors, from level measurement devices to real-time data servers, and from boilers to condensers, just operating this collection of technologies is challenging. Making them all work together at their best to produce the best product at a profit is a daunting task. It takes more than just monitoring the process to be successful. It takes optimizing the devices and the process together in the right environment with people who have a clear understanding of both.

Working in a plant for long periods of time can create "legacy thinking", where even when it is in the best interest to change, nobody can bring themselves to do so because "that's the way we've always done it." Emerson's Educational Services offerings can show how to optimize existing equipment with new methods and technology.

AMS Device Manager

Course 7020 CEUs: 2.1

Overview
Completing 3-day of AMS Device Manager hands-on instructor assisted training modules and exercises provide the quickest route to your productive use this predictive maintenance application. The training exercises focus on skills required by engineers and technicians and are based on real-world tasks that most users will encounter on the job.

7020-1 Configuring and Using AMS Device Manager
- Viewing and Modifying Devices
- Creating a Plant Database Hierarchy and Adding Devices
- Field Communicator-AMS Device Manager
- AMS Device Manager Browser Functions
- Audit Trail
- Calibrating Device - Calibration Assistant
- Configuring and Monitoring System Alerts

7020-2 System Administration
- AMS Device Manager System Overview
- Installing an AMS Device Manager Server Plus Standalone
- Starting AMS Device Manager for the 1st Time
- Network Communication Interface Setup
- AMS Device Manager Database Management
- Installing a Distributed System
- Installing Device Types from Media

This instructor assisted course is operated in a hands-on, self-paced environment which allows the student to work at their individual pace. Training can also be delivered at your plant with the help of our certified instructors. AMS Device manager modules may also be purchased for self-study which comes in three separate paper/bound modules. POA.

AMS - Intelligent Device Manager Overview

Course e7020 CEUs: .2

Audience
This course is for maintenance personnel and managers responsible for understanding the benefits of using the AMS Suite Intelligent Device Manager. This is a 2-hour (average online course with AMS Device Manager screens including interactive practice sessions, workshops, demonstrations, audio presentations and quizzes.

Topics
- Be able to identify areas that AMS Device Manager could be used to:
  - Speed-Up Start-Ups and Commissioning
  - Improve Quality and uptime
  - Reduce Costs- Both Fixed and Operating
  - Simply Safety System Use and Compliance Including Start-Ups
- Identify and Navigate the AMS Device Manager's Screens

AMS Device Manager with Rosemount HART Instruments

Course 7021 CEUs: 2.1

Learn the installation, calibration, maintenance and troubleshooting of measurement instrumentation using AMS Device Manager. The hands-on focus is on skills required by engineers, technicians or others that are new to the plant or instrument environment.

Overview
This 3-day course teaches maintenance and calibration of measurement devices using AMS Device Manager software to communicate and track information. The student will learn how pressure and temperature transmitters function are installed and calibrated using AMS Device Manager. The course uses hands-on training, labs and lecture to teach the student how to:
- Configure and use AMS Device Manager
- Correctly perform transmitter installation and setup procedures
- Properly configure SMART transmitters
- Properly calibrate transmitters
- Perform basic troubleshooting-transmitters

Topics
- Configuring and Using AMS Device Manager
- HART Communication
- SMART Transmitters (3051C, 3144P)
- Test Equipment Selection
- Transmitter Installation
- Transmitter Configuration
- Transmitter Calibration
- AMS Calibration Manager
- Intelligent Calibrators
- Transmitter Troubleshooting

Fieldbus Measurement Instruments

Course 2370 CEUs: 2.1

This course is for users that use DeltaV™ Operate Graphics.

Overview

This 3-day course covers a complete DeltaV™ system implementation. Upon completion of this course the student will be able to define system capabilities, define nodes, configure continuous and sequential control strategies, operate the system and define users and security.

Prerequisites

Windows experience. It is recommended that prospective attendees new to process control systems attend Course 7101 or 7018.

Topics

- System Overview
- Explorer
- Control Modules
- Control Studio
- Motor Control
- Regulatory Control
- Workspace
- System Operation
- Alarms & Process History View
- Sequential Function Charts
- Phase Logic
- Security

Combustion Control & Safety Workshop

Overview

This 1-day course covers optimizing combustion efficiency, safety and reliability within industrial and process plants. It brings significant savings in fuel consumption, increased process unit reliability and stability, increased steam generation and overall energy efficiency. This training course focuses on proven best practices, techniques and methodologies that have delivered positive results across many combustion & safety projects.

The course is designed to help engineers accelerate their knowledge and the application of this knowledge to improve their combustion fired equipment.

Combustion Control & Safety The course agenda comprises

- Common problems found in combustion equipment
- International standards compliance
- How to identify improvement opportunities
- Implementation of a unit based improvement methodology
- Critical instrumentation for combustion equipment performance
- Fuel and performance optimization
- Enhanced Burner Management Systems
- Combustion and Safety - Practical demonstration
- Advanced automation technologies for performance improvement
- Getting started - Improvement opportunity assessment

This course is delivered by an experienced combustion and safety expert providing real world experience and expertise.

The attendees will be shown how best practice is implemented with practical demonstration of combustion control and safety using a simulated application.

Fieldbus Systems and Devices

Course 7032 CEUs: 2.5

This course is for individuals responsible for installing, troubleshooting, calibrating and configuring FOUNDATION™ Fieldbus instruments and control strategies using the DeltaV™ scalable systems.

Overview

This 3½-day lecture/lab provides maximum hands-on experience working with the integration of FOUNDATION™ Fieldbus devices and the DeltaV™ scalable system. The student will be able to install Fieldbus instruments and segment checkout for the correct operation of the physical layer.

The student will be able to use the DeltaV system to perform AMS Device Manager methods such as calibration, setup wizards, zero trim and diagnostics. The student will be able to implement a pressure loop using FOUNDATION™ Fieldbus function blocks with the DeltaV™ Control Studio application. The student will configure PlantWeb Alerts and device alarm parameters.

Prerequisites

Course 7009 or 7018. The 375 Field Communicator and Valve link for Fieldbus will be demonstrated and available for students as optional activities.

Topics

- FOUNDATION™ Fieldbus Overview
- Macro Cycle Execution
- Fieldbus Function Blocks
- Control Strategy Configuration
- Control Anywhere
- FieldVue Theory of Operation
- Transmitter Theory of Operation
- AMS Device Manager Methods
- Fieldbus Wiring Practices
- System Troubleshooting
- Configuring Fieldbus Device
- Alarms and PlantWeb Alerts
- Configuring a Fieldbus Operator Display
- Segment Checkout Procedures

Communication Bus Interface with DeltaV™ System

Course 7037 CEUs: 2.5

This course is for individuals responsible for interfacing with Device Net, AS-i, Profibus DP HART and serial communication buses to a DeltaV™ scalable system.

Overview

This 3½-day course covers the integration of field-bus compliant devices using DeltaV™ systems. Upon completion of the course the student will be able to install, configure and verify proper operations of AS-i, Profibus DP. DeviceNet and HART devices, including proper wiring practices. The AMS Intelligent Device Manager will be used to configure HART instruments.

Prerequisites

Course 7009, DeltaV™ Implementation or Course 7018, DeltaV™ Hardware and Troubleshooting. The 375 Field Communicator will be available for the students.

Topics

- HART Overview
- Configuring DeltaV™ Control Module with HART
- Configuring HART Device with AMS Intelligent Device Manager and/or Rosemount 375 Handheld Communicator
- Serial Interface Overview
- Configuring DeltaV and Serial Interface Card
- Actuator Sensor Interface (AS-i) Overview
- AS-i: Wiring and Installation
- Assembling and Configuring AS-i Network with DeltaV™
- Profibus DP Overview

Our new wireless curriculum provides an introduction to wireless technology, describes how it can help you solve common problems and access information that was previously out of economic and technical reach, and delivers practical advice on implementing a wireless solution.

Wireless Self Organizing Network (Rosemount Specific)

Course 2375 CEUs: 1.4

This course is intended for technicians, engineers and other plant personnel who need to know how to design, install, setup, configure, maintain and troubleshoot Wireless Self Organizing Networks and their Components.

Overview

This 2-day course explains how Self Organizing Wireless Networks function and how they are installed, setup, configured and integrated. It emphasizes planning, proper installation and startup, configuration, maintenance and integration.

The course uses lectures and labs to maximize the hands-on experience and teach the students. Students who complete this course will:

- Correctly install and setup the 1420 Wireless Gateway
- Properly install and configure Wireless Transmitters
- Properly integrate Host interfaces to the Wireless Gateway Prerequisites Some experience in Networks and Host integration would be helpful.

Topics

- How Self Organizing Networks Function
- Self Organizing Networks Best Practices
- Network Components
- 1420 Installation and Setup
- Network Parameters
- 648 and 30515 Wireless Transmitters Installation, Configuration, Maintenance and Calibration
- Using AMS Device Manager with the 1420 Wireless gateway
- Configuring Wireless Devices with AMS Device Manager
- Modbus Serial Integration
- Modbus TCP Integration
- OPC Integration
- 1420 Advanced Features
- Operation of AMS Wireless Snap-on

Rosemount Analytical Wireless Instrumentation Models 6081 P and 6081C

Course 2203/2203V CEUs: .2

Overview

This 2-hour class covers features, benefits and operation of Rosemount Analytical's Model 6081 wireless device. The Model 6081 P measures pH and ORP and is SMART sensor enabled. The Model 6081 C measures Contacting Conductivity with sensors that have either 2-wire or 4-wire inputs. Each device communicates back to a 1420 Gateway via Wireless HART communication.

This class is free when performed in conjunction with course 2200 "General pH, Conductivity and ORP theory".

Topics

- Connecting the Model 6081 to a Wireless Mesh Network
- Configuring Update Rates
- Mesh Network Theory
- Sensor Calibration
- Troubleshooting

Wireless Tank Gauging

The wireless tank gauging training is a 3-day training focusing on the Rosemount Smart Wireless Gateways, the Wireless THUM adapter as well as Tank master, AMS and AMS Snap-on.

Overview

The course goal is to help users in designing and configuring a wireless tank gauging system. Training courses are based on classroom instructions backed up with laboratory work to deliver the trainees with a well-balanced knowledge in an integrated manner.

Prerequisites

Attended Product training, or has fair knowledge in Tank Gauging systems supplied by Rosemount.

Topics

- The THUM adapter
- The Gateway
- Configuration in Tank Master
- AMS with wireless RTG

Reliability Solutions

PATHS TO SUCCESS

Emerson training gives you the confidence and experience in industrial maintenance technologies. Our alumni can tell you about the recognition and job promotions they've received from plant management. With Emerson, you walk down a path that leads to full mastery of knowledge and skills necessary in a Machinery Health program. These "Paths to Success" are outlined here. They include both theory/application courses for certification as well as product-specific courses. Offered at Emerson's training centers, these classes can also be held at your chosen facility. For a calendar schedule of courses and registration information, visit *www.assetweb.com/admin.*

Category I Vibration Analyst Path to Success

- Fundamentals of Vibration Analysis
- Fundamentals of CSI 2130 Machinery Health Analyzer
- Basic Vibration Analysis
- Introduction to AMS Machinery Manager
- Category I Vibration Analyst Certification Exam

Category II Vibration Analyst Path to Success

- Intermediate Vibration Analysis
- Intermediate AMS Machinery Manager
- CSI 2130 Advanced Function with PeakVue™
- Category II Vibration Analyst Certification Exam

Category III Vibration Analyst Path to Success

- Advanced Vibration Analysis
- Advanced AMS Machinery Manager
- PeakVue™ Mystery and Autocorrelation
- Category III Vibration Analyst Certification Exam

Online Monitoring Path to Success

- Online Prediction (CSI 4500/6500/XP32) Operation and Maintenance
- Online Protection (CSI 6000/6500) Operation and Maintenance
- Turbo Machinery Diagnostic

Lubrication Analyst Path to Success

- Lubrication Level 1 & 2 with Certification exam
- Wear Debris Analysis Workshop
- OilView® for AMS Machinery Manager
- Reliability Management Path to Success
- Maintenance Best Practice
- Root Cause Failure Analysis Adding other Technologies to your Credentials
- Laser Alignment
- Balancing Theory & Application
- Basic Ultrasonic Theory & Technology & Level 1 Certification Exam
- Electric Motor Diagnostics & Basic Motor View
- IR Thermography & Level 1 Certification Exam

Companies today rely on fewer people to do more work. That's why the need of training is more critical than ever to achieve and maintain cost-effective maintenance programs. Emerson helps maximize the return on your investment in technology and people. Every year, more than 1500 individuals receive training from Machinery Health around the world.

Vibration Analysis - Fundamentals

Course 2069 CEUs: 1.4

This course is for individuals responsible for interfacing with Device Net, AS-i, Profibus DP HART and serial communication buses to a DeltaV™ scalable system.

Overview

This 2-day vibration training course is for those with no prior experience in vibration analysis. The class prepares participants for the Basic Vibration Analysis Course. Students learn about causes of vibration and methods of measurement. Although the training course does not provide instruction on Emerson's CSI technologies, the class will use them to demonstrate vibration principles.

Prerequisites

none

Topics

- Introduction to Vibration
- Components of a Predictive Maintenance Program
- Basic Fault Identification
- Vibratory Fault Characteristics and Patterns
- Information to Help Jump Start a Vibration Program

Basic Vibration Analysis/Category I Compliant

Course 2031 CEUs: 2.8

This course is for individuals needing an introduction to the technology and concepts used in the new generation of process control systems.

Overview

This 4-day course complies with Category I Vibration Analyst per ISO standard 18436-2: Vibration condition monitoring and diagnostics. This course is intended to enable students to operate single channel machinery analyzers, dump and load routes, recognize the difference between good and bad data, and compare vibration measurements against pre-established alert settings. Although this training course is not product specific, students will use Emerson's CSI technologies for demonstration purposes.

The class shows the student how to use the vibration analyzer in conjunction with Emerson Machinery Health Management supported software to analyze basic vibration defects.

Prerequisites

Fundamentals of vibration or up to six months of vibration experience is recommended.

Topics

- Principles of Vibration
- Data Acquisition & Signal Processing
- Condition Monitoring & Corrective Action
- Equipment Knowledge
- Acceptance Testing
- Basic Analyzer Functions
- The Class Shows Students How to Recognize Machine Defects such as:
  - -Unbalance
  - -Shaft Misalignment
  - -Looseness
  - -Rolling Element Bearing Defects
  - -Gear Problems
  - -Resonance Introduction to Electrical Defects
  - -Introduction to Electrical Defects

Participants will receive a complimentary copy of the Pocket Vibration Analysis Trouble-Shooter Guide.

Fundamentals of Vibration eLearning

Course e2069 CEUs: 0.2 3months unlimited access

This e-course provides instruction to individuals with no prior experience in vibration analysis. The course introduces the technology of vibration analysis by explaining what vibration analysis is and how it plays a critical role in any predictive maintenance program. Students are led through a self-paced discussion on how vibration analysis works with many examples of the types of faults that can be detected.

Students will also gain an understanding of where and how vibration is measured with an emphasis on good data collection techniques. Students will learn important terminology that will be critical to their success as they progress to the next level of training in vibration analysis; Emerson's Basic Vibration Analysis course.

Topics to be covered includes:

Chapter 1: Fundamentals of Vibration
Chapter 2: How is Vibration Measured?
Chapter 3: Understanding the Vibration Signal
Chapter 4: Vibration Units
Chapter 5: Analysis Parameters
Chapter 6: Data Analysis: Where to begin?

Note: Typical duration of course access is 3 months. Contact education@emerson.com to request an extension.

Reliability Solutions

Our instructors share their own real-world experiences and guide classes through hands-on exercises that reinforce the lesson. Reliability Solutions strategy includes training courses designed to help you start-up and maintain your mechanical equipment. Our goal is to provide you with the knowledge to keep your plant running smoothly.

Intermediate Vibration Analysis/Category II Compliant

Course 2032 CEUs: 2.8

Overview

This 4-day course complies with Category II Vibration Analyst per ISO standard 18436-2: Vibration condition monitoring and diagnostics. Category II vibration analysts are expected to be able to select appropriate vibration measurement techniques, set up instruments for basic resolution of amplitude, frequency, and time, perform basic spectrum analysis, maintain a database of results and trends, perform single-channel impact tests, classify, interpret and evaluate test results in accordance with applicable specifications and standards, recommend minor corrective actions, and understand basic single plane field balancing concepts.

This course also features the use of the CSI 2130 Machinery Analyzer in conjunction with advanced machinery analysis techniques. Discussions of case histories on machinery faults are one of the focal points of this course.

Prerequisites

Basic Vibration Analysis course and accumulative 18 months of field experience are recommended.

Topics

- Equipment Testing and Diagnostics
- Reference Standards
- Reporting and Documentation
- Fault Severity Determination
- Analyzer Averaging Techniques
- Slow Speed Applications using Slow Speed Technology (SST®)
- Sensor Selection Guidelines
- Introduction to Demodulation and PeakVue®
- Advanced Waveform Analysis
- Sideband Analysis
- Rolling Element Bearing Failure Modes
- Advanced Electrical Analysis Techniques
- Pump/fan Vibration
- Phase Analysis using Single and Dual Channel
- Perform Basic Single-Plane Field Balancing

Students will receive a complimentary copy of the Simplified Handbook of Vibration Analysis, Volume I, by Art Crawford.

Vibration Analyst Exam - Category I

Course 2021EX

Overview

Category I exam, available at the end of course 2031. Test Format: Written exam, Duration: 2 hours, Passing Grade: 75%

Eligibility for Examination:

- Recommended Minimum Duration of Cumulated Training (hours): 32
- Recommended Minimum Duration of Cumulated Experience (months): 6

Course 2022EX

Overview

Category II exam, available at the end of course 2032. Test Format: Written exam, Duration: 3 hours, Passing Grade: 75%

Eligibility for Examination:

- Recommended Minimum Duration of Cumulated Training (hours): 70
- Recommended Minimum Duration of Cumulated Experience (months): 18
- Passing Category I exam is NOT a prerequisite for taking Category II exam.

Fundamentals of CSI 2130 Machinery Health Analyzer

Course 2072 CEUs: 1.4

Overview

This 2-day hands-on course focuses on the basic operation of the CSI 2130 Machinery Health Analyzer. Students will collect data on lab machines. This course is designed for students with little or no experience with CSI analyzers, but who are experienced in the field of vibration data collection and analysis.

Note: You may take with Fundamentals of Vibration as a 4-day course.

Prerequisites

Understanding of vibration analysis.

Topics

- Analyzer/Computer Communication
- Predefined Route Data Collection
- Off-Route Data Collection and Setup
- Monitor Mode Measurements
- Peak and Phase Measurements

Mystery PeakVue™and Autocorrelation

Course 2035/2075 CEUs: 2.1

This 3-day course provides insight into advanced functionality of Emerson's patented PeakVue™ technology and Autocorrelation. Machine vibrations generate both macro and microscopic vibrations, and microscopic vibrations generate stress waves that have frequency ranges determined by the mass of the impacting object. The properties of these stress waves will be explained.

Overview

The Autocorrelation section of the course will teach the power of the autocorrelation coefficient function for the analysis of vibration induced time wave form data. The autocorrelation function data generally are computed from the same time wave form data used to compute the spectrum. The strengths of the autocorrelation data are complimentary to the strengths of the spectral data. This course makes use of both case studies from real-life examples of common faults and live demonstrations illustrating specific mounting procedures to reliably detect certain faults. The difference between PeakVue™ techniques and demodulation will also be demonstrated.

Prerequisites

Students should be familiar with vibration data collection and analysis techniques and the use of AMS Machinery Manager Software.

Topics

- Proper PeakVue™ Set-Ups for all Speeds (as low as 1 rpm)
- Sensor Selection and Sensor Mounting
- Setting Alarm Levels
- Choosing Trend Parameters
- Analyzing PeakVue™ Spectra and Waveforms
- Uses of the Circular Waveform Plot
- Introduce the Autocorrelation Coefficient
- Demonstrate the Computation of the Autocorrelation Coefficient Data from the Time Wave form Data
- Highlight the Strengths of the Autocorrelation Coefficient Function Data/ Spectra Data
- Demonstrate the use of the Autocorrelation Coefficient Data as a Diagnostic Tool to Support the Spectra Data for Vibration Analysis Through Several Case Studies
- Identify Unique Patterns of the Autocorrelation Function Data for Certain Classes of Bearing Faults, Gearing Faults, etc.

Introduction to AMS Machinery Manager

Course 2068 CEUs: 2.8

Overview

This 4-day course was designed for the new users of AMS Machinery Manager. Students learn methods of database creation and vital features of route creation such as collecting reference data, analyzer/computer communication and the basic concepts of Analysis Parameter Sets, Alarm Limit Sets and Fault Frequency Sets. A CSI 2130 Analyzer will be used to load routes and collect data on lab machinery for basic vibration analysis using Export and Diagnostic Plotting.

Prerequisites

Computer experience with the Windows operating system and Basic Vibration are recommended.

Topics

- Navigation
- Database Creation
- Data Collection
- Basic Analysis and Reporting
- Link to RBMview®
- Data locker Management (lite)

This course is based on the current mass release of the AMS Machinery Manager soft-ware. Students can call to verify if the course is appropriate to the version they are using. Advanced Vibration Analysis Module, Infrared Analysis, Motorview, CSI On-Line Machinery Health Monitor and Oilview modules are covered in other course offerings and are not part of this course.

Intermediate AMS Machinery Manager

Course 2074 CEUs: 3.5

Overview

This 5-day course was designed for students who have a basic understanding of AMS Machinery Manager. Students expand their knowledge of machinery analysis techniques, focusing on analysis and reporting using Plot-Data, Diagnostic Analysis, Export, PeakVue™ and the full version of RBMview®.

Prerequisites

Introduction to AMS Machinery Health Manager Course

Topics

- Vibration Analysis Module
- Export
- PeakVue™ Technology
- RBMview®
- PlotData

This course is based on the current mass release of the AMS Machinery Manager software. Students can call to verify if the course is appropriate to the version they are using. Infrared Analysis, Motorview, CSI On-line Machinery Health Monitor and Oilview modules are covered in other course offerings and are not part of this course.

Fundamentals of CSI 2140

Course 2076 CEUs:1.4

Overview
This 2-day hands-on course focuses on the basic operation of the CSI 2140 Machinery Health Analyzer. Students collect data on lab machines. This course is designed for personnel with little or no experience with CSI analyzers, but who are experienced in the field of vibration data collection and analysis.

Prerequisites
Understanding of vibration analysis. Familiar with basic vibration collection principles

Topics
- Analyzer/Computer Communication
- Predefined Route Data Collection
- Job Data Collection and Setup
- Manual Mode Measurements
- Introduction to CSI 2140 Analysis Expert Functions

Note: You may take with Fundamentals of Vibration as a 4-day course.

Practical Application of CSI Online Technologies

Course 2088A CEUs: 2.8

Overview
This 4-day course explores the operation, use and application of online monitoring and transient capture technologies using CSI's 4500, 6500, XP-32 and 2600 online products and AMS Suite: Machinery Health Monitoring Software.

This course is intended for:
- anyone interested in online monitoring and transient capture
- reliability managers
- vibration analysts and technicians responsible for reliability services

Prerequisites
Knowledge of vibration and industrial machinery is helpful, but not necessary.

Topics
- On-line Monitoring Database Configuration including Gross Scan and Spectral Scan
- Database Construction of Sleeve Bearing Configuration including Shaft Centerline Plots and Orbits
- Sensor Configurations for Various Sensor Types including: Accelerometer, Velocity, Proximity Probe, Microphone, Pressure, Laser Displacement, Temperature and other Sensors
- Practical Application of Input and Output Relays
- Troubleshooting Tools (Putty or Tel net)
- Constructing Analysis Parameter Sets for Normal Vibration, High Frequency Vibration, PeakVue™ and Process Signals
- Time and Predicate Based Data Collection Sets
- On-line Watch Program Operation
- Transient Capture Database Configurations
- Transient Auto Archive Creation
- Transient Data Extraction
- Online and Transient Capture Case Histories
- Analyzing On-line and Transient Data using the Vibration Analysis Program

Advance CSI 2130 with PeakVue

Course 2091 CEUs: 2.1

Overview
This 3-day course is intended for students with single-channel vibration analysis experience and little or no multi-channel experience. This class covers advanced signal processing using Emerson's patented PeakVue™ technology for slow-speed analysis, transient capabilities, coherence and cross-channel phase, operating deflection shapes (ODS), modal analysis and other advanced techniques.

Prerequisites
Single channel vibration analysis experience is required.

Topics
- PeakVue™
- Resonance Detection
- Dual Channel 1 data Collection
- Fundamentals of Cross-Channel Data Collection
- Introduction to Coherence and Cross-Channel Phase
- Orbit Data Collection
- Introduction to Operating Deflection Shape (ODS) Testing Methods
- Introduction to Modal Analysis Testing Methods
- Advanced Two-Channel DLP
- Zoom Analysis, Cascade and Overall
- Transient Wave Form Capture and Analysis
- CSI 2130 Analysis Experts

Advanced Vibration Analysis/ Category III Compliant

Course 2033 CEUs:3.5

Overview
This 5-day course complies with Category III Vibration Analyst per ISO standard 18436-2: Vibration condition monitoring and diagnostics.

This course expands on the subjects covered in the Intermediate Vibration course (Category II), especially in the areas of fault analysis and corrective actions. The class details advanced analysis techniques.

The dual channel machinery health analyzer features are introduced including the use of AMS™ Suite: Machinery Health Manager Software to set up the advanced analyzer features and the powerful downloadable programs for data collection. The transient machinery health analyzer capabilities are covered such as long-term time waveform.

The class covers advanced resonance detection using a variety of testing methods, including triggered data collection.

Prerequisites
Intermediate Vibration Analysis course and a cumulative three years of field experience are recommended.

Topics
- Specify appropriate vibration instrumentation hardware and software for both portable and permanently installed systems
- Perform spectrum and time waveform analysis under both steady-state and unsteady operating conditions
- Establish specifications for vibration levels and acceptance criteria for new machinery
- Measure and analyze basic operational deflection shapes (ODS)
- Measure and analyze PeakVue™ technology measurements
- Slow Speed Technology (SST®)
- Zoom Analysis
- Transient Techniques
- Dual Channel Machinery Analyzer Features
- Triggered Data Capture
- Resonance Detection

Balancing Theory & Application for CSI 2130

Course 2015 CEUs: 2.8

Overview
This 4-day class (2 days on Balancing Theory and 2 days on Balancing Applications with CSI 2130) teaches how to perform single- and dual-plane balancing using both graphical and analyzer-based balancing methods. The class uses the CSI 2130 Machinery Health Analyzer on lab machinery.

Prerequisites
Understanding of vibration analysis is recommended.

Topics
- Imbalance identification
- Use of vectors
- Calculating influence coefficients
- Use of the auxiliary analyzer balance functions
- Use of UltraMgr module
- Calculating a system lag
- Estimate trial weights
- Balancing flexible rotor systems
- Balancing overhung rotors
- Applying balancing techniques in an industrial setting

Online Protection Operation and Maintenance

Course 2080 CEUs: 1.4

Overview
This 2-day course is a hands-on training for anyone involved with operating and maintaining a CSI Online Protection System. Workshops include practice with “live” monitors and racks.

Topics
- Overview of hardware components
- Rack configuration
- Operator display software
- Data acquisition software
- Interface with the CSI online prediction system
- System troubleshooting and maintenance.

Advanced AMS Suite: Machinery Health Manager

Course 2070 or 2070V
CEUs: 2.8

Overview
This 4-day course is the third in our series of AMS Machinery Manager courses. Its focus is on management, modification and optimization of the existing AMS Machinery Manager database. Students will learn how to modify existing Wizard configurations, add and edit users, statistically adjust alert and fault levels make global database changes, and many other very useful database functions. This course is intended for the advanced user who has already created a machinery database and has been acquiring, storing and analyzing data for six months or more.

Prerequisites
Intermediate Vibration course 2032 or one year vibration analysis experience is recommended. Experience with the Windows operating system is recommended.

Topics
- Advanced Analysis Features in Vibration Analysis Module
- Problem Reporting
- Status-at-a-Glance Operation and Reporting
- Nspectr®
- Wizard - Reporting Techniques and Modification/Addition of Setup Information
- Austostat
- Database Utility
- Database Zip Utility
- Network Administration
- Data Locker Management

This course is based on the current mass release of the AMS Machinery Manager software. Students can call to verify if the course is appropriate to the version they are using. Infrared Analysis Motorview, CSI Online Machinery Health Monitor and Oilview modules are covered in other course offerings and are not part of this course.

eLearning: Vibration Analysis Module AMS Machinery Manager (V5.2 or Higher)

Course e2074V CEUs: 0.1
3 Months Unlimited Access

Overview
This e-course provides thorough introduction on the Vibration Analysis module in the V5.2 or higher AMS Machinery Manager software. The interface of the Vibration Analysis module is much more user intuitive. With the V5.2N5.3 version of the Vibration Analysis module, powerful tools for the analysis and comparison of multiple types of data are right at your fingertips.

Prerequisites
Familiar with the AMS Machinery Manager Software I

Topics
- Introduction of the New Vibration Analysis Module (V5.2N5.3)
- Learn to Display Spectra, Waveform and Trends
- Use the Toolbar for Data Manipulation
  Note: Typical duration of course access is 3 months. Contact education@emerson.com to request an extension.
- Custom Faceplates
- Custom Dynamos

eLearning: Fundamentals of CSI 2140 Machinery Health Analyzer

Course e2140 CEUs: .6
3 Months Unlimited Access

Emerson's Machinery Health Management training now includes the Fundamentals of the CSI 2140 elearning course, designed to provide you with the tools you need to perform data collection using the CSI 2140 Machinery Health Analyzer. The course leads you through a basic introduction of the analyzer including panel descriptions and reviews of the purpose and function of all connectors, ports, slots, keys, indicators and buttons. The user learns how to load a pre-defined route into the analyzer, take general data as well as specialized data and then dump that data back into the computer for further diagnostic analysis.

Topics
- Analyzer/Computer Communication
- Predefined Route Data Collection
- Job Data Collection and Setup
- Manual Mode Measurements
- Introduction to CSI 2140 Analysis Expert Functions

AutoStat for AMS Suite: Machinery Health Manager

Course 2070CV CEUs: 1.4

AutoStat is included in the standard curriculum of the 4-day Advanced AMS Machinery Manager, course 2.070. This 2-day session only covers AutoStat in the AMS Machinery Manager software.

Alarms are an important part of any analysis program. Properly setting alarms allows the user to quickly identify an abnormal machine condition and reduces time spent analyzing machines that are running in acceptable or "normal" condition.

AMS Machinery Health Manager provides the user the ability to create up to 12 parameter bands with alarms in addition to the Overall value. Calculating ideal alarm values for these parameters can be very complicated. Autostat uses statistical analysis to provide limit value, for the individual parameter bands by analyzing the data associated with similar pieces of equipment.

Overview

This 2-day hands-on course focuses on the basic operation of the CSI 2140 Machinery Health Analyzer. Students collect data on lab machines. This course is designed for personnel with little or no experience with CSI analyzers, but who are experienced in the field of vibration data collection and analysis.

Topics

- Analysis Parameter Alarms vs Narrow band Alarms -What's the Difference?
- Database Setup Requirements and Reports
- Creating and Editing Analysis Groups
- Modifying and Creating New Parameter Alarms
- Creating and Editing Statistical Envelopes
- Using these Alarms within the Vibration Analysis Plotting Application

Power Quality and Grounding for Electronic Systems

Course 5590 CEUs: 1.4

This 2-day course is designed for personnel involved with the planning, installation and maintenance of DeltaV™ digital automation system and provides essential knowledge regarding the power and grounding system for DeltaV™ equipment.

Overview

This course focuses on specific power and grounding requirements of a control system. You will learn:

- how to conduct site verifications
- how to audit using hands-on testing labs
- to detect power and grounding problems on existing sites

Prerequisites

A working knowledge of electronics and AC power basics is required.

Topics

- Review of Power Basics
- Power System Measurements
- Low Voltage Power Systems
- Power System Grounding
- Earthing vs. Grounding
- Connection to Earth
- Equipment Grounding
- Code Requirements
- Building Power Distribution
- Feeders and Branch Circuits
- Separately Derived Systems
- Power & Grounding for the DeltaV™ System
- Single Point Grounding
- Isolated Ground Installations
- Dedicated Circuits
- DC Grounding
- Verifying New Installations
- Power Quality Problems
- Applying Power Conditioning
- SIS Power and Grounding Installation
- Intrinsic Safety Devices

Introduction to Developing Reliability-Based Maintenance Strategies

Course REL003 CEUs: 1.4

Overview
This 2-day course is an introduction to the basic maintenance strategy model that will act as the foundation for developing RCM techniques, choosing and deploying PMs and creating an effective maintenance strategy to support an efficient maintenance environment.

Topics
- Maintenance Strategy Models
- Basic RCM Techniques
- PM Task Selection
- Basic PM Tools
- PM Program Design
- PM Development Principles
- PM Scheduling Techniques
- PM Program Monitoring

Introduction to Planning and Scheduling Principles

Course REL004 CEUs: 1.4

Overview
This 2-day course is an introductory course designed to provide participants with an understanding of the fundamentals of creating and maintaining an efficient planning and scheduling program.

Topics
- Planning and Scheduling World Class Model
- Planning Principles
- Scheduling Principles
- Planning and Scheduling Program Monitoring

Materials Management Strategies

Course REL006 CEUs: 1.4

Overview
This 2-day course is an introductory course designed to provide participants instructions about how to manage, organize and control inventory risk through strategic MRO inventory management.

Topics
- Introduction to Material Management
- Purpose and Strategic Importance
- Organizing for Maintenance Stores and
- Management Control
- Stores Management Tools
- High Performance Stores
- Stores KPI Metrics and World Class Benchmarks

Reliability Centered Maintenance (RCM) Principles

Course REL007 CEUs: 1.4

Overview

This 2-day course covers the principles of RCM. RCM is a key foundational element of a Reliability Based Maintenance program. This course covers all important aspects of Reliability Centered Maintenance Analysis and Implementation. Participants will learn how to effectively participate in an RCM program and have all necessary information to support such an implementation.

- Introduction
  - History of RCM
  - Why RCM
  - Selecting candidate equipment
  - Team approach
  - RCM philosophies
- Conducting RCM Analysis
  - RCM terms and definitions
  - Identifying system parameters
  - Answering the 7 questions of RCM
  - Determining failure mitigation strategies
  - Implementing the results of RCM analysis
- Conducting RCM Analysis
  - Facilitating RCM at your site
  - Who should lead
  - Choosing the appropriate analysis tools
  - Tracking progress through to completion
  - Avoiding the causes of failed RCM Implementations
- Conducting RCM Analysis
  - Leveraging the Benefits of RCM
  - Lateral deployments
  - The FMEA library
  - Celebrating results
  - Showing the business case

Foundational Awareness for Maintenance & Reliability Professionals

Course REL009 CEUs: 2.8

Overview

This 4-day comprehensive course provides participants with an overview of both technical and non-technical, key foundational elements of maintenance and reliability profession. This is required to be most effective in the maintenance and reliability profession.

Topics

- The Business of Maintenance and Reliability
  - Setting goals and objectives
  - Selling change
  - Measuring performance evaluation
  - Building the business case
  - Communication
  - Resource planning and budgeting
  - Performance agreements
- Production System Reliability
  - Process and industry standards
  - Production system understanding
  - Process improvement methods
  - Environmental, Health and Safety considerations
  - Management of change
- Equipment Reliability Tactics
  - Establishing reliability targets
  - Reliability gap analysis
  - Equipment maintenance strategy development
  - Continuous improvement
- People and Culture Management
  - Assessing organizational competence
  - Defining the maintenance and reliability organization
  - Skills development
  - Communication for change
- Work management best practices
  - Work identification
  - Work prioritization
  - Planning and scheduling
  - Backlog management
  - Resource management
  - Work history documentation
  - Analyzing work history for improved performance
  - Performance measures
  - Capital project planning Information technology

DeltaV™ Operator Training Simulation (OTS)

Overview

DeltaV Operator Training Simulation (OTS) is an engineered, hands-on, process-specific learning environment designed to up-skill our customers' operations workforce. DeltaV OTS exposes operators to what they will experience in their actual control room. This enables operations personnel to gain experience in an off line, non-intrusive environment. Operators will learn DeltaV operating concepts while learning their actual process in preparation to effectively handle incidents or process upsets. The ability to practice how to handle potential incidents in a simulation environment is invaluable. The OTS training solution is not only key to preparing operations personnel prior to the start-up of new automation projects. It is an ongoing tool to train future operators, a great refresher tool and a platform for more advanced training for current operators.

DeltaV™ OTS includes the following key deliverables:

- Self-Guided Custom Curriculum Based on the Customer's Configuration and actual displays
- DeltaV Training Simulators that include both hardware and software that operate the customer configuration in a simulated environment
- Student Testing that includes realistic failure scenarios that record actual operator responses

Key tangible savings and benefits include:

- Quicker, Smoother Start-Ups
- Reduced Operator Error
- Product Loss Reduction/Elimination
- Improved Product Quality
- Regulatory Violation Reduction/Elimination
- Reduce Incident Reporting
- Operator Acceptance and Endorsement to Change Management

To discuss OTS and simulation contact us at OTS@EmersonProcess.com

DeltaV™ Implementation I

Course 7009 CEUs: 3.2

This course is for users that use DeltaV Operate Graphics.

Overview

This 4½-day course covers a complete DeltaV system implementation. Upon completion of this course the student will be able to define system capabilities, define nodes, configure continuous and sequential control strategies, operate the system and define users and security.

Prerequisites

Windows experience. It is recommended that prospective attendees new to process control systems attend Course 7101 or 7018.

Topics

- System Overview
- Explorer
- Control Modules
- Control Studio
- Motor Control
- Regulatory Control
- Work Space
- System Operation
- Alarms & Process History View
- Sequential Function Charts
- Phase Logic
- Security

DeltaV™ Operator Interface for Continuous Control

Course 7012 CEUs: 1.4

This course is for operators, supervisors and managers responsible for the operation of continuous processes using DeltaV system.

Overview

This 2-day course uses lectures and hands-on workshops to provide an in-depth overview on operating the DeltaV System. Students who complete this course will:

- Access operator displays
- Manipulate various control module operating parameters to operate the process
- Respond to process alarms
- Monitor process performance
- View real-time and historical trend data

Topics

- System Overview
- Accessing DeltaV Operate Window, Menus Displays and Directories
- Discrete and Analog Control Module Operation
- Accessing Alarm Displays/Alarm Handling
- Motor Control Module Operation
- Regulatory/Cascade Control Module Operation
- Accessing Real-time/Historical Trend Data
- Unit Alarms
- Sequential Function Chart Operation
- Phase Logic Modules

eLearning: DeltaV™ Operator Interface for Continuous Control

Course e7012 CEUs: 1.2

Audience

Operators, supervisors and managers responsible for the operation of continuous processes with a DeltaV System. Ideal students for this course are new to the DeltaV System but already have process control/plant experience. This interactive on-line course includes audio presentations, demonstrations, practice sessions, workshops, quizzes and a final examination. The average time to complete the course is 12 hours.

Topics

- System Overview; Accessing DeltaV Operate
- Navigating in DeltaV Operate
- Discrete, Analog, Regulatory and Cascade Control Module Operation
- Motor Control Module Operation
- Accessing: Alarm Displays; Real-Time/ Historical Trend Data; Process History View

DeltaV™ Operator Interface for Batch

Course 7014 CEUs: 2.1

This course is for operators, supervisors and managers responsible for the operation of batch processes using DeltaV system.

Overview

This 3-day course uses lectures and hands-on workshops to provide an in-depth overview on operating the DeltaV System. It includes all content in course 7012 plus students will:

- understand basic batch terminology
- manipulate Unit Module parameters
- access the Batch Operator Interface
- run procedures
- review batch history data

Topics

- System Overview
- Accessing DeltaV Operate
- Window, Menus Displays and Directories
- Discrete, Analog, Regulatory and Cascade Control Module Operation
- Motor Control Module Operation
- Accessing Alarm Displays/Alarm Handling
- Accessing Real-time/Historical Trend Data
- Accessing Process History View
- Sequential Function Chart Operation
- Phase and Recipe Controls
- Batch Operator Interface
- Batch Historian
- Campaign Manager

DeltaV™ Systems Batch Implementation

Course 7016 CEUs: 3.2

This course is designed for individuals responsible for configuring and commissioning DeltaV Batch software.

Overview

This 4½-day course covers the implementation of a complete batch application. A process simulator will provide a batch application. Students will use DeltaV Batch software to configure recipe entities including, Aliasing, Equipment Trains, Dynamic Unit Allocation, Phase Logic, Operations and Unit Procedures. Equipment entities will also be configured including, Units modules and Process cells.

Prerequisites

Course 7009, DeltaV Implementation I

Topics

- Batch Overview
- Unit Phase
- Alias Definition
- Unit Module
- Process Cell
- Class Based Control Modules
- Class Based Equipment Modules
- Operation
- Unit Procedure
- Procedure
- Equipment Trains
- Unit Aliasing
- Dynamic Unit Allocation

DeltaV™ Implementation II

Course 7017 CEUs: 3.2

This sequential course is for users that have completed course 7009.

Overview

This 4½-day course is for process control engineers responsible for configuring the DeltaV system. Advanced topics will be covered including displays, function blocks and configuration tips.

Prerequisites

Course 7009, DeltaV Implementation I

Topics

- Function Block Structure
- HART Inputs and Outputs
- Analog Control Blocks
- DeltaV Tune with InSight
- Device Control Options
- Class Based Control Modules
- Expressions
- Unit Alarms
- Multi-Dimensional (Array Parameter)
- Equipment Modules
- Display Environment
- Custom Faceplates
- Custom Dynamos

eLearning: DeltaV™ Operator Interface for Batch Control

Course e7014 CEUs: 1.6

Audience

Operators, supervisors and managers responsible for the operation of a batch process using the DeltaV system. This is an interactive 16-hour on-line course with DeltaV screens including audio presentations, demonstrations, practice sessions, workshops, quizzes and a final examination.

Topics

- System Overview
- Accessing DeltaV Operate
- Navigation in DeltaV Operate
- Discrete, Analog, Regulatory and Cascade Control Module Operation
- Motor Control Module Operation
- Accessing Alarm Displays
- Accessing Real-Time/Historical Trend Data
- Accessing Process History View
- Phase and Recipe Controls
- Batch Operator Interface
- How to Add/Run Batches

www.emersonprocess.com/education
Note: Course access is 3 months

DeltaV™ Hardware & Troubleshooting

Course 7018 CEUs: 2.8

This course is recommended for instrumentation and maintenance technicians and their managers, and for configuration engineers prior to taking configuration classes. It provides an overview of the DeltaV Control Network, hardware and software applications. Upon completion, you will be able to describe the hardware and perform troubleshooting techniques for the DeltaV Control Network, Controllers,1/0 subsystem and workstation.

Overview

This 4-day course focuses on the hardware components that make up the DeltaV system. Using a combination of lectures and workshops, you will assemble the system and power up the Controller, 1/0 subsystem, and workstation. You will learn how to use the diagnostic tools available to verify and locate hardware-related fault conditions, and you will be introduced to configuration tools and the operator interface. If your systems include bus technologies, we recommend courses 7030, 7032or 7037. The 7018 course satisfies the prerequisite requirement for these bus courses.

Prerequisites

Windows experience.

Topics

- DeltaV Overview
- Controllers
- 1/0 Cards
- Carriers
- Field Power
- System Power Supplies
- Control Network
- Workstation
- Diagnostics
- Troubleshooting
- DeltaV Operate Overview
- Interpreting the Event Journal, Trend Charts and Alarm List
- Introduction to HART Devices and AMS
- Intelligent Device Manager

DeltaV™ Systems Administration XP/Server 2003

Course 7024 CEUs: 2.8

Overview

This course is designed for system administrators that will be installing, commissioning and implementing a DeltaV system running on the XP operating system and Windows Server 2003. The course is 4 days in length.

Prerequisites

Course 7009, DeltaV Implementation l, or Course 7018, DeltaV Hardware and Troubleshooting

Topics

- Overview/Review of System Components and Topologies
- Installation Checklist of the XP Operating System
- Installation of the DeltaV Software Components
- DeltaV Control Networks
- DeltaV Domains and Work groups
- Users and Securities
- Upgrading Hardware and Software
- Backup and Restore Procedures
- Importing/Exporting
- Process Historian Administration
- DeltaV Zones

DeltaV™ Systems Administration for Windows 7 and Server 2008

Course 7027 CEUs: 3.2

Overview

This 4½-day course is designed for system engineers and administrators responsible for installing, commissioning, and managing a DeltaV system running on the Windows 7 operating system and Windows Server 2008.

Prerequisites

Course 7009, DeltaV Implementation I or Course 7018, DeltaV Hardware and Troubleshooting

Topics

- Overview/Review of System Components and Topologies
- Installation Checklist of the Windows 7 and Windows Server 2008 Operating Systems
- Installation of the DeltaV Software Components
- DeltaV Control Networks and Remote Access
- DeltaV Domains and Work groups
- User Administration and Network Security
- Upgrading Hardware and Software
- Backup and Restore Procedures
- Importing/Exporting
- DeltaV Zones

DeltaV™ Cybersecurity - Virtual

Course 7026 CEUs: 3.2

Overview

The 4-1/2 day DeltaV Cyber security course focuses on the DeltaV Security Manual and the practical implementation of the guidance provided within. Students will engage in activities to properly apply Emerson's Defense-in-Depth strategies so that students can have the skills to apply these same strategies on their DeltaV systems. Students are encouraged to read the DeltaV Security Manual before attending class.

Topics

- **DeltaV Deployment Guidelines and Physical Security**
  - Define the expected DeltaV installation environment
  - Define physical access rules (cabinets, switches, consoles, etc.)
- **DeltaV Area Control Network**
  - Define proper network segmentation and topology rules
  - Use DeltaV Firewall-IPD and Smart Switches
  - Lock and protect embedded nodes
- **Communications Security and Remote Access to DeltaV**
  - Define communication and security requirements for remote access
  - Use Emerson Smart Firewall
  - Deploy Remote Desktop Gateway server
  - Configure DeltaV remote desktop server
- **Active Directory Design and User Account Management**
  - Define Active Directory implementation guidelines
  - Create customized DeltaV users and groups
  - Audit user privileges
  - Configure password policies through Group Policy Objects
- **Device Hardening and Event Logging**
  - Define device internal and interface protection rules
  - Deploy DeltaV Endpoint protection and Application White listing
  - Configure Windows Firewall
  - Create USB/Removable media Group Policy Object
  - Configure syslog and other device logs to report to a System Information and Event Management (SIEM) appliance
  - Configure DeltaV Network Security Monitoring appliance
  - Use and customize SIEM dashboard to show system events
- **Software Patching**
  - Define how to obtain and install security patches
  - Use Emerson's Automated Patch Management solution

- **Backup and Recovery**
- Define best practices and available technologies to backup critical data
- Use the DeltaV Backup and Recovery (Acronis) software

Audience
DeltaV System Administrators or IT personnel responsible for implementing DeltaV security

Prerequisites
Course 7027

DeltaV™ Virtualization

Course 7029 CEUs: 3.2

Overview
This 4-1/2 day course focuses on the installation, configuration and system administration of a virtualized DeltaV distributed control system. Using a combination of lectures and workshops students will learn skill sets that enable them to properly plan, implement and maintain a robust DeltaV Virtual Studio (DVS) system intended for online (production) use. A key objective of this course is to prepare students for all aspects of owning a DVS system with special emphasis on providing highly available, reliable and secure access for end users of the DVS system.

Topics
- Virtualization Primer — Basics of How Virtualization Works
- Overview of DeltaV Virtualization Solutions
- Planning a DeltaV Virtual Studio System
- Installing and Configuring a VRTX Chassis and Blade Servers
- Creating DeltaV Virtual Machines including a Professional Plus Node
- Configuring a WYSE Thin Client and Redundant Thin Client Networks
- Create a Highly Available Fail-over Cluster
- Patching and Hardening of Cluster Nodes
- Cluster Health Monitoring and Troubleshooting
- Disaster Recovery and Replication
- Upgrading and Capacity Expansion

Audience
This course is designed for system administrators responsible for installing and maintaining DeltaV Workstations on a virtual platform.

Prerequisites
Course 7027, DeltaV Systems Administration for Windows 7 and Server 2008

DeltaV™ Advanced Graphics

Course 7025 CEUs: 3.2

Overview
This 4½-day course is for process control engineers responsible for configuring advanced functionality in the DeltaV user interface. This course expands on graphic topics covered in both the DeltaV Implementation, course 7009 and DeltaV Implementation II, course 7017.

Prerequisites
Course 7009, DeltaV Implementation I

Topics
- Visual Basic Primer
- Forms
- Modules
- Schedules
- User Preferences
- Picture Sizing
- Environment Customization
- Custom Faceplates
- Function Block Faceplates
- FRS Functions
- Pop Up Menus
- Color Threshold Tables
- Custom Dynamos
- Tag Groups
- Key Macro Editor

Practical Implementation of FOUNDATION™ fieldbus

Course 7035 CEUs: 1.4

This course is for individuals responsible for evaluating FOUNDATION™ fieldbus technology for process automation projects.

Overview
This 2-day course covers the practical implementation issues with FOUNDATION™ fieldbus faced by design and project engineers familiar with 4-20mA DCS installations. Upon completion of the course the student will understand the basics of fieldbus technology and be aware of areas that will change during project execution. The student will be able to design H1 fieldbus segments, specify equipment, comply with hazardous area requirements, modify current engineering practices, troubleshoot installations and estimate installed benefits for a project using FOUNDATION™ fieldbus. The course content is not vendor specific though DeltaV and Emerson Automation Solutions field devices are used for examples and demonstration purposes.

Prerequisites
Background in instrumentation & electrical engineering, control systems engineering or project engineering.

Topics
- Introduction to FOUNDATION™ fieldbus Technology
- Design of H1 Field bus Segments
- Hazardous Area Applications
- Project Engineering Practices Using FOUNDATION™ field bus
- Economic Benefits Compared to Traditional 4-20mA DCS Technology

eLearning: Features Training on DeltaV Analyze 2.0

Course e7045 CEUs: .2

Overview
This course is for personnel who will be using DeltaV Analyze in their alarm management program. This on-line course includes audio presentations, quizzes and up to a four hour access to DeltaV Analyze. To obtain hands-on experience, e7045 students will have four-hour access to DeltaV Analyze over a two-week timeframe.

Topics
- DeltaV Analyze Overview
- DeltaV Analyze Administration Features
- How to Create a Bookmark
- How to Create an Alarm Statistics Report

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Quick links - Click to eStore: Blended Learning

Note: Course access is 3 months

DeltaV™ Advanced Control

Course 7201 CEUs: 3.5

Overview
This 4½-day course introduces students to the advanced control tools available within DeltaV and how they may be used to improve plant operations. The principal technology that is utilized in each product will be discussed. The areas of improvement that may be achieved will be detailed. Also, each student will gain hands-on experience with these tools in class exercises based on realistic process simulations.

Prerequisites
Courses 7101, PlantWeb DeltaV Intro or 7009, DeltaV Implementation I or equivalent field experience.

Topics
- The Control Foundation in DeltaV
  - -Traditional Tools e.g. Override, Cascade, Ratio
  - -Improvements Provided by Advanced Control
- DeltaV Inspect with InSight
  - -Detection of Abnormal Conditions
  - -Performance Indices
  - -Performance Reports
- DeltaV Tune with InSight
  - -Tuning Response
  - -Process learning
  - -Adaptive Tuning
  - -Adaptive Control
- DeltaV Fuzzy
  - -Principles of logic Control
  - -FIC Function Block, Tuning
- DeltaV Predict
  - -MPC for Multi
  - -Variable Control
  - -Model Identification, Data Screening
  - -Simulation of Response, Tuning
- DeltaV Neural
  - -Creation of Virtual Sensor
  - -Data Screening, Training
- DeltaV Simulate Suite
  - -Process Simulation
  - -Simulate Pro

DeltaV™ Safety Instrumented System (SIS) Maintenance

Course 7303 CEUs: 2.1

This course is for individuals responsible for maintaining a DeltaV SIS.

Overview
This 3-day course is a hands-on instructor led course. The course covers the architecture of the DeltaV SIS including Rosemount SIS instruments and Fisher SIS Digital Valve Controllers. Students will gain a working knowledge of the hardware and software allowing them to troubleshoot and maintain the system.

Prerequisites
Course 7018, DeltaV Hardware and Troubleshooting, is a requirement.

Topics
- Safety Life cycle
- DeltaV SIS Overview
- DeltaV SIS Hardware
- Safety Instrumented Functions
- Rosemount SIS Instruments
- AMS Device Manager
- Fisher SIS Digital Valve Controller
- SISNet Repeaters course offerings and are not part of this course.

DeltaV Safety Instrumented System with Electronic Marshalling Maintenance

Course 7304 CEUs: 2.1

This course is for Electrical & Instrument technicians, maintenance technicians, E&I/ reliability engineers and other personnel responsible for maintaining DeltaV SIS with Electronic Marshalling.

Overview

This 3-day hands-on instructor led course covers the architecture of the DeltaV SIS with Electronic Marshalling including Rosemount SIS instruments and Fisher SIS Digital Valve Controllers. Students will be able to identify the DeltaV SIS with Electronic Marshalling hardware and software components. Students will be able to configure Partial Stroke Test using DeltaV SIS with Electronic Marshalling. Students will practice troubleshooting and maintenance techniques with DeltaV SIS simulators throughout the course.

Prerequisites

Course 7018, DeltaV Hardware and Troubleshooting, is a requirement.

Topics

- Safety Life cycle
- DeltaV SIS Overview
- DeltaV SIS with Electronic Marshalling Hardware architecture Including Power Requirements
- Commissioning and Downloading the DeltaV SIS with Electronic Marshalling components
- Safety Instrumented Functions
- Rosemount SIS Instruments
- AMS Device Manager
- Fisher SIS Digital Valve Controller
- DeltaV Diagnostics
- Partial Stroke Test using DeltaV SIS with Electronic Marshalling

DeltaV™ SIS Implementation

Course 7305 CEUs: 3.2

This course is for personnel who design, implement, commission and service DeltaV SIS.

Overview

This 4½-day course is a hands-on instructor led course. The course covers complete DeltaV SIS Implementation including hardware and software architecture. Students will be able to design a DeltaV SIS Network and Safety Instrumented Functions (SIFs). Additionally, students will be able to configure smart SIS instruments and their associated alerts, including partial stroke testing.

Prerequisites

Course 7009 is a requirement.
Recommend IEC 61511 knowledge.

Topics

- DeltaV SIS Overview
- DeltaV SIS Hardware
- Configuring SIFs in DeltaV
- Rosemount SIS Instruments
- AMS Device Manager
- Fisher SIS Digital Valve Controller
- SISNet Repeaters
- DeltaV SIS Security
- DeltaV Version Control

DeltaV - Using DeltaV Live Operator Interface - Implementation I

Course 7409 CEUs: 3.2

Overview

During the 4-1/2-day course, the student will be able to define system capabilities, define nodes, configure continuous and sequential control strategies, create process alarms, operate the system, troubleshoot the system and modify operator displays using the DeltaV Live Operator Interface introduced with DeltaV Version 14.3.

This course includes access to a virtual DeltaV system to practice and review course workshops complete with brief recorded demonstrations available after course completion

This course is designed for process & process control engineers responsible for obtaining key production data, maintaining, configuring and troubleshooting a DeltaV system.

Prerequisites

Microsoft Windows experience. Prospective attendees lacking process control experience should first attend Control Loop Foundation, Course 9025.

Topics

- System Overview
- DeltaV Explorer
- DeltaV Diagnostics
- Control Modules
- Control Studio
- Motor Control with Interlocking and Permissive Conditions
- Cascade Control
- Regulatory Control
- DeltaV Live
- Graphics Studio
- System Operation
- Alarms & Process History View
- Alarm Help
- Sequential Function Charts
- Configure Theme Dynamos
- Electronic Marshalling (CHARMS)

DeltaV - Advanced Graphics – Using DeltaV Live Operator Interface

Course 7425 CEUs: 3.2

Overview

This 4-1/2-day course is for process control engineers responsible for configuring graphics in the DeltaV Live operator interface. This course teaches basic options through advanced configuration topics.

This course is designed for process and process control engineers responsible for obtaining key production data, maintaining, configuring and troubleshooting a DeltaV system with the DeltaV Live user interface.

Topics

- Graphics Studio
- Environment Customization
- DeltaV Live
- DeltaV Live Administration
- Display Interactions
- Conversion Functions
- Class Based Graphical Element Modules (GEMs)
- Contextual Displays
- Custom Faceplates
- Pop Up pictures
- Forms
- Display Layout Configuration – Multi-Monitor Configuration
- Frame Customization
- Publishin
- Display Hierarchy
- Script Assistant
- Language Changes
- Theme GEMs
- Importing & Exporting Displays

AMS - Device Manager with DeltaV

Course 7039 CEUs: 2.8

Overview

This 4-day course is for instrumentation technicians responsible for all areas of managing and ensuring the reliability of instrumentation in the plant process including startup and commissioning, normal operations, maintenance, and troubleshooting.

The target audience usually does following:

- Responds to work orders created tocalibrate, troubleshoot, repair, service,and replace instruments and valves
- Monitors alerts to preemptivelyaddress problems prior to operatorsseeing a problem in the control room
- Provides loop testing & assistancewith instrumentation in plantturnarounds, startups, and for projectwork
- Improves process availability &reduces operations and maintenancecosts

Prerequisites

Microsoft windows experience. Minimal DeltaV and AMS experience is recommended but not required. Recommended to take 7018, but not required.

Topics

- DeltaV and PlantWeb Overview
- AMS Device Manager Overview
- FOUNDATION™ fieldbus Overview
- ValveLink™ SNAP-ON Introduction
- ValveLink™ DVC Setup
- ValveLink™ SNAP-ON Tests andDiagnostics
- HART® Overview
- PROCONEX QuickCheck SNAP-ON
- PROFIBUS Overview
- PlantWeb Alerts
- AMS Device Manager User Interface
- Setup and use of Alert Monitor in AMSDevice Manager
- Device Replacement for HART, Fieldbus, and PROFIBUS Devices
- AMS Device Manager Audit Trail
- AMS Device Manager Calibration Assistant
- Smart Commissioning

DeltaV - Batch Analytics Operator

Course e7044 CEUs: 0.6

Overview
This 6-hour (average duration) on-line course provides an orientation of Batch Analytics and how it is used in a production environment. The course includes audio presentations, demonstrations, hands-on practices, hands-on workshops, and quizzes.

This course is designed for operators, process engineers, and management.

Upon completion of this course, the student will be able to:

- Define basic principles of BatchAnalytics
- Identify how Batch Analytics is used infault detection and quality parameter prediction
- Identify the Batch List, Quality Prediction, and Fault Detection screens
- Monitor a fault
- Interpret analytic data of a saline example
- Identify the cause of a detected fault

Prerequisites
DeltaV Batch experience and Microsoft Windows experience is required.

Topics
- Batch Analytics Overview
- Batch Analytics Model BuilderOverview
- Batch Analytics Viewer Overview
- Batch Saline Simulation
- Benefits of Using Batch Analytics
- Batch Analytics Viewer – Batch ListTab
- Batch Analytics Viewer – FaultDetection Tab
- Batch Analytics Viewer – QualityPrediction

DeltaV - Batch Analytics Model Builder

Course e7046 CEUs: 0.8

Overview
This 8-hour (average duration) on-line course provides an orientation of Batch Analytics Model Builder. The course includes audio presentations, demonstrations, hands-on practices, hands-on workshops, and quizzes. Course access is 12 months.

This course is designed for Chemometricians, Process Engineers, Quality Engineers, and Process Control Engineers.

Upon completion of this course, the student will be able to:
- Define basic principles of Batch DataAnalytics and their use in faultdetection and quality parameterprediction
- Use the Batch Data Analytics ModelBuilder application to build and deploya project for fault detection and qualityparameter prediction
- Users will be able to recognize andnavigate the screens needed to builda model in Batch Analytics
- Users need to define batch logic,stage logic, and initial condition logicneeded for model development
- Users will be able to interpret analyticdata of the Model Builder applicationusing a saline example
- Users will be able to build a BatchData Analytics model

Topics
- Batch Analytics Overview
- Batch Analytics Model Builder Overview
- Batch Analytics Viewer Overview
- Batch Saline Simulation
- Benefits of Using Batch Analytics
- Batch Analytics Manager Administration
- Batch Logic, Stage Logic, and Initial Logic Required to Build a Model
- Batch Analytics Model Builder –Equipment
- Batch Analytics Model Builder –Product
- Batch Analytics Model Builder –Model

DeltaV InSIght – Virtual

Course 7201CV CEUs: 0.7

Overview
This 1-day course introduces students to DeltaV InSight and how it may be used to improve the plant operations. The measurement of the process dynamics will be discussed, and the DeltaV Tune application will be introducedand used with Adaptive Tuning and Adaptive Control. Also, each student will gain hands on experience with these tools in class exercises based on realistic process simulations.

Prerequisites
7009, DeltaV Implementation I or equivalent field experience.

Topics
- DeltaV Tune with InSight
- Measurement of Process Dynamics
- Tuning Methods
- Tuning Response
- Process Learning
- Adaptive Tuning
- Adaptive Control
- DeltaV Inspect with InSight
- Detection of Abnormal Conditions
- Performance Indices
- Performance Reports

DeltaV - Administration - Virtual Course

Course 7027V CEUs: 3.2

Overview

This 4-1/2-day course is designed for control system administrators, process control engineers and IT specialist responsible for managing, installing, and commissioning a DeltaV system. This course includes access to a virtual DeltaV system to practice and review course workshops complete with brief recorded demonstrations available after course completion.

This course is designed for control system administrators, process control engineers and IT specialist responsible for managing, installing, and commissioning a DeltaV system.

Topics

- Overview of system components and topologies
- DeltaV domain setup, including independent deltav domain controllers
- DeltaV installation procedures
- Licensing
- Import and export of configuration
- Firmware upgrades
- Controller health diagnostics
- User administration
- Configuration Database administration
- Creating additional workstations
- Auto Update services
- Continuous historian administration
- Advanced continuous historian administration
- Remote desktop services
- Event chronicle administration
- Network Time Protocol configuration/ diagnostics
- Backup and restore procedures

DeltaV - Model Predictive Control

Course 7202 CEUs: 2.4

Overview

This 3-1/2-day course is designed for process and control engineers who are applying DeltaV Predict and Predict Pro. It provides practical examples of how to determine the benefits of MPC application and how this control may be used to meet specific application requirements.

Students will gain hands on experience through lab exercises based on realistic dynamic process simulations.

This course is designed for process and control engineers who are applying DeltaV Predict and Predict Pro.

Prerequisites

7201 DeltaV Advanced Control

Topics

How to Justify an MPC Project
- Evaluating the Cost of Process Variation
- Estimating the Reduction in Variation that is possible using MPC
- Calculating the Benefit of Maximizing throughout\when plant production is restricted by Input Limits or Measurable Constraint

Meeting Application Requirements
- Meeting Control Requirements when the Response Times are Very Different
- Understanding the Design and Testing of an Integrating Process

Tailoring Control Performance
- Placing more Emphasis on Selected Control or Constraint Parameters
- Improving Control Performance when the Process is Dead Time Dominant
- Compensating for Large Changes in Process Gain or Dynamics
- Minimizing the Impact of Process Noise on Control Performance

MPC Application
- Selecting and Applying MPC, MPC-Pro and MPC-Plus Blocks

Optimizing Control
- Optimizing the Control Using theMPC-Pro or MPC-Plus Blocks

DeltaV – Control – Advanced – Custom - Virtual

Course 7203CV CEUs: 3.2

Overview

This 4-1/2-day course is designed for process and control engineers who are applying DeltaV Predict and Predict Pro. This is a condensed course with selected content from Courses 7201 and 7202. It provides practical examples of how to determine the benefits of MPC application and how this control may be used to meet specific application requirements. Students will gain hands on experience through lab exercises based on realistic dynamic process simulations.

This course is designed for process and control engineers who are applying DeltaV Model Predictive Control.

Prerequisites

7201 DeltaV Advanced Control

Topics

How to Implement an MPC Solution
- DeltaV MPC Function Blocks and Predict / PredictPro
- MPC for Multi-Variable Control
- Model Identification, Data Screening
- Simulation of Response, Tuning

How to Justify an MPC Project
- Evaluating the Cost of ProcessVariation
- Estimating the Reduction in Variation that is possible using MPC
- Calculating the Benefit of Maximizingthroughput\when plant production isrestricted by Input Limits orMeasurable Constraint

Meeting Application Requirements
- Ensuring Disturbance Inputs are Independent of Other Process Inputs
- Meeting Control Requirements when the Response Times are VeryDifferent
- Understanding the Design andTesting of an Integrating Process

Tailoring Control Performance
- Placing more Emphasis on Selected Control or Constraint Parameters
- Improving Control Performance whenthe Process is Dead time Dominant
- Compensating for Large Changes in Process Gain or Dynamics
- Minimizing the Impact of ProcessNoise on Control Performance MPCApplication
- Selecting and Applying MPC, MPC-Pro and MPC-Plus Blocks OptimizingControl
- Optimizing the Control Using the MPC-Pro or MPC-Plus Blocks

DeltaV - Virtualization Administration

Course 7028 CEUs: 2.1

Overview

This 3-day DeltaV Virtualization course focuses on the various software that is used in the management of a DeltaV Virtualization environment. Students will engage in workshops that will reinforce the material discussed to successfully run and maintain a Virtualized DeltaV system.

This course is designed for system administration personnel that will be maintaining DeltaV workstations on a virtual platform after installation.

Prerequisites

7027 DeltaV System Administration

Topics

Virtualization Hardware Setup
- Overview of a typical virtualization system
- Differences between a Host and DC Servers
- Role of a DC
- Networks within a virtualized system
- Clusters
- Virtual Networks

Virtual Machines
- Review Templates
- Process to create Virtual machines
- Overview of classroom setup
- Create additional DeltaV Workstations

DeltaV Virtual Studio Tools
- Grouping
- VM Modifications
- Edit Collection Settings

Thin Clients
- DeltaV Remote Desktop Connection(DRDC)
- Redundant Thin Client Networks

Replication & Disaster Recovery
- Install/Configure Replication
- Examine replication options
- Recover from failovers

Health Monitoring & Troubleshooting
- Emerson SHM
- DVS/Cluster Diagnostics
- DeltaV Alarming
- Failure Scenarios

Host Patching & Moving VMs
- Patching Procedures, Verification

Process Control

Persons completing these courses receive a good grounding in process control principles and strategies, controller tuning and loop dynamics as they relate to Fisher control valves. Engineers and technicians with little or no experience begin to build the fundamental knowledge they need to move forward in this field. Completing these courses receive a good grounding in process control principles and strategies, controller tuning, and loop dynamics as they relate to Fisher control valves. Engineers and technicians with little or no experience begin to build the fundamental knowledge they need to move forward in this field.

Introduction to Process Control

Course 9000 CEUs: 3.2

This Fisher course is for students that have little or no process experience.

Overview

This course provides those new to the field with the basic, overall fluid process controls knowledge they need to better understand the function of automated control loops. Aspects of process control (measurement devices, controllers, final control elements, and fundamental control methods) are covered by classroom presentations and laboratory exercises that are intended to familiarize students with the function and application of the wide variety of equipment commonly found in process plants.

Prerequisites

None. This is an introductory course.

Topics

- Process Control Terminology and Symbols
- Process Loop Introduction
- Measurement Instrumentation for:
  - Flow;- Level;- Temp;- Pressure
- Instrument Calibration Concepts
- Final Control Elements
  - Control Valves; -Actuators;
  - Control Valve Instrumentation
- Introduction to Loop Dynamics, Tuning and Control

Loop Tuning Short Course

Course 9006 CEUs: 1.4

This Fisher course is designed for those who have the job responsibility of tuning or monitoring industrial process control loops. Students will learn to tune controllers to meet the needs of each loop.

Overview

Students will practice tuning on process simulation software using tuning methods that do not require calculations. The baseline method requires knowledge of the type of process, and the trial and error method requires making small setpoint bumps and changing controller gain and reset to meet the desired loop performance.

Students will also learn open loop response testing and Lambda tuning to obtain greater loop accuracy, stability and predictability.

Prerequisites

None

Topics

- Load Upsets
- Process Noise
- Self Regulating Process
- Integrating Process (Level)
- Valve Deadband and Stick/Slip
- Limit Cycling
- Baseline Controller Tuning
- Trial and Error Tuning
- Lambda Tuning
- Process Time Constant, Deadtime and Gain
- Positioner Application Guidelines

Control loop Foundation

Course 9025 CEUs: 3.2

This course is for engineers, managers, technicians and others that are new to process control. This course includes the practical aspects of control design and process applications that course developers personally learned through years of hands-on experience while designing and commissioning process control applications.

Overview

This 4½-day course for personnel new to automation and covers process control fundamentals as well as the practical aspects of control system design and applications. Upon completion of this course the student will be able to effectively work with and commission single and multi-loop control strategies. Interactive workshops allow the student to apply what the learn in the class.

Prerequisites

Windows experience.

Topics

- Background - Historic Perspective
- Measurements - Basic Transmitter Types, Limitations
- Analyzers - Examples of On-Line Analyzers
- Final Elements - Valves and Variable Speed Drives
- Field Wiring and Communications Traditional, HART Foundation fieldbus, Wireless HART
- Control Strategy Documentation- Plot Plan, Flow Sheet, P&ID, Loop Sheet
- Operator Graphics and Metrics - Considerations in Display Design
- Process Characterization - Identifying Process Dynamics and Gain
- Control Objectives
- Single Loop Control- Basis for PID, Guideline in Selecting PID Structure, Action
- Tuning and Loop Performance - Manual and Automated Tuning Techniques
- Multi-loop Control - Feed forward, Cascade, Override, Split-range, Valve Position Control
- Model Predictive Control -Addressing Difficult Dynamics, Interactive Processes
- Process Modeling - Development of Process Simulation for Control System Checkout
- Application Examples - Batch, Continuous, Combustion, Distillation, Unit Coordination

All these courses deal with optimizing process performance and reliability by reducing process variability through better control. Loop tuning-by-feel is replaced by a systematic, scientifically sound approach, which is the subject of several courses for process control engineers and technicians. These courses provide an excellent platform for further economic optimization via advanced process control.

eLearning: Control loop Foundation

Course e9025 CEUs: 1.8

This course is designed for process engineers, process control engineers, managers, technicians and operators new to the process control industry.

Overview

This 18-hour (average duration) on-line course includes audio presentations, demonstrations, hands-on workshops and quizzes. Upon completion of this course, the student will be able to read control strategy documentation and will be able to effectively work with and commission single/multi-loop control strategies.

Prerequisites

Microsoft Windows experience.

Topics

- Background - Historic Perspective
- Measurements- Basic Transmitter Types, Limitations
- Analyzers- Examples of On-Line Analyzers
- Final Elements -Valves and Variable Speed Drives
- Field Wiring and Communications - Traditional, HART, Foundation Fieldbus, Wireless HART
- Control Strategy Documentation - Plot Plan, Flow Sheet, P&ID, Loop Sheet
- Operator Graphics and Metrics - Considerations in Display Design
- Process Characterization - Identifying Process Dynamics and Gain
- Control Objectives
- Single Loop Control- Basis for PID, Guideline in Selecting PID Structure, Action
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Note: Course access is 3 months

Process Systems and Solutions
LEARNINGPATH

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Applied Modern Loop Tuning 9032

Applied Advanced Regulatory Controls 9034

EnTech Applied Modern Loop Tuning and Advanced Regulatory Controls 9035

Process Dynamics and Tuning Fundamentals (PCE I) 9030

Process Analysis and Minimizing Variability (PCE II) 9031

EnTech Toolkit Training 1430

Applied Modern Loop Tuning

Course 9032 CEUs: 2.1

This course is for engineers and technicians responsible for maintaining process control performance using instrumentation and control loop tuning.

Overview

Applied Modern Loop Tuning (9032) is a 3-day registration or on-site course that introduces participants to effective methods for determining optimal tuning parameters for regulation of processes. The non-oscillatory En Tech tuning techniques, based on Lambda tuning concepts, are taught with a focus on minimizing process variability. Effectiveness is gained by the implementation of a tuning strategy that matches control loop dynamics to process operating requirements. It contains formal lectures that are amply populated with process examples and supported with hands-on lab exercises using computer-based process simulators. Participants learn how to recognize acceptable versus unacceptable control loop performance and to identify the most common source of problems. Fundamental tuning concepts, including the PID controller, process dynamics, valve motion characteristics deadband (backlash) and resolution (section), setpoint tracking and regulatory control, integrating processes and level control are reviewed and demonstrated using case study examples.

Prerequisites

Some experience with process instrumentation and control is helpful.

Topics

- Process Dynamics -Perform Bump Tests to Identify Process Model (Gain, Deadtime, Time Constant and Valve Dynamics) to Determine PID Tuning
- Self Regulating Loops -Apply Lambda Tuning to First-Order and Second-Order Process Loops (Flow, Pressure, Temperature, pH, etc)
- Integrating Loops -Tune Levels and Header Pressures for Load Recovery and Setpoint Response
- Process Interactions- Lambda Tune Loops to Minimize Interactions and Increase Production

Process Control

Applied Advanced Regulatory Controls

Course 9034 CEUs: 2.1

This course is for engineers and technicians responsible for process control design, implementation and control performance.

Overview

This is a 3-day course that teaches the practical principals of advanced regulatory controls and tuning techniques to achieve improvements that can exceed that of basic PID controls. The course will examine many advanced regulatory control technologies commonly available today and help participants understand which technologies are best suited and how to appropriately apply them given specific process dynamics and conditions. Formal lectures are amply populated with process examples and supported with hands-on lab exercises. Approximately 40% of the course is hands-on lab based workshops where students develop practical skills required to apply and tune advanced regulatory controls. A dynamic process simulator is used to simulate a variety of process unit dynamics and evaluate the benefits of different advanced regulatory control strategies.

Prerequisites

Participants should possess basic process control knowledge and experience with DCS control strategy configuration.

Topics

- Process and Disturbance Dynamics
- PID Algorithms- PID, PI, PI-D, 1-PD, PD, P-D, ID, 1-D, 2 degrees of Freedom Control
- Cascade Control, Dynamic Feed forward
- Ratio Control, Override (selector) Control
- Split Range and Midrange Control
- Interactive Control Loops- Decoupling Control (2X2) and Lambda Tuning
- Deadtime Compensation (Smith Predictor)
- Adaptive Control (Gain Scheduling, Auto Tuning)
- Introduction to Model Predictive Control (Multiple Inputs Single Output)

En Tech Applied Modern Loop Tuning and Advanced Regulatory Controls

Course9035 CEUs: 2.8

This course is for engineers and technicians responsible for process control design, implementation and control performance.

Overview

This is a special combined 9032 and 9034 4-day course that teaches the practical principals of advanced regulatory controls and tuning techniques to achieve improvements that can exceed that of basic PID controls. The course will examine many advanced regulatory control technologies commonly available today and help participants understand which technologies are best suited and how to appropriately apply them given specific process dynamics and conditions. Formal lectures are amply populated with process examples and supported with hands-on lab exercises. Approximately 40% of the course is hands-on lab based workshops where students develop practical skills required to apply and tune advanced regulatory controls. A dynamic process simulator is used to simulate a variety of process unit dynamics and evaluate the benefits of different advanced regulatory control strategies.

Prerequisites

Participants should possess basic process control knowledge and experience with DCS control strategy configuration.

Topics

- Lambda Tuning for Self Regulating and Integrating processes
- Process and Disturbance Dynamics
- PID Algorithms- PID, PI, PI-D, 1-PD, PD, P-D, ID, 1-D, 2 degrees of freedom control
- Cascade Control, Dynamic Feed forward
- Ratio Control, Override (selector) Control
- Split Range and Midrange Control
- Interactive Control Loops - Decoupling Control (2X2) and Lambda Tuning
- Deadtime Compensation (Smith Predictor)
- Adaptive Control (Gain Scheduling, Auto Tuning)
- Introduction to Model Predictive Control (Multiple Inputs Single Output)

Process Dynamics and Tuning Fundamentals (PCE I)

Course 9030 CEUs: 2.8

This course is for engineers, or persons with equivalent math and theoretical background, who have responsibility for process control design and implementation, process optimization or process design and troubleshooting.

Overview

Process Dynamics, Control and Tuning Fundamentals (Process Control for Engineers I) is a 4-day course that provides the fundamental theory governing process dynamic behavior, control system operation and controller tuning. Course material is based on experience gained in process variability optimization work and is based on modern control engineering concepts coupled with practical process application knowledge. This course presents a systematic approach to optimizing the control of a process unit operation in order to manufacture uniform product more efficiently. The course uses formal lectures with hands-on lab exercises. High fidelity process simulators are used as the basis for the labs and simulation analysis.

Prerequisites

Had functionality in the mathematics required to understand the concepts listed in “topics”.

Topics

- Process Dynamics - Self Regulating and Integrating
- First Order Process Model
- Second Order Process Model
- Integrating Process Model
- Process & Control Nonlinearity
- Feedback Control & PID Controllers
- QAD Tuning & Lambda Tuning
- Setpoint & Load Response
- Frequency Response - Bode Plots
- Tuning Interactive Control Loops
- Coordinated Lambda Tuning for Unit Optimization

Process Analysis and Minimizing Variability (PCE II)

Course 9031 CEUs: 2.1

This course is for engineers and technicians responsible for process control design, implementation and control performance.

Overview

This is a 3-day course that teaches the practical principals of advanced regulatory controls and tuning techniques to achieve improvements that can exceed that of basic PID controls. The course will examine many advanced regulatory control technologies commonly available today and help participants understand which technologies are best suited and how to appropriately apply them given specific process dynamics and conditions. Formal lectures are amply populated with process examples and supported with hands-on lab exercises. Approximately 40% of the course is hands-on lab based workshops where students develop practical skills required to apply and tune advanced regulatory controls. A dynamic process simulator is used to simulate a variety of process unit dynamics and evaluate the benefits of different advanced regulatory control strategies.

Prerequisites

Participants should possess basic process control knowledge and experience with DCS control strategy configuration.

Topics

- Process and Disturbance Dynamics
- PID Algorithms- PID, PI, PI-D, 1-PD, PD, P-D, ID, 1-D, 2 degrees of Freedom Control
- Cascade Control, Dynamic Feed forward
- Ratio Control, Override (selector) Control
- Split Range and Midrange Control
- Interactive Control Loops- Decoupling Control (2X2) and Lambda Tuning
- Deadtime Compensation (Smith Predictor)
- Adaptive Control (Gain Scheduling, Auto Tuning)
- Introduction to Model Predictive Control (Multiple Inputs Single Output)

En Tech Toolkit Training

Course 1430 CEUs: 2.8

This course is for engineers and technicians responsible for process control design, implementation and control performance.

Overview

This is a special combined 9032 and 9034 4-day course that teaches the practical principals of advanced regulatory controls and tuning techniques to achieve improvements that can exceed that of basic PID controls. The course will examine many advanced regulatory control technologies commonly available today and help participants understand which technologies are best suited and how to appropriately apply them given specific process dynamics and conditions. Formal lectures are amply populated with process examples and supported with hands-on lab exercises. Approximately 40% of the course is hands-on lab based workshops where students develop practical skills required to apply and tune advanced regulatory controls. A dynamic process simulator is used to simulate a variety of process unit dynamics and evaluate the benefits of different advanced regulatory control strategies.

Prerequisites

Participants should possess basic process control knowledge and experience with DCS control strategy configuration.

Topics

- Lambda Tuning for Self Regulating and Integrating processes
- Process and Disturbance Dynamics
- PID Algorithms- PID, PI, PI-D, 1-PD, PD, P-D, ID, 1-D, 2 degrees of freedom control
- Cascade Control, Dynamic Feed forward
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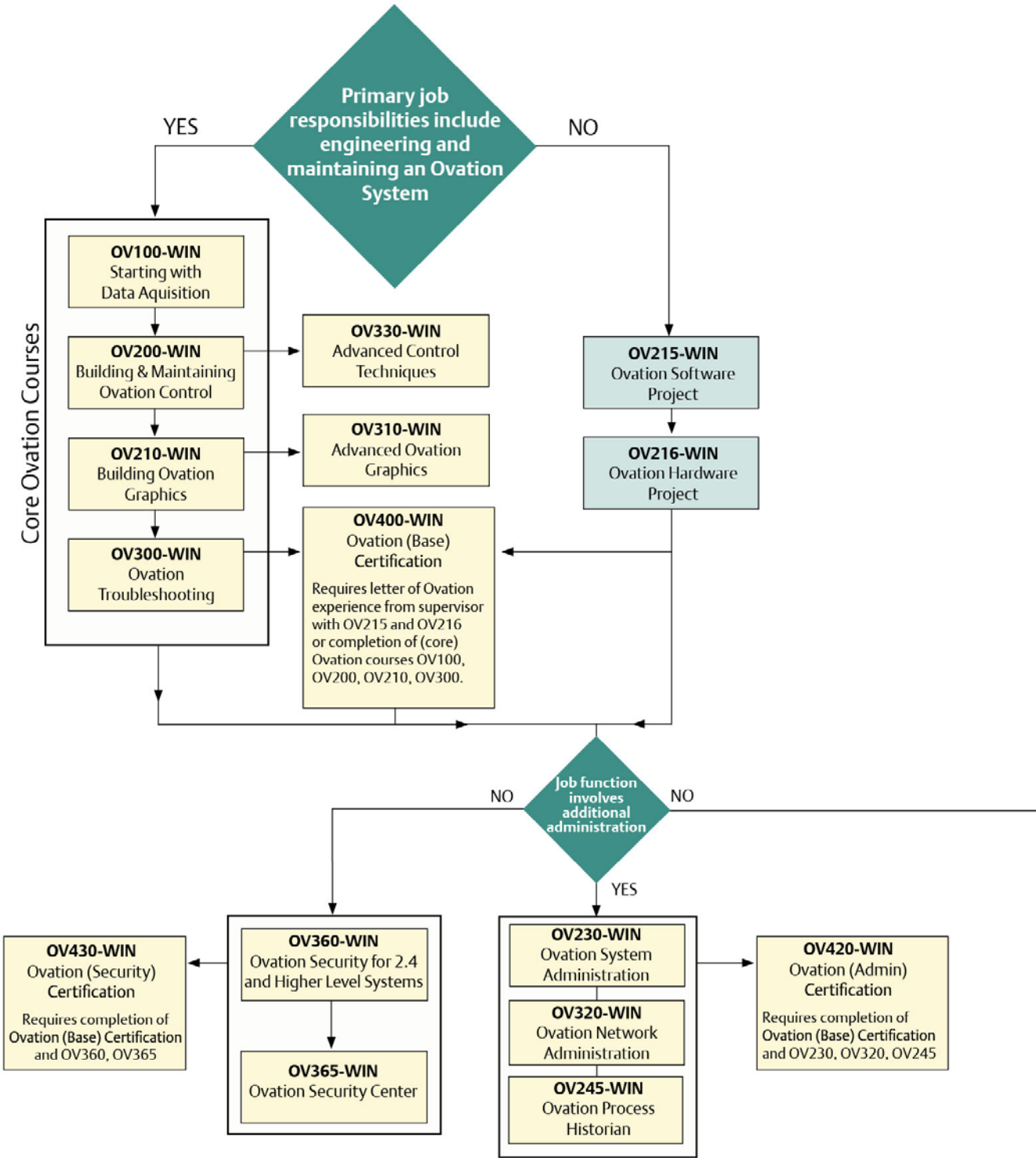
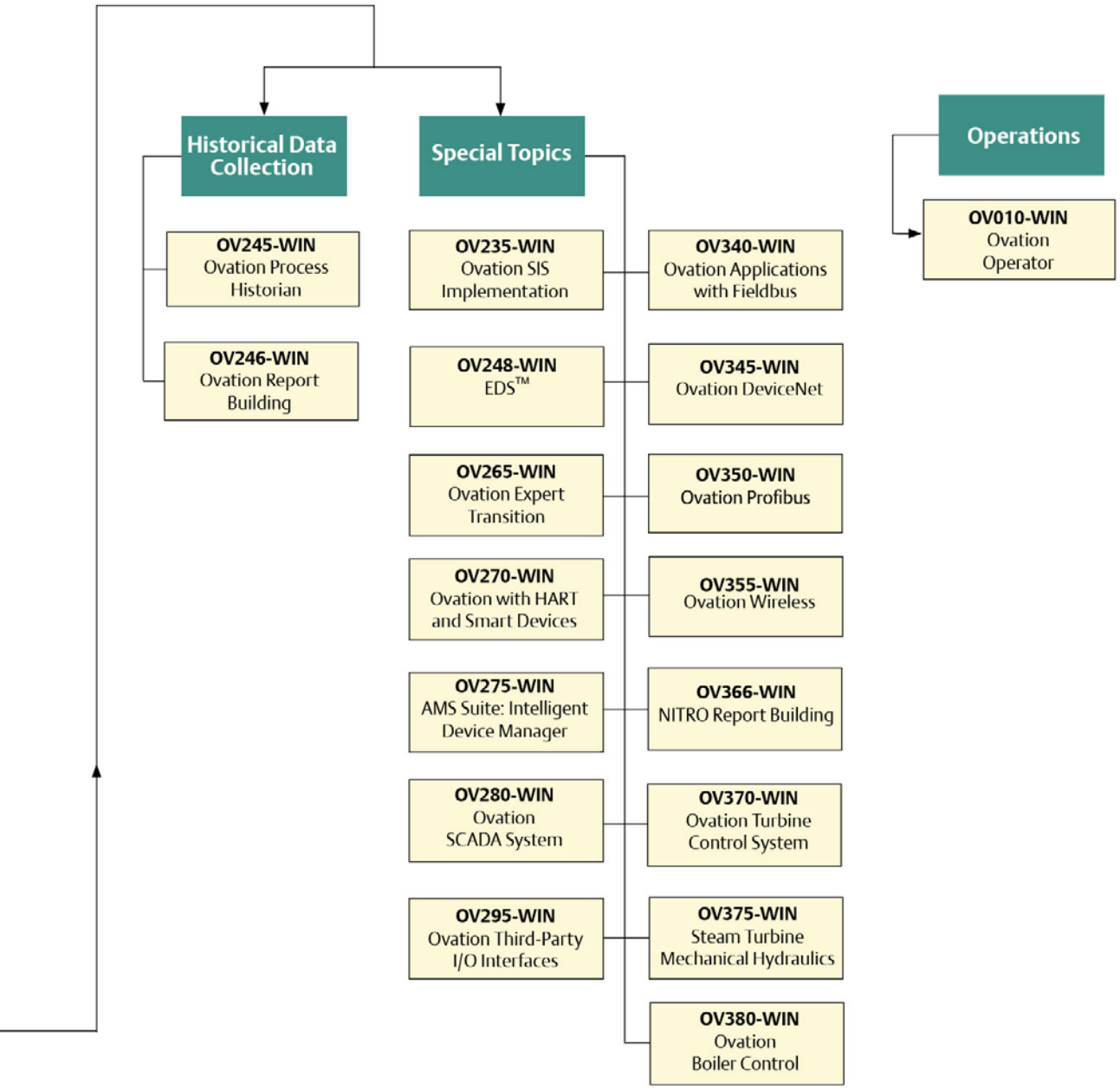
- Introduction to Model Predictive Control (Multiple Inputs Single Output)

Ovation™ COURSEMAP

The Ovation Course Map is designed to help students determine their course path for Ovation training. Emerson offers the industry's broadest array of process automation products and services; a total solution for your plant automation needs. We are committed to providing our customers with an exceptional level of education that spans every aspect of our product portfolio.

We work hard to ensure that our academic deliverables are as applicable to your everyday job functions and responsibilities as possible. Our course map is an instrumental tool for charting your path to success.





All Ovation training courses can be conducted on-site.
Contact us at MEA.Education@Emerson.com.

Ovation™

Emerson Automation Solutions Power & Water Solutions is the premier source of proven technology and application for the power generation, water treatment, and wastewater treatment industries. The Ovation expert control system, a key component of the proven PlantWeb digital architecture, delivers higher levels of plant availability, reliability, and environmental compliance.

Starting with Data Acquisition

Course OV100-WIN CEUs: 3.5

Overview
This 5-day course provides experience using an Ovation Data Acquisition System (DAS). Ovation terminology and proper use of Ovation documentation are discussed. Students are introduced to the major components of the system and practice using Ovation tools that are designed to make data acquisition easy. Exercises include modifying and building database point records for analog and digital points. The students physically connect various field devices to the I/O and test the signals. Basic techniques for troubleshooting data acquisition hardware and software are also included in the course. These courses are intended for anyone who will need to work with the DAS of the Ovation system in a Windows environment.

Prerequisites
There are no prerequisites for this course.

Topics
- Recognize Ovation terminology and identify the types of drops used for data acquisition in an Ovation system.
- Demonstrate the ability to effectively use Ovation documentation.
- Describe the functions of the Ovation network and its components.
- Describe the functions of the Ovation network and its components.
- Describe the general architecture of an Ovation system.
- Describe the database point record movement between various drops as points are monitored, modified and built.
- Monitor plant processes using data acquisition tools.
- Recognize, modify and build the various types of database point records in an Ovation system.
- Select and configure I/O modules for typical field devices.
- Wire and test complete signal paths between various field devices and appropriate \ database point records.
- Analyze problem situations and implement appropriate corrective solutions.

Building and Maintaining Ovation Control

Course OV200-WIN CEUs: 3.5

Overview
This 5-day course is designed to provide proficiency in reading Ovation functional control schemes. Tuning, building and implementing new control schemes to improve performance are covered. Both modulating (analog) and discrete digital control schemes are included in the scope of the course. Discussions include the various types of control algorithms available and how they can be used to create effective control. These courses are intended for people who work with Ovation Controllers to tune and build the analog and digital control schemes.

Prerequisites
Students must have a good understanding of the Ovation system architecture and how database point records are built and maintained in the Ovation Windows-based system. It is recommended that students attend an OV100-WIN course prior to attending this course.

Topics
- Interpret and apply a control functional to the Windows-based system.
- Interpret and tune implemented control using the available tools.
- Edit existing control schemes.
- Demonstrate proficiency in building digital & analog control.
- Design and implement a tracking scheme to meet specific control requirements.
- Recognize the relationship between control schemes and graphic diagrams.
- Implement given control requirements using the Control Builder.
- Evaluate and determine the proper operation of a control scheme using the tools and methods provided.

Building Ovation Graphics

Course OV210-WIN CEUs: 3.5

Overview
This 5-day course will teach the user to build Ovation system graphic diagrams. Students will learn how to use the Ovation Graphics Builder in various applications. Course topics include the layout and implementation of static and dynamic objects, linking to control and creating perspective-type diagrams. Methods for standardizing information entities and control interfaces and troubleshooting problems within the graphics code are also covered. These courses are intended for anyone who will build process diagram displays to the Ovation system.

Prerequisites
Students must understand Ovation point record fields and Ovation control algorithm structures. It is recommended that students attend OV100-WIN prior to attending these courses. If the student will be heavily involved in creating control interfaces or OV200-WIN is also recommended.

Topics
- Describe the different coding areas within the graphic source code.
- Build graphics to display live plant data.
- Use various drawing techniques to create 3D graphics.
- Interface graphics to the control system by using poke fields.
- Design and implement macros to be used within graphics.
- Use conditional statements to create dynamic indications in graphics.
- Employ various techniques to make graphics code execute more efficiently.
- Use various application programs within a graphic to perform specific actions.
- Assess and correct problems in graphics using available tools.

Extensive training opportunities are available for project managers, engineers, operators, technicians and system administrators.

Ovation Operator

Course OV010-WIN CEUs:1.8

Overview
This 2½-day course is designed to provide students with the ability to efficiently perform routine plant operations using the Ovation control system. Key topics include data acquisition, process analysis and control interfaces. Students will be able to use the tools provided to monitor processes controlled by the Ovation system and will learn to take appropriate actions to control these processes. These courses are intended for all operations personnel using the Ovation system in Windows environment.

Prerequisites
There are no prerequisites for this course.

Topics
- List the major components of the Ovation control system.
- Display process diagram graphics.
- Use process diagrams to interface with the control system.
- Evaluate point alarm conditions and acknowledge emergent alarms.
- Differentiate various point types and use the Point Information system to find and edit point records.
- Create live and historical trends.
- Navigate through control tuning diagrams.
- Analyze problem conditions.
- Use system reporting procedures.
- Describe the function of Ovation applications icons.
- Demonstrate familiarity with menu bars and tool bars in the various process diagram windows.
- Demonstrate familiarity with the task bar and other Windows utilities.

Global Ovation OPH Report Building

Course OV246-WIN CEUs: 2.1

Overview
This 3-day course will teach students to configure and retrieve historical data using the Ovation Process Historian (OPH) and Crystal Reports. Students will learn how to use the OPH Report Manager to define: Alarm, Soe, Point and Operator Event Reports. Students will also learn how to configure demanded reports, triggered reports and timed reports in the OPH Report Manager. Students will also use Crystal Reports to create new report formats for use in the OPH Report Manager.

Prerequisites
There are no prerequisites for this course.

Topics
- Describe the functions of the Ovation Process Historian and related components.
- Recognize the Ovation Process Historian Database Schema and understand the concept of a Relational Database Management System (RDBMS)
- Schedule, automate and manipulate reports
- Distribute reports using printers and various output files
- Create custom reports and ad-hoc queries using various 3rd party applications such as Crystal Reports and MS Excel

EDS™

Course OV248-WIN CEUs: 2.1

Overview
This 3-day course is designed to give students a detailed understanding of EDS™. Upon completion of this course, the student will be able to configure an EDS server to collect point data from an existing Ovation system. An EDS client will be properly configured and the applications of the EDS station will be covered extensively. This course is designed for anyone who will be using or managing the EDS.

Prerequisites
There are no prerequisites for this course.

Topics
- Illustrate the functions of the EDS system and architecture
- Explain how an EDS server is loaded and configured
- Configure an EDS client to communicate with an existing EDS
- Manage the data storage of the EDS
- Demonstrate how to view and interpret error messages
- Build reports using the EDS Report Builder
- Build custom graphics using the EDS Graphics Builder

AMS Suite: Intelligent Device Manager

Course OV275-WIN CEUs: 1.4

Overview
This 2-day course will provide the student with the skills to fully utilize the special features of I/O related to HART and smart field devices attached to the Ovation™ system. Students will learn the basic components of an Ovation system. Items discussed will include physical attachment of field devices to the Ovation I/O modules, building of HART/smart data points in the system, analysis of the data available from the field device, and diagnosis of problems that may occur. This course is intended for technicians and administrators using an Ovation system that includes HART and smart field devices.

Prerequisites
Students should complete OV100-WIN prior to taking this course. OV270-WIN and either OV200-WIN-3.0.X or OV200-WIN-3.1.X are also recommended.

Topics
- Identify the configuration of components in an Ovation system using Hart/smart devices
- Attach HART/smart field devices to the Ovation I/O cards
- Build database points for the field devices
- Use AMS™ Suite to obtain data from the devices
- Diagnose common problems and configuration errors

Ovation SCADA System

Course OV280-WIN CEUs: 2.1

Overview
This 3-day course will provide the student with the skills to take full advantage of their Ovation SCADA system. Students will learn the basic components of an Ovation SCADA system. Items discussed will include SCADA Servers, remote terminal units, scan blocks, lines, ports, configuration tool, protocol analyzers and more. Students will establish communications using available Allen-Bradley, MODBUS or DNP 3.0 protocols. This course is intended for technicians and administrators using the Ovation SCADA system.

Prerequisites
Students should complete OV100-WIN and OV270-WIN prior to taking this class. OV200-WIN is also recommended, but not required.

Topics
- Identify the purpose and components in an Ovation SCADA system
- Identify the licensing requirements of an Ovation SCADA system
- Use the configuration tool to access and modify the system
- Analyze the communication protocols used with and Ovation SCADA system
- Utilize the protocol analyzer to interpret signal traffic between the SCADA Server and RTUs
- Interpret scan block data
- Create Ovation graphics to interface to the Ovation SCADA system

Ovation Advanced Control

Course OV330-WIN CEUs: 3.5

Overview
This 5-day course is intended for students who will implement their own control programs, or who will make significant modifications to existing programs. Using previous control-building knowledge, the student will learn how to implement control design in an Ovation environment. This course is a continuation of the control topics discussed in OV200-WIN. The course will emphasize the proper selection, configuration and application of algorithms in the Ovation control system.

Prerequisites
Prior completion of OV200-WIN is strongly recommended. A working knowledge of control systems and control theory is suggested.

Topics
- Apply, tune and track all appropriate algorithms in open- and closed-loop configurations.
- Select, filter and compensate transmitter inputs.
- Implement complex sequential control.
- Appreciate important closed-loop control forms.
- Configure general math computations.
- Describe the interface of selected algorithms to input/output hardware.
- Use algorithms for timing, counting, accumulation and system-time applications.

Ovation System Administration

Course OV230-WIN CEUs: 3.5

Overview
This 5-day course will provide students with an understanding of Ovation system licensing, security, configuration, backup and recovery. Students will learn how to navigate the Ovation file system as well as basic administration skills. Students will also explore Ovation workstation hardware. This course is intended for Ovation system administrators and those wishing to complete the Ovation Certification Program.

Prerequisites
Students must have a good understanding of Ovation system architecture. Experience working in a Windows environment is helpful but not necessary. Prior completion of the OV100-WIN, OV200-WIN and OV210-WIN, courses, is highly recommended but not required.

Topics
- Navigate and understand the Ovation engineering tools Developer Studio for Windows).
- Understand licensing of the Ovation system.
- Implement process control and user security in the Ovation system (2.3 and lower).
- Apply system configuration changes to the Ovation system.
- Add new and modify existing drops to the Ovation system
- Navigate and understand the Ovation file systems, structure, sharing and security.
- Backup the Ovation database and required files to various media.
- Load an Ovation system.
- Recover the Ovation database and required files from backup.
- Understand upgrading and maintaining the Ovation hardware.

Ovation Process Historian

Course OV245-WIN CEUs: 3.5

Overview
This 5-day course will teach students to configure and retrieve historical data using the Ovation Process Historian. The course covers data collection, data storage and data retrieval. Students will learn how to configure Ovation points and the Ovation system for collection. This course is intended for people who will configure, access and maintain the Ovation Process Historian and the Report Scanner/ Report Generator drops of the Ovation system.

Prerequisites
Students must have a good understanding of the Ovation system architecture and how database point records are built and maintained in the Ovation Windows-based system. It is recommended that students attend an OV100-WIN course prior to attending this course.

Topics
- Describe the functions of the Ovation Process Historian and related components
- Configure scanners and points for collection
- Recognize the Ovation Process Historian database scheme and understand the concept of a relational database management system (RDBMS)
- Understand the Ovation Process Historian architecture and hardware
- Install and configure the Ovation Process Historian report manager
- Schedule, automate and manipulate reports
- Distribute reports using various techniques such as email, web publishing, printers and various output files
- Create custom reports and ad-hoc queries using various third-party applications such as Crystal Reports, MS Excel, MS Access and SQL
- Create historical trends and build global trend groups
- Create historical point, alarm, SOE, op-Event, ASCII and common reviews
- Analyze the Ovation Process Historian with the diagnostic tools available

Ovation with HART and Smart Devices

Course OV270-WIN CEUs: 1.4

Overview
This 2-day course will provide the student with the skills to fully utilize the special features of I/O related to HART and smart field devices attached to their Ovation system. Students will learn the basic components of an Ovation system. Items discussed will include physical attachment of field devices to the Ovation I/O modules, building of HART/smart data points in the system, analysis of the data available from the field device and diagnosis of problems that may occur. This course is intended for technicians and administrators using an Ovation system that includes HART and smart field devices.

Prerequisites
Students should complete OV100-WIN prior to taking this course. OV200-WIN and OV210-WIN are also recommended.

Topics
- Identify the configuration of components in an Ovation system using HART/smart devices.
- Attach HART/smart field devices to the Ovation I/O cards.
- Build Database points for the field devices.
- Use AMS™ Suite to obtain data from the devices.
- Diagnose common problems and configuration errors.

Ovation Troubleshooting

Course OV300-WIN CEUs: 3.5

Overview
This 5-day course provide students with the skills and methods to troubleshoot and repair faults in the data acquisition and control functions of the Ovation system. Students will be required to isolate faults anywhere in the signal path - from the field terminations to the I/O modules, through the controller, across the network and into the graphic display. Students will evaluate single- and multiple-problem scenarios. These courses are intended for anyone who may be called to troubleshoot any part of the data acquisition, control or display areas of the Ovation system.

Prerequisites
Students must have a basic understanding of the Ovation system architecture, database point records, system controls, and process diagrams. It is strongly recommended that students attend the OV100- WIN and OV200-WIN courses prior to attending this course. The OV210-WIN and OV230-WIN courses also provide useful skills that support this course.

Topics
- Identify and resolve selected hardware, system administration and software problems.
- Troubleshoot the system using documentation and available tools to analyze system faults or problem conditions.
- Interpret system error messages.
- Recognize and resolve problems with the system administration tool.
- Using a systematic approach to fault analysis, isolate and correct selected network, port and printer faults.

Advanced Ovation Graphics Programming

Course OV310-WIN CEUs: 2.8

Overview
This 4-day course will give students the ability to use application programs and advanced programming techniques, including the use of memory segments combined with pointer manipulation to enhance advanced graphic programming skills. These courses are intended for anyone who will build specialized process diagram displays for the Ovation system.

Prerequisites
Students must have a good understanding of the Ovation system architecture, database point records and how basic graphics are built and maintained in the Ovation system. It is strongly recommended that students attend the OV100 - WIN and OV210-WIN courses prior to attending this course. It would also be helpful to have taken the OV200-WIN course if the student wants to improve skills pertaining to graphic interfaces with plant controls.

Topics
- Define the different memory segments available in the graphics subsystem.
- Build several graphics utilizing pointers and memory segments.
- Interpret application programs.
- Use the trigger section of the graphics code for efficiency.
- Use graphic commands only available in a text editor.
- Troubleshoot graphics using available tools.

Ovation Network Administrator

Course OV320-WIN CEUs: 3.5

Overview
This 5-day introductory networking course will provide students with an understanding of general networking concepts, as well as Ovation-specific network configurations for Fast Ethernet systems. Students will learn the basic networking skills required for general network administration and troubleshooting. Students will also be provided with hands-on knowledge of switch and router configuration for use in Ovation systems. This course is intended for Ovation network administrators, Ovation system administrators and those wishing to Complete the Ovation Certification Program.

Prerequisites
Prior completion of the OV230-WIN course is recommended but not required.

Topics
- Explore basic networking concepts including the OSI reference model, MAC addressing, TCP/IP, IP addressing, multicast addressing and local area networks.
- Implement an Ovation specific network addressing scheme and network topology.
- Define and explore basic network commands.
- Define network devices and media and their relation to the OSI reference model.
- Configure Cisco 2600 series routers, Cisco3550 series switches and Cisco 2950 switches series for use in an Ovation network (where applicable).
- Configure and implement SNMP for Ovation.
- Troubleshoot inter-networked systems with network tools and software.
- Configure and apply third-party networking software.

Ovation Security for 2.4 Systems or Later

Course OV360-WIN CEUs: 3.5

Overview
This 5-day course will guide students in the proper planning and installation of security for Ovation 2.4 and higher level systems. Students will discuss and come to understand Ovation external and internal security concerns, and learn to apply appropriate safeguards. Students will install and configure Ovation compatible Windows Server 2003 Domain Controllers, Windows XP service packs and Windows security patches. The student will configure Ovation security using the Ovation Security Manager and have a basic understanding of Windows group policy objects.

Prerequisites
This course is designed for students who will administer Ovation 2.4-level or higher systems. It is recommended that students attend OV230-WIN and have a basic understanding of Ovation system configuration and security concepts prior to attending this course. No prior knowledge of Windows-based security is required.

Topics
- Identify and explain Ovation-specific internal and external security threats.
- Plan and implement Ovation 2.4 software installation including Windows 2003 Server, Windows service packs and Windows security patches
- Describe the function of the Ovation Security Manager.
- Create and manage user accounts, computer accounts, and Ovation roles and group policies.
- Create and manage Ovation point security groups.
- Manage and understand domain policies.
- Create and manage Ovation domain administrators.
- Design and implement a specific Ovation security configuration.
- Explore the Windows group policy objects.

Ovation Certification Program

Course OV400-WIN CEUs: 3.5

Overview
This is a 5-day blend of (core) course subjects. The course comes complete with a vigorous examination designed to test and measure the student's proficiency in areas related to database building, control implementation, graphic linkage of process points and control algorithms and troubleshooting on a system-wide basis. Earning Ovation Certification acknowledges the competency of the individual while working within the Ovation product lines and enhances their abilities in addressing, assessing and repairing problematic situations within the Ovation system. During the 5-day course of (core) subject's instruction, attending students may elect to complete the examination during mid-week subject reviews. The attending students have two chances of achieving certification during this 5-day offering. Failure to achieve the desired results will result in the student having to retest via web-access at a later period-of-time.
A 100-point online exam is administered in which students are required to achieve a score of 80% or greater to successfully gain certification. Ovation certification is valid for three years and is applicable to the current software revision only.

Prerequisites
Students must have a strong background and understanding of the Ovation system and demonstrated proficiency in programming, configuring and troubleshooting said system. Before enrolling in the Ovation Certification program, students are required to have attended and completed the full course-length offerings of the following courses: OV100, OV200, OV210, OV300.

Topics
- Building, saving and implementing the Oracle database
- Constructing control sheets using both Boolean and Analog logic
- Loading and configuring the Ovation controller
- Designing graphics with control implementation
- Troubleshooting procedures as related to I/O and Controller modules

Ovation Software Project

Course OV215-WIN CEUs: 7.0

Overview
This 10-day course is designed for those who have a need or desire for a good, general, overall understanding of Ovation® system software and software utilities. This course contains and connects software topic segments from five different Ovation one-week courses: OV100-WIN, OV200-WIN-3.0.X, OV210-WIN, OV230-WIN and OV300-WIN. The topics covered include Ovation application functions; the Developer Studio architecture; point building; creating and modifying control sheets; creating and modifying graphics; backing-up MMI s including a domain controller; and adding points for collection to an Ovation Process Historian. This course is not intended to replace the five one-week courses directed toward personnel who have a singular need for the detailed knowledge provided in the one-week courses. The course does not involve implementing any I/O modules.
A sequel course, OV216-WIN, specifically focuses on I/O applications and is scheduled to follow OV215-WIN.

Prerequisites
There are no prerequisites for this course.

Topics
- Identify the major components of an Ovation system
- Understand basic Ovation terminology
- Demonstrate basic Ovation operator functions
- Understand data movement in an Ovation system
- Understand the hierarchy and basic right-click functions within the Ovation Developer Studio
- Use the Ovation Developer Studio to modify and create points
- Monitor control that has been implemented in an Ovation system
- Interpret and tune implemented control using the available tools
- Build and modify control schemes using the Developer Studio
- Interpret and modify tracking schemes to meet specific control requirements
- Recognize the relationship between control schemes and graphic diagrams
- Implement given control requirements using the Developer Studio
- Evaluate and determine the proper operation of a control scheme using the tools and methods provided

Ovation SIS Implementation

Course OV235 CEUs: 3.5

Overview
This 5-day course is designed to provide an overall understanding of the Ovation Safety System. This course is intended for people who work with the Ovation SIS systems.

Prerequisites
Students must be knowledgeable in Ovation point record field content and Ovation control algorithm structures. It is suggested that students attend the OV100-WIN course prior to taking this course. If the student is going to be heavily involved in creating control interfaces, it is also suggested that the OV200-WIN course be taken.

Topics
- Recognize the terminology used with an Ovation SIS
- Describe the functions of the Ovation SIS network and its components
- Describe the general architecture of an Ovation SIS
- Monitor Ovation SIS using the data acquisition tools
- Configure an Ovation SIS network and SIS Controller

Ovation Third-Party I/O Interfaces

Course OV295-WIN CEUs: 2.1

Overview
This 3-day teaches the students how to create specialized I/O links to non-Ovation field devices using both serial link modules and the Ovation Ethernet highway. The course covers configuring and loading link controller modules, creating third party points, memory mapping, adding third party drivers to controllers and the Ovation addressing requirements.

Prerequisites
There are no prerequisites for this course.

Topics
- Understand the Architecture and the functionality of the Ovation Fast Switched Ethernet Highway, and the need to protect it from external sources
- Define MAC and IP addressing, and Ethernet protocols
- Understand how Ethernet switches work
- Understand the Ovation IP addressing requirements
- Understand the various options for connecting Third Party I/O to the Ovation Highway
- Understand the Modbus register concept
- Understand the Modbus commands available in Ovation releases
- Be Aware of the difference in Modbus Drivers based on Ovation Releases
- Be Able to install Ovation Modbus drivers
- Be Able to build Ovation Point records for communication to Modbus
- Verify successful communications between Ovation and a PC Modbus simulation
- Interpret Ovation Controller Modbus error codes
- Recognize Fundamental AB Data Files
- Be Able to install Ovation Allen-Bradley Drivers
- Be Able to build Ovation Point records to communicate to an AB SLC500
- Verify successful communications between Ovation and the AB SLC500

Ovation Wireless with Wireless HART

Course OV355-WIN CEUs: 1.4

Overview
This 2-day course reviews the major components in an Ovation wireless system (wireless transmitters, gateways and the components of the SmartPack™). The student is taught how to utilize the available configuration tools to set up an Ovation wireless interface and add transmitters to an existing network.

Prerequisites
There are no prerequisites for this course.

Topics
- Understand Wireless HART® communications and Terminology
- Identify the Wireless HART® configuration components
- Attach Wireless HART® field devices and Gateway to the Ovation DCS.
- Build Database points for the field devices.
- Identify Wireless HART® Applications.
- Commission a Wireless HART® Device.

Ovation Security Center

Course OV365-WIN CEUs: 3.5

Overview
This 5-day course consists of a suite of security packages and services that has the ability to enhance and manage the cyber security of Ovation expert control systems without disrupting the controlled process. The OSC is a key component in achieving NERC CIP compliance by offering services such as: Patch Management, Event Management, and Malware Prevention. The course will examine how to configure and maintain the components of an OSC system on Ovation levels 2.4 and newer on Window's OS and Ovation levels 1.7 and newer on Solaris OS.

Prerequisites
There are no prerequisites for this course.

Ovation Hardware Project

Course OV216-WIN CEUs: 3.5

Overview
This 5-day course was developed for personnel whose primary interest and/or assignment is maintaining Ovation® hardware. Selected topics from the OV100-WIN, OV200-WIN, OV300-WIN and OV320-WIN courses are incorporated and expanded to cover hardware features of the controllers, the power supplies, the most commonly applied I/O modules, the Cisco switches and the Dell MMIs.

Hardware information contained within node and module records are explained, and the criteria for adding and changing modules assigned to a branch and slot positions are defined.

Hands-on exercises include building control sheets and linking inputs and outputs to selected modules. Also, included will be the application and activation of remote I/O, relay modules, serial link modules and third-party I/O as well as an exercise requiring a complete reload of a software server in order to understand how to recover from a hard drive failure.

Prerequisites
Students must have attended either OV215-WIN or both OV100-WIN and either OV200-WIN-3.0.X or OV200-WIN-3.1.X prior to attending this course.

Topics
- Utilize documentation to analyze faults
- Interpret Ovation system error messages
- Demonstrate remote I/O
- Understand recovery of hard drive failures on MMI(s)
- Configure Cisco switches and routers
- Monitor various LEDs of the system
- Build various RM records
- Recognize system administration tool problems and apply a solution
- Implement closed loop control
- Evaluate and determine operation of power supplies
- Implement given control requirements using the Developer Studio
- Evaluate and determine the proper operation of a control scheme using the tools and methods provided

Ovation Turbine Control System

Course OV370-WIN CEUs: 3.5

Overview
This 5-day course provides expert knowledge of the Ovation turbine control system (TCS). Turbine simulators will be used to demonstrate turbine operation, graphics and control logic. Turbine over speed protection and trip functions will be closely examined. The course includes calibration and troubleshooting exercises on the speed detector and valve positioner modules. Students will also learn how to tune the turbine control feedback loops and turbine valve curves using methods developed by Emerson.

Prerequisites
Students must have a good understanding of the Ovation system architecture. It is recommended that students attend the OV100-WIN, OV200- WIN and OV210-WIN courses prior to attending this course.

Topics
- Understand major Ovation operator functions as they apply to turbine control, including the process graphic, alarm, trend and point information systems.
- Identify basic functions of turbine control logic drawings.
- Recognize how the turbine control logic connects to the turbine control graphics.
- Identify the fail-safe design components: (1) power, (2) controller, (3) relay module.
- Understand the turbine first out trip logic and sequence of event (SOE) alarm reporting.
- Configure and test a speed detector module.
- Configure and calibrate a valve positioner or servo driver module. Identify logic sheets that require field tuning. Discuss field proven tuning examples.
- Retrieve historical trend data for valve curve tuning.
- Import data into an Excel spreadsheet, calculate and plot new valve curves.

Ovation Boiler Control

Course OV380-WIN CEUs: 3.5

Overview
This 5-day course is designed for customers who maintain or troubleshoot control strategies within the Ovation DCS system related to boiler control. This course is intended for students who will implement their own control programs, or who will make significant modifications to existing programs. Using previous control building knowledge, the student will learn how to implement design pertinent to boiler controls in an Ovation environment. This course is a continuation of the control topics discussed in more basic control classes. The course will emphasize the proper selection, configuration and application of algorithms in a typical Ovation boiler control system.

Prerequisites
Prior completion of OV200-WIN and OV330-WIN is strongly recommended. A working knowledge of control systems and control theory is required.

Topics
- Recognize the terminology used with an Ovation SIS
- Describe the functions of the Ovation SIS network and its components
- Describe the general architecture of an Ovation SIS
- Monitor Ovation SIS using the data acquisition tools
- Configure an Ovation SIS network and SIS Controller

Ovation (Admin) Certification

Course OV420-WIN CEUs: 3.5

Overview
This 5-day course is offered as a stand-alone web-based exam or implemented with a pre-testing review at the Training Center, the OV420-WIN measures the student's proficiency in areas that address the overall Ovation system configuration while maintaining the integrity of the system software. It assesses the students understanding of networking concepts and that of switch and router configurations. Achieving Admin Certification acknowledges the competency of the individual in maintaining the integrity of the Ovation system concerning user access and capabilities. A multi-point examination is administered and participants are required to achieve a grade score of 80% or greater to successfully gain certification.

Prerequisites
Students should have achieved Ovation (Base) Certification through the OV400WIN program. Students are required to attend the OV230-WIN, OV320-WIN and OV245-WIN courses.

Topics
Upon successful completion of this course, the student will receive Ovation (Admin) Certification. This accreditation affirms that the student is competent in all areas of the Ovation System and possesses the abilities and understanding to engineer and supervise the system integrity, communications and user capabilities.

Control Wave Troubleshooting Configuration

Course RA331C

Overview

This 3-day hands-on course, held at Emerson's Interactive Plant Environment, covers the installation, wiring of external devices, troubleshooting, hardware configuration and maintenance of the ControlWave product family.

This course will equip you with the necessary knowledge and practice needed to configure the ControlWave hardware for communications. Learn how to troubleshoot and utilize software application programs to perform diagnostics and monitor live data and communication statistics.

Topics

- Intro to ControlWave product family
- Hardware options
- LocalView for local communications
- Wiring external devices
- Local serial communications
- Downloading ControlWave project loads
- Viewing live data using Dataview
- Collecting archive and audit logs
- Creating and saving configurations
- Flashing firmware
- Diagnostics program for hardware
- Understanding communication statistics
- Establishing an Ethernet/IP communication link
- Hands-on troubleshooting.

Control Wave Designer Fundamentals

Course RA441

Overview

This 2-1/2 day hands-on course covers program¬ming the ControlWave product family using the ControlWave Designer IEC61131-3 software and the Designer function block library.

This course will provide the participant the necessary knowledge and skills required to define and control inputs and outputs of related real world applications. Participants will generate and debug simple control strategy programs using Function Block, Ladder Logic, Structured Text, and Sequential Function Chart programming. They will also learn the basics of ControlWave communications, historical data storage, alarm¬ing, hardware configurations and much more.

Topics

- Ladder Logic
- Structured Text
- Function Block Diagram
- Creating User Function Blocks

Control Wave Designer Communications Programming

Course RA442

Overview

This 1-1/2 day course is a continuation of ControlWave® Designer Fundamentals course focusing on networking and communications. Participants will program the ControlWave to communicate to other devices in a network, as well as transfer and receive signal lists using serial and IP communications. Other application software will be utilized to configure, establish, and debug communications with these devices. Participants will learn the advanced methods of communicating to Bristol and ControlWave devices using Client/Server modules, and to Modbus protocol devices using custom function blocks

Topics

- Client/Server Function Blocks
- Modbus Programming
- System Communication Variables
- BSAP Network Communications

FloBoss Configuration and Operation

Course RA 1220

Overview
This 4-1/2 day course will provide an overall working knowledge of the FloBoss 103, FloBoss 107 and the FloBoss 107E. Participants are presented with a comprehensive view of the FloBoss 103/107/107E hardware and software to obtain the necessary knowledge needed to effectively install, configure and maintain the FloBoss 103/107/107E products. Each student will be provided with a PC (ROCLINK preinstalled), a Remote Automation Solutions RTU, a communications cable, and a workbook for the duration of the class.

Prerequisites
Participants should have a working knowledge of their application/process and should also have advanced PC knowledge and be thoroughly familiar with Microsoft Windows operating systems (XP or later versions).

Topics
- FloBoss 103/107/107E Hardware Overview
- Flow Measurement Review
- Overview on MVS Product
- Set Up Multi-Dropping on MVS
- FloBoss Configuration
- Elements of a Basic Configuration
- Setting and Checking ROC System Flags
- Set and Check ROC Information
- Configuring I/O Points
- Calibrating AI and AO points
- Communication Basics
- Configuring AGA Flow Calculations
- Configuring FloBoss History
- Building FloBoss Displays
- FST Workshop

Flo Boss S600+ Operator Fundamentals

Course RA 900

Overview
The 2-day FloBoss S600+ Fundamentals course will have participants become familiar with the FloBoss S600+ hardware, the start up menu, fundamental features of the S600+ applica¬tions. Be able to operate FloBoss S600+ front panel and web-server. Be able to download and upload configurations. Be able to edit S600+ configuration files using PC Setup, Report Editor, Modbus Editor and Display Editor.

The FloBoss S600+ Fundamentals course provides an overview into the hardware and operational aspects of the FloBoss S600+ flow computer

Topics
- Introduction to S600+
- Standard Application Overview
- S600+ Hardware Overview
- Navigating Displays
- Editing Display Items
- Editing Configurations with Config600
- Using Config600 Transfer

Flo Boss S600+ Advanced

Course RA 901

Overview
The 2-1/2 day advanced course provides an insight into the generation of application configurations for the FloBoss S600+.

Topics
- Loading Config600 Pro Software License
- Firmware Versions
- Using System Editor Object Types
- Logicalc Editor
- Registering Tickets - Do's and Don'ts

Flo Boss S600+ Combined

Course RA 902

Overview
The 4-1/2 day course will provide participants hardware knowledge of the S600+. How to navigate the keypad display and be able to create and edit S600+ configurations using Config600 software.

The FloBoss 600+ Combined Course is a combination of both the fundamentals course and the advanced course in one.

Topics
- Standard Application Overview S600+
- Hardware Overview Navigating Displays
- Editing Display Items
- Editing Configurations with Config600 Using Config600 Transfer
- Loading Config600 Pro Software License
- Firmware Versions
- Using System Editor Object Types
- Logical Editor
- Registering Tickets - Do's and Don'ts

Open Enterprise SCADA Systems Basics

Course RA 801

Overview
This 4 ½ day course provides a very brief introduction to the OpenEnterprise Server, and more detailed coverage of the Open Enterprise Workstation and OpenEnterprise Reporting packages (version 3.x). At the conclusion of the class, students will be able to install a simple OE Server and Workstation, configure communications with Remote Automation Solution's RTU's and then begin building HMI displays, trends, alarm windows, and develop a basic user interface using these products.

Topics
- Database Structure
- Creating Display Objects
- Alarm Windows, Alarm & Event History
- Creating and Configuring Trends
- Data Export
- Creating Reports
- Calculation Server
- Communications Manager
- Data Collection
- Plant Area Grouping

Open Enterprise SCADA Systems Intermediate

Course RA 802

Overview
This 4 ½ day course will equip the participant to be able to; configure the communications, security, historical, alarming, asset modeling and other major subsystems of an OpenEnterprise and Workstation (version 3.x). Most of the tools within the OpenEnterprise Administrative Tools will be covered during this class.

Topics
- Configure Security
- Historical Collections
- Alarming
- Asset Modeling
- Work Flows
- Local Signals and Alarms
- Administrative Tools

PAC Systems Controller Maintenance & Programming Course

Course RA

Overview
Learn programming for PACSystems, 90/70, 90/30, and VersaMax controllers in this Machine Edition class featuring the PACSystems RX3i Controller. This 4 day class covers programming techniques and the advanced features of the PACSystems Controller using Logic Developer PLC Machine Edition software. Starting with the controller software architecture, students are taught how to effectively develop control applications using building block concepts. This course builds upon Object-Oriented concepts with PACSystems User-Defined Function Blocks (UDFBs), as well as the development of application components using Ladder Diagram (LD) and Function Block Diagram (FBD) programming languages.

This course is intended for those who are or will be involved in the development, modification, and troubleshooting of control systems using Proficy Logic Developer PLC and PACSystems Controllers.

Prerequisites
Participants should be comfortable operating in a Microsoft Windows environment, and have a basic understanding of electrical/ control fundamentals.

Topics
Upon completion of this course, the student will be able to:
- Describe Control System Architecture & Operational Fundamentals
- Operate Proficy Machine Edition
- Establish and Utilize Communications to the Controller
- Configure a Controller and its associated hardware modules
- Effectively use and create Controller Variables
- Create Projects in Ladder Diagram (LD), Function Block Diagram (FBD), and Structured Text (ST)
- Understand and program Arithmetic, Timer, Counter, and Move operations
- Utilize programming guidelines for developing robust control applications
- Use User Defined Function Blocks (UDFBs) to build structured applications
- Effectively use the Machine Edition Tool chest as a repository for Application Building Blocks
- Create, Monitor, and Modify running Controller applications

Final Control Elements
LEARNINGPATH

At the foundation of any process are the field devices that measure and control the flow of air, steam, water, gas or hundreds of other materials. Without proper basic setup, calibration and configuration of these devices, advanced control techniques cannot provide the levels of efficiency the technology is capable of.

Knowledge of process control devices within a plant is often passed down from generation to generation. At the same time, if advances in process technology and methodology usually brought about by training aren't brought into the plant, in-house standards for device setup and maintenance can become based on out-dated theory. The result is that while a valve or instrument may be working, it may not be working up to its capabilities and is not delivering on its promised performance.

Educational Services has made a global commitment to helping our customers find and keep that promise of performance.

Factory Training
At our Dubai & Jubail training facilities, we host factory training courses in which the student will attend class in our fully equipped training laboratory. Our courses include small group hands-on sessions, one-on-one time with instructors and a facility tour in the factory. Our workshops are simply the best investment you can make today in your employees and your business.

Regional Training Center
Our regional training center at RLIC – Qatar is strategically located to support your training needs when and where you need it. Our fully equipped training laboratory allows us to host the same training courses as in Dubai & Jubail.

On-site, Local Training
We offer on-site training subject to availability of dedicated classroom facilities and suitable workshop locations so that we can maintain the same high standards of education at site.

eLearning Courses
Are a convenient and flexible way to manage your time and costs. Browse an online catalog of the latest eLearning courses on a variety of technical topics.

You can purchase directly from eStore with a credit card or provide a PO to mea.education@emerson.com

Final Control Elements
LEARNINGPATH

Valve Mechanic or Maintenance Technician

- c1500 Control Valve e-Learning Fundamentals
- 1400 Valve Trim & Body Maintenance
- 1751 Fundamentals of HART based FIELDVUE™ Digital Valve Controllers using Emerson Field Communicators and ValveLink™ Mobile

Senior Technician

- c1500 Control Valve e-Learning Fundamentals
- 1400 Valve Trim & Body Maintenance
- 1751 Fundamentals of HART based FIELDVUE™ Digital Valve Controllers using Emerson Field Communicators and ValveLink™ Mobile
- 1752 Valvelink™ Software for Configuration and Calibration of FIELDVUE Digital Valve Controllers
- 7036 FOUNDATION™ fieldbus FIELDVUE™ Digital Valve Controllers
- 1759 Diagnostics Data Interpretation using Valvelink™ Software for FIELDVUE™ Digital Valve Controllers
- 1766 FIELDVUE™ Digital Valve Controller - SIS Setup with Valvelink™ Software

Instrument Technician

- c1500 Control Valve e-Learning Fundamentals
- 1751 Fundamentals of HART based FIELDVUE™ Digital Valve Controllers using Emerson Field Communicators and ValveLink™ Mobile
- 7036 FOUNDATION™ fieldbus FIELDVUE™ Digital Valve Controllers
- 1752 Valvelink™ Software for Configuration and Calibration of FIELDVUE™ Digital Valve Controllers
- 1759 Diagnostics Data Interpretation using Valvelink Software for FIELDVUE Digital Valve Controllers

Valve Engineer

- Control Valve e-Learning Fundamentals
- 1300 Control Valve Engineering I
- 1325 Control Valve Engineering II
- 1751 Fundamentals of HART based FIELDVUE™ Digital Valve Controllers using Emerson Field Communicators and ValveLink™ Mobile
- 1752 Valvelink™ Software for Configuration and Calibration of FIELDVUE Digital Valve Controllers
- 7036 FOUNDATION™ fieldbus FIELDVUE™ Digital Valve Controllers
- 1759 Diagnostics Data Interpretation using Valvelink™ Software for FIELDVUE™ Digital Valve Controllers

Fisher TRAININGFACILITIES

- ✓ A state-of-the-art dedicated training room able to accommodate 12 students in comfort
- ✓ Audio visual: 70 inch interactive touch screen TV and 9 sq.mtr WIDE Screen with high resolution and high brightness projector
- ✓ HD repeater screen in the center of the room
- ✓ Radio mic with ambient sound for the instructor
- ✓ Work stations: 6 live work stations capable of both Hart and Fieldbus communications with their own PC's and double monitors, connected through Wi-Fi to the main AV stations allowing any 4 students on the main screen simultaneously
- ✓ Broadcast: self tracking video cameras for broadcasts and recording of sessions, plus independent live video conferencing

The twin forces of advancing technology, exemplified by the rapid acceptance of FIELDVUE digital valve controllers, and the merging of the valve and instrument technician crafts in many plants are making control valve education more important today than ever before. These interrelated trends necessitate higher levels of education on the part of those responsible for valve maintenance and operation.

Control Valve Engineering I

Course: 1300 **CEUs: 2.1**

Overview

This course is for engineers, technicians and others responsible for the selection, sizing and application of control valves, actuators and control valve instrumentation.

This 3-day course reviews design and operating principles of control valves, actuators, positioners and related accessories. It describes the sizing and selection methods for a broad variety of control valve assemblies. Students will solve several problems using Fisher Specification Manager and published materials, plus participate in equipment demonstrations and hands-on workshops.

Students who complete this course will:

- Select the proper valve characteristic for a given process.
- Choose suitable styles of control valves for an application.
- Size of control valves and actuators.
- Properly apply positioners and instruments.

Prerequisites

Some experience with industrial controls equipment including control valves and actuators would be helpful.

Topics

- Control Valve Selection: Rotary/ Sliding Stem
- Actuator Selection and Sizing
- Corrosion Resistant Valves
- Liquid Valve Sizing
- Gas Valve Sizing
- Positioners and Transducers
- Valve Application Guidelines
- Valve Characteristics
- Valve Packing Considerations

Control Valve Engineering II

Course: 1325 **CEUs: 0.8**

Overview

This course is designed for engineers, technicians, and others responsible for the selection, sizing, and application of control valve assemblies.

This 1-day course event consists of two parts, 4 hours for each part. It reviews design and operating principles of control valves in various applications. It describes the sizing and selection methods utilized in selecting appropriate control valve assemblies, as they relate to severe service applications such as noise and cavitation. Students will solve several advanced sizing and selection problems using Fisher Specification Manager software and published materials. Students will also have the opportunity to ask Emerson certified instructors for Fisher engineering courses to clarify questions and assist in better understanding of these advanced fluid mechanic ideas.

Students who successfully complete this course will :

- Size control valves and trim for cavitating application
- Size control valves and trim for a noisy application
- Choose suitable styles of control valves for an application
- Size control valves for an erosive and/or corrosive application
- Properly apply knowledge learned from 1300

Prerequisites

Successful completion of 1300 is required. Familiarity with sizing, selection, and advanced applications of control valves is strongly encouraged.

Topics

- Cavitation and Flashing
- Noise
- Corrosion
- Erosion
- Valve Application Guidelines

Valve Trim & Body Maintenance

Course: 1400 **CEUs: 2.1**

Overview

This 3-day course explains how valves and actuators function and how they are installed and calibrated. It emphasizes installation, troubleshooting, parts replacement, and calibration of control valves, actuators, and digital valve controllers. Those who complete this course will be able to:

- Correctly perform installation procedures
- Perform basic troubleshooting
- Properly apply and calibrate, FIELDVUE digital valve controllers
- Change valve trim, gaskets and packing

Topics

- Control Valve Terminology
- Globe Valves
- Packing
- Actuators, and Digital Valve Controllers
- Bench Set
- Seat Leak Testing
- Ball Valves
- Butterfly Valves
- Eccentric Disc Valves
- Valve Characteristics

Audience

This introductory course is for valve mechanics, maintenance personnel, instrument technicians, and others who are responsible for maintaining control valves, actuators and control valve instrumentation.

Prerequisites

Some experience in instrument calibration and in control valve maintenance, installation, and operation would be helpful.

Control Valves

Courses for valve and instrument technicians explain what's required to maintain modern control valves and demonstrate the skills necessary to do that job effectively. These classes are very structured, but students have plenty of opportunities to practice newly learned skills and receive feedback from experts in the field. The goal is to reduce the number of poorly operating control valves throughout industry in order to enhance processing and reduce downtime.

Fundamentals of HART based FIELDVUE™ Digital Valve Controllers using Emerson Field Communicators and ValveLink™ Mobile

Course: 1751 **CEUs: 1.4**

Overview

This course is for technicians, engineers and others responsible for installing, calibrating and basic troubleshooting FIELDVUE™ instruments using the 475 Field Communicator.

This 3-day course provides the necessary skills to:

- Install and mount a FIELDVUE™ digital valve controller onto Sliding Stem Actuator/Valve and Rotary Actuator/Valve Assemblies.
- Configure and calibrate FIELDVUE™ Instruments with the Field Communicator.

Prerequisites

Control valve experience and/or course 1400, 1300, 1710 or 1451

Topics

- Control Valve Terminology
- Globe Valves/Packing
- Actuators
- Bench Set
- Ball Valves / Butterfly Valves / Eccentric Disc Valves
- Valve Characteristics
- Control Valve Noise and Cavitation
- FIELDVUE™ Digital Valve Controller Theory of Operation
- HART Communication Signal
- FIELDVUE™ Instrument Installation
- 475 Field Communicator
- Instrument Configuration and Calibration
- Instrument Troubleshooting
- ValveLink™ Mobile Overview

ValveLink™Software for Configuration and Calibration of FIELDVUE™ Digital Valve Controllers

Course: 1752 **CEUs: 1.8**

Overview

This course is for technicians, engineers and others responsible for installation, calibration and diagnostics for FIELDVUE™ digital valve controllers and ValveLink™ software. The primary focus of this course is to provide a comprehensive experience in managing Digital Valve Controllers using the ValveLink™ software.

This 3-day lecture/lab style course provides hands-on experience working with FIELDVUE™ digital valve controller and ValveLink™ Software. Students will be able to execute ValveLink™ calibration and diagnostic routines, and create an instrument database.

Prerequisites

Control valve experience and course 1451 / 1751

Topics

- Introduction to ValveLink™ software
- ValveLink™ Tag and Database Management
- Configuration with ValveLink™
- Calibration with ValveLink™
- ValveLink™ Advanced and Performance Tier Diagnostics
- Troubleshooting
- Introduction to Diagnostic Data Interpretation

FOUNDATION™ fieldbus FIELDVUE ™ Digital Valve Controllers

Course: 7036 **CEUs: 2.1**

Overview

This course teaches technicians and engineers the basics of FOUNDATION™ fieldbus digital valve controller installation, configuration, calibration and troubleshooting using 475 Handheld and ValveLink™ Software.

The 3-day course is designed for the reviews of the role and function of control valve positioners, followed by a series of hands-on exercises to disassemble, inspect, assemble, install and commission a fieldbus FIELDVUE™ digital valve controller. During commissioning students will learn the basics of the FOUNDATION™ fieldbus protocol, the role of function blocks, addressing, modes and status. Students will configure, calibrate and commission devices using the 475 Field Communicator and ValveLink™ software. Hands-on exercises also teach students how to perform detailed setup routines and how to run and collect data for various ValveLink™ diagnostics.

Prerequisites

Basic familiarity with positioners and control valve basics is required. Course 1400 / 1451 is recommended.

Topics

- Positioner Basics
- FOUNDATION™ Fieldbus Overview
- FIELDVUE™ digital valve controller Installation and Mounting
- Modes and Status
- Configuration and Calibration with new 475 Field Communicator
- ValveLink™ Setup Wizard / Detailed Setup
- Tuning
- Tag Management
- Pressure Control
- Valvelink™ Diagnostics
- FIELDVUE™ Instrument
- Troubleshooting

Diagnostic Data Interpretation Using ValveLink™ Software for FIELDVUE™ Digital Valve Controllers

Course: 1759 **CEUs: 2.1**

Overview

This 3-day course uses practical exercises and discussions to teach the student to interpret and analyze diagnostic data obtained using FIELDVUE™ Digital Valve Controllers and ValveLink software. Students will perform diagnostic tests on a variety of valve/actuator combinations and use the data to determine bench set, dynamic error band, seat load, spring rate and other pertinent parameters. Students will also perform comparison tests on valves/ actuators containing assembly or operating flaws and use the data for troubleshooting purposes.

This course is for technicians, engineers and others responsible to collect and interpret valve diagnostic tests performed using Valvelink™ software.

Prerequisites

Students must have completed one of the following: 1751, 1752, 7036, or 1760V Series (1760V, 1761V, 1762V, 1763V). Completion of 1400, 1700, and 1450 are recommended if additional experience with valve maintenance and basic troubleshooting is needed

Topics

- Review of ValveLink software diagnostic Tests
- Data Interpretation
- Troubleshooting Techniques
- Comparison Testing Techniques
- Performance Diagnostics

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Course: 1766 **CEUs: #.#**

Overview

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Prerequisites

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Topics

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Pressure Management

As the world-wide leading provider of precision pressure relief devices & industrial regulators with such brands as Fisher, Anderson Greenwood, Crosby, and Varec, we are committed to provide the technical assistance needed to help designers and engineers meet pressure vessel code requirements and attain optimum pressure relief valve performance. These training modules aims to assist skills development related to the design, installation, and operation of effective pressure relief systems.

Pressure Relief Valve Overview

Course: PRM-MEA-101

Overview
This 1-day course explains how pressure relief valves function and how they are installed and tested. At the end of the course the attendees will be familiar with various Pressure Relieving Devices, their design, operation, maintenance, calibration, testing and installation. The course also covers the causes of improper valve performance. Those who complete this course will be able to:

- Understand the reasons for & history of pressure relieving devices.
- Gain knowledge on design considerations.
- Understand the basic terminologies used .

Topics
- Pressure relief valve types
- An overview of Codes & standards
- Basic Valve Operation
- Initial troubleshooting

Audience
This introductory course is for valve mechanics, mechanical inspectors, piping engineers, mechanical maintenance personnel, instrument technicians, and others who deal with pressure relieving device management and maintenance.

Prerequisites
Some experience in valve maintenance, design concepts, installation, and operation would be helpful.

Pressure Relief Valve Maintenance

Course: PRM-MEA-102

Overview
This 5-day course caters for maintenance personnel dealing with pressure relief valves Upon completion of the course, the candidates will be able to overhaul, fault find, calibrate and test Pressure Relief Valves utilizing the relevant maintenance instructions.

Topics
- Terminology
- Valve Types & Operation
- Codes and Standards
- Temperature/Back Pressure Compensation
- Causes of Improper Performance
- Type Numbering
- Machining of Valve Components
- Practical Valve Engineering
- Troubleshooting

Audience
This is a workshop style course that includes “hands on” overhaul and test procedures, along with practical and written assessment. It is intended for workshop supervisors, valve mechanics, mechanical maintenance personnel, instrument technicians, and others who deal with pressure relieving device management and maintenance.

Prerequisites
Some experience in valve maintenance, design concepts, installation, and operation would be helpful.

Regulators Technician

Course: 1100

Overview
This 3-day course is designed primarily for technicians responsible for the installation and maintenance of natural gas regulators. Emphasizing hands-on training, this course teaches students to install, troubleshoot, and adjust gas regulators. Students who complete this conference will be able to:

- perform maintenance on regulators and relief valves
- troubleshoot field problems

Topics
- Self-Operated Regulators
- Pilot-Operated Regulators
- Overpressure Protection
- Series Regulation
- Monitors
- Slam Shut Options
- Regulator Failure Analysis
- Troubleshooting and Installation

Audience
This course is designed primarily for technicians responsible for the installation and maintenance of gas regulators.

Prerequisites
At least one year's field experience with natural gas regulators is recommended.

Actuation Technologies combines the strengths of seven world-recognized brands; Bettis, Biffi, Dantoque, El-O-Matic, Hytork, FieldQ, and Shafer into a single unit. We capitalized on more than 100 years of combines experience dedicated to only one thing - controlling and automating valve operation.

Emerson Electric Actuators Overview

Course ACT-MEA-101

Overview

This 1-day course discusses on Emerson's next generation portfolio of compact electric actuators for quarter-turn and multi-turn applications. Brands like Bettis, Biffi, & EIM along with different models and application will be discussed to give the audience a general overview of these versatile valve actuation packages.

This course is for technicians, engineers and others who wish to understand the basic concepts for electric actuator functionality, principles of operation, selection criteria & best practices for maintenance.

Topics

- Review of ValveLink software diagnostic Tests
- Data Interpretation
- Troubleshooting Techniques
- Comparison Testing Techniques
- Performance Diagnostics

Biffi Electric Actuators Service Training

Course ACT-MEA-102

Overview

This 5-day course provides information on the ICON 200 & 300 portfolio ranging from multi-turn to ¼ turn, the principles of operation, mechanical and electrical components, followed by a hands-on demonstration and practical troubleshooting.

Prerequisites

Personnel involved with the design, commissioning, operations & maintenance of electric actuators & systems.

Topics

- Product overview
- Actuator operation
- Operation by Handwheel
- Local /Remote Control
- Configuration
- Local Operator Interface
- Set-up Menu and Routines
- View Menu and Routines
- A Manager programs
- Maintenance
- Troubleshooting
- Diagnostics Messages
- Differences between Icon 2000 and Icon 3000

EIM Electric Actuators Service Training

Course ACT-MEA-103

Overview

This 3-day Fundamental overview of the construction, assembly, hardware, software and configuration of Emerson's Bettis Tec2000 and Tec2 actuators. Students attending this program will demonstrate an ability to identify actuators, hardware, components and assemblies. All students will demonstrate the ability to setup, configure, check and verify operation of various actuator configurations using appropriate hardware or software.

This course is for feld service technicians, sales engineers, quotation managers, instrumentation and control technicians

Prerequisites

Students should have a minimum of one-year field service experience and a working knowledge of Bettis TEC2 actuators.

Topics

- Identify main mechanical components and understand the function of Emerson's Bettis Tec2 actuators
- Identify main components and understand function of the non-intrusive Tec2 control package.
- Setup and Commissioning
- Identify function and main components of bevel gears and worm gears

Isolation Valves

No one else can offer the breadth of product of the scope of service. As the world's leader in valve automation we are constantly innovating and improving on the quality of our products and are able to augment our own resources with those of our colleagues in the Emerson organization.

Gate, Globe, & Check Valve Overview and Maintenance

Course ISV-MEA-101

Overview
This 2-day course discusses on Emerson's extensive manual valve portfolio comprised of gate, globe, check, & knife gate valves. A practical session with hands-on is included in a workshop type environment.

This course is for mechanics, engineers and others who wish to understand the basic concepts for GGC valves functionality, principles of operation, selection criteria & best practices for maintenance.

Topics
- Types of valves & application
- Design standards & testing standards
- Packing designs
- Repair & Maintenance

Ball & Butterfly Valves Overview and Maintenance

Course ISV-MEA-102

Overview
This 2-day course discusses on Emerson's extensive ball & butterfly valve lines comprised of floating & trunnion mounted ball valves, swing type & triple-offset butterfly valves. Brands like Vanessa, Fisher, KTM, and Virgo will be discussed along with different types and models manufactured. A practical session with hands-on is included in a workshop type environment.

Prerequisites
Personnel involved with the design, commissioning, operations & maintenance of these mechanical isolation equipment.

Topics
- Product overview
- Principle of operation
- Servicing, repair & Maintenance

Bettis™, EI-O-Matic & FieldQ Scotch-Yoke and Rack & Pinion Product Servicing

Course VA-MEA-201

Overview
This 3-day class provides comprehensive information concerning the installation, operation and maintenance of all Bettis Scotch-Yoke Products, EI-O-Matic & FieldQ Rack & Pinion Products.

Prerequisites
Involved with the purchase / application / marketing or sales of products

Topics
- Instruction / Maintenance Instruction Manuals
- Product Serial Numbers Review
- Service Procedure Index Review
- General Operating / Maintenance Instructions
- General Servicing information on CBB, CBA300, G-Series, E-Series and FieldQ Series
- Conversion of Fail Action in G-Series Actuators
- 2 days of practical exercises involving the disassembly /reassembling of Products

Bettis™ Multiport Flow Selector (MPFS) Servicing

Course VA-MEA-203

Overview
This 1½-day course provides information on the Bettis MPFS, principles of operation and hands-on experience concerning the installation, operation and maintenance of the product.

Prerequisites
Involved with the purchase / application / marketing or sales / service of products.

Topics
- MPFS Design Philosophy
- MPFS assembly overview
- Plug seal components overview
- MPFS Disassembly
- MPFS Re-assembly
  - -Bonnet seal change
  - -Plug seal change
- Actuator local mode operation
- Actuator remote mode operation
- Actuator communication with DCS
- Port alignment/calibration
- Home port calibration

Roxar's objectives are to help oil and gas operators increase oil and gas recovery from their reservoirs, reduce uncertainty and make improved field management decisions. The need for training is more critical than ever to achieve and maintain cost-effective operations. Roxar supports all the delivered instrumentation with a range of highly practical training programs.

A leading international technology solutions provider covering the entire reservoir optimization value chain.

All courses are run by certified instructors who combine their understanding of theory with their unrivaled, on-site practical experience. The result is a complete service-focused solution defined by partnership and collaboration.

Our global organization is available to work with you defining the appropriate subject matter and the right approach to satisfy your training need. Understanding the data is the key to make the right decisions for reservoir management.

Roxar - Acoustic Sand Monitor - RX007 CEUs - 1.2

Overview

The Roxar Sand Monitor is a non-intrusive acoustic sand monitoring system that identifies in real-time sand production in any water, oil, gas or multiphase flow lines for onshore and offshore locations. This 1-day training course focuses on teaching the participants what valid and non-valid data are; provides knowledge on how to create reports from data received by the instrument in order to provide input to integrity managers to enable better decision-making. The course is available in two versions: SAM Server and Fieldwatch, depending on the system software that your installation is using to operate the instrumentation.

Topics

Introduction to Sand Metering
- Causes of Sand Production
- Why Do we Need Sand Detection System?
- Roxar Sand and Pig Detection System
- System Enclosure, History; Challenge, Integration with Other Products

Measurement Technology
- How Do We Measure - Sand Interface
- Sand Rate Calculation - Sand Detector
- Product Optimization

Operations
- Software and General Set-Up; - System Overview
- Configure Sensor Parameters
- Process Data Interface: Flow Rate Input, Velocity Input, Choke Input, Well Test Data Interface
- Alarm Settings Interface, Data Logging
- Basic Interpretation: Basic Noise Estimation, Sand Production Estimation
- Adv. Interpretation: Velocity in Signal Interpretation
- Flow Regime Consideration

Maintenance
- Detector Installation: Locations on Pipe, Temperature Considerations; - Wiring
- Communication Digital Output, Analogue Output, Volt Free Contact, Lamp Output
- Calibration: Factory Calibration, Background Noise Calibration, Automatic Background Noise Curve (ABA), Sand Noise Calibration
- Sand Transport Capability Indicator
- Sand Mass Correction (L)
- Choke Calibration
- Filtering Settings: Alpha and Beta Filtering of Raw Data, K-Factor
- Preventative Maintenance: Visual Inspection and Routine Testing
- Calibration Adjustment: Background Noise Calibration (Zero Calibration)
- Sand Calibration, Hardware Maintenance: Checking Sensor Connections, Re-installing or Replacing the Detector

Roxar - CorrLog - Intrusive Corrosion Monitoring System - ROX008 CEUs - 1.2

Overview

Our intrusive corrosion monitor 1-day training course will provide your personnel with the knowledge of the Roxar intrusive corrosion monitoring system, providing understanding of the different system infrastructures, components and measurement principles. The course focuses on teaching the participants what valid and non-valid data are; provides knowledge on how to create reports from data received by the instrument in order to provide input to integrity managers to enable better decision-making. The course is available in two versions: MultiTrend and Fieldwatch, depending on the system software that your installation is using for operations of the instrumentation.

Topics

Introduction to Corrosion Monitoring
- Overview of Corrosion Issues
- Why Corrosion Monitoring?

Corrosion Control and Process Optimization

Integrity Management and Safety
- Basic Principles for Selecting Locations for Corrosion Monitoring
- Overview of the Roxar Intrusive Corrosion Monitoring System

Weight Loss Coupons, Electrical Resistance Probes, Linear Polarization Probes, Galvanic Probes

Mechanical Accessories
- Instrumentation
- System Software
- Integrated Flow Assurance Monitoring Systems

Measurement Principles
- Weight Loss Coupons
- Electrical Resistance Probes
- Linear Polarization Probes
- Galvanic Probes

Software Operations
- Verification of the Software
- Configuration and Installation Architecture
- Instrument Specific Parameters
- Raw Data Verification
- Engineer Values

Data Handling and Presentation

Data Interpretation

Reporting
- Exporting Data

Maintenance
- Battery Replacement (Offline Systems Only)
- System Health Check

Replacing Interface Cards

Roxar Metering

Roxar - FSM - ROX010 CEUs - 1.2

Overview

Corrosion is a major cost in the oil and gas as well as other industries, and frequently being the reason for accidents and unplanned interruptions in production plans. Corrosion monitoring is thus important for verification of the assets integrity. Roxar's FSM (Field Signature Method) system is a non-intrusive system for monitoring internal corrosion in pipes, pipelines or vessels directly in the pipe wall. Our Non-Intrusive Corrosion Monitor 2-day training course will provide your personnel with the knowledge of the Roxar non-intrusive corrosion monitoring system, understanding of the different system infrastructures, components and measurement principles. The course focuses on teaching the participants what valid and non-valid data are; provides knowledge on how to create reports from data received by the instrument in order to provide input to integrity managers to enable better decision making. The course is available in two versions: MultiTrend and Fieldwatch, depending on the system software that your installation is using for operations of the instrumentation.

Topics

Introduction
- Overview of Corrosion Issues
- Why Corrosion Monitoring?

Corrosion Control and Process Optimization

Integrity Management and Safety
- Basic Principles for Selecting Locations for Corrosion Monitoring
- Overview of the Roxar FSM System

Mechanical Components

Buried System
- Instrumentation
- System Software
- System Infrastructure
- Integrated Flow Assurance Monitoring Systems

Measurement Principles
- Field Signature Method

Software Operations
- Verification of the Software
- Configuration and Installation Architecture
- Instrument Specific Parameters
- Raw Data Verification
- Signature
- Engineering Values

Data Handling and Presentation

Data Interpretation

Reporting
- Exporting Data

Maintenance
- Battery Replacement (EX Version)
- System Health Checks

Roxar - Hydraulic Retrieval & Access Fitting System - ROX011 CEUs - 1.8

Overview

The objective of this course is to give the participant an overview of the Hydraulic Retrieval & Access Fitting System. The focus of this 1-day course is to bring awareness of working safely and efficiently with the tool and safe work practices. It will explain the design and operations of the tool and the fitting, and is recommended for anyone who will work with retrieval operations using our hydraulic retrieval system. Physical demonstrations with retrievers, service valves and retractors on non-pressurized stands may be arranged by special request.

Topics

Introduction
- The Hydraulic Access Fitting and its Components
- The Hydraulic Tool Retrieval and its Components
- Different Variations of the Tool (PED/Non-PED)

Theoretical Operation
- Videos
- Theoretical Run through the Operation
- Understanding How the Tool Works
- Safe Operation of the Tool
- Troubleshooting and Maintenance

Practical Operation
- Practical Troubleshooting
- Focus on Getting Comfortable using the Tool
- Repeated Operations
- Maintenance After Use
- Practical Exam

Roxar - Multiphase Meter 1900VI ROX001 CEUs - 1.8

Overview

The Roxar topside Multiphase meter measures accurately the flow rates of oil, gas and water without separation, mixing or moving parts. Field experience shows long term stability, high accuracy and very good repeatability. The objective of the 3-day Roxar MPFM 1900VI course is to provide the participant with an understanding of the multi phase flow, components and measurement principles of the instrument. The course focuses on providing the participants with detailed understanding of the set-up and configuration; calibration data, reference fluid parameter set-up and operation of the meter. The course will cover interpretation and correlation of MPFM parameters versus influences of process conditions.

Topics

Introduction to Multiphase
- Metering of Oil & Gas Production
- Purpose of the Roxar Multiphase Meter
- Multiphase Flow and Terminology
- Roxar Multiphase Sensors and Electronics

Measurement Technology
- Overview of the Measurement System
- Measurement Principles used in Roxar MPFM 1900VI
- Determination of Flow Rates
- Velocity Measurements: Pressure, Temperature & Volume
- Verification of the Measurements - which Factors have Vital
- Importance for Design and Process Calculation

Operations
- Overview of Roxar MPFM 1900VI

Operation System
- Service Console Software Installation and Main Screen Presentations
- Communication Set-Up
- Calibration and Reference Fluid Parameter Set-Up
- Purpose of the Service Console Program (SCP)
- Interpretation of the SCP screen — Diagnostics
- SCP Screen Alarm Indication, Configuration of the Multiphase Meter
- Practical Information on How to Access and Save Parameter Files;
- Practical Information on How to Log and Retrieve Data; Well Test Options

Maintenance
- Test Equipment and Recommended Spare Parts
- Main Checks and Intervals
- Radiological survey (Topside)
- Reference Fluid Density Parameter Set-Up
- Reference Permittivity and Conductivity
- Temperature, Pressure and Differential Pressure Function Check
- Capacitance Unit Function Check
- Inductive Unit Function Check
- Densitometer Unit Function Check

Roxar - Multiphase Meter 2600 - ROX002 CEUs - 1.8

Overview

The Roxar Zector technology provides accurate and real-time characterization of flow patterns. The voxel-based signal processing and electrode geometry provides information, including multiple flow velocity data and near wall measurements. The objective of the Roxar MPFM2600 2-day course is to provide the participant with an understanding of the multiphase flow, components and measurement principles of the instrument. The course focuses on providing the participants with detailed understanding of the set up and configuration; calibration data, reference fluid parameter set up and operation of the meter. The course will cover interpretation and correlation of MPFM parameters versus influences of process conditions. Understanding the data is the key in order to make the right decisions for reservoir management.

Topics

Introduction to Multiphase Metering
- Single Phase Metering/Multiphase Metering
- Flow Regimes
- Roxar's Experience in Multiphase Metering
- Roxar MPFM2600
- Mechanical Design

Mechanical Specifications
- Installation and Commissioning Instructions

Measurement Technology
- Overview of the Measurement System
- The Principle of Operation (Phase Fraction Measurement, the Gamma Densitometer, Velocity Measurement, PVT Tables, Phase Slip, Static Properties)

Software Operations
- Overview of Roxar MPFM Operation System
- Installation and Start Up of the Service Console

Software Operations: Practical Information on How to Access and Save Parameter Files, Logging and Retrieving data, Well Test Options

Maintenance
- Overview of the Mechanical System Maintenance
- Gamma System
- Electrical System
- Calibration
- Replacement of Parts

PVT
- What is PVTx
- Fluid Analysis: Sampling, Compositional Data
- Tempest PVTx
- Import Tables
- Parameter Save and Download; Diagnostics; Troubleshooting

Roxar - SandLog Intrusive Sand Monitoring System - ROX009 CEUs - 1.2

Overview

Our intrusive sand monitor 1-day training course will provide your personnel with the knowledge of the Roxar Sand Monitoring System, providing understanding of the different system infrastructures components and measurement principles. The course focuses on teaching the participants what valid and non-valid data is; provides knowledge on how to create reports from data received by the instrument in order to provide input to integrity managers to enable better decision making. The course is available in two versions: MultiTrend & Fieldwatch, depending on the system software that your installation is using for operations of the instrumentation.

Topics

Introduction to Intrusive Sand Metering
- Overview of Sand/Erosion Issues
- Basic Principles for Selection Locations for Sand/ Erosion Monitoring
- Erosion Control Integrity & Safety
- Optimizing Flow Rates & Production
- Overview of the Roxar Intrusive Sand/ Erosion Monitoring System

Mechanical Accessories

Sand Erosion Probes

Combined Sand Erosion & Corrosion Probe
- Electrical Resistance Probes
- Instrumentation
- System Software
- Integrated Flow Assurance Monitoring Systems

Measurement Principles
- Electrical Resistance Probes

Sand Erosion Measurements

Correlations with Sand Production

Combined Sand Erosion and Corrosion Probe

Software Operations
- Verification of the Software
- Configuration & Installation Architecture
- Instrument Specific Parameters
- Raw Data Verification
- Engineer Values

Data Handling and Presentation

Data Interpretation

Reporting
- Exporting Data

Maintenance
- Battery Replacement (Offline Systems Only)
- System Health Check
- Replacing Interface Cards

Roxar - Subsea Multiphase Meter - ROX003 CEUs - 1.8

Overview

The Roxar subsea Multiphase meter provides flow rates for oil, gas and water; vital information for managing reservoirs and processes. The objective of the Roxar SMPFM 2-day course is to provide the participant with an understanding of the multiphase flow, components and measurement principles of the instrument. The objective of the Roxar Subsea Multiphase Meter course is to provide the participant with an understanding of the multiphase flow, components and measurement principles of the instrument. The course focuses on providing the participants with detailed understanding of the set up and configuration; calibration data, reference fluid parameter set up and operation of the meter. The course will cover interpretation and correlation of SMPFM parameters versus influences of process conditions. Understanding the data is the key to make the right decisions for reservoir management.

Topics

Introduction to Multiphase Metering
- Single Phase Metering/Multiphase Metering
- Flow Regimes
- Roxar's Experience in Multiphase Metering
- Roxar SMPFM
- Well Testing, Monitoring and Allocation

Mechanical Specifications
- Roxar SMPFM Components
- Versions of the Meter

Measurement Technology
- Overview of the Measurement System
- The Principle of Operation (Phase Fraction Measurement, the Gamma Densitometer, Velocity Measurement, PVT Tables, Phase Slip, Static Properties)

Software Operations
- Overview of Roxar SMPFM operation system
- Installation and Start-Up of the Service Console
- Software Operations: Practical Information on How to Access and Save Parameter Files, Logging and Retrieving Data, Well Test Options
- Well Test
- Creating Diagnostic Files
- Setting Up Fluid Parameters

Maintenance
- Gamma System
- Electrical System
- Calibration
- Software Updates
- Sensor Geometry

Roxar Metering

PVT
- What is PVTx
- Fluid Analysis: Sampling, Compositional Data
- Tempest PVTx
- Import Tables

Roxar - Subsea Watercut Meter - ROX006 CEUs - 1.2

Overview

The Roxar Watercut meter measures water in oil (0% to 100%) and is used in process control on test separators, fiscal metering, on- and offloading, export metering, desalting in refineries, two phase flow metering. The Roxar Watercut meter uses a unique and patented microwave resonance technology to measure the permittivity of an oil/water mixture with an extremely high level of accuracy and sensitivity. The aim of this 1-day course is to enable participants to take full advantage of the meter in real applications. Upon completion of the course participants should be able to efficiently run the instrument on their own, including delivering on-site quality reliable data, do normal routine maintenance, fault finding and troubleshooting.

Topics

Introduction to Water Cut Metering and Technology
- Why Measure Water Cut?
- Water Cut Metering Challenges
- Water Cut Metering Requirements
- Technology for Water Cut Measurement

Measurement Technology
- How Do We Measure Water Cut
- Installation
- Microwave Signal Path
- Entrapment of Microwaves in a Pipe
- Microwave Resonance
- Permittivity of Oil and Water
- Water Continuous and Oil Continuous Phase
- The Tables of Water Cut Made from the First Meter
- The Production of the Meters to Fit the Model of the First Meter
- The Production Sequence in a Meter
- Measurement Uncertainty and Initial Explanation

Operations
- Connecting to the Meter
- Software Operations: Entering the Meter, Configuration
- Measurement
- Inline Calibration of the Meter
- Measurement Uncertainty
- Practical Exercises on Meter Electronics

Maintenance
- Overview of Recommended Maintenance
- Turning Diagnostics and Logging of Hyper Terminal
- Taking a 50dB Plot of Microwave Electronics
- Common Error Messages
- Sending Diagnostic Data to Roxar for Analysis and Filing
- Download New Code for a Meter
- Erasing Battery Backed RAM in a Meter
- Troubleshooting the Temperature Transmitter
- Practical Exercises

Roxar - Subsea Wetgas Meter - ROX005 CEUs - 1.2

Overview

The Roxar Subsea Wetgas meter is a unique instrument allowing accurate measurement of hydrocarbon flow rates and water production with a very compact mechanical solution. The aim of this 1-day training is to provide the participants with in-depth knowledge of instrument operations which enable participants to take full advantage of the meter in real applications. Course participants will be taught the intricacies of the meter and measurement technology, understanding of the data and the measurement principles will allow better decision making when it comes to reservoir management and optimizing the production process.

Topics

Introduction to Wetgas
- Introduction
- Wet Gas
- Why Measure Water?
- Multiphase Flow
- Flow Conditions
- Ranges and Specifications
- Installation Examples

Mechanical Specifications
- Material Overview
- Design Standards
- SWGM Components
- Cathodic Protection and HISC
- Insulation and Coating
- Testing

Measurement Technology
- Overview of the Measurement System
- The Principle of Operation
- Direct Measurement and Required Inputs
- Fraction Calculations
- Formation Water Detection
- Calculation Modes
- Redundancy

Operations and Maintenance
- Pre-commissioning Phases
- Commissioning and Start Up
- Communication
- Roxar SWGM Console
- Meter Operation
- Alarms and Warnings
- Calibration (Describe All Alternatives)
- Maintenance

Roxar - Wetgas Meter - ROX004 CEUs - 1.2

Overview

The Roxar Wetgas Meter is a unique instrument allowing accurate measurement of hydrocarbon flow rates and water production, with a very compact mechanical solution. The aim of this 1-day training is to provide the participants with in-depth knowledge of instrument operation, which enables participants to take full advantage of the meter in real applications. Course participants will be taught the intricacies of the meter and measurement technology, understanding of the data and the measurement principles will allow better decision making when it comes to reservoir management and optimizing the production process.

Topics

Introduction to Wetgas
- Introduction
- Wet Gas
- Why Measure Water?
- Multiphase Flow
- Flow Conditions
- Ranges and Specifications
- Installation Examples

Mechanical Specifications
- Material Overview
- Design Standards
- WGM Components
- Cathodic Protection and HISC
- Insulation and Coating
- Testing

Measurement Technology
- Overview of the Measurement System
- The Principle of Operation
- Direct Measurement and Required Inputs
- Fraction Calculations
- Formation Water Detection
- Calculation Modes
- Redundancy

Operations and Maintenance
- Pre-Commissioning Phases
- Commissioning and Start Up
- Communication
- Roxar WGM Console
- Meter Operation
- Alarms and Warnings
- Calibration (Describe All Alternatives)
- Maintenance

Introduction to Tempest ENABLE

KBA-01133-J9Q2G9

Overview
Tempest ENABLE provides mathematical support to reservoir engineers in their use of reservoir simulation software. This support allows engineers to complete tasks like history matching much more quickly than using the simulator on its own, and provides a more rigorous approach to predicting future reservoir performance or optimizing field development.

In this introductory course, students learn how to perform history matching and prediction uncertainty using Tempest ENABLE in conjunction with the reservoir simulator. The course normally uses the Tempest MORE simulator, but can also be run with Eclipse and some proprietary simulators, as per demand.

Duration
3 days

Intended for
Reservoir engineers with background knowledge or hands-on experience in reservoir simulation technology

Overview & Project setup:
- Overview of ENABLE
- Setting up an ENABLE project
- Setting up and importing the deck
- Setting up modifiers
- Scoping runs
- ENABLE theory 1: Statistical approach and its impact
- Setting up and importing history

History Matching
- Selecting history match points
- Using the stochastic estimator
- Refinement runs
- ENABLE theory 2: Refinement runs
- Analyzing results and managing plots
- Qualities & tolerances
- Automation macros
- Import & export

Prediction & Optimization:
- Analyzing qualities & modifiers
- Results calculator
- Confidence Intervals
- Multiple scenarios
- User functions
- Using ENABLE for Appraisal and optimization

RMS for Reservoir Geologist Specialising in Property Modelling

KBA-01121-Y7Y5N6

Overview
The complete geological 3D modelling workflow is covered, from data I/O to volumetrics. Facies modelling and petrophysical modelling are covered to an advanced level, making the course particularly relevant to those geologists who will focus on this part of the characterization workflow.

Duration
5 days

Intended for
Reservoir geologists. No previous RMS experience required.

Orientation
- Project panel and data layout
- Visualization - multi-viewer, map views, 3D views, correlation views
- Creating cross sections
- Printing & plotting
- Setting up workflows
- Project units

Structural Modelling
- Data loading horizons, wells, well picks and isochores
- QC & cross check of horizon & well data
- Fault surface creation and truncation
- Fault QC tools
- Creating the horizon model
- Data filtering and updating the horizon model
- Adjusting the structural model to zone logs
- 3D grid - creating, visualizing and QC

Facies Modelling, basic
- Blocked wells - creation & visualization
- QC of blocked wells using statistics, well log editor and data analysis
- Object based facies modelling
- Pixel based facies modelling
- Combining facies techniques

Facies Modelling, advanced (fluvial, shoreface & delta and turbidite environments will be modelled.)
- Using proportions and variograms to influence lateral distribution
- Creating and editing a body log
- Generating a facies log from well data
- Correlating channels in 3D space
- Modelling crevasses
- Using vertical proportion curves
- Using seismic data to distribute facies
- Creating average facies maps
- Working with progradational/ retrogradational systems - Progradational direction, stacking angles, facies interfingering & curved boundaries
- Using 'backbone' objects to influence facies body shapes and direction in a turbidite environment
- Using sedseis

Petrophysical Property Modelling
- Interpolation of well data - basic and conditioned to facies
- Stochastic petrophysical property modelling - basic distribution
- Water saturation- using trends and variable contacts
- Volumetrics
- Model updating
- Preventive maintenance
- Maintenance calibration
- Hardware maintenance

Introduction to 3D Geological Modelling in RMS

KBA-01114-Y9F5Y4

Overview
Geologists are taken through the full 3D static modelling workflow to enable new users to return to their office and confidently build a model from data I/O to volumetrics.

Duration
3 days

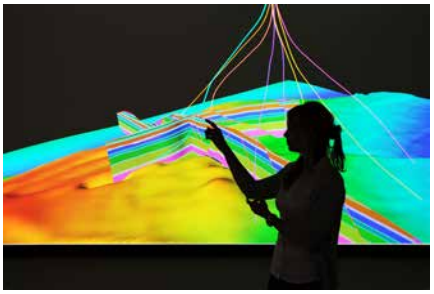
Intended for
Reservoir Geologists. No prior RMS training required

Orientation
- Project panel and data layout
- Visualization - multi-viewer, map views, 3D views, correlation views
- Creating cross sections
- Printing & plotting
- Setting up workflows
- Project units

Structural Modelling
- Data loading horizons, wells, well picks and isochores
- QC & cross check of horizon & well data
- Fault surface creation and truncation
- Fault QC tools
- Creating the horizon model
- Data filtering and updating the horizon model
- Adjusting the structural model to zone logs
- 3D grid - creating, visualizing and QC

Facies Modelling
- Blocked wells - creation & visualization
- QC of blocked wells using statistics, well log editor and data analysis
- Object based facies modelling
- Pixel based facies modelling
- Combining facies techniques

Petrophysical Property Modelling
- Interpolation of well data - basic and conditioned to facies
- Stochastic petrophysical property modelling - basic distribution
- Water saturation - using trends and variable contacts
- Volumetrics
- Model updating



Advanced Property Modelling in RMS

KBA-01120-P5Y0P0

Overview
Building on the facies & petrophysical property modelling material covered in the basic geological modelling course, this advanced module focuses on detailed 3D modelling in a variety of sedimentary environments, to give the necessary skills with which to tackle any environment with a best practice approach.

Duration
3 days

Intended for
Reservoir geologists who have completed an introductory course or have RMS experience

Facies Modelling, advanced (fluvial, shoreface & delta and turbidite environments will be modelled.)
- Using proportions and variograms to influence lateral distribution
- Creating and editing a body log
- Generating a facies log from well data
- Correlating channels in 3D space
- Modelling crevasses
- Using vertical proportion curves
- Using seismic data to distribute facies
- Creating average facies maps
- Working with progradational/ retrogradational systems - Progradational direction, stacking angles, facies interfingering & curved boundaries
- Using 'backbone' objects to influence facies body shapes and direction in a turbidite environment
- Using sedseis

Petrophysical Property Modelling
- Interpolation of well data - basic and conditioned to facies
- Stochastic petrophysical property modelling - basic distribution
- Water saturation - using trends and variable contacts
- Volumetrics
- Model updating

Model Driven Interpretation in RMS

KBA-01213-Y3W9G6

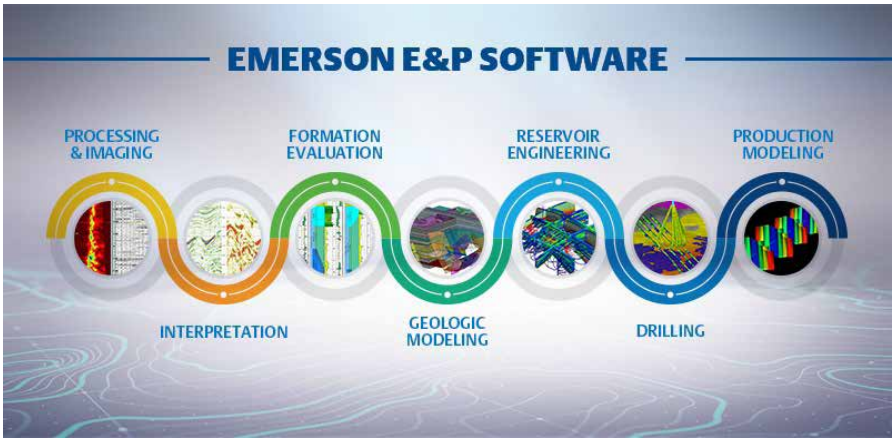
Overview
A new module in RMS 2013, Model Driven Interpretation provides a fresh, unique approach to interpretation of any geophysical surveys and data, including 2D & 3D seismic, attributes & inversion models. Centered on the concept of the Agile Model, interpreted surfaces are generated using RMS's proprietary structural modelling algorithms, which imparts geological consistency from the outset, and enables complex structures to be created very easily. The integrated workflow flows from data right through to structural modelling.

Interpreters and modellers can also capture the geophysical uncertainty during the interpretation process, and this uncertainty can be carried through the full structural modelling workflow to explore different configurations matching the interpretation, as well as uncertainty maps to help determine areas that might need further work.

Duration
2 days

Intended for
Geophysicists, geologists & RMS modellers

Content
Students are guided through a full interpretation workflow, from data import to the structural model, and learn about inherent data uncertainties and how to evaluate uncertainty in the interpretation context.
- Import & visualise SEGY data
- Interpretation concepts and techniques - create a new interpretation
- Measuring uncertainty during interpretation
- Geo-entities : connecting the interpretation to reservoir geology
- Velocity modeling and depth conversion
- Build a structural model from the interpretation
- Refining an existing interpretation
- Well ties
- Fault uncertainty (quick overview)



Reservoir Simulation using Tempest MORE and Tempest PVTx

KBA-01230-Q8S8Q8

Overview
The course is designed for reservoir engineers looking to create and run EOS compositional simulation models using Tempest. A thorough overview of this highly visual, easy to use & comprehensive suite is given, with practical examples used throughout on both black oil and compositional simulation technology.

Duration
5 days

Intended for
Reservoir Engineers

Content
Participants with a reservoir engineering background are guided through the workflow required to create EOS compositional simulation models in Tempest MORE, perform compositional simulation runs and analyze results. After an initial overview of Tempest functionalities, a step by step approach is used to prepare EOS compositional simulation datasets, perform runs and view the simulation results. Through interactive EOS modeling the participants will learn how to use Tempest-PVTx to build the fluid data needed for EOS compositional simulation. The created fluid data files will be imported to Tempest-MORE for simulation. Exercises for both Tempest-PVTx and compositional simulation with Tempest-MORE are provided and on completing the course, engineers will be confident in generating and running compositional simulation models on their own data.

Black oil simulation
- Introduction to the Tempest suite and an overview of Tempest VIEW pre & post processing
- Visualizing and editing the input model
- Setting up a simulation using the simulation wizard
- Viewing simulation output
- DAT file & grid coarsening
- Fluid file. Set up of simulation models: black oil, dry gas, wet gas & retrograde gas, compositional, polymer, thermal and coal bed methane
- Relative permeability file
- GRID file
- INT file
- Recurrent file

EOS simulation
- Highlight similarities and differences between Black Oil and EOS Compositional simulation in Tempest
- Set up EOS simulation cases using the Tempest MORE Simulation Wizard
- Tempest Data Explorer for pre-processing
- Run a simulation and perform post-processing on results
- Generate/review/run various EOS simulation cases

PVTx
- Use Tempest PVTx to interactively create reservoir fluid models
- Hydrocarbon composition and fluid properties
- Perform fluid characterization and phase behavior
- Laboratory techniques and model PVT experiments used in petroleum engineering and process applications
- Equation of State (EoS)
- Flash calculations
- Regression
- Export reservoir fluid models from Tempest PVTx into simulators

Reservoir Simulation using Tempest

KBA-01131-D4N0P6

Overview
The course is designed for reservoir engineers looking to create and run simulation models using Tempest. A thorough overview of this highly visual, easy to use & comprehensive software is given, with practical examples used throughout.

Duration
3 days

Intended for
Reservoir engineers

Daniel Operation and Maintenance to Control Valves and Turbines

Course D4290 CEUs: 2.1

Overview
This 3-day course covers the operation, installation and maintenance of the Daniel control valve and turbines.

Prerequisites
Basic knowledge of flow measurement. Note: North America: Courses typically start at 8 AM on Wednesday and end at 12 PM on Friday to accommodate travel.

Topics
- Theory of operation: Turbines, Valves, Digital Pilots
- Disassembly and Reassembly of Turbine Internals
- Disassembly and Reassembly of Valve Cylinder Assemblies
- Disassembly and Reassembly of Digital Pilots
- Valve Needle Valve Adjustment
- 'A' series vs. 'B' Series Control Valves
- Turbine Pick-Off Sensor and Preamp
- Flow Conditioning
- Parity vs UMB Series Turbine
- Meter Troubleshooting

Introduction to Daniel Senior Orifice Fittings

Course D4420 CEUs: .7

Overview
This 1-day course is for the beginner or experienced technicians. The students will learn the operation and how to repair and troubleshoot the Model 2000.

Prerequisites
Basic knowledge for flow measurement.

Topics
- Theory of Operation
- 'C' Style vs. Model 2000
- Maintenance
- Operating Instructions
- Installation
- Hands-on Learning
- Troubleshooting
- New Features of M2000

Hydrocarbon Gas Flow Measurement Systems Operation and Maintenance

Course D4510 CEUs: 1.4

Overview
This 2-day course provides students with a detailed understanding of the principles of measurement for Hydrocarbon Gases. Consideration of the correct Primary measuring device, its installation, operation and secondary instrumentation requirements will be explained. The instructor will reference applicable standards, used to design the system to optimize performance. This includes system calibrations and device maintenance. Full supporting literature will be made available to students.

Prerequisites
A basic knowledge of flow measurement is required.

Topics
- Background to Gas Flow measurement
- Commercial and Legal Requirements
- Principles of Current Gas Flow Measurement Techniques
- Secondary Instrumentation, including Gas Quality Analyzers
- System Design Standards Used
- Meter Operation, calibration and Master Metering Operations
- Maintenance Procedures
- Reporting and Book Keeping

Hydrocarbon Liquid Flow Measurement Systems Operation and Maintenance

Course D4520 CEUs: 2.1

Overview
This 3-day course provides students with a detailed understanding of the principles of measurement for Hydrocarbon Liquids. Consideration of the correct Primary measuring device, its installation, operation, and secondary instrumentation requirements will be explained. The instructor will reference applicable standards, used for design, and to optimize system performance. This includes system calibrations, meter-proving practices and maintenance. Full supporting literature will be made available to students.

Prerequisites
A basic knowledge of flow measurement is required.

Topics
- Background to Liquid Flow Measurement
- Commercial and Legal Requirements
- Principles of Current Liquid Flow Measurement Techniques
- Secondary instrumentation, including Liquid Samplers
- Meter Operation, Calibration and Meter Proving Operations
- Maintenance Procedures
- Reporting and Book Keeping

Flow & Density Measurement

DANIEL

Daniel is a division of Emerson Automation Solutions. The name synonymous with high quality, reliable, flow measurement products and systems in the oil and gas industry, also provides unparalleled service support and commitment to serving our customers.

Operation and Maintenance of Gas/Liquid Ultrasonic Meters

Course: D4230/D4280 CEUs: 1.4

Overview
This 2-day course prepares students to install, operate and maintain Daniel multi-path ultrasonic flow meters. In addition to classroom instruction, the training course includes hands-on experience using the flow meter, simulator and diagnostic software.

Topics
- Basics of Sound Waves
- How Ultrasonic Flow Meters Work and their Advantages over other Meters
- The Performance Characteristics of Transit Time Ultrasonic Flow meters
- System Components and Mark III Electronics, including the Central Processing Unit (CPU) Board and the Option Board
- Meter Mechanics
- Removal and installation of Transducer Assemblies
- Volumetric and Mass Ultrasonic Gas Flow Measurement
- Meter Installation Considerations
- Inform the instructor if working on Liquid Meter

Operation and Maintenance of the Daniel Compact Prover™

Course: D4270 CEUs: 1.4

Overview
This 2-day course covers the operation, installation and maintenance of the Daniel Compact Prover™.

Prerequisites
Basic knowledge of flow measurement.

Topics
- Theory of Operation: Double Chronometry and Specifications
- Overview of the Parts Which Make up the Compact Prover such as Actuator Assembly, Pneumatic Spring Chamber, Piston and Poppet, Optical Switches, Hydraulic Motor and Pump, and Solenoid Valve
- Installation: Prover and Meter Location, Nitrogen Spring Plenum Setting, and Power requirements
- Troubleshooting and Repair of: safety Barriers, Seal and O-ring Replacement, Detector Switches, Interface Board, Hydraulic and Nitrogen System, and Spare Parts
- Overview of Calibration: Seal Leak Test, Upstream and Downstream calibration and Waterdraw Data Sheet
- Overview of Prover Electronics: Programming, Input and data Modes Using Software/Local Display, Circuit Module Description and Diagnostics
- Proving Operations: Direct Proving and Master Meter Proving
- Prover Maintenance

Introduction to Model 500 and 700 Gas Chromatographs

Course: D4100 CEUs: 2.1

Overview
This 3-day course provides students with a basic understanding of how a gas chromatograph works, emphasizing chromatograph fundamentals and basic theory. The only prerequisites are basic computer skills and DMS provides an experienced on-site instructor as well as all necessary equipment and handouts for the course.

Topics
- Basic Chromatography Principles and Their Application to Gas Measurement
- Basic Chemistry, Flow Configuration and Carrier and Calibration Gas Systems
- Basic Sample Systems
- Basic Chromatograph Hardware
- Times Events, Retention Times, Response Factors
- Calculations & control parameter
- Using Chromatograms to Identify Problems
- Identifying Gas Components
- Calibrating a Gas Chromatograph
- Operation of MON Software

Operation and Maintenance of S600/S600+ Flow Computers

Course D4260/D4262 CEUs: 1.4

Overview
This 2-day course provides students with an appreciation of the operation, design, capabilities and configuration of the S600/S600+ flow computer. This hands-on course deals with file transfer and machine recovery as part of the maintenance scope. The instructor will make use of the latest configuration software. Full supporting literature will be made available to all students.

Prerequisites
Basic knowledge of flow measurement.

Topics
- Introduction to the S600/S600+
- Board Removal and Layout
- Keypad Access and Security
- Menu Navigation
- Data/Mode Changing
- Alarm Handling and Configuration
- Configuring and Generating Reports
- Application Specific Functions
- Cold/Warm Starting Modes
- File Back-Up and Download
- Using the configuration Software

Understanding Metering Systems: Applications, Operations and Maintenance

Course D4530 CEUs: 1.4

Overview
This 2-day course is an introduction to high accuracy fluid flow measurement systems. The instructor will explain the practical application of gas and liquid flow meters and secondary instrumentation as well as the liquid sampling and gas analysis techniques for measuring product quality. Good practice for System operation and maintenance will also be discussed. Supporting literature will be supplied to students.

Prerequisites
A background in process control or process instrumentation is required.

Topics
- Background to High Accuracy Fluid Flow Measurement
- Custody Transfer, Fiscal and Allocation Metering
- Commercial Agreements and Legal Requirements
- Flow Measurement Methods
- Qualitative Measurement
- Reference Standards Employed
- Flow and Energy calculations
- System Maintenance
- Good Metering Practices

DanPac Measurement and Control System Introduction to Operation and Maintenance

Course D4540 CEUs: 1.4

Overview
This 2-day generic course provides students with an operational introduction to the Danpac Measurement & Control System. The instructor will explain the metering system architecture, its function and administration. As well as showing how to navigate the operator interface, the course covers basic troubleshooting. The instructor will also explain the features and benefits of the control options available within DanPac. Students will receive supporting literature.

*More detailed training for a specific project application is also available and will be quoted on request.

Prerequisites
A background in flow measurement is required.

Topics
- Introduction to the DanPac System Architecture
- Operator Interface Graphics and Controls
- Access and Security
- Communication and Interface to System Field Components
- Reporting and Alarm Functions
- Simple Diagnostics and Troubleshooting

Flow & Density Measurement

Emerson's best-in-class Micro Motion and Rosemount flow and density measurement technologies, wide breadth of products and unmatched value ensure you will realize outstanding results in your process and operation. Emerson Flow Middle East and Africa offers classes at our factory, regional locations or at your plant.

Micro Motion Comprehensive Training Class

Course : 2352 CEUs: 2.1

Overview
This three-day class consists of a blend of lectures and hands-on exercises that cover the Installation, configuration and calibration of the Micro Motion metering system. Students will learn the Series 100012000 transmitters using ProLink® Ill, HC475 and the Series 3000 Interface devices. Students will perform a master reset and use ProLink Ill to configure the Series 100012000, perform a flow calibration and solve troubleshooting problems. On the third day, based on students' needs, we will cover one or all the following topics RFT9739 transmitter, T-Series, R-Series and Series 3000 platform and an introduction to the new Micro Motion's 5700's transmitter. Students will also learn the Modbus communications model, including RS-485 network requirements, memory structure, data types, functions, character framing and message framing.

Topics
After attending this course the student will be able to do the following:
- Be able to explain the fundamentals for how a Micro Motion Coriolis meter works and the functions of the key components.
- Be able to apply the installation best practices for orienting, mounting and wiring the sensor and transmitter.
- Be able to configure the metering system to measure flow, density and temperature for the application.
- Be able to apply a step-by-step process to perform basic troubleshooting for the most common meter and process issues.
- Be able to explain the fundamentals for the Modbus protocol model.
- Be able to configure, commission, read process data, view & analyze key diagnostic registers and loop test a batch application using a Micro Motion Meter.

Audience
This class is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Micro Motion Coriolls flow and density meter. Typical job functions include; Micro maintenance technicians, instrument technicians and instrumentation engineers.

Prerequisites
None required. However, basic understanding of the fundamentals of how measurement, electricity, analog and frequency signal processing are assumed.

Micro Motion - Density and Viscosity Product Training - 5708 CEUs - 1.40

Overview
This 2-day course consists of a blend of lectures and hands-on exercises that cover the installation, configuration, calibration checks and troubleshooting of Micro Motion transmitters and peripherals. Courses held at customer specified sites can be customized to address specific transmitter and configuration tools. Public registration classes cover a broad range of equipment based on the needs of the attendees.

Topics
After attending this course the student will be able to do the following:
- Explain the principle of operation for how a Micro Motion density & Viscosity meter works and the function of the key components.
- Apply the installation best practices for orienting, mounting and wiring the sensor and transmitter.
- Configure the metering system to measure flow, density and temperature for their application.
- Apply a step-by-step process to perform basic troubleshooting of the most common meter and process issues.

Micro Motion Coriolls Comprehensive Training Class

Course : 2380 CEUs: 1.4

Overview
This two-day class is modeled after the 2352 factory course. It consists of a blend of lectures and extensive hands-on exercises that cover the installation, configuration and calibration of the Micro Motion metering system. Students will learn the Series 1000/2000 transmitters using either ProLink® III, AMS Device Manager, HC475 or L.O.I. Students will perform a master reset, configure the Series 1000/2000, perform a flow calibration and solve troubleshooting problems. Based on student need, we will cover one or all of the following topics: RFT9739, 9739MVD transmitter, T-Series, R-Series, or Series 3000 platform. Onsite classes can be customized to cover the customer's installed base, preferred configuration tools and application questions. This course also includes an introduction to Micro Motion's new 5700 transmitter.

Topics
- Explain the Fundamentals for how a Micro Motion Coriolis Meter Works and the Function of the Key Components
- Learn the Installation Best Practices for Orienting, Mounting and Wiring the Sensor and Transmitter
- Configure the Metering System to Measure Flow, Density and Temperature for Various Applications
- Learn a Step by Step Process to Perform Basic Troubleshooting of the Most Common Meter and Process Issues

Audience
This class is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Micro Motion flow and density meter. Typical job functions include, maintenance technicians, instrument technicians and instrumentation engineers.

Prerequisites
Basic understanding of the fundamentals of flow measurement, electricity, analog and frequency signal processing are assumed.

Flow Measurement Technologies

Course : 2398 CEUs: 3.5

Overview
This 5-day class covers the basic fluid dynamic concept, selection/sizing of right flowmeter for application/s installation, configuration and calibration basics for most inline flowmeter technologies. Introduction/basics of calibration/proving for various Flowmeter Technologies.

Topics
- Introduction to Process Measurements & Fluid Dynamics
- Introduction to Flow Measurement
- Types of Flow Measurement
- Principle of operation (dP-Flow, Turbine, PD, Electro-Magnetic, Vortex, Coriolis & Ultrasonic Flow measuring devices)
- Methods of Calibration/ Proving-Introduction
- Flowmeter Selection
- Installation Guidelines

Micro Motion Coriolis 1000/2000 Training Class

Course : 2358 CEUs: .7

This course is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Micro Motion Coriolis flow and density meter. Typical job functions include; maintenance technicians, instrument technicians and instrumentation engineers.

Overview

This 1-day course consists of a blend of lectures and hands-on exercises that cover the installation, configuration, calibration checks and troubleshooting of Micro Motion sensors with the Series 1000/2000 transmitters and peripherals. This course includes hands-on exercises. Courses held at customer specified sites can be customized to address specific transmitters and configuration tools. Public registration classes cover a broader range of equipment based on the needs of the attendees.

After completing this training, students will also get unlimited access to the Micro Motion's Online Training (e2353) for a year. This online training cost $400/license per year if purchased separately.

Prerequisites

A basic understanding of the fundamentals of flow measurement, electricity, analog & frequency signal processing are assumed

Topics

- Explain the Fundamentals for how a Micro Motion Coriolis Meter Works and the Function of the Key Components
- Be able to apply the installation best practices for orienting, mounting and wiring the sensor and transmitter
- Configure the Metering System to Measure Available Process Variables from the Device for Their Application
- Learn a Step by Step Process to Perform Basic Troubleshooting of the Most Common Meter and Process Issues

Micro Motion Configuration and Diagnostic Tool - Prolink

Course : 2396 CEUs: .7

Overview

This 1-day class covers the installation, connection and use of Prolink - a complete tool for exploring Micro Motion Coriolis Flow meters to the fullest. Prolink is a Windows based, fast response, Coriolis sensor troubleshooting and service tool.

Prerequisites

Course: MMI-COR-01 or have equivalent knowledge/experience

Topics

- Introduction to Prolink
- Hands-On- Configuration and Alarm handling
- Hands-On - Device Simulation & offline configuration management
- Hands-On - Smart Meter Verification & Reports
- Installation Guidelines

Rosemount 8700 Series Magnetic Flowmeter

Course 2340 CEUs: .7

This course is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Rosemount 8700 Series Magnetic flowmeter. Typical job functions include: maintenance technicians, instrument technicians and instrumentation engineers.

Overview

This 1-day course consists of a blend of lectures and hands-on exercises that cover how to install, configure and maintain the Rosemount 8700 Series Magnetic Flowmeter Systems composed of the Model 8712 and 8732 transmitters and the 8705 Flanged and 8711 Wafer Sensors. The students will learn the operation and capabilities of Local Operator Interface (LOI), 475 Field Communicator, and/or AMS Device Manager and how to use these tools to perform configuration. Common issues encountered and troubleshooting techniques will also be covered.

Prerequisites

Knowledge of basic flow fundamentals and instrumentation.

Topics

- Explain the Difference and Capabilities of the Rosemount 8700 Series Magnetic Flowmeters
- Identify Transmitter and Sensor Parts and Explain Functionality
- Explain Faraday's Law and the Principles of Operation of Magnetic Flowmeter System
- Configure and Test Transmitters Using the LOI, Field Communicator or AMS Device Manager or PROLINK III
- Properly Install/Troubleshoot the Rosemount Magnetic Flowmeter System

Flow & Density Measurement

ROSEMOUNT

Customized Training at a customer's plant is a convenient, cost-effective means of training four to ten technicians. Also, offering special technical training tools and materials for self-study.

Rosemount 8800 Series Smart Vortex Flowmeter with HC475/ prolink

Course 2341 CEUs: .7

This course is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Rosemount 8800 Series Vortex Flowmeter. Typical job functions include; maintenance technicians, instrument technicians and instrument engineers.

Overview

This 1-day course consists of a blend of lectures and hands-on exercises that cover how to install, configure and maintain the Rosemount 8800 Series Smart Vortex flowmeter systems. The students will learn the operation and capabilities of the Local Operator Interface and HC475 Field Communicator and how to use these tools to perform configuration. Common issues encountered and troubleshooting techniques will also be covered.

Topics

- Explain the Differences and Capabilities of the Rosemount 8800 Series Vortex Flowmeters
- Explain the von Karman Effect and the Principles of Operation of Vortex Flowmeters.
- Identify Vortex Parts and Explain Functionality
- Configure and Test Transmitters using Field Communicator or AMS Device Manager
- Properly Install and Troubleshoot the Rosemount 8800 Series Vortex Flowmeter System

Digital Net Oil Computing & Applications

Course: 2397 CEUs: 2.1

This 3-day class covers the basic of Net Oil Computing and Coriolis measurement based Net Oil Computers. Insights of Series 3000 Net Oil Computer and Digital Oil Computer DNOC platform and solutions.

Prerequisites

Course: MMI-COR-01 or have equivalent knowledge/experience

Topics

- Introduction to Net Oil Computing applications and solutions
- Coriolis Meter based Net Oil Computing
- Introduction to Series 3000 & DNOC solutions
- Series 3000 NOC Solutions
- Digital Net -Oil Computer DNOC solutions
- Installation, Configuration and Commissioning
- Hand-On- Smart Meter Verification & Reports
- Hands-On Series 3000 NOC
- Hands-On DNOC

Micro Motion Sensors 9739MVD/5700 Transmitter

Course 2351 CEUs: .7

This course is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Micro MotionCoriolis flow and density meter. Typical job functions include; maintenance technicians, instrument technicians and instrumentation engineers.

Overview

This 1-day course consists of a blend of lectures and hand-on exercises that cover the installation, configuration, calibration checks and troubleshooting of Micro Motion ELITE, F-Series and D sensors with the RFT9739 or 9739MVD transmitters and peripherals. This course includes hands-on exercises. Courses held at customer specified sites can be customized to address specific transmitters and configuration tools. Public registration classes cover a broader range of equipment based on the needs of the attendees.

Prerequisites

None required. However, basic understanding of the fundamentals of the behavior/properties of gases and gas density measurement are helpful. Basic electricity, analog & frequency signal processing knowledge are also assumed.

Topics

After attending this course the student will able to do the following:

- Explain the Fundamentals for how a Micro Motion Coriolis Meter works and the Function of the Key Components
- Learn the Installation Best Practices for Orienting, Mounting and Wiring the Sensor and Transmitter
- Configure the RFT9739 or 9739MVD to Measure Flow, Density and temperature for their Application
- Learn a Step by Step Process to Perform Basic Troubleshooting of the Most Common Meter and Process Issues

Micro Motion ModBus Digital Communication

Course : 2381 CEUs: .7

This course is appropriate for personnel who have any of the following responsibilities: Installing a Micro Motion transmitter on an RS-485 network, configuring, calibrating, operating or troubleshooting a Micro Motion transmitter using ModBus protocol, setting up a Modbus host or PLC to communicate with a Micro Motion transmitter or writing programs that use ModBus protocol to communicate with Micro Motion transmitters.

Overview

This 1-day class consist of a blend of lectures and hands-on exercises. Students will learn the Modbus communication model, including RS-485 network requirements, memory structure, data types, functions, character framing and message framing. Students will use Micro motion's Modbus documentation set and Modbus tool to configure transmitter features, read process data, reset totals, read and acknowledge alarms, analyze diagnostic registers, zero the flowmeter, perform a loop test and manage a batch process. Troubleshooting will also be covered.

Prerequisites

Students should have completed Micro Motion Comprehensive Product Training, Course 2352 or have equivalent knowledge or experience.

Topics

- Explain the Fundamentals for the Modbus Protocol model
- Configure, Commission, Read Process Data, View and Analyze Key Diagnostic Registers and Loop Test a Batch Application using a Micro Motion Meter
- Set up a Host System or PLC to Communicate with a Micro Motion Transmitter via Modbus Diagnostics
- Meter Verification Diagnostics

Micro Motion Specific Gravity Meter Training Class

Course : 2386 CEUs: .7

This course is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Micro Motion 3098 Gas Specific Gravity meter. Typical job functions include; maintenance technicians and instrumentation engineers.

Overview

This 1-day course consists of a blend of lectures and hands-on exercises that cover an overview of the operating principle, key components and applications of a 3098 Micro Motion Gas Specific Gravity meter. The process of commissioning a 3098 is covered including: installation, wiring, configuration and field calibration at initial start-up. Troubleshooting of commonly seen issues is also covered. This course includes hands-on demonstrations.

Prerequisites

None required. However, basic understanding of the fundamentals of the behavior/properties of gases and gas density measurement are helpful. Basic electricity, analog and frequency signal processing knowledge are also assumed.

Topics

- Explain the Principle of Operation for how a Micro Motion 3098 Gas Specific Gravity works and the Function of the Key components.
- Learn the installation Best Practices for orienting, mounting, piping and wiring the 3098
- Configure the 3098 and perform the required field calibration.
- Learn a step by step process to perform basic troubleshooting of the most common issues Customers encountered

Measurement Instrumentation

Process Measurement Products III (Level)

Course 2333 CEUs:2.1

This course is intended for technicians, engineers and other plant personnel who need to know installation, calibration, maintenance and troubleshooting of measurement instrumentation.

Overview

This 3-day course explains how level instruments function and how they are installed and calibrated. It emphasizes installation, proper setup and calibration / verification of level instruments.

The course uses lectures and labs to teach the students. Those who complete this class will be able to:

- Correctly install Guided Wave Radar Transmitters
- Correctly install Non-contacting Radar Transmitters
- Properly calibrate Level instruments
- Perform basic troubleshooting

Prerequisites

Some experience in instrument calibration, maintenance , installation and operation would be helpful.

Topics

- DP Level Fundamentals
- Radar Applications
- Radar Instruments
- Radar PC Software
- Field Communicator
- Test Equipment Selection
- Installation
- Configuration
- Calibration / Verification
- Troubleshooting

3051 Smart Pressure Transmitter

Course 2305 CEUs: .7

This course is designed for those individuals responsible for the installation and maintenance of the Rosemount Model 3051 Smart Pressure Transmitter.

Overview

This 1-day course lecture and labs to teach the student how to install, configure, calibrate, and maintain the Rosemount Model 3051 Smart Pressure Transmitter.

The Student will also learn the operation of the Model Field Communicator, Students will:

- Explain the differences between Smart & Analog Transmitters
- Identify 3051 parts and functionality
- Explain the principles of operation of the 3051
- Configure, calibrate and test 3051 Smart Pressure Transmitters using the Field Communicator or AMS
- Properly install/troubleshoot the 3051 Smart Transmitter

Prerequisites

Knowledge of basic pressure fundamentals and pressure instrumentation

Topics

- Smart and Analog Transmitters
- 3051 Overview and Principles of operation
- Test Equipment selection
- Bench Testing the 3051 Smart transmitter
- Field Communicator Operation
- Digital Trims/Calibration
- Installation and Start-up
- Troubleshooting and Maintenance

3051 Fieldbus Pressure Transmitter

Course 2307 CEUs: .7

This course is designed for those individuals responsible for the installation and maintenance of the Rosemount Model 3051 Fieldbus Pressure Transmitters.

Overview

This 1-day course uses lectures and labs to maximize the hands-on experience and teach the student how to install and maintain the Rosemount Model 3051 Fieldbus Pressure Transmitter.

The Student will also learn the operation of the Field Communicator. Students who complete this course will able to :

- Identify 3051 parts and functionality
- Explain the principles of operation of the 3051
- Design and build a Fieldbus segment
- Configure test, and calibrate the 3051 Fieldbus Pressure Transmitter using the field Communicator
- Properly install and troubleshoot the 3051 Fieldbus Transmitter

Prerequisites

Knowledge of basic pressure fundamentals and pressure instrumentation.

Topics

- 3051 Overview and Principles of Operation
- FOUNDATION™ Fieldbus Overview
- Fieldbus Wiring/Segment Design/ Function Blocks
- Test Equipment Selection
- Bench Testing 3051 Fieldbus Transmitter
- Field Communicator Operation
- Digital Trims/Calibration
- Installation and Start-up
- Troubleshooting and Maintenance

Rosemount's leadership in the design, manufacture, and application of smart field instrumentation is unchallenged for pressure, level, temperature and flow measurement instruments to monitor and control process.

3051S Smart Pressure Transmitter

Course 2308 CEUs: .7

This course is designed for those individuals responsible for the installation, configuration, calibration, troubleshooting and maintenance of the Rosemount Model 3051S Smart Pressure Transmitter.

Overview

This 1-day course uses lectures and labs to maximize the hands-on experience and teach the student how to install, configure, calibrate, troubleshoot and maintain the Rosemount Model 3051S Smart Pressure Transmitter. The student will also learn the operation if the Model Field Communicator. Students who complete this course will be able to:

- Identify 30501S parts and functionality explain the principle of operation of the 3051S
- Configure and test the 3051S Smart Pressure Transmitters using the Field Communicator or AMS
- Properly install, configure and test the 3051S Smart Transmitter

Prerequisites

Knowledge of basic pressure fundamentals and pressure instrumentation

Topics

- 3051S Overview/Principles of Operation
- 3051S Installation & Options
- Test Equipment Selection
- Configure & Test the 3051S Advance Features:
  - Alarm & Saturation Levels, Alarm Direction, Write Protection,
  - Process Alerts, Scaled Variable
- Digital Trims/Calibration
- Troubleshooting and Maintenance

3144P Temperature Transmitters

Course 2321 CEUs: .7

This course is designed for those individuals responsible for the installation and maintenance of the Rosemount Model 3144P Smart Temperature Transmitters.

Overview

This 1-day course uses lecture and labs to teach the students how to install, configure, calibrate and maintain the Rosemount Model 3144P Smart Temperature Transmitters. The Student will also learn the operation of the field Communicator. Students who complete this course will:

- Identify 3144P parts and explain their functionality
- Explain the principles of operation of the 3144P
- Configure, calibrate and test 3144P Smart Temperature Transmitter using the Field Communicator or AMS
- Properly install and troubleshoot the 3144P Smart Transmitter

Prerequisites

Knowledge of basic temperature fundamentals and temperature instrumentation

Topics

- 3144P Overview and Principles of Operation
- Test Equipment Selection Sensor Selection and Wiring
- Bench Testing the 3144P Smart Transmitters
- Field Communicator Operation
- Digital Trims/Calibration
- 3144P Dual Sensor Setup and Configuration
- Installation and Start-up
- Troubleshooting and Maintenance

Measurement Instrumentation

The vast amounts of information generated by these devices make possible lower automation costs, improved plant performance, faster troubleshooting, fewer unscheduled lower maintenance costs.

3144P Fieldbus Temperature Transmitters

Course 2324 CEUs: .7

This course is designed for those individuals responsible for the installation and maintenance of the Rosemount Model 3144P Fieldbus Temperature Transmitters.

The student will also learn the operation of the Field Communicator. Students who complete this course will be able to:

- Identify 3144P parts and explain their functionality
- Explain principles of operation of the 3144P
- Design and build a Fieldbus segment
- Configure, calibrate and test 3144P Fieldbus Temperature transmitter using Field Communicator
- Properly install and troubleshoot the 3144P Fieldbus Transmitters

Prerequisites

Knowledge of basic temperature fundamentals and temperature instrumentation

Topics

- 3144P Overview and Principles of Operation
- FOUNDATION™ FieldBus Overview
- Fieldbus Wiring
- Fieldbus Segment Design
- Fieldbus Function Blocks
- Test Equipment Selection
- Sensor Selection and Wiring
- Bench Testing 3144P FieldBus Transmitters
- Field Communicator Operation
- Digital Trims/Calibration
- Installation and Start-up
- Troubleshooting and Maintenance

5400 Series HART Radar Level Transmitter

Course 2336H CEUs: 1.4

This course is designed for those individuals responsible for the installation, configuration, calibration and maintenance of the Rosemount Model 5400 HART Radar Level Transmitter.

Overview

This 2-day course uses lecture and labs to maximize the hands-on experience and teach the student how to install, configure, troubleshoot and maintain the Rosemount Model 5400 Radar Transmitters. Students who complete this course will be able to:

- Explain the principle of operation of the 5400 Radar
- Identify 5400 Radar parts and explain their functionality
- Properly install and wire the 5400 Radar
- Configure and test the 5400 Radar to work in different applications
- Properly troubleshoot the 5400 Radar Transmitter and the installation using Radar Master Software

Prerequisites

Knowledge of basic level fundamentals and instrumentation

Topics

- 5400 Overview and Principles Operation
- Installation of the 5400 Radar
- Wiring 5400 Radar
- Configuration of 5400 Radar
- Bench testing the 5400 Radar
- Field Communicator Operation
- AMS Devise Manager Operation
- Radar Master Software Operation
- Troubleshooting and Maintenance
- Tank & Application Troubleshooting and Echo Handling Using Radar Master Software

NOTE: 5400 HART Radar Level transmitter is also included in the 3-day Level course # 2333

5300 High Performance Guided Wave Radar HART Level Transmitter

Course 2337H CEUs: .7

This course is designed for those individuals responsible for the installation, configuration, calibration and maintenance of the Rosemount Model 5300 High Performance Guided Wave Radar (GWR) Series HART Radar Level Transmitter.

Overview

This 2-day course uses lecture and labs to maximize the hands-on experience and teach the student how to install, configure, troubleshoot and maintain the Rosemount Model 5300 High Performance GRW Transmitter. Students who complete this course will be able to :

- Explain the principles of operation of the 5300 GRW
- Identify 5300GRW parts and explain their functionality
- Understand the available probe option and when each should be used
- Properly install and wire the 5300GRW
- Understand how to setup the 5300 GRW in work in application
- Properly troubleshoot the 5300 GRW Transmitter and installation using Radar Master Software

Prerequisites

Knowledge of basic level fundamentals and instrumentation

Topics

- 5300 Overview and Principles of Operation
- Installation of the 5300 GRW
- Wiring the 5300 GRW
- Field Communicator Operation
- AMS Software Operation
- Troubleshooting and Maintenance
- Tank & Application Troubleshooting and Echo Handling Using Radar Master Software

Rosemount sponsors more than two-dozen courses covering product installation, configuration, calibration and maintenance.

5400 Guided Wave Radar Level Transmitter

Course

This course is designed for those individuals responsible for the installation, configuration, calibration and maintenance of the Rosemount Model 3300 Series Guided Wave Rader GRW Level & interface Transmitters.

Overview

This 2-day course uses lectures and hands-on exercise to help the student how to install, configure, calibrate troubleshoot maintain the Rosemount Model 5400 GWR level and Interface Transmitters. Student who completes this course will be able to:

- Explain the principles of operation of the 5400 GWR
- Identify 5400 parts and explain their functionality
- Understand the Available Probe option and when each should be used
- Properly install the 5400 GWR
- Configure and test the 5400 GWR
- Properly troubleshoot the 5400 GWR Transmitter using RCT Software
- Understand the Eco curve and deliver the Deilectric Calculation

Prerequisites

Knowledge of basic Level and Interface fundamentals and Instrumentation.

Topics

- 5400 Overview and Principles of Operation
- Installation of 5400 Radar
- Wiring of 5400 Radar
- Basic Configuration of 5400 Radar
- Field communicator Operation
- Troubleshooting and Maintenance
- Tank and Application Troubleshooting and Echo Handling Using Radar Master Software

Measurement Instrumentation

Process Measurement Products I (Pressure and Temperature)

Course 2326 CEUs: .2.8

This course is designed for technicians, engineers and plant personnel who need to know installation, calibration, maintenance, and troubleshooting of measurement instrumentation.

Overview

The course explains how pressure and temperature instruments function and how they are installed and calibrated. It emphasizes installation, proper setup and calibration of Analog and Smart Pressure and Transmitters. The course uses lectures and labs to teach the students. Those who complete this course will be able to:

- Correctly perform installation and setup procedures
- Properly Configure Pressure and Temperature Transmitters.
- Properly Calibrate Pressure and Temperature Transmitters.
- Perform basic troubleshooting

Course Duration

4 days

Prerequisites:

Some experience in instrument calibration, maintenance, installation and operation would be helpful.

Topics:

- Basic 4-20 mA Loop Setup
- Pressure sensors
- Temperature Sensors
- Analogue Transmitters
- Smart Transmitters
- AMS Device Manager
- Hart and Field Communicator
- Test Equipment Selection
- Installation and Configuration
- Calibration / Verification
- Troubleshooting

Process Measurement Products II (DP Flow)

Course 2327 CEUs: 1.4

This course is designed for technicians, engineers and plant personnel who need to know installation, calibration, maintenance and troubleshooting of DP Flow measurement instrumentation.

Overview

The course explains how DP Flow functions and how they are installed and calibrated. It emphasizes installation, proper setup and calibration of DP Flow Instruments. The course uses lectures and labs to teach the students. Those who complete this course will be able to:

- Correctly install, configure and calibrate the DP Flow instruments.
- Perform DP Flow troubleshooting

Prerequisites:

Some experience in instrument calibration, maintenance, installation and operation would be helpful.

Course Duration

2 days

Topics:

- Basic DP Flow Fundamentals
- DP Flow sizing Calculations
- Multivariable Flow Transmitters
- AMS Device Manager with Engineering Snap-on Assistant
- Field Communicator
- Test Equipment Selection
- Installation and Configuration
- Calibration / Verification
- Troubleshooting

Fieldbus Measurement Instruments

Course 2370 CEUs: 2.1

This course is intended for technicians, engineers responsible, calibrating and troubleshooting FOUNDATION Fieldbus measurement instruments.

Overview

The course covers the integration of Foundation Fieldbus compliant measurement devices using the communicator, FF Modem and AMD device manager and other hosts. Those who complete this course will be able to:

- Install, Configure and Calibrate & Troubleshooting Rosemount Fieldbus Devices, including pressure Transmitter, Temperature Transmitter and Radar level transmitters.

Prerequisites

Some experience in instrument calibration, maintenance, installation and operation would be helpful.

Course Duration

3 days

Topics:

- Foundation Fieldbus Overview
- Fieldbus Wiring / Segment deign function Blocks
- Field Communicator Operation
- AMD Device Manager Operation
- Theory of operation, Installation, Configuration and Troubleshooting of the following:
- 3051 C & 3051S Pressure Transmitters
- 3144 & 644 Temperature Transmitters
- GWR level Transmitters

848 Fieldbus Temperature Transmitter

Course 2328 CEUs: .7

This 1-day course use lecture and labs to maximize the hands-on experience and teach the student how to install, configure, troubleshoot and maintain the Rosemount Model 848T Fieldbus Temperature Transmitters.

Overview

The Student will also learn the operation of the Field Communication. Students who complete this course will be able to:

- Explain the principles of operation of the 848T
- Configure, calibrate, and test the 848T Fieldbus temperature transmitter using the Field Communicator
- Design and build a fieldbus segment
- Properly install and troubleshoot the 848T Fieldbus Transmitter

Prerequisites

Knowledge of basic temperature fundamentals and temperature instrumentation

Topics:

- 848T Overview and Principles of Operation
- FOUNDATION™ Fieldbus Overview
- Fieldbus wiring
- Fieldbus Segment Design
- Fieldbus Function Blocks (including the MAI and ISEL Blocks)
- Test Equipment Selection
- Sensor Selection and Wiring
- Bench Testing the 848T Fieldbus Transmitters
- Field Communicator Operation
- Digital Trims/Calibration
- Installation and Start-up
- Troubleshooting and Maintenance

3095MV Multi-Variable Transmitters

Course 2343 CEUs:. 7

This course is designed for those individuals responsible for the installation and maintenance of the Rosemount 3095 MV Transmitter

Overview

This 1-day course uses lecture and labs to teach the student how to install, configure, calibrate and maintain the Rosemount Model 3095MV Smart Transmitters. The Student will also learn the operation of the Field Communicator. Students who complete this course will:

- Identify transmitter parts and explain their functionality
- Explain the principles of operation of the transmitter
- Configure and test using the Field Communicator and the 3095MW Engineering Assistant Snap-on Software
- Configure the compensated flow parameters using AMS Device manager with the 3095MV Engineering Assistant Snap-On software
- Properly install/troubleshoot transmitters

Prerequisites

Knowledge of basic pressure and temperature fundamentals/instrumentation

Topics:

- DP Flow Fundamentals
- Overview and Principles of operation
- Test Equipment selection
- Temperature Sensor Wiring
- Bench Testing the Smart Transmitters
- AMS Device manage with the 3095MV EA Snap-On Software
- Operation of Field communicator
- And AMS
- Device Manager
- Digital Trims/Calibration
- Installation and Start-up
- Troubleshooting and maintenance
- Troubleshooting and maintenance
- Configure/wire/Setup the HART Tri-Loop

3300 Guided Wave Radar Level Transmitter

Course 2332 CEUs: 1.4

This course is for those individuals responsible for the installation/maintenance of the Rosemount Model 330 Series Guided Wave Radar (GWR) Level & interface transmitters

Overview

This 2-day course uses lecture and labs to maximize the hands-on experience and teach the student how to install, configure, calibrate, troubleshoot and maintain the Rosemount Model 330 GWR Level & Interface Transmitters. Students who complete this course will be able to:

- Explain the principle of operation of the 330 GWR
- Identity 330 parts and explain their functionality
- Understand the available probe option and when each should be used
- Properly install the 330 GWR
- Configure and test the 330 GWR
- Properly troubleshoot the 3300 GWR transmitter using RCT software

Prerequisites

Knowledge of basic level and interface fundamentals and instrumentation.

Topics:

- 330 Overview/principles of Operation
- Installation of the 330GWR
- Configuration of the 3300 GWR
- Bench Testing the 330 GWR
- Field communicator Operation
- Calibration, Verification and adjustments
- Troubleshooting and maintenance
- Troubleshooting and Reading Tank Graphs using RCT Software

Wireless Self Organizing Network

Course 2375 CEUs: 1.4

This course is intended for technicians, engineers and other plant personnel who need to know how to design, install, setup, configure, maintain and troubleshoot Wireless Self Organizing Networks And their Components.

Overview

This 2-day course explains how Self Organizing Wireless Networks function and how they are installed, setup, configured and integrated. It emphasizes planning, proper installation and startup, configuration, maintenance and integration.

The course uses lectures and labs to maximize the hands-on experience and teach the students. Students who complete this course will:

- Correctly install and setup the 1420 Wireless Gateway
- Properly install and configure Wireless Transmitters
- Properly integrate Host interfaces to the Wireless Gateway Prerequisites Some experience in Networks and Host integration would be helpful.

Prerequisites

Some experience in network and Host integration would be helpful

Topics:

- How Self organizing networks function
- Self Organizing networks best practices
- Network components
- 1420 installation and setup
- Network parameters
- Wireless transmitters installation configuration, maintenance and calibration
- THUM installation wiring and configuring
- Using AMS Device manager with the 1420 wireless gateway
- Configuring wireless devices with AMS device manager
- Modbus serial integration
- Modbus TCP integration
- OPC integration
- 420 Advance features

Analytical Instrumentation

Rosemount Analytical offers the most complete range of analyzers, transmitters and sensors for continuous on-line measurement of pH, ORP, conductivity, dissolved oxygen, ozone, chlorine and turbidity. These products are used in the chemical, food and beverage, power, mineral, petroleum, pharmaceutical, water and waste-water industries and others. Our course is taught by an experienced instructor.

General pH, Conductivity, And ORP Theory

Course 2200 CEUs: .7

Overview

This 1-day course provides a solid theoretical background in pH, conductivity and ORP measurements. Students will:

- Understand how much measurement is made
- Recognize installation/application problems
- Learn configuration/calibrate procedures
- How to implement a maintenance program
- Troubleshooting problems using diagnostics

Topics:

- What is pH/Conductivity/ORP
- How pH/Conductivity /ORP Measurements are Made
- Physical Process Properties and How They Affect On-Line Measurements
- Proper Calibration Techniques
- Cleaning and Maintenance of a Sensor
- How to Decipher Diagnostics Readouts
- pH/Conductivity Sensor Overview
- pH/Conductivity/ORP Analyzer Overview

Amperometric Measurement Theory: Chlorine, Dissolved Oxygen & Ozone

Course 2201 CEUs:.7

Overview

This 1-day course provides insight into the complicated amperemetric measurements of Chlorine, Dissolved Oxygen and Ozone. Students will learn the concepts of how amperemetric sensor work and how to calibrate each type of measurement. Student will:

- Differentiate the various species of chlorine
- Implement a proper maintenance program
- Use diagnostics to troubleshoot problems

Topics:

- Amperometric Measurement Theory
- Chlorine/Dissolved Oxygen/Ozone
- Calibration Produces for Each Meas.
- Maintenance & Troubleshooting Tips

Rosemount Analytical Two-Wire Instrumentation Models Xmt and 5081 Transmitters

Course 2202/2202V CEUs: .2

Overview

This 2-hour class cover features, benefits and operation if any Rosemount Analytical's Model 5081 or Model Xmt two wire transmitters. Each Transmitters family can measure ph, ORP, Contacting, Dissolved Oxygen and Ozone. Both Transmitters have advanced diagnostics capabilities and can communicate via HART or Foundation Fieldbus communication protocols This class is free when performed in conjunction with either course 2200 "General pH, Conductivity, ORP theory", Course 2201 "Amperometric Measurement Theory".

Topics:

- Installation and Application Problems
- Configuration of Outputs (HART only)
- Use Diagnostic Features (if Applicable)
- Sensor Calibration
- Troubleshooting

Analytical Instrumentation

Rosemount Analytical Four-Wire Instrumentation Models 54e, 1055, 1056 or 1057

Course 2204/2204V CEUs: .2

Overview
This 2-hour class covers features, benefits and operation of any Rosemount Analytical Model 54e, 1055, 1056 or 1057. Each analyzer family can measure pH, ORP, contacting conductivity, toroida conductivity, chlorine, dissolved oxygen and ozone. The Model 1056 can also measure turbidity in drinking water and flow from a pulse sensor, and display any 4-20mA signal input. Each instrument has its own available features, and menu tree which will be covered in great detail.

Topics:
- Installation and Application Problems
- Configuration of Outputs/Alarms (If Applicable)
- Programming of Automated Cleaning Systems (DO, pH)
- Use Diagnostic Features (If Applicable)
- Sensor Calibration
- Troubleshooting

Available on Request or at Customer Site

Customer Specific Measurement Theory

Course 2205/2205V CEUs: .7

Overview
This 1-day class is fully customized to cover the specific measurements that the customer requests. A certified trainer will cover up to 4 subjects in one day. The 4 subjects may be measurement or product related. The list of measurements that can be bundled into a tailored made training course are pH, ORP, contacting conductivity, toroidal conductivity, turbidity, chlorine, dissolved oxygen and ozone. Each measurement theory has its own duration which can be modified to fit the customers' time frame needs. Select an analyzer (course 2204) or transmitter (course 2202) to accompany the measurement theories for a well-rounded class.

Topics:
- Installation and Application Problems
- Configuration of Outputs/Alarms (if applicable)
- Use Diagnostic Features (if Applicable)
- Sensor Calibration & Maintenance
- Troubleshooting

Available on Request or at Customer Site

Basic Course for Flame & Gas Detectors

Course FG 2100 CEUs: 1.4

Overview
This is a 2-day basic course about Flame and Gas Detectors.

Topics:
Flame Detection:
- Introduction to Flame detection principals
- Types of flame detection and its applications
  - Ultra Violet (UV), Infra Red (IR) and UV/IR
  - Installing – Where to locate and aim the detector
  - Causes of false alarms from Flame Detection and ideas to minimize the alarms
  - Preventive Maintenance

Gas Detection - Flammable and Toxic Gas:
- Introduction to Gas detection principals
- Gas Detector Transmitters - Millennium Transmitters – M2B and 21
- Types of Gas detectors available in the market and its Operating principals: Cat Bead, Electro chemical and Metal Oxide Semiconductor
- Installing – Where to site and locate the gas detectors
- Causes of false alarms and how to minimize it
- Preventive Maintenance

Smoke/Oil Mist Detector (EExd model):
- Introduction to Airborne Particle Monitor (APM)
- Applications using APM
- Installing the APM – Where to site and locate the detector
- Causes of false alarms and how to minimize it
- Preventive Maintenance

Ultrasonic Gas Leak Detector:
- Introduction to Ultrasonic Gas Leak Detector (UGLD)
- Applications using UGLD
- Site Mapping of Background Noise
- Installing the UGLD – Where to site and locate the detector
- Causes of false alarms and how to minimize it
- Preventive Maintenance

Notes
- Course duration is 2 days
- Minimum 5 students per class
- Maximum 10 students per class
- Additional students will be charged extra

With a wide selection of sensors, analyzers, gas chromatographs and other measurement and analysis technologies, Rosemount Analytical helps customers streamline process performance with innovative improvements that increase throughput, minimize energy usage, maximize asset life and take advantage of continuous online diagnostics for amazing results.

Introduction to Model 500 and 700 Gas Chromatographs

Course : R4100 **CEUs: 2.1**

Overview

This 3-day course provides students with a basic understanding of how a gas chromatograph works, emphasizing chromatograph fundamentals and basic theory.

Topics:

- Reviewing Basic Chromatography Principles
- Understanding Chemistry, Flow Configuration and Gas Systems
- Understanding Basic Sample Systems
- Working with Chromatograph Hardware
- Setting Timed Events, Retention Times and Response Factors
- Understanding Data Calculations
- Identifying Problems Using Chromatograms

Oxygen Fuel Gas Analyzer Maintenance, Including Oxymitter and World Class 3000

Course 2153 **CEUs: .7**

Overview

This 1-day course is the service requirements for oxygen analysis in general and the installation, operation, calibration and maintenance of the World Class and Oxymitter.

Topics:

- Combustion Requirements
- Methods of Oxygen Analysis
- Combustion Efficiency
- Zirconia (ZrO2) Oxygen Analysis
- Theory of Operation
- Oxygen Analyzer
  - Installation
  - Hardware
  - Maintenance
  - Troubleshooting
  - HART Communication

Operation and Maintenance of Model 500 Gas Chromatographs

Course : R4210 **CEUs: 2.8**

Overview

This 4-day course is appropriate for those who have either worked with a chromatograph for at least six months or completed the 'Introduction to Gas Chromatographs' course. It prepares participants to operate and repair a Model 500 gas chromatograph.

Prerequisites

'Introduction to Gas Chromatographs' course or equivalent knowledge

Topics:

- Understanding Gas Chromatography and a Gas Chromatograph
- Using the Basic Chromatograph System in Process Gas Analysis
- Understanding Carrier and Calibration Gas Systems
- Installing and Operating MON Software
- Applying Chromatograph Integration Techniques and Post-Analysis Calculations
- Using the Chromatograph to Identify Problems
- Setting Timed Events, Retention Times, and Response Factors
- Starting Up a Gas Chromatograph
- Understanding Sample Handling Systems
- Verifying Proper Operation -Gas Chromatograph
- Troubleshooting the 2350A Controller
- Configuring the 2350A Controller User Directory Outputs
- Conducting Preventative Maintenance
- Communicating to Other Devices
- Reviewing Spare Parts Recommendations

Operation and Maintenance of Model 700 Gas Chromatographs

Course : R4212 **CEUs: 2.8**

Overview

This 4-day course is appropriate for those who have either worked with a chromatograph for at least six months or completed the 'Introduction to Gas Chromatographs' course. It prepares participants to operate and repair a Model 700 gas chromatograph.

Prerequisites

'Introduction to Gas Chromatographs' course or equivalent knowledge

Topics:

- Understanding Gas Chromatography and a Gas Chromatograph
- Using the Basic Chromatograph System in Process Gas Analysis
- Understanding Carrier and Calibration Gas Systems
- Installing and Operating MON Software
- Applying Chromatograph Integration Techniques and Post-Analysis Calculations
- Using the Chromatograph to Identify Problems
- Setting Timed Events, Retention Times and Response Factors
- Starting Up a Gas Chromatograph
- Understanding Sample Handling Systems
- Verifying Proper Operation of the Gas Chromatograph
- Conducting Preventative Maintenance
- Communicating to Other Devices
- Reviewing Spare Parts Recommendations

Operation and Maintenance of 700XA Gas Chromatographs

Course : R4213 **CEUs: 2.8**

Overview

This 4-day course is appropriate for those who have either worked with a chromatograph for at least six months or completed the 'Introduction to Gas Chromatographs' course. It prepares participants to operate and repair a 700XA gas chromatograph.

Prerequisites

'Introduction to Gas Chromatographs' course or equivalent knowledge

Topics:

- Understanding Gas Chromatography and a Gas Chromatograph
- Using the Basic Chromatograph System in Process Gas Analysis
- Understanding Carrier and Calibration Gas Systems
- Installing and Operating MON Software
- Applying Chromatograph Integration Techniques and Post-Analysis Calculations
- Using the Chromatograph to Identify Problems
- Setting Timed Events, Retention Times, and Response Factors
- Starting Up a Gas Chromatograph
- Understanding Sample Handling Systems
- Verifying Proper Operation -Gas Chromatograph
- Conducting Preventative Maintenance
- Communicating to Other Devices
- Reviewing Spare Parts Recommendations

Tank Gauging Technical Product Training

Course RTG 101

This 5-day course covers the products range supplied by Rosemount tank Gauging. This course is suitable for project and maintenance engineers, and persons that are responsible for maintaining the tank gauging system at site.

Overview

This provides good coverage for Tank Gauging products supplied by Rosemount. It gives a general understanding on how to install, startup, commission and maintain a tank gauging system. It also helps the trainee to understands how he can optimize and maximize the benefits of using Rosemount Tank Gauging systems.

Training courses are based on classroom instructions backed up with laboratory work to deliver the trainees with a well-balanced knowledge in an integrated manner.

Prerequisites

- Instrumentation background and basic understanding of level measurement techniques in tanks
- Radar Technology Basics
- Installation of 3900 series/ 5900 Series
- REX/ Raptor hardware and software
- FCU/ FBM functionality
- MTT/ GFD functionality (Raptor)
- Tanks Master WINOpi & Winsetup
- Redundancy
- Lab works (installation, configuration, operation and troubleshooting)

Note: Customer to specify whether they want REX Tank gauging training or RAPTOR tank Gauging training.

Tank Master Training

Course RTG 102

Tank Master is a 3-day course covering the Maintenance and inventory management software that communicates to the tank Gauging system. Tank Master is certified by OIML for inventory calculation as per API standards. This course helps the user to fully understand the Tank Master software and all its functionalities. It is suitable for individuals that are responsible for administrating and maintaining the tank Master software.

Overview

The course goal is to provide comprehensive knowledge about tank Master Software and its capabilities. It starts by demonstrating the different tools in Tank master and how it can be utilized, and then it continues to demonstrate that advanced capabilities of Tank Master when it comes to connecting to devices and host systems. The course also demonstrates troubleshooting and problem solving techniques in Tank Master.

Training courses are based on classroom instructions backed up with laboratory work to deliver the trainees with a well-balanced knowledge in an integrated manner.

Prerequisites

Product training, or fair knowledge in Tank Gauging systems supplied by Rosemount.

Topics

- Inventory Calculation
- WinOpi tools
- Host Communication
- Driver and Communication
- Custom Views
- Redundancy
- Tankmaster.net
- Hybrid/ HTG
- Trouble Shooting

Onsite/Offsite Customized Tank Gauging Training

Rosemount Tank Gauging Middle East can provide variety of onsite and offsite courses to meet customer needs.

Overview

Customized courses are normally designed to fit the products available at customer site. The instructor takes a backup from the existing setup at site and designs the training material around it. The material to be covered in the training is customized as per customer requirement and the background of the trainees. Possible trainings are:

1 – ITG maintenance course
2 – ITG operation course
3 – Wireless Course
4 – Tank Master Course

Prerequisites

Basic knowledge about level measurement in tanks.

GENERAL INFORMATION

IACET Authorized Provider

Educational Services is an Authorized Provider of International Association for Continuing Education and Training (IACET) Continuing Education Units (CEU). IACET Authorized Provider status means our Organization:
Demonstrates compliance with proven, research-based standards created in cooperation with the U.S Department of Education.
Is dedicated to high standards for quality in continuing in education and training.
Awards the IACET CEU, the hallmark for quality in continuing education and training.
Educational Services is proud to have received Authorized Provider status. We look forward to the opportunity to share our training with you.

Qualifications for Enrollment

Educational Services agrees to accept for training, individuals who are not competitors of Emerson Process Management in the field to which the training pertains.

Tuition

All tuition is subject to change without notice. Transportation, personal expenses and most meals are responsibility of the student. Lunch during the training courses will be provided.

Course Materials

All materials presented and copyrighted. audio and video recording is prohibited and no material or portion of any school may be reproduced in any manner without prior written approval. All necessary documentation, catalogs and literature are included in the course tuition.

Continuing Education Units

Continuing Education Units (CEU) are awarded for the successful completion of most Emerson Process Management schools, based on 80% minimum attendance and satisfactory class and lab participation as determined by the course instructor.

To be Placed on our Mailing List

There are frequent mailings of current course offerings and new classes. Please contact us if you, or someone you know, would like to be place on our mailing list.

On-Site and Local Training

Educational Services instructors are available to provide expert training anywhere in the world. We can conduct training tailored to meet your needs at your facility or regional and local sites. To learn more about on-site and local training contact us.

eLearning

Training courses are now available to you on-line. You can learn at your pace and your own time. For more information please visit our webpage: www.emersonprocess.com/education

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TRAINING REGISTRATION FORM

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Course Name / Course Number	Training Location	Training Start Date	Number of Participants

EMERSON

TRAINING CALENDARS

CALENDARS2020

BY COUNTRY

CALENDARS2020
BY COUNTRY

Angola

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow & Density Measurement													
Understanding Metering Systems: Applications, Operations and Maintenance	D4530		18-19										

Bahrain

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rosemount Tank Gauging													
Tank Gauging Technical Product Training, REX	RTG 101												8-12
Tank Gauging Technical Product Training, RAPTOR	RTG 101									6-10			
Tank Master Training	RTG 102					3-5							
Tank Gauging Operation Course		Call for schedule											
Wireless Tank Gauging Training		Call for schedule											
Reliability Solutions													
Intermediate Vibration Analysis Category II	2032		23-26										

Egypt - Cairo

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Process Systems & Solutions													
DeltaV™ Implementation I for Continuous Process	7009	Call for schedule											
DeltaV™ Hardware & Troubleshooting	7018	Call for schedule											

Iraq - Basrah

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow & Density Measurement													
Micro Motion Comprehensive Product Training	2352			11-13									
Process Systems & Solutions													
DeltaV™ Implementation I for Continuous Process	7009							5-9					6-10
DeltaV™ Operator Training for Continuous Process	7012		25-26										
DeltaV™ Hardware & Troubleshooting	7018						29-2					30-3	
Rosemount Measurement													
Process Measurement Products I (Pressure and Temperature)	2326					3-6							
Process Measurement Products II (DP Flow)	2327							12-13					
Process Measurement Products III (Level)	2333							12-14					
Rosemount Tank Gauging													
Tank Gauging Technical Product Training, REX	RTG 101					17-21							

** Taxes are not Included*

Morocco - Casablanca

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Process Systems & Solutions													
DeltaV™ Implementation I for Continuous Process	7009		2-6										
DeltaV™ Hardware & Troubleshooting	7018	27-30							10-13				
DeltaV™ Safety Instrumented System with Electronic Marshalling Maintenance	7304									3-5			
DeltaV™ Safety Instrumented Systems (Implementation)	7305									21-25			

Nigeria - Lagos

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow & Density Measurement													
8700 Series Smart Magnetic FlowMeter with HC475/ AMS Device Manager	2340/2340A						17						
8800 Series Smart Vortex FlowMeter with HC475/AMS Device Manager	2341/2341A						17						
Micromotion Corios Comprehensive Training	2352							22-24					

Qatar - Doha

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Process Systems & Solutions													
DeltaV™ Implementation I for Continuous Process	7009	Call for Schedule											
DeltaV™ Implementation II	7017	Call for Schedule											
DeltaV™ Hardware & Troubleshooting	7018	Call for Schedule											

** Taxes are not Included*

CALENDARS2020
BY COUNTRY

Saudi Arabia - Al-Khobar

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow & Density Measurement													
Operation and Maintenance of Liquid/Gas Ultrasonic Flowmeters	D4230/D4280			11-12									
Operation and Maintenance of S600/S600+ Flow Computers	D4260/D4262			16-17									
Introduction to Daniel Senior Orifice Fittings	D4420			17									
Understanding Metering Systems: Applications, Operations and Maintenance	D4530		11-12										
8700 Series Smart Magnetic FlowMeter with HC475/ AMS Device Manager	2340/2340A					1							
8800 Series Smart Vortex FlowMeter with HC475/AMS Device Manager	2341/2341A					5							
Micromotion Corios Comprehensive Training	2352				29-1								
Flow Measurement Technologies	2398					6-10							
Process Systems & Solutions													
DeltaV™ Implementation I for Continuous Process	7009						17-21						
DeltaV™ Operator Training for Continuous Process	7012				25-26								
DeltaV™ Hardware & Troubleshooting	7018						4-7					26-29	
AMS Device Manager	7020		Call for Schedule										
DeltaV™ System Administration	7027		Call for Schedule										
DeltaV™ Safety Instrumented Systems (Maintenance)	7303		Call for Schedule										
DeltaV™ Safety Instrumented Systems (Implementation)	7305		Call for Schedule										
Rosemount Measurement													
Process Measurement Products I (Pressure and Temperature)	2326		9-12										
Process Measurement Products II (DP Flow)	2327				5-6								
Process Measurement Products III (Level)	2333			15-17									
Fieldbus Measurement Instruments	2370	Call for Schedule											
Wireless Self Organizing Network	2375												
Roxar Multiphase & Software													
Roxar Multiphase Meter 2600	ROX002			18-19				15-16					
Reliability Solutions													
Balancing Theory and Application Using CSI 2130/2140	2016									1-2			
Basic Vibration Analysis Category I	2031	26-29			5-8			19-22			18-21		
Intermediate Vibration Analysis Category II	2032				19-22				16-19				6-9
Advanced Vibration Analysis Category III	2033			8-12						13-17			
Peakvue Mystery and Autocorrelation	2035 & 2075		9-11										
Introduction to AMS & Fundamentals of CSI 2130/2140	2068 & 2076			22-26						27-30			
Intermediate AMS & Advanced CSI 2130/2140	2074 & 2094						7-11						
CSI Protection System, Operations and Maintenance	2080	Call for schedule											
Online Prediction Operation and Maintenance	2088	Call for schedule											
Advanced AMS Machinery Health Manager	2070	Call for schedule											
Electric Motor Diagnostics and AMS Motorview	2081	Call for schedule											
Laser Alignment using CSI 2140	2096	Call for schedule											

** Taxes are not Included*

Saudi Arabia - Al-Khobar

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow & Density Measurement													
Ovation Software Project	OV215				5-16								
Ovation Hardware Project	OV216				19-23								
Ovation System Administration	OV230											29-3	
Ovation Process Historian	OV245												6-10
Remote Automation Solutions													
ControlWave Configuration	RA331							5-6					
ControlWave Designer Fundamentals	RA441							7-9					
OpenEnterprise for SCADA	RA801	19-23											
Fisher Flow Controls													
Control Valve Engineering I	1300			8-12						13-17			
Fundamentals of HART Based FIELDVUE™ Digital Valve Controller using Emerson Field Communicator & Valvelink Mobile	1751			9-11				13-15					
ValveLink™ Software for FIELDVUE™ Digital Configuration and Calibration of Valve Controllers	1752			23-25						21-23			
Diagnostic Data Interpretation using Valvelink™ Software for FIELDVUE™ Digital Valve Controllers	1759				6-8		22-24						

Saudi Arabia - Jubail

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fisher Flow Controls													
Control Valve Engineering I	1300			8-12						13-17			
Fundamentals of HART Based FIELDVUE™ Digital Valve Controller using Emerson Field Communicator &	1751			9-11				13-15					
ValveLink™ Software for FIELDVUE™ Digital Configuration and Calibration of Valve Controllers	1752			23-25						21-23			
FOUNDATION™ Fieldbus FIELDVUE™ Digital Valve Controllers	7036							22-24			7-9		
Diagnostic Data Interpretation using Valvelink™ Software for FIELDVUE™ Digital Valve Controllers	1759				6-8		22-24						

** Taxes are not Included*

CALENDARS2020
BY COUNTRY

United Arab Emirates - Abu Dhabi

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Process Systems & Solutions													
DeltaV™ Implementation I for Continuous Process	7009				12-16		7-11						
DeltaV™ Implementation II	7017						21-15			6-10			
DeltaV™ Hardware & Troubleshooting	7018	20-23	24-27										
AMS Device Manager	7020						15-17			21-23			
DeltaV Cyber Security	7026					10-14		12-16		27-1		29-3	
DeltaV™ System Administration	7027		2-6						23-27				
DeltaV™ Virtualization	7029	Call for schedule											
Fieldbus Systems and Devices	7032				6-9								
DeltaV™ Safety Instrumented Systems (Maintenance)	7303	6-8											14-16
DeltaV™ Safety Instrumented System with Electronic Marshalling Maintenance	7304						1-3						
DeltaV™ Safety Instrumented Systems (Implementation)	7305										4-8		
Roxar Multiphase & Software													
Introduction to Tempest ENABLE											26-28	16-18	
RMS for Reservoir Geologists Specializing in property Modelling												8-12	
Advanced Property Modelling in RMS												9-11	
Model Driven Interpretation in RMS												17-18	
Reservoir Simulation using Tempest												23-25	
Reservoir Simulation using Tempest MORE and Tempest PVTx													13-17
Introduction to 3D Geological Modelling in RMS													14-16

** Taxes are not Included*

United Arab Emirates - Dubai

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fisher Flow Controls													
Control Valve Engineering I	1300	19-23					14-18				11-15		
Valve Trim & Body Maintenance	1400		10-12	2-4									
Fundamentals of HART Based FIELDVUE™ Digital Valve Controller using Emerson Field Communicator & Valvelink™ Mobile	1751	13-15			13-15		8-10					23-25	
ValveLink™ Software for FIELDVUE™ Digita Configuration and Calibration of Valve Controllers	1752	20-22			20-22		15-17			7-9			
Diagnostic Data Interpretation using Valvelink™ Software for FIELDVUE™ Digital Valve Controllers	1759		17-19	16-18									
Pressure Relief													
Pressure Relief Valve Overview	PRM-MEA-101		9	8			12					22	
Pressure Relief Valve Maintenance	PRM-MEA-102		9-13		12-16		21-25	12-16		13-17			
Emerson Electric Actuator Overview	ACT-MEA-101	14,21,28											
BIFFI Electric Actuators Service Training	ACT-MEA-102		9-13		12-16		21-25	12-16		13-17			
EIM Electric Actuators Service Training	ACT-MEA-103			9-11				13-15					
Gate, Globe, Check Valve Overview & Maintenance	ISV-MEA-101			17-18									
Ball & Butterfly Valves Overview & Maintenance	ISV-MEA-102						17-18						
Power & Water Solutions													
Starting with Data Acquisition	OV100	5-9							23-27				
Building and Maintaining Ovation Control	OV200	12-16							30-3				
Building Ovation Graphics	OV210	19-23								6-10			
Ovation Software Project	OV215		23-5								4-15		
Ovation Hardware Project	OV216			8-12							18-22		
Ovation System Administration	OV230						7-11					1-5	
Ovation Process Historian	OV245						14-18					8-12	
Ovation Troubleshooting	OV300	26-30								13-17			
Ovation Network Admin	OV320						21-25					15-19	
Ovation Security for 2.4 & Higher Level Systems	OV360						28-2					22-26	
Process Systems & Solutions													
DeltaV™ Implementation I for Continuous Process	7009	12-16							9-13				
DeltaV™ Operator Training for Continuous Process	7012	29-30				13-14							
DeltaV™ Operator Interface for Batch	7014	Call for schedule											
DeltaV™ Implementation for Batch Process	7016	Call for schedule											
DeltaV™ Implementation II	7017	19-23									11-15		
DeltaV Virtualization	7029	Call for schedule											
DeltaV™ Hardware & Troubleshooting	7018			16-19	27-30								
AMS Device Manager	7020		10-12									23-25	
DeltaV™ Advanced Graphics	7025	Call for schedule											

** Taxes are not Included*

CALENDARS2020
BY COUNTRY

United Arab Emirates - Dubai

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Process Systems & Solutions													
DeltaV™ System Administration	7027					1-5		19-23					
Fieldbus Systems and Devices	7032							6-9					
"Communication Bus Interface with PlantWeb DeltaV™"	7037								20-23				
DeltaV™ Safety Instrumented Systems (Maintenance)	7303											2-4	
DeltaV™ Safety Instrumented System with Electronic Marshalling Maintenance	7304			30-2					24-26				
DeltaV™ Safety Instrumented Systems (Implementation)	7305		16-20										
DeltaV-Using DeltaV Live Operator Interface - Imple-mentation-I	7409	Call for schedule											
Control Loop Foundation	9025	Call for schedule											
Applied Modern Loop Tuning	9032	Call for schedule											
PAC Systems Controller Programming & Maintenance Course		Call for schedule											
Reliability Solutions													
Basic Vibration Analysis Category I	2031			15-18									
Intermediate Vibration Analysis Category II	2032											8-11	
Intermediate AMS & Advanced CSI 2130/2140	2074 & 2094						14-18						
CSI Protection System, Operations and Maintenance	2080	Call for schedule											
Online Prediction Operation and Maintenance	2088	Call for schedule											
Advanced AMS Machinery Health Manager	2070	Call for schedule											
Electric Motor Diagnostics and AMS Motorview	2081	Call for schedule											
Laser Alignment using CSI 2140	2096	Call for schedule											
Lubrication Level I&II	2082	Call for schedule											
Remote Automation Solutions													
ControlWave Configuration	RA331						14-15						
ControlWave Designer Fundamentals	RA441						16-18						
ControlWave Communication Programming	RA442	12-13					21-22						
OpenEnterprise for SCADA Systems – Basics, Level I	RA801		2-6	8-12									
OpenEnterprise for SCADA Systems – Interm, Level II	RA802		9-13							6-10			
FloBoss S600+ Operator	RA900			1-2								1-2	
Config S600 + Pro FloBoss S600+ Advanced-Config600	RA901			3-5								3-5	
FloBoss S600+ Combined-Config600	RA902	26-30	23-28								18-22		
API 21.1 Electronic Gas Flow Measurement Standard & Flowcomputer FB1000 & FB2000 series	RA1100			22-24			7-9						
Flo Boss 107 Station Manager Configuration & Operation	RA1220C		16-18										6-8

** Taxes are not Included*

United Arab Emirates - Dubai

Courses	Course #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow & Density Measurement													
Operation and Maintenance of Liquid/Gas Ultrasonic Flowmeters	D4230/D4280							22-23					
Operation and Maintenance of S600/S600+ Flow Computers	D4260/D4262							27-28					
Introduction to Daniel Senior Orifice Fittings	D4420							28					
8700 Series Smart Magnetic FlowMeter with HC475/ AMS Device Manager	2340/2340A		5						19				
8800 Series Smart Vortex FlowMeter with HC475/AMS Device Manager	2341/2341A		12						18				
Micromotion Corios Comprehensive Training	2352		4-6					15-17					
Roxar Multiphase & Software													
Roxar Multiphase Meter 2600	ROX002				15-16								
Roxar Corr Log-Intrusive Corrosion Monitoring System	ROX008				14			14					
Roxar FSM	ROX010				15-16								
Rosemount Measurement													
Process Measurement Products I (Pressure and Temperature)	2326				19-22								
Process Measurement Products II (DP Flow)	2327	26-27											
Process Measurement Products III (Level)	2333				19-21								
Fieldbus Measurement Instruments	2370	Call for schedule											
Wireless Self Organizing Network Training Course	2375	Call for schedule											
Rosemount Tank Gauging													
Tank Gauging Technical Product Training, REX	RTG 101			22-26									
Tank Gauging Technical Product Training, RAPTOR	RTG 101			8-12									
Tank Master Training	RTG 102									20-23			
Tank Gauging Operation Course		Call for schedule											
Wireless Tank Gauging Training		Call for schedule											
Rosemount Analytical Instrumentation													
Oxygen Flue Gas Analyzer Maintenance, Including Oximeter and World Class 3000	2153				5								
General pH, Conductivity & ORP Theory	2200							5					
Amperometric Measurement Theory: Chlorine, Dissolved Oxygen & Ozone	2201				7								
Rosemount Analytical Two-Wire Instrumentation Models Xmt and 5081 Transmitters	2202/2202V							8					
Rosemount Analytical Four-Wire Instrumentation Models 54e, 1055, 1056, or 1057	2204/2204V	9											
Introduction to Gas Chromatographs	R4100	12-14						12-14					
Operation & Maintenance of Model 500 Gas Chromatographs	R4210		2-5			3-5							
Operation & Maintenance of Model 700 Gas Chromatographs	R4212		10-13			12-15							
Operation & Maintenance of Model 700 XA Gas Chromatographs	R4213			1-4			7-10						
Flame & Gas		19-20			14-15								

** Taxes are not Included*

TRAINING CALENDARS

CALENDARS2020 BY BUSINESS UNIT

Process Systems & Solutions

Course Details	Location	Dates	Duration	Cost per Student (US$)
Class Room Training				
7009 DeltaV™ Implementation I for Continuous Process	Abu Dhabi	Apr 12-16, Jun 7-11	4.5 Days	$3,875
	Al-Khobar	May 17-21		
	Basrah	Jul 5-9, Dec 6-10		
	Cairo	Call for Schedule		
	Casablanca	Feb 2-6		
	Doha	Call for Schedule		
	Dubai	Jan 12-16, Aug 9-13		
7012 DeltaV™ Operator Training for Continuous Process	Basrah	Feb 25-26	2 Days	$1,700
	Al-Khobar	Mar 25-26		
	Dubai	Jan 29-30, May 13-14		
7014 DeltaV™ Operator Interface for Batch	Dubai	Call for Schedule	3 Days	$1,700
7016 DeltaV™ Implementation for Batch Process	Dubai	Call for Schedule	4.5 Days	$3,875
7017 DeltaV™ Implementation II	Abu Dhabi	Jun 21-25, Sept 6-10	4.5 Days	$3,875
	Doha	Call for Schedule		
	Dubai	Jan 19-23, Oct 11-15		
7029 DeltaV™ Virtualization	Abu Dhabi	Call for Schedule	4.5 Days	$3,900
	Dubai	Call for Schedule		
7026 DeltaV Cyber Security	Abu Dhabi	May 10-14, Jul 12-16, Sep 27-Oct 1, Nov 29-Dec 3	4.5 Days	$3,900
7018 DeltaV™ Hardware & Troubleshooting	Abu Dhabi	Jan 20-23, Feb 24-27	4 Days	$3,700
	Al-Khobar	May 4-7, Oct 26-29		
	Basrah	Jun 29-Jul 2, Nov 30-Dec 3		
	Cairo	Call for Schedule		
	Casablanca	Jan 27-30, Aug 10-13		
	Doha	Call for Schedule		
	Dubai	Mar 16-19, Apr 27-30		
7020 AMS Device Manager	Abu Dhabi	Jun 15-17, Sep 21-23	3 Days	$2,475
	Al-Khobar	Call for Schedule		
	Dubai	Feb 10-12, Nov 23-25		
7025C DeltaV™ Advanced Graphics	Dubai	Call for Schedule	4.5 Days	$3,700
7027 DeltaV™ System Administration	Abu Dhabi	Feb 2-6, Aug 23-27	4.5 Days	$3,875
	Al-Khobar	Call for Schedule		
	Dubai	May 1-5, Jul 19-23		
7032 Fieldbus Systems and Devices	Abu Dhabi	Apr 6-9	3.5 Days	$3,700
	Dubai	Jul 6-9		
7037 Communication Bus Interface with PlantWeb DeltaV™	Dubai	Aug 20-23	3.5 Days	$2,800

** Taxes are not Included*

CALENDARS2020
BY BUSINESSUNIT

Process Systems & Solutions

Course Details	Location	Dates	Duration	Cost per Student (US$)
Class Room Training				
7303 DeltaV™ Safety Instrumented Systems (Maintenance)	Abu Dhabi	Jan 6-8, Dec 14-16	3 Days	$2,900
	Al-Khobar	Call for Schedule		
	Dubai	Nov 2-4		
7304 DeltaV™ Safety Instrumented System with Electronic Marshalling Maintenance	Abu Dhabi	Jun 1-3	3 Days	$2,900
	Casablanca	Sep 3 -5		
	Dubai	Mar 30-April 2, Aug 24-26		
7305 DeltaV™ Safety Instrumented Systems (Implementation)	Abu Dhabi	Oct 4-8	4.5 Days	$3,700
	Al-Khobar	Call for Schedule		
	Casablanca	Sep 21-25		
	Dubai	Feb 16-20		
7409 DeltaV-Using DeltaV Live Operator Interface - Implementation-I	Dubai	Call for Schedule	4.5	3875
5590C Power Quality and Grounding for Electronic Systems	Call for schedule		2 Days	$1,850
9025 Control Loop Foundation	Dubai	Call for Schedule	4.5 Days	$2,950
9032 Applied Modern Loop Tuning	Dubai	Call for Schedule	3 Days	Call for Pricing
PAC Systems Controller Programming & Maintenance Course	Dubai	Call for Schedule	4 Days	Call for Pricing
Virtual Training				
7009V DeltaV™ Implementation I	Call for schedule		4.5	$3,875
7012V DeltaV™ Operator Interface for continuous control	Call for schedule		2	$1,700
7016V DeltaV™ Systems Batch Implementation	Call for schedule		4.5	$3,875
7017V DeltaV™ Implementation II	Call for schedule		4.5	$3,875
eLearning				
e7012 DeltaV™ Operator for Continuous Operations	Call for price			
e7014 DeltaV™ Operator Interface for Batch	Call for price			
e7020 AMS Intelligent Device Manager Overview	Call for price			
e7045 DeltaV Analyze Features Training	Call for price			

** Taxes are not Included*

Reliability Solutions

Course Details	Location	Dates	Duration	Cost per Student (US$)
2016 Balancing Theory and Application Using CSI 2130/2140	Al-Khobar	Sep 1-2	2 Days	Call for price
2031 Basic Vibration Analysis Category I	Dubai	Mar 15-18	4 Days	Call for Price
	Al-Khobar	Jan 26-29, Apr 5-8, Jul 19-22, Oct 18-21		
2032 Intermediate Vibration Analysis Category II	Bahrain	Feb 23-26	4 Days	Call for Price
	Dubai	Nov 8-11		
	Al-Khobar	Apr 19-22, Aug 16-19, Dec 6-9		
2033 Advanced Vibration Analysis Category III	Al-Khobar	Mar 8-12, Sep 13-17	5 Days	Call for Price
2035 & 2075 Peakvue Mystery and Autocorrelation	Al-Khobar	Feb 9-11	3 Days	Call for Price
2068 & 2076 Introduction to AMS & Fundamentals of CSI 2130/2140	Al-Khobar	Mar 22-26, Sep 27-30	4 Days	Call for Price
2074 & 2094 Intermediate AMS & Advanced CSI 2130/2140	Al-Khobar	Jun 7-11	5 Days	Call for Price
	Dubai	Jun 14-18		
2080 CSI Protection System, Operations and Maintenance	Al-Khobar / Dubai	Call for Schedule	2 Days	Call for Price
2088 Online Prediction Operation and Maintenance	Al-Khobar / Dubai	Call for Schedule	4 Days	Call for Price
2070 Advanced AMS Machinery Health Manager	Al-Khobar / Dubai	Call for Schedule	4 Days	Call for Price
2081 Electric Motor Diagnostics and AMS Motorview	Al-Khobar / Dubai	Call for Schedule	4 Days	Call for Price
2096 Laser Alignment using CSI 2140	Al-Khobar / Dubai	Call for Schedule	4 Days	Call for Price
2082 Lubrication Level I&II	Al-Khobar / Dubai	Call for Schedule	4 Days	Call for Price

Power & Water Solutions

Course Details	Location	Dates	Duration	Cost per Student (US$)
OV100 - Starting with Data Acquisition	Dubai	Jan 5-9, Aug 23-27	5	$3,200
OV200 - Building and Maintaining Ovation Control	Dubai	Jan 12-16, Aug 30-Sep 3	5	$3,200
OV210 - Building Ovation Graphics	Dubai	Jan 19-23, Sep 6-10	5	$3,200
OV215 - Ovation Software Project	Al-Khobar	Apr 5-16	10	$3,300
	Dubai	Feb 23-Mar 5, Oct 4-15		$3,200
OV216 - Ovation Hardware Project	Al-Khobar	Apr 19-23	5	$3,300
	Dubai	Mar 8-12, Oct 18-22		$3,200
OV230 - Ovation System Administration	Al-Khobar	Nov 29-Dec 3	5	$3,300
	Dubai	Jun 7-11, Nov1-5		$3,200
OV245 - Ovation Process Historian	Al-Khobar	Dec 6-10	5	$3,300
	Dubai	Jun 14-18, Nov 8-12		$3,200
OV300 - Ovation Troubleshooting	Dubai	Jan 26-30, Sep 13-17	5	$3,200
OV320 - Ovation Network Admin	Dubai	Jun 21-25, Nov 15-19	5	$3,200
OV360 - Ovation Security for 2.4 & Higher Level Systems	Dubai	Jun 28-Jul 2, Nov 22-26	5	$3,200

** Taxes are not Included*

CALENDARS2020
BY BUSINESSUNIT

Remote Automation Solutions

Course Details	Location	Dates	Duration	Cost per Student (US$)
RA331 ControlWave Configuration	Al-Khobar	Jul 5-6	2 Days	$1,550
	Dubai	Jun 14-15		
RA441 ControlWave Designer Fundamentals	Al-Khobar	Jul 7-9	3 Days	$2,350
	Dubai	Jun 16-18		
RA442 ControlWave Communication Programming	Dubai	Jun21-22, Jan 12-13	2 Days	$1,400
RA801 OpenEnterprise for SCADA Systems – Basics, Level I	Al-Khobar	Jan 19- 23	5 Days	$3,150
	Dubai	Feb 2-6, Mar 8-12		
RA802 OpenEnterprise for SCADA Systems – Interm, Level II	Dubai	Feb 9-13, Sep 6-10	5 Days	$3,150
RA900 : FloBoss S600+ Operator	Dubai	Mar1-2, Nov1-2	2 Days	$2,600
RA901 : Config S600 + Pro FloBoss S600+ Advanced-Config600	Dubai	Mar 3-5, Nov 3-5	3 Days	$5,025
RA902 : FloBoss S600+ Combined-Config600	Dubai	Oct 18-22, Jan 26-30, Feb 23-28	5 Days	$5,565
RA1100: API 21.1 Electronic Gas Flow Measurement Standard & Flowcomputer FB1000 & FB2000 series	Dubai	Mar 22-24, Jun 7-9	3 Days	$2,100
RA1220C Flo Boss 107 Station Manager Configuration & Operation	Dubai	Dec 6-8, Feb 16-18	3 Days	$2,100

Fisher

Course Details	Location	Dates	Duration	Cost per Student (US$)
1300 Control Valve Engineering I	Dubai	Jan 19-23, Jun 14-18, Oct 11-15	4.5 days	$2,700.00
	Jubail/DTV	Mar 8-12, Sep 13-17		
1400 Valve Trim & Body Maintenance	Dubai	Feb 10-12, Mar 2-4	3 Days	$2,450.00
1751 Fundamentals of HART Based FIELDVUE™ Digital Valve Controller using Emerson Field Communicator & Valvelink Mobile	Dubai	Jan 13-15, Apr 13-15, Jun 8-10, Nov 23-25	3 Days	$2,450.00
	Jubail/DTV	Mar 9-11, Jul 13-15		
1752 ValveLink™ Software for FIELDVUE™ Digital Configuration and Calibration of Valve Controllers	Dubai	Jan 20-22, Apr 20-22, Jun 15-17, Sep 7-9	3 Days	$2,450.00
	Jubail/DTV	Mar 23-25, Sep 21-23		
7036 FOUNDATION™ Fieldbus FIELDVUE™ Digital Valve Controllers	Jubail	Jul 22-24, Oct 7-9	3 Days	$2,450.00
1759 Diagnostic Data Interpretation using Valvelink™ Software for FIELDVUE™ Digital Valve Controllers	Dubai	Feb 17-19, Mar 16-18	3 Days	$2,700.00
	Jubail/DTV	Apr 6-8, Jun 22-24		

Pressure Relief

Course Details	Location	Dates	Duration	Cost per Student (US$)
PRM-MEA-101 Pressure Relief Valve Overview	Dubai	Feb 9, Mar 8, Jun 12, Nov 22	1 Day	$1,250
PRM-MEA-102 Pressure Relief Valve Maintenance	Dubai	Feb 9-13, Apr 12-16, Jun 21-25, July 12-16, Sep 13-17	5 Days	$2,700
ACT-MEA-101 Emerson Electric Actuator Overview	Dubai	Jan 14, 21, 28	1 Day	$850
ACT-MEA-102 BIFFI Electric Actuators Service Training	Dubai	Feb 9-13, Apr 12-16, Jun 21-25, July 12-16, Sep 13-17	5 Days	Call for Price
ACT-MEA-103 EIM Electric Actuators Service Training	Dubai	Mar 9-11, Jul 13-15	3 Days	$2,450
ISV-MEA-101 Gate, Globe, Check Valve Overview & Maintenance	Dubai	Mar 17-18	2 Days	$1,700
ISV-MEA-102 Ball & Butterfly Valves Overview & Maintenance	Dubai	Jun 17-18	2 Days	$1,700

** Taxes are not Included*

Rosemount Analytical Instrumentation

Course Details	Location	Dates	Duration	Cost per Student (US$)
2153 Oxygen Flue Gas Analyzer Maintenance, Including Oximeter and World Class 3000	Dubai	Apr 5	1 Day	$1,000
2200 General pH, Conductivity & ORP Theory	Dubai	Jul 5	1 Day	$1,000
2201 Amperometric Measurement Theory: Chlorine, Dissolved Oxygen & Ozone	Dubai	Apr 7	1 Day	$1,000
2202/2202V Rosemount Analytical Two-Wire Instrumentation Models Xmt and 5081 Transmitters	Dubai	Jul 8	1 Day	$1,000
2204/2204V Rosemount Analytical Four-Wire Instrumentation Models 54e, 1055, 1056, or 1057	Dubai	Jan 09	1 Day	$1,000
R4100 Introduction to Gas Chromatographs	Dubai	Jan 12-14, Jul 12-14	3 Days	$3,000
R4210 Operation & Maintenance of Model 500 Gas Chromatographs	Dubai	Feb 2-5, May 3-5,	4 Days	$4,000
R4212 Operation & Maintenance of Model 700 Gas Chromatographs	Dubai	Feb 10-13, May 12-15	4 Days	$4,000
R4213 Operation & Maintenance of Model 700 XA Gas Chromato-graphs	Dubai	Mar 1-4, Jun 7-10	4 Days	$4,000
Flame & Gas	Dubai	Jan 19-20, Apr 14-15	2 Days	$2,000

Rosemount Tank Gauging

Course Details	Location	Dates	Duration	Cost per Student (US$)
RTG 101 Tank Gauging Technical Product Training, REX	Dubai	Mar 22-26	5 Days	$3,700
	Bahrain	Dec 8-12		
	Basrah	May 17-21		
RTG 101 Tank Gauging Technical Product Training, RAPTOR	Dubai	Mar 08-12	5 Days	$3,700
	Bahrain	Sep 6-10		
RTG 102 Tank Master Training	Dubai	Sep 20-23	3 Days	Call for Price
	Bahrain	May 3-5		
Tank Gauging Operation Course	Dubai	Call for Schedule	5 Days	$3,350
	Bahrain			
Wireless Tank Gauging Training	Dubai	Call for Schedule	3 Days	Call for Price
	Bahrain			

** Taxes are not Included*

CALENDARS2020
BY BUSINESSUNIT

Rosemount Measurement

Course Details	Location	Dates	Duration	Cost per Student (US$)
2326 Process Measurement Products I (Pressure and Temperature)	Dubai	Apr 19-22	4 Days	$4,000
	Basrah	May 3-6		
	Al-Khobar	Feb 9-12		
2327 Process Measurement Products II (DP Flow)	Dubai	Jan 26-27	2 Days	$2,000
	Basrah	Jul 12-13		
	Al-Khobar	Apr 5-6		
2333 Process Measurement Products III (Level)	Dubai	Apr 19-21	3 Days	$3,000
	Basrah	Jul 12-14		
	Al-Khobar	March 15-17		
2370 Fieldbus Measurement Instruments	Dubai	Call for Schedule	3 Days	$3,000
	Al-Khobar	Call for Schedule		
2375 Wireless Self Organizing Network Training Course	Dubai	Call for Schedule	2 Days	$2,000
	Al-Khobar	Call for Schedule		

Roxar Multiphase & Software

Course Details	Location	Dates	Duration	Cost per Student (US$)
ROX001 Roxar Multiphase Meter 1900VI	Call for schedule		3 Days	$2,061
ROX002 Roxar Multiphase Meter 2600	Al-Khobar	Mar 18-19, Jul 15-16	2 Days	$2,061
	Dubai	Apr 15-16		
ROX003 Roxar Subsea Multiphase Meter	Call for schedule		2 Days	$2,269
ROX004 Roxar Wetgas meter	Call for schedule		1 Day	$1,031
ROX005 Roxar Subsea Wetgas Meter	Call for schedule		1 Day	$1,135
ROX006 Roxar Watercut Meter	Call for schedule		1 Day	$854
ROX007 Roxar Acoustic Sand Monitor	Call for schedule		1 Day	$854
ROX008 Roxar Corr Log-Intrusive Corrosion Monitoring System	Dubai	Apr 14, Jul 14	1 Day	$854
ROX009 Roxar Sand Log-Intrusive Sand Monitoring System	Call for schedule		1 Day	$854
ROX010 Roxar FSM	Dubai	Apr 15-16	2 Days	$1,031
ROX011 Roxar Hydraulic Retrieval and Access Fitting System	Call for schedule		1 Day	$1,707
Introduction to Tempest ENABLE	Abu Dhabi	Oct 26-28, Nov 16-18	3 Days	$2,700
RMS for Reservoir Geologists Specialising in property Modelling	Abu Dhabi	Nov 8-12	5 Days	$4,500
Advanced Property Modelling in RMS	Abu Dhabi	Nov 9-11	3 Days	$2,700
Model Driven Interpretation in RMS	Abu Dhabi	Nov 17-18	2 Days	$1,800
Reservoir Simulation using Tempest	Abu Dhabi	Nov 23-25	3 Days	$2,700
Reservoir Simulation using Tempest MORE and Tempest PVTx	Abu Dhabi	Dec 13-17	5 Days	$4,500
Introduction to 3D Geological Modelling in RMS	Abu Dhabi	Dec 14-16	3 Days	$2,700

** Taxes are not Included*

Flow & Density Measurement

Course Details	Location	Dates	Duration	Cost per Student (US$)
D4100 Introduction to Model 500 and 700 Gas Chromatographs	Call for schedule		3 Days	Call for Price
D4230/D4280 Operation and Maintenance of Liquid/Gas Ultrasonic Flowmeters	Al-Khobar	Mar 11-12	2 Days	$1,875
	Dubai	Jul 22-23		
D4260/D4262 Operation and Maintenance of S600/S600+ Flow Computers	Al-Khobar	Mar 16-17	2 Days	$1,875
	Dubai	Jul 27-28		
D4270 Operation and Maintenance of the Daniel Compact Prover™	Call for schedule		2 Days	$1,875
D4290 Operation and Maintenance of Control valves and Turbines	Call for schedule		3 Days	$2,185
D4420 Introduction to Daniel Senior Orifice Fittings	Al-Khobar	Mar 17	1 Day	$830
	Dubai	Jul 28		
D4510 Hydrocarbon Gas Flow Measurement Systems Operation and Maintenance	Call for schedule		2 Days	$2,390
D4520 Hydrocarbon Liquid Flow Measurement Systems Operation and Maintenance	Call for schedule		3 Days	$2,390
D4540 DanPac Measurement and Control System Introduction to Operation and Maintenance	Call for schedule		2 Days	$2,300
2340/2340A 8700 Series Smart Magnetic FlowMeter with HC475/AMS Device Manager	Dubai	Feb 5, Aug 19	1 Day	$730
	Nigeria	Jun 17		
	Al-Khobar	May 1		
2340/2340A 8700 Series Smart Magnetic FlowMeter with HC475/AMS Device Manager	Dubai	Feb 5, Aug 19	1 Day	$730
	Nigeria	Jun 17		
	Al-Khobar	May 1		
2341/2341A 8800 Series Smart Vortex FlowMeter with HC475/AMS Device Manager	Dubai	Feb 12, Aug 18	1 Day	$730
	Nigeria	Jun 17		
	Al-Khobar	May 5		
2351 Micro Motion Sensors and 9739MVD / 5700 Transmitter	Call for schedule		1 Day	$700
2352 Micromotion Corios Comprehensive Training	Dubai	Feb 4-6, Jul 15-17	3 Days	$1,875
	Nigeria	July 22-24		
	Basrah	Mar 11-13		
	Al-Khobar	Apr 29 - May 1		
2358 Micromotion Series 1000/2000	Call for schedule		1 Day	$730
2386 Micro Motion Specific Gravity Meter Training	Call for schedule		1 Day	$730
2396 Micro Motion Configuration and Diagnostic Tool - Prolink	Call for schedule		1 Day	$730
2397 Digital net Oil Computing & Applications	Call for schedule		3 Days	Call for Price
5708 Micromotion Density and Viscosity Product Training	Call for schedule		2 Days	$1,460
2398 Flow Measurement Technologies	Al-Khobar	May 6-10	5 Days	$3,120

** Taxes are not Included*

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