Spartan Controls

Education Services
2018 Training Catalogue

Plant Automation  Valves & Actuation  Measurement Instrumentation

Variable Frequency Drives  Automation Packaging  Fire & Security

Rotating & Reciprocating Machinery  SCADA, Flow Computers & RTUs  Environmental Leadership
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Welcome to Spartan Controls Education Services

Whether you have experience with Spartan Controls Education or are just beginning on your training path with us, we are dedicated to offering the best training in the industry. We offer more than fifty courses that our certified instructors, product specialists, and dedicated coordinators can customize to meet all of our customers’ needs.

Spartan Controls Education Services has been training students from around the world for over 20 years. Our Education Centre operates as an Emerson certified training facility and continues to offer the highest quality in industry expertise on technology training and complex process control topics.

In this catalogue you get a glimpse of what Spartan has to offer. There are full course descriptions containing a synopsis, topics covered, any necessary prerequisites, start and end times, as well as scheduled dates and locations. For additional information, including the most up-to-date schedules and prices, please visit www.spartancontrols.com/education or contact an Education Coordinator.

Sincerely,

Education Services Team
Spartan Controls
Training Options

Scheduled Training
Scheduled training includes courses that have specified dates for which any customer can register. These courses contain the standard material to satisfy the group as a whole and are offered in our certified training centers. To sign up for a scheduled course, visit the Spartan Controls website and complete a registration form.

Local/On-Site Training
Spartan completes dozens of customer-specific courses every year for a variety of industries. This is a great alternative to attending scheduled training if:

- If several employees need to be trained at once;
- If training on specific topics or custom material is required;
- If an alternative to sending employees to our certified training centres is needed.

Not sure which option is best for you?
Contact a coordinator to discuss training needs, timelines, and best location for the training, and we will find a solution to fit your needs.

How to Register
Register for any of our scheduled courses by completing the online registration form at www.spartancocontrols.com/education/.
Training Facilities

Our main training facility is in Edmonton; however, we do schedule courses in our other Spartan facilities. For a local/on-site training, we can travel to your site or the nearest Spartan location to provide you with the training you need.
Full Course Descriptions
Course synopsis, objectives, topics, length, times, and prerequisites

Introductory Courses

Fundamentals of Control
Course #S900

Synopsis:
This half day course is an introduction for anyone in the process industry interested in the fundamentals of process instrumentation.

Who Should Attend?
This course is intended to introduce those in the process field to components of the typical feedback control loop, their application, and operation.

Objectives:
Upon completion of this course the attendee should understand the operation of regulators, measurement instrumentation, control valves, actuators, control accessories, and controllers as well as a basic understanding of the HART and Fieldbus protocols

Topics:
The following will be discussed in terms of design, selection and application:

- Regulators
- Measurement instrumentation
- Control valves and actuators
- PID controllers
- Control accessories
- Advanced control (HART & Fieldbus)

Prerequisites: None  Start & End Times: 8am to 1pm  Length: 0.5 Days
Introduction to Measurement
Course #MSMT

Synopsis:
If you are new to engineering or specifying instrumentation, then we invite you to join Spartan's specialists for an overview of measurement.

Objectives:
We offer three seminars – for measurement, control valves, and regulators – which focus on theory, technology, and application with respect to the topics mentioned below.

Topics:
- Pressure measurement theory
- Pressure transmitter selection
- Flow fundamentals
- dP flow theory
- Velocity flowmeter technology & application
- Coriolis flowmeter theory & installation
- Flow best practices
- Level and temperature fundamentals & technology
- Liquid and gas analysis
- Instrumentation installation requirements
- Instrumentation specification
- Instrumentation diagnostics

Prerequisites: None  Start & End Times: 8am to 5pm  Length: 1 Day

Introduction to Control Valve Selection
Course #VLVS

Synopsis:
If you are new to engineering or specifying instrumentation, then we invite you to join Spartan's specialists for an overview of measurement.

Objectives:
We offer three seminars – for measurement, control valves, and regulators – which focus on theory, technology, and application with respect to the topics mentioned below.

Topics:
- Globe valve and actuator design overview
- Rotary valve and actuator design overview
- Control valve positioners
- Instrumentation diagnostics
- Aero and hydrodynamic control valve noise
- Flashing and cavitation
- Liquid and gas sizing
- Fundamentals of automated on/off valves

Prerequisites: None  Start & End Times: 8am to 5pm  Length: 1 Day
Introduction to Regulators
Course #REGS

Synopsis:
If you are new to engineering or specifying instrumentation, then we invite you to join Spartan’s specialists for an overview of measurement.

Objectives:
We offer three seminars – for measurement, control valves, and regulators – which focus on theory, technology, and application with respect to the topics mentioned below.

Topics:
- Fundamentals of direct operated and pilot operated regulators
- Regulator application on to various process media
- Regulator sizing and selection
- Methods of overpressure protection and the associated benefits
- Overview of available resources including Fisher Regulator website
- Best practices and troubleshooting tips

Prerequisites: None Start & End Times: 8am to 12pm Length: 0.5 Days

Introduction to Overpressure Management Systems
Course #OPMS

Synopsis:
If you are new to engineering or specifying instrumentation, then we invite you to join Spartan's specialists for an overview of measurement.

Objectives:
We offer three seminars – for measurement, control valves, and regulators – which focus on theory, technology, and application with respect to the topics mentioned below.

Topics:
- Rupture disks
- Steam and hot water relief valves
- Safety relief valves
- Tank vents & flame arresters

Prerequisites: None Start & End Times: 1-5pm Length: 0.5 Days
Process Control Boot Camp
Course #S009

Synopsis:
In collaboration with Dave Shook & Associates, Spartan Controls is pleased to offer a four-day Process Control Boot Camp integrating both a classroom and hands-on lab learning experience.

Our Boot Camp will provide hands-on opportunities for our customers to put learning into practice and develop useful skills that can increase the productivity of individuals who are both on the tools or managing a group of professionals.

Learn how to troubleshoot a control loop, decide the control objective, or tune controllers for different types of process or control objectives. Gain a better understanding of how to solve real world automation challenges and how to tell if a problem is caused by tuning, hardware, disturbances, or process interactions.

Our hands-on learning experience will allow students to develop critical thinking skills and to work more effectively in the multi-disciplined environment of a real plant.

Topics:
• Control engineering concepts and terminology
• Introduction to control systems
• The fallibility of instrumentation
• Flow and level controller tuning
• Temperature control design and tuning
• Control of processes with time delay, IMC (Lambda) tuning
• Statistical Process Control
• Nonlinear control
• Multi-loop control
• Alarm management
• Control project management
• Controller performance measurement and loop troubleshooting

Prerequisites: None                     Start & End Times: 8am to 4:30pm                     Length: 4 Days
Actuators & Valve Automation Courses

Fundamentals of Bettis PressureGuard System
Course #B100

Synopsis:
This 1 day course uses classroom and hands-on sessions to introduce the Fundamentals of the Bettis PressureGuard self contained hydraulic emergency shutdown systems.

Who Should Attend?
This seminar is designed for technicians, mechanics, operators, and others who are responsible for the installation, maintenance, and efficient operation of Bettis PressureGuard Systems.

Objectives:
Upon completion, the student should understand the basic principles of operation, maintenance, and troubleshooting of the Bettis PressureGuard System.

Topics:
- PressureGuard hydraulic module
- Pressurematic pilots
- ISO test valve
- UM bonnets
- Bettis linear actuators
- Bettis rotary actuators

Prerequisites: None  Start & End Times: 8am to 4:30pm  Length: 1 Day

Fundamentals of Bettis Gas/Hydraulic System
Course #B400

Synopsis:
This 1 day course uses classroom and hands-on sessions to introduce the Fundamentals of the Bettis Gas/Hydraulic emergency shutdown systems.

Who Should Attend?
This seminar is designed for technicians, mechanics, operators, and others who are responsible for the installation, maintenance, and efficient operation of Bettis Gas/Hydraulic Systems.

Objectives:
Upon completion, the student should understand the basic principles of operation, maintenance and troubleshooting of the Bettis Gas/Hydraulic System.

Topics:
- Gas/Hydraulic module rotary
- Gas/Hydraulic module linear
- Control manifold components
- Control manifold operation and service
- Trouble shooting leaks/seal failures
- Hand pumps operation & service
- Soft parts installation/repair
- Tank levels
- Limit switch adjustment
- Understanding control schematics
- Upgrade components
- Pressurematic pilots
- ISO test valves

Prerequisites: None  Start & End Times: 8am to 4:30pm  Length: 1 Day

**EIM Series 2000 Actuator Maintenance**  
Course #S-EIM-1

**Synopsis:**
This 1 day course provides an overall working knowledge of the EIM Series 2000 electric actuator. This program provides the fundamentals of electrical operation through the use of a M2CP modular control package. Each student will learn how to identify and troubleshoot the electrical as well as mechanical components. Students will learn how to differentiate actuator control problems from valve problems and they will learn the basic skills required to provide on-site operation, maintenance, and servicing for series 2000 model actuators.

**Who Should Attend?**
This course is designed for technicians, mechanics, operators, and others who are responsible for the installation, maintenance, and efficient operation of EIM electric actuators.

**Objectives:**
- Gain a general knowledge of the functions of actuators and valves as well as an understanding of the operation of the Series 2000 electric actuator
- Identify and locate the components that make up a M2CP package and housing group
- Learn basic wiring diagram interpretation skills — the wiring diagram interpretation skills are required to operate and maintain the control package with its wide variety of control options.
- Set travel limits and torque switches
- Develop the skills required to provide on-site operation, maintenance and servicing for Series 2000 model actuators

**Topics:**
- Functions of actuators
- General valve operation
- Actuator/valve physical configurations
- Basic series 2000 actuator operation
- EIM product basics-M2CP control
- Model number codes and selection
- Wiring diagram and data sheet interpretation
- Setting travel limits and torque
- Recommended maintenance

Prerequisites: None  Start & End Times: 8am to 4:30pm  Length: 1 Day
EIM Series TEC2000 Actuator Maintenance
Course #5-EIM-2

Synopsis:
This 1 day course provides an overall working knowledge of the EIM Series TEC2000 (Total Electronic Control) electric actuator. This program provides the fundamentals of electrical operation, construction, assembly, hardware, software, and hands-on configuration through the use of a RDM (Remote Display Module). Each student will learn how to identify and troubleshoot the electronic as well as mechanical components. Students will learn how to interconnect various control configurations for the TEC2000 units and they will learn the basic skills required to provide on-site operation, maintenance, and servicing for Series TEC2000 actuators.

Who Should Attend?
This course is designed for technicians, mechanics, operators, and others who are responsible for the installation, maintenance, and efficient operation of EIM electric actuators.

Objectives:
- Identify the basic components and assemblies of a TEC2000 non-intrusive actuator by function, configuration and operation
- Identify and locate the components that make up a TEC2000 package
- Learn TEC2000 wiring diagram interpretation skills—these skills are required to operate and maintain the control package with its wide variety of control options
- Configure the TEC2000 unit with local controls, RDM (Remote Display Module) and a laptop computer using factory supplied software
- Develop the skills required to provide on-site operation, maintenance and servicing for Series TEC2000 model actuators

Topics:
- TEC2000 actuators overview
- Actuator mechanics
- TEC2000 control package
- EIM product basics
- Model number codes and selection
- Wiring diagram and data sheet interpretation
- Setting travel and torque limits
- Configuration and software tools
- Recommended maintenance

Prerequisites: None
Start & End Times: 8am to 4:30pm
Length: 1 Day
Compression & Ignition Courses

REMVue Level I Master Technician Program
Courses R425, R435, R445

Synopsis:
This 4.5 day program is divided between 3 separate courses—Course #R425, #R435, and #R445. This in-depth program provides attendees with the knowledge to achieve master level proficiency with all aspects of the REM Vue® 500 control system and all related products.

Objectives:
Upon completion of the 3 modules of the Level I Master Technician program, a successful student will be able to:

- Display competent screen navigation
- Display an understanding of all REMVue settings and be able to configure them appropriate to the application
- Understand all controller, HMI, and I/O
- Understand REMVue panel drawings
- Successfully upload and download with all REMVue software
- Complete program changes
- Add any I/O (DI, DOs, AI, AO, and TCs)
- Add a PID Loop
- Display troubleshooting skills on all of the above topics

Module 1 - Course #R425
Synopsis:
This 1 day course is designed for maintenance and operations personnel requiring the understanding of the functionality, hardware, and maintenance requirements of a REM Vue® 500 controller and the basic skills necessary to configure, calibrate and support it.

Topics:
- Operating philosophy
- Tiering and terminology
- HMI screen navigation
- Controller, HMI, and I/O modules
- Configuration of setpoints, transmitter ranges, timers, and parameters

Prerequisites: None  Start & End Times: 8am to 4:30pm  Length: 1 Day
Module 2—Course #R435
Synopsis:
This 1 day course is designed for technical personnel requiring advanced understanding of the hardware, software tools (REM Vue® – 500 IO Toolkit) and maintenance requirements of a REM Vue® – 500 controller and the skills necessary to configure, calibrate and support it.

Topics:
- Drawing review - mechanical & electrical sections
- Sixnet I/O Toolkit operations – upload/download, advanced download.
- Troubleshooting common problems
- RTI configuration utility – read/write parameters
- HMI basic exercises

Prerequisites: Course #R425
Start & End Times: 8am to 4:30pm
Length: 1 Day

Module 3— Course #R445
Synopsis:
This 2.5 day course is designed for technical programming personnel requiring the understanding of the software tools and structure of the REM Vue® – 500 control system.

Topics:
- Sixnet I/O Toolkit – REMVue toolkit configuration
- GP-Pro Ex – HMI configuration
- ISaGRAF – program overview
- Exercises – multi-platform programming labs involving all REMVue electronic hardware and software tools

Prerequisites: Course #R435
Start & End Times: 8am to 4:30pm
Length: 2.5 Days

REMVue Level II Master Technician Program
Courses R525, R535, R545

Synopsis:
This 5 day program is divided between 3 separate courses—Course #R525, #R535, and #R545. This in-depth program provides attendees with the knowledge to achieve master level proficiency with all aspects of the REM Vue® – 500 AFR and MPI Ignition System.

Objectives:
Upon completion of the 3 modules of the Level II Master Technician program, a successful student will be able to:
- Understand REMVue AFR theory
- Display competent AFR screen navigation
- Display an understanding of all REMVue AFR settings and be able to configure them appropriate to the application
- Understand all AFR hardware and end devices
- Understand ignition theory
- Understand ignition system components
- Understand ignition system configuration
- Display configuration and troubleshooting skills on all of the above topics
Module 1—Course #R525

Synopsis:
This 1 day course is designed for maintenance and operations personnel requiring the background understanding of combustion theory, considerations used for REM Vue®—500 AFR application and basic control methods.

Topics:
- AFR Theory
- Combustion and Emissions
- Waukesha GSI
- White Engines
- Caterpillar Engines

Prerequisites: Course #R435 recommended
Start & End Times: 8am to 4:30pm  Length: 1 Day

Module 2—Course #R535

Synopsis:
This 2 day course is designed for maintenance and operations personnel requiring the understanding of the functionality, hardware, and maintenance requirements of a REM Vue®—500 AFR system and the basic skills necessary to configure, calibrate, tune and support the system.

Topics:
- AFR screen navigation and settings
- Installation, setup and troubleshooting of AFR end devices including:
  - Air valve with actuator (Kinetrol & EL-O-Matic)
  - Fuel valve with DVC positioner (2000 & 6200)
  - Micromotion
  - Air manifold pressure transmitter
  - Air manifold temperature thermocouple
- ECOM exhaust analyzer
- AFR tuning

Prerequisites: Course #R525 recommended
Start & End Times: 8am to 4:30pm  Length: 2 Days

Module 3—Course #R545

Synopsis:
This 2 day course is designed for maintenance and operations personnel requiring the understanding of the functionality, hardware, and maintenance requirements of MPI ignition system and the basic skills necessary to configure, calibrate and support it.

Topics:
- Ignition fundamentals
- Ignition troubleshooting
- Flywheel installation and theory
- Cam and crank disk
- MPI ignition system configuration
  - Operations; programming; diagnostics; startup; installation preparation; and troubleshooting

Prerequisites: Course #R535 recommended
Start & End Times: 8am to 4:30pm  Length: 2 Days
MSAPR Engine Emissions Testing Workshop I
Courses R225

Synopsis:
This 2-day workshop will enable students to plan, perform or supervise engine emissions testing in compliance with the Canadian Multi-Sector Air Pollutants Regulations. Designed for fleet managers, compliance engineers, mechanics and environmental technicians alike, this workshop provides classroom instruction on emissions sources and engine operation, as well as hands-on calibration and emissions checks with a portable emissions analyzer on a live engine.

Objectives:
Following this workshop, students will be able to: identify the compounds that must be measured under MSAPR Part 2, describe the effects of engine operation and after treatments on each compound, perform the steps to complete a valid emissions check, and evaluate which performance test methods are most suitable for their applications.

Prerequisites: None                      Start & End Times: 8am to 4:30pm                          Length: 2 Days
Control Valves & Instrumentation Courses

Valve Sizing & Selection
Course #S100

Synopsis:
This 1 day course uses lectures and examples to explain the correct procedure for sizing and selecting control valves using Fisher Specification Manager Software.

Who Should Attend?
This seminar is designed for engineers, technicians, and others who are responsible for the sizing and selection of control valves.

Objectives:
- Select the proper style and size of control valve for a given application
- Perform control valve sizing
- Select the proper trim size for an application

Topics:
- Control valve selection
- Actuators overview
- Liquid sizing
- Flashing
- Cavitation
- Liquid sizing examples
- Gas sizing
- Noise discussion
- Noise examples
- Gas sizing examples

Prerequisites: None Start & End Times: 8am to 4:30pm Length: 1 Day

Valve Technician I
Course #1400

Synopsis:
This 4.5 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, positioners, and digital valve controllers.

Who Should Attend?
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.
Objectives:
Students who complete this course will be able to:
- Correctly perform installation procedures
- Perform basic troubleshooting
- Properly apply and calibrate positioners and FIELDVUE digital valve controllers
- Change valve trim, gaskets, and packing

Topics:
- Control valve terminology
- Globe valves
- Packing
- Actuators, positioners, and digital valve controller
- Bench set
- Seat leak testing
- Ball valves
- Butterfly valves
- Eccentric disc valves
- Valve characteristics

Prerequisites: Experience in instrument calibration and control valve maintenance, installation, and operation would be helpful

Start & End Times: 8am to 4:30pm  Length: 4.5 Days

Valve Technician II
Course #1450

Synopsis:
This 4 day course discusses a basic approach to troubleshooting and correcting many common control valve problems. Fisher Specification Manager Software is introduced to give the student a better feel for the sizing and selection process of the valve and actuator. Problems such as cavitation, flashing, and aerodynamic noises are also discussed, as well as common solutions to these problems using different control valve trims and materials. Instrumentation topics are expanded from course 1400 to include troubleshooting and advanced calibration for split ranging, non-compatible signals, or using additional instruments such as a volume booster and trip valves. Loop performance due to stick-slip, high friction, and improper loop tuning are also discussed, along with the use of process simulation software to look at the basic approach to loop tuning and troubleshooting.

Who Should Attend?
Students are typically experienced valve mechanics and maintenance personnel, instrument technicians, and others who will benefit from a broadened perspective of control valve performance and maintenance issues.

Topics:
- Control loop basics
- Major loop basics
- Control loop performance
- Influences on loop performance
- Valve sizing & selection
- Valve troubleshooting
- Actuator sizing & selection
- Actuator troubleshooting
- Instrument selection
- Instrument troubleshooting
- Controller tuning
- Severe service considerations

Prerequisites: Course #1400  Start & End Times: 8am to 4:30pm  Length: 4 Days
Note: This course is offered on-demand only
Valve Maintenance with DVC Calibration  
Course #1451

Synopsis  
The first two days of this 4.5 day course will cover sliding stem and rotary valves and actuators. Topics will include valve and actuator setup, maintenance, repair, and troubleshooting. The balance will be focused on the installation and calibration of the DVC6000 series using the 475 handheld communicator.

Objectives:  
Students spend 50% of their time in hands-on workshops. Students who complete this course will be able to:

- Correctly perform installation procedures  
- Perform basic troubleshooting  
- Change valve trim, gaskets and packing  
- Install/mount a DVC onto a sliding stem actuator/valve and rotary actuator/valve  
- Configure and calibrate FIELDVUE® Instruments with the HART Model 475 communicator

Topics

- Control valve terminology  
- Globe valves/packing  
- Actuators  
- Bench set  
- Ball valves / butterfly valves / eccentric disc valves  
- Valve characteristics  
- Control valve noise and cavitation  
- Digital Valve Controller theory of operation  
- HART communication signal  
- FIELDVUE instrument signal  
- HART Model 475 handheld communicator  
- Instrument configuration and calibration  
- Instrument troubleshooting  
- Control loop wiring practices

Prerequisites: Experience in instrument calibration and in control valve maintenance, installation, and operation would be helpful.

Start & End Times: 8am to 4:30pm  
Length: 4.5 Days  
Note: This course is offered on-demand only

Fundamentals of HART based FIELDVUE Digital Valve Controllers  
Course #1751

Synopsis:  
This 2 day lecture/lab style course provides the skills necessary to install and mount FIELDVUE digital valve controller onto sliding stem actuator/valve and rotary actuator/valve assemblies and configure and calibrate FIELDVUE instruments with the field communicator.

Who Should Attend?  
This course is for technicians, engineers and others responsible for installing, calibrating and basic troubleshooting FIELDVUE instruments using the 475 Handheld Communicator.

Topics:

- FIELDVUE digital valve controller theory of operation  
- FIELDVUE instrument installation  
- Field communicator for instrument configuration, calibration, and troubleshooting  
- ValveLink mobile overview

Prerequisites: Course #1400, or field experience

Start & End Times: 8am to 4:30pm  
Length: 2 Days
ValveLink Software for Configuration and Calibration of FIELDVUE Digital Valve Controllers
Course #1752

Synopsis:
This 2.5 day lecture/lab style course provides hands-on experience working with FIELDVUE digital valve controllers, and ValveLink software. Students will be able to execute ValveLink calibration and diagnostic routines and create an instrument database. The primary focus of this course is to provide a comprehensive experience in managing digital valve controllers using the ValveLink software.

Who Should Attend?
This course is for Technicians, engineers and others responsible for installation, calibration, and diagnostics for FIELDVUE digital valve controllers and ValveLink software.

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

Prerequisites: Course #1400 or experience Start & End Times: 8am to 4:30pm Length: 2.5 Days

ValveLink Software for Diagnostics of FIELDVUE—Digital Valve Controller
Course #1759

Synopsis:
This 2.5 day course 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.

Who Should Attend?
This course is for technicians, engineers, and others responsible for installing and calibrating control valve related instruments.

Topics:
- Pneumatic control valve terminology
- Features of the digital valve controller and ValveLink software
- ValveLink diagnostic tests
- Data interpretation
- Troubleshooting techniques
- Comparison testing techniques
- Performance diagnostics

Prerequisites: Course #1752 Start & End Times: 8am to 4:30pm Length: 2.5 Days
Fisher Control Valve Instrument Maintenance and Calibration
Course #1700

Synopsis:
This 3-day course and hands-on workshop covers the principles of operation, calibration and installation procedures for electronic and pneumatic instruments. The class will discuss maintenance procedures for Fisher sliding stem and rotary actuator assemblies. Hands-on workshop exercises and lectures to discuss the operation and calibration of many Fisher instruments such as I/P transducers, pneumatic positioners, electro-pneumatic positioners, and Fisher FIELDVUE™ digital valve controllers will be covered. Students will:

- calibrate a variety of pneumatic and electronic instruments
- correctly perform installation procedures
- perform basic troubleshooting, basic controller tuning, positioner and FIELDVUE digital valve controller application

Topics:
- Actuators and Bench Set
- Current to Pneumatic (I/P) Transducers
- Instrument Terminology
- Pneumatic and Electro-Pneumatic Positioners
- FIELDVUE Digital Valve Controller

Prerequisites: Some experience in electronic and pneumatic instrument maintenance and calibration would be helpful.

Start & End Times: 8am to 4:30pm  Length: 3 Days
Field Automation Courses

Bristol ControlWave Gas Measurement Application Tool
Course #S340

Synopsis:
This 3 day course covers the integration of Bristol Multivariable Sensors and the Standard Directive 17 Flow Computer application for gas measurement using the ControlWave micro.

Who Should Attend?
This course is designed for Bristol integrators, field maintenance technicians, and end-users.

Objectives:
- Configure, calibrate, and integrate Bristol Multi-Variable transmitter products
- Build a D17 gas metering application using the Bristol Canadian EFM function block library

Topics:
- Overview of Bristol RTU and measurement hardware
- Connect, configure, and calibrate a Bristol 3808 MVT
- Introduction to TechView and WebBSI
- Flash configuration in LocalView and TechView
- Intro to OpenBSI utilities (ataview, downloader, comms stats etc.)
- Hardware troubleshooting
- Connection to analog MVT’s using FSK-RS232 modem (TIU/CTIU)
- Field and network firmware upgrades
- Introduction to ControlWave Designer IEC 61131-3 programming environment
- Build a gas measurement program using the Canadian EFM function block library (AGA3 and XMTR 3-in-1 interface)
- Configure a modbus RTU master/slave communications program
- I/O configurator
- System variable wizard overview
- Building and transferring download files
- Logic debugging and troubleshooting

Prerequisites: None Start & End Times: 8am to 4:30pm Length: 3 Days

Advanced Programming using Bristol ControlWave Designer
Course #S440

Synopsis:
This 4.5 day course is an advanced IEC-61131 programming session using Bristol ControlWave Designer software. It focuses on building a standard gas wellhead measurement and automation application using a blend of IEC programming languages such as function block diagram, structured text and ladder logic.

Who Should Attend?
This course is designed for system integrators or end-users looking for an advanced programming experience.

Topics:
- Build an AGA3 (orifice plate) gas metering application with flow control valve and shutdown key automation including a Modbus TCP SCADA interface
- Review of ControlWave Designer IEC 61131-3 programming environment
• Build a gas measurement program using the Bristol ACCOL3 function block library (AGA3, AGA8, MVT Interface) with a mix of structured text and function block diagram
• Program shutdown key automation with ladder logic
• Create a user defined function block with logic for automating a flow control valve using function block diagram
• Define and program historical data archives for trending and meter report data
• Configure a modbus TCP slave communications program for a SCADA host interface

Prerequisites: Course #S340  Start & End Times: 8am to 4:30pm Length: 4 Days
Note: This course is offered on-demand only

ROC & FloBoss Engineering I
Course #1200

Synopsis:
This 4 day course provides an overall working knowledge of the ROC 300 series as well as the FloBoss 100, 400, and 500 series products. Students are presented with a comprehensive view of the hardware and software in the ROC family and then are taught how to configure a working unit. The FloBoss 107 will be used as the standard configuration platform for the workshops.

Who Should Attend?
This course is for engineers, technicians, and others involved in system configuration, operation, and maintenance of ROC products.

Objectives:
Upon complete will be able to effectively configure, operate, and maintain the ROC products.

Topics:
• Overview of ROC & FloBoss hardware
• Overview of ROCLINK 800 software
• Configuring ROC products
• Basic communication
• Operating the ROC products
• Maintaining and troubleshooting ROC products
• FST guidelines
• FST structure
• Processor loading considerations
• Application overview
• Discussing and explaining typical oil & gas process applications
• Calibration of A/I and A/O modules
• AGA configuration and overview
• PID control
• PID structure
• Application and use of ROC PID control

Prerequisites: A working knowledge of PCs, the windows XP operating system, and a basic understanding of process control.

Start & End Times: 8am to 4:30pm Length: 4 Days
Machinery Health Management Courses

Basic Vibration Analysis
Course #2031

Synopsis:
This 4 day 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 AMS technologies for demonstration purposes. The class shows the students how to use the vibration analyzer in conjunction with Emerson Machinery Health Management supported software to analyze basic vibration defects. This course complies with Category I Vibration Analyst per ISO standard 18436-2:
Vibration condition monitoring and diagnostics.

Topics:
- Principles of vibration
- Data acquisition and signal processing
- Condition monitoring and 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

Prerequisites: Fundamentals of Vibration or 6 months of experience
Start & End Times: 8am to 4:30pm Length: 4 Days

Intermediate Vibration Analysis
Course #2032

Synopsis:
In this 4 day course, category II vibration analysts are taught to be able to select appropriate vibration measurement techniques, set up instruments for basic resolution of amplitude, frequency, and time, 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. The course also features the use of the AMS 2130 Machinery Analyzer in conjunction with advanced machinery analysis techniques. Discussions on case histories on machinery faults are one of the focal points of this course. This course complies with Category II Vibration Analyst per ISO Standard 18436-2: Vibration condition monitoring and diagnostics.
Topics:
- Equipment testing & diagnostics
- Reference standards
- Reporting & documentation
- Fault severity determination
- Analyzer averaging techniques
- 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

Prerequisites: Course #2031 and 18 months of field experience are recommended.
Start & End Times: 8am to 4:30pm    Length: 4 Days

Introduction to AMS Machinery Manager
Course #2068

Synopsis:
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. An AMS 2130 Analyzer will be used to load routes and collect data on lab machinery for basic vibration analysis using export and diagnostic plotting.

Topics:
- Equipment configuration using RBMwizard®
- Machine duplication
- Route creation
- Basic diagnostic plot options
- Introduction to reporting techniques
- Problem reporting

Prerequisites: Computer experience and Basic Vibration are recommended.
Start & End Times: 8am to 4:30pm    Length: 4 Days

Fundamentals of the AMS 2140
Course #2076

Synopsis:
This two-day hands-on course covers the basic operation of the AMS 2140 Machinery Health Analyzer. Students collect data on lab machines. Course materials are designed for personnel with experience in the field of vibration data collection and analysis, but little or no experience with AMS analyzers.
Topics:
- Analyzer/computer communication
- Predefined route data collection
- Job data collection and setup
- Manual mode measurements
- Introduction to AMS 2140 Analysis Experts functions

Prerequisites: Understanding of vibration analysis and basic vibration collection principles
Start & End Times: 8am to 4:30pm  Length: 2 Days

AMS 2140 Advanced Functions
Course #2094

Synopsis:
This 3-day course is intended for personnel 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, coherence and cross-channel phase, operating deflection shapes (ODS), modal analysis, and other advanced techniques.

Topics:
- PeakVue
- Resonance detection
- Dual channel 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 time waveform capture and analysis
- AMS 2140 analysis experts

Prerequisites: Single-channel vibration analysis experience required
Start & End Times: 8am to 4:30pm  Length: 3 Days

Note: This course is offered on-demand only
PeakVue Mystery and Autocorrelation
Course #2035

Synopsis:
This 3-day course provides insight into advanced functionality of Emerson’s unique 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. 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.

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.

Prerequisites: Students should be familiar with vibration data collection and analysis techniques and the use of AMS Machinery Manager Software
Start & End Times: 8am to 4:30pm       Length: 3 Days
Measurement Instrumentation Courses

Micro Motion Mass Flowmeter Training
Course #S210

Synopsis:
This 2 day course uses classroom lectures and hands on workshops to explain how to correctly commission, maintain, and apply Micro Motion mass flowmeters.

Who Should Attend?
This course is designed for people who will be responsible for maintenance, selection and application of Micro Motion mass flowmeters.

Objectives:
- Understand the theory of operation of a mass flowmeter
- Select and size a Mass Flowmeter for a suitable application
- Correctly plan and install the meter
- Correctly configure the meter for a proposed application
- Perform basic troubleshooting

Topics:
- Theory of operation
- Product overview
- Configuration
- Sizing and installation
- Proving and meter verification
- Net oil measurement
- Applications

Prerequisites: None                                    Start & End Times: 8am to 4:30pm                                    Length: 2 Days
Note: This course is offered on-demand only

Operation & Maintenance of Gas Chromatographs
Course #4210

Synopsis:
This 3 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 gas chromatograph.

Objectives:
Students who complete this course will be able to effectively operate and repair a gas chromatograph.
Topics:
- Hands-on learning that explains the chromatograph, how it operates, and what it does to analyze natural gas
- Carrier and calibration gas systems
- Chromatograph hardware
- Installation and operation of MON2000 software
- Identifying problems, setting timed events, preparing samples, and implementing preventative maintenance procedures
- Troubleshooting
- Share parts & service tools

Prerequisites: ‘Introduction to Gas Chromatographs’ course or equivalent knowledge.
Start & End Times: 8am to 4:30pm   Length: 3 Days

Note: This course is offered on-demand only

Phase Dynamics
Course #S245S

Synopsis:
This 1 day course uses classroom lectures and workshops to teach how to correctly commission, maintain, and apply Phase Dynamics. The course will cover: principle of operation, watercut 101, best practices, installation, configuration, operation, and troubleshooting.

Who Should Attend?
This course is designed for people who will be responsible for maintenance, selection and application of Micro Motion mass flowmeters.

Objectives:
- Understand the theory of operation of a mass flowmeter
- Select and size a Mass Flowmeter for a suitable application
- Correctly plan and install the meter
- Correctly configure the meter for a proposed application
- Perform basic troubleshooting

Topics:
- Theory of operation
- Transmitter and sensor types
- Applications
- Best practices
  - Installation
  - Sampling techniques
- Troubleshooting
- Configuration

Prerequisites: None   Start & End Times: 8am to 4:30pm   Length: 1 Day

Note: This course is offered on-demand only
TruckVue Truck Unload
Course #5216

Synopsis:
This 1 day course uses lectures and workshops to provide an overview of the Spartan Controls industrial computer based touch screen Truck Unloading system. This course is intended to cover the current TruckVue Server 2010-2012 systems and will not provide details on predecessor or ROC based offerings.

Who Should Attend?
This course is designed for people who will be responsible for maintenance, selection and application of Micro Motion mass flowmeters.

Objectives:
- Provide an understanding of the application and how the measurement instrumentation interacts with the system
- Familiarize site personnel with the configuration and maintenance menus
- Troubleshoot problematic unloads and hardware

Topics:
- Identify system components
- Understand the principles of operation of the system measurement instrumentation
- Understand the principles of operation of the primary software
- Troubleshoot panel hardware operation issues
- Familiarize oneself with the user setup screens, software capabilities and configuration

Prerequisites: None
Start & End Times: 8am to 4:30pm
Length: 1 Day
Note: This course is offered on-demand only
Process Systems & Solutions Courses

DeltaV Implementation I
Course #7009

Synopsis:
Upon completion of this 4.5 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.

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

Topics
- System overview
- DeltaV Explorer
- DeltaV Diagnostics
- Control Modules
- Control Studio
- Motor Control with interlocking and permissive conditions
- Regulatory control
- Cascade controls
- DeltaV Operate
- System operation
- Alarms & Process History View
- Sequential Function Charts
- Configure Theme Dynamos
- Custom Dynamos
- Alarm help
- Electronic Marshalling (CHARMS)

Prerequisites: Experience using the Windows operating system. Course #7018 recommended
Start & End Times: 8am to 4:30pm Length: 4.5 Days

DeltaV Operator Interface for Continuous Controls
Course #7012

Synopsis:
This 2 day course uses lectures and hands-on workshops to provide an in-depth overview on operating the DeltaV System.

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

Objectives
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
- Accessing alarm displays/alarm handling
- Motor control module operation
- Regulatory/Cascade Control Module Operation

Prerequisites: None

Start & End Times: 8am to 4:30pm
Length: 2 Days

Note: This course is offered on-demand only

**DeltaV Implementation II**
Course #7017

Synopsis:
During this 4.5 day course, students will be able to identify block structures, interpret function block status values, design error masking, define nodes, configure modules using State-Driven and Command-Drive algorithms, configure modules with Analog Control Palette Blocks and create simulation for testing purposes.

Who Should Attend?
This sequential course is designed for process control engineers responsible for designing, implementing, and testing configuration using DeltaV system.

Topics

- Function block structures & status values
- Analog control palette blocks – bias/gain, deadline, limit, ratio, signal characterizer, splitter
- HART inputs & outputs
- HART device alarms
- AMS Intelligent Device Manager
- DeltaV Simulate suite
- Unit alarms
- DeltaV Tune with InSight
- Device control options
- Class based control modules

Prerequisites: Course #7009
Start & End Times: 8am to 4:30pm
Length: 4.5 Days

**DeltaV Hardware & Troubleshooting**
Course #7018

Synopsis:
This 4 day course focuses on the hardware components that make up the DeltaV system: M-series controllers and I/O, S-series controllers and I/O (including CHARMS), and DeltaV Smart Switches. Using a combination of lectures and workshops, you will learn how to use operator and diagnostic tools to identify and locate hard-ware-related fault conditions. Workshops provide the opportunity to disassemble and reassemble the M- and S-series hardware and return the system to an operating state.

Who Should Attend?
This course is recommended for instrumentation and maintenance technicians, managers, and configuration engineers who need to know about DeltaV hardware. It provides an overview of the DeltaV Control Network, M- and S-series hardware, and software applications. Upon completion, you will be familiar with the hardware and be able to perform troubleshooting techniques.
Topics

- DeltaV overview
- Operator alarms
- DeltaV diagnostics
- DeltaV Smart Switches
- DeltaV I/O cards and carriers
- Controllers and power supplies
- Electronic Marshalling (CHARMs)
- HART I/O
- DeltaV and AMS Suite Intelligent Device Manager
- Redundant I/O

Prerequisites: Windows Experience  Start & End Times: 8am to 4:30pm  Length: 4 Days

**AMS Device Manager**
Course #7020

Synopsis:
Completing 3 days of AMS Device Manager hands-on instructor assisted training modules and exercises, provides the quickest route to your productive use of 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.

Topics:

**Part 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 alarms

**Part 2 – System Administration**
- AMS Device Manager system overview
- Installing an AMS Device Manager server plus Standalone
- Starting AMS Device Manager for the first time
- Network communication interface setup
- AMS Device Manager database management
- Installing a distributed system
- Installing device types from media

**Part 3 – SNAP-ON™ Applications**
- AMS ValveLink™ SNAP-ON application
- MV engineering assistant SNAP-ON application
- Wireless SNAP-ON application
- QuickCheck™ SNAP-ON application
- AMS Device Manager OPC Server and the Matrikon OPC Explorer
- AlertTrack™ SNAP-ON application
- AMS Device Manager web services

Prerequisites: None  Start & End Times: 8am to 4:30pm  Length: 3 Days
DeltaV Systems Administration for Windows 7 and Server 2008  
Course #7027

Synopsis:  
This 4.5-day course is designed for control system administrators, process control engineers and IT specialists responsible for managing, installing, and commissioning a DeltaV system running on the Windows 7 operating system and Windows Server 2008.

Topics:
- Overview/Review of System Components and Topologies
- DeltaV Licenses
- Database Administration
- User Administration
- Network Node Diagnostics
- Auto Update Service
- Cybersecurity Tools – Smart Firewall, Controller Firewall, Smart Switches
- Installation Checklist of the Windows 7 and Windows Server 2008 Operating Systems
- Installation of the DeltaV Software and AMS Device Manager Components
- DeltaV Control Networks and Remote Access
- DeltaV Domains and Workgroups
- Network Security
- Upgrading Hardware and Software
- Backup and Restore Procedures
- Importing/Exporting
- DeltaV Zones

The purchase of this course includes access to the eDV23 course at no extra charge. Upon confirmed enrollment, the student will receive access to the eDV23 online course (via email) to take at any time.

Prerequisites: Course #7009 or course #7018  
Start End Times: 8am to 4:30pm  
Length: 4.5 Days

DeltaV Virtualization  
Course #7029

Synopsis:  
This 4.5 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
- Cluster Health Monitoring and Troubleshooting
- Planning a DeltaV Virtual Studio System
- Creating DeltaV Virtual Machines including a ProPlus Node
- Upgrading and Capacity Expansion
- Configuring a WYSE Thin Client and Redundant Thin Client Networks
- Installing and Configuring a VRTX Chassis and Blade Servers
- Create a Highly Available Failover Cluster
- Patching and Hardening Cluster Nodes

Prerequisites: Course #7027  
Start & End Times: 8am to 4:30pm  
Length: 4.5 Days
DeltaV Advanced Controls
Course #S7203

Synopsis:
This 5 day course is designed for system engineers who will be using DeltaV Advanced Control features. This is a condensed course with selected content from Courses 7201 and 7202. The principal technology that is utilized in each product will be discussed, and 50% of the course will be hands-on workshops. Students will log into DeltaV systems to apply the advanced control features to customized simulated process applications. The course will feature approximately 1 day on DeltaV Insight, and 3.5 days on DeltaV PredictPro (MPCPro).

Topics
DeltaV InSight
- Embedded Process Learning
- Intelligent Process Monitoring
- Adaptive Tuning and Control
- Advanced Control Diagnostics
- Customized Performance Reporting

DeltaV PredictPro (MPC)
- Model Predictive Control Background and Theory
- MPCPro Controller Setup
- MPCPro Model Analysis and Controller Generation
- Large Process Application of MPCPro
- Real-time Optimization with MPCPro
- MPCPro Control and Optimization Strategy Design and Development
- MPCPro Simulation

Prerequisites: Course #7009
Start End Times: 8am to 4:30pm
Length: 4.5 Days
Note: This course is offered on-demand only

DeltaV Advanced Graphics
Course #7025

Synopsis:
This 4.5 day course expands on graphic topics covered in both the DeltaV Implementation I & II.

Who Should Attend?
This course is for process control engineers responsible for configuring advanced functionality in the DeltaV user interface.

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
- Theme Dynamos

Prerequisites: Course #7009
Start & End Times: 8am to 4:30pm
Length: 4.5 Days
Fieldbus Systems & Devices
Course #7032

Synopsis:
This 4 day lecture/lab course provides hands-on experience working with the integration of FOUNDATION fieldbus devices and DeltaV. The student will be able to: install fieldbus instruments and segment checkout for the correct operation of the physical layer; use DeltaV to perform AMS Device Manager methods such as calibration, setup wizards, zero trim and diagnostics; implement a pressure loop using FOUNDATION fieldbus function blocks with Control Studio; and configure PlantWeb Alerts and device alarm parameters.

Who Should Attend?
This course is for individuals responsible for installing, troubleshooting, calibrating and configuring FOUNDATION fieldbus instruments and control strategies using the DeltaV scalable systems.

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

Note: A demonstration on the 475 Field communicator and ValveLink for Fieldbus will be provided and available to students for optional activities.

Prerequisites: Course #7009
Start & End Times: 8am to 4:30pm
Length: 4.5 Days

DeltaV SIS Implementation
Course #7305

Synopsis:
This 4.5 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.

Who Should Attend?
This course is for personnel who design, implement, commission and service DeltaV SIS.

Topics
- DeltaV SIS overview
- DeltaV SIS SLS 1508 hardware architecture
- DeltaV SIS with Electronic Marshalling hardware architecture
- DeltaV Safety Instrumented functions
- Rosemount SIS Instruments security
- AMS Device Manager relating to DeltaV SIS
- DeltaV SIS Fisher SIS digital valve controller
- SISNet repeaters
- DeltaV SIS security
- DeltaV version control

Prerequisites: Course #7009
Start & End Times: 8am to 4:30pm
Length: 4.5 Days
AMS Device Manager with DeltaV
Course #7039

Synopsis:
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 the following:
• responds to work orders created to calibrate, troubleshoot, repair, service, and replace instruments and valves
• monitors alerts to preemptively address problems prior to operators seeing a problem in the control room
• provides loop testing and assistance with instrumentation on plant turnarounds, startups, and for project work
• improves process availability and reduces operations and maintenance costs

The hands-on workshops with AMS Device Manager 13.5 along with DeltaV v13.3.1 will address areas relating to the instrument technician’s daily tasks.

Topics
• DeltaV and PlantWeb Overview
• AMS Device Manager Overview
• Foundation Fieldbus Overview
• ValveLink SNAP-ON Introduction
• HART Overview
• PROCONEX QuickCheck SNAP-ON
• PROFIBUS Overview
• AMS Device Manager User Interface
• AMS Device Manager Help
• Device Replacement for HART, Fieldbus, and PROFIBUS Devices

AMS Device Manager Plant Location Hierarchy
AMS Device Manager Browser
Monitoring System Alerts with AMS Device Manager
PROCONEX AlertTrack SNAP-ON
AMS Device Manager Audit Trail
ValveLink SNAP-ON Tests and Diagnostics
AMS Device Manager Calibration Assistant
PlantWeb Alerts

Prerequisites: Microsoft windows experience. Prospective attendees should first complete the eLearning e7020 AMS Device Manager Suite Primer. The purchase of this course includes access to the e7020 course at no extra charge. Upon confirmed enrollment, the student will receive access to the e7020 online course (via email) to take as a prerequisite prior to attending the instructor led course.

Start & End Times: 8am to 4:30pm     Length: 4.5 Days
Safety Relief Valve Courses

Overpressure Protection
Course #S110

Synopsis:
This 1 day course uses lectures and examples to explain the correct procedure for sizing and selecting safety relief valves.

Who Should Attend?
This seminar is designed for engineers, technicians, and others who are responsible for the sizing and selection of safety relief valves.

Objectives:
On completion, the student should have an understanding of:
- The applicable ASME, API and ANSI specifications which govern safety relief valves
- Safety relief valve design and operation
- Different types of overpressure protection and their uses

Topics:
- ASME, API and ANSI specification review
- Valve design
- Sizing requirement overview
- Gas/vapor sizing
- Liquid sizing
- Fire sizing

Prerequisites: None               Start & End Times: 8am to 4:30pm               Length: 1 Day

Safety Relief Valve Maintenance
Course #S140

Synopsis:
This 2 day course uses lectures and examples to explain the correct procedure for valve maintenance.

Who Should Attend?
This seminar is designed for technicians and others who are responsible for the maintenance of Crosby valves.

- Valve nomenclature and definitions
- ASME code requirements
- Pressure-level relationship
- Valve maintenance
- Valve disassembly and inspection
- Test bench technique; air, steam and water
- Cold differential testing
- Pilot valve testing
- Adjustments for blowdown
- Ring locations effects
- Bench teardown of valves
- Parts inspection & critical dimension measurement
- Remachining of nozzles
- Maintenance problems and remedies
- Discussion on "do’s" and "don’t's"
- Quiz on safety and safety relief valves

Prerequisites: None               Start & End Times: 8am to 4:30pm               Length: 2 Days
General Information

Qualifications for Enrollment
Education Services agrees to accept for training, individuals who are not competitors of Emerson or Spartan Controls in the field to which the training pertains.

Course Scheduling, Locations, and Pricing
Course schedule and locations, including length of the courses, dates, and prices are listed on the next page of this catalogue. All prices are in Canadian dollars. For the most up to date information, visit our website at www.spartancontrols.com.

Tuition Payment
Acceptable methods of payment include purchase orders, VISA, MasterCard or American Express cards. Tuition is subject to change without notice. Tuitions listed do not include the additional 5% GST charge. Transportation, personal expenses, and most meals are the responsibility of the student.

Continuing Education Units
Continuing Education Units (CEUs) are awarded for successful completion of most Emerson courses, with a minimum of 80% attendance rate.

Copyright
All materials are copyrighted. Audio and video recordings are prohibited and no material or portion of any course may be reproduced in any manner without prior approval.

Cancellations and Transfers
All courses have a minimum attendance requirement that, if not met, could mean cancellation or rescheduling of the course. In the event of a cancellation, Spartan’s liability is limited to the tuition cost, not travel or accommodation expenses.
We reserve the right to cancel or reschedule a course up to 14 days prior.
If you must cancel your enrollment, we require a minimum of 14 days notice or you are subject to a 50% tuition charge. Full tuition is charged for failure to attend without cancellation. Substitutions are permitted until the first day of class.

Travel Details
Students are responsible for arranging their own accommodations. If you intend to buy airline tickets with penalty clauses, please call us to check the course status before booking.
Out of town students should make the necessary arrangements to ensure they arrive early enough for 8am start time. If you are travelling by air, please allow sufficient time for travelling to the airport and checking in when scheduling return transportation.

Waitlist
If you register for a course that is already full you can be put on a waitlist. Waitlists hold no guarantees and your registration is not automatically transferred to the next session; you must register for the next session.

Course Dates, Locations, and Prices

Dates and prices are subject to change. For updated information visit our website at www.spartancontrols.com
Alberta Training Grant

What is Canada Job Grant?
The Canada Job Grant helps employers train new or existing employees for jobs that need to be filled. This flexible program is designed to meet the needs of businesses of all sizes, in all industries and regions.

What is the Canada-Alberta Job Grant?
The Canada-Alberta Job Grant is an employer-driven training program. This means that employers decide on who gets training and what type of training may be needed for new and existing employees. Employers are required to use a third-party training provider to deliver the formal training either onsite, online, or in a classroom setting.

The Canada Job Grant is part of the Government of Canada and Government of Alberta’s commitment to help address skills mismatches and ensure that employees are being trained in high-demand areas.

What is the grant amount?
Under the Canada-Alberta Job Grant, employers will cover a minimum of one third of direct training costs, with up to a maximum of $10,000 per trainee in government contributions.

Who is eligible?
All private sector and non-profit employers in Alberta
First Nations and Métis Settlements in Alberta
Some Crown agencies in communities with population less than 100,000
Eligible trainees
New or existing employees that will fill current or future job vacancies
Canadian citizens, permanent residents, or protected persons under the Immigration and Refugee Protection Act (Canada) entitled to work in Canada who are currently residing in Alberta

Training providers
Must be eligible Alberta third-party training providers who are separate and distinct from the employer
An explanation must be provided to justify out-of-province training requests

Eligible training programs
Training must be incremental, meaning that the training is in addition to the employer’s regular operational training, and would not have otherwise taken place without the grant must result in a credential

How to apply
The Canada-Alberta Job Grant involves three steps: application, reimbursement and completion. Before applying, be sure to download and review the Canada-Alberta Job Grant Applicant Guide.

http://www.albertacanada.com/opportunity/employers/jobgrant-application-forms.aspx
There are three steps in the grant application process:

1. Employers complete, sign and submit all sections of the *Canada-Alberta Job Grant Application*. Once the Application has been submitted, the employer may register and pay for training. If the Application is declined and training has been paid, the Employer is responsible for any training costs incurred.

2. Following the approval of the Application, and after training has been paid for, employers submit a *Canada-Alberta Job Grant Reimbursement Form* along with applicable receipts. Employers are then reimbursed for one-third of the training costs.

3. Upon training completion, a *Canada-Alberta Job Grant Completion Form* will be submitted to the Government of Alberta and an additional one-third of training costs will be reimbursed. The remaining one-third of training costs is paid for by the employer.

   - Read the applicant guide before filling out the application form.
   - Only training courses that are approved before they start will be funded by the CAJG.
   - You may pay for the cost of training as soon as your application is signed and submitted. However, if your application is declined, you will be responsible for the training costs incurred.
   - Forms must be completed and submitted with the original signature, and dated when signed. These documents are a legal contract, and photocopied signatures cannot be accepted.
   - If requesting out of province training, you must provide a brief explanation on the application as to why you are not able to use an Alberta based training provider.
   - If requesting a certificate or diploma program, avoid processing delays by listing each of the courses that will start within 6 months. The program name is not required.
   - We must be able to verify training dates, hours and costs. Send supporting documentation with the application.
   - The amount of your training requests must be in Canadian dollars.
   - If circumstances change after your application is submitted, call us as soon as possible. We may require a new application which will impact your training invoice and start date.

Application forms must be mailed to the address provided and cannot be accepted by courier.

Application process

- Minimum 21 hours of training
- Must start within 6 months of approval and be completed within 52 weeks of start date
- Training cannot start until grant is approved
- Training can be e-learning, part-time, full-time, on-site or in a classroom and must result in a form of credential

Apply a minimum 30 days before your program’s start date and only for courses that start within six months.

*Please click here to visit the Government of Alberta website for more information.*
**British Columbia Job Grant**

**What is Canada Job Grant?**

The Canada Job Grant helps employers train new or existing employees for jobs that need to be filled. This flexible program is designed to meet the needs of businesses of all sizes, in all industries and regions.

**British Columbia Job Grant**

The Canada-B.C. Job Grant is accepting applications with training start dates between April 1 and August 31, 2017 for all streams. Applications with training start dates prior to April 1, 2017 will continue to be accepted until those targets are met.

**What is the Canada-B.C. Job Grant?**

The Canada-B.C. Job Grant (CJG) is an employer-driven, cost-sharing program that helps employers invest in training for their current or future employees. The CJG assists eligible employers to offset the cost of training up to a maximum of $10,000 per participant per fiscal year, and up to a maximum of $15,000 per participant per fiscal year for the Unemployed Stream. The employer contributes at least one-third to the cost of training, with the exception of the Unemployed stream. The employer of all streams must have a job for the participant at the end of training.

The goals of the CJG are to increase participation of British Columbians in the labour force by helping them develop the skills they need to find and keep a job. The CJG is also an opportunity for employers to invest in training that is better aligned to job opportunities. Please refer to CJG criteria to fully understand the eligibility requirements of the program before you apply.

**Who can apply?**

Eligible employers or organizations acting on behalf of employers can apply to four streams of funding:

**Priority Sectors**
The CJG is open to applications from employers or organizations working in eligible priority sectors, including most BC Jobs Plan priority sectors, identified as critical to B.C.’s labour market and economic development. For details on eligible priority sectors, please visit the **Priority Sectors page**:  
[https://www.workbc.ca/getmedia/7d52bc1f-9489-4460-a124-cb915bf9333a/General-Criteria.pdf.aspx](https://www.workbc.ca/getmedia/7d52bc1f-9489-4460-a124-cb915bf9333a/General-Criteria.pdf.aspx)

**Unemployed Stream**
The Unemployed Stream is open to applications from employers and organizations who are hiring unemployed British Columbians, covering up to 100% of the costs of training where there is permanent employment at the end of training. For details, please visit the **Unemployed Stream Page**.

**Underrepresented Groups in the Workforce**
The CJG is open to applications from employers or organizations wishing to provide skills training and jobs to individuals in one of the eligible underrepresented groups. For details on eligible underrepresented groups, please visit the **Underrepresented Groups in the Workforce page**.

**Refugee Fund**
The CJG is open to applications from industry/sector associations, employer associations, and union and non-profit organizations working with refugees, who are working with employers to help refugees gain skills and employment in B.C. Employers must contribute one-third of the cost of job-specific skills training and have a job at the end of the training for the participant. For details, visit the **Refugee Fund Page**.
General Eligibility Criteria

Employers meeting eligibility requirements are not guaranteed funding. The Ministry will assess applications on a first come, first served basis, with the exception of applications under the Unemployed Stream and Underrepresented Stream which will be assessed on a priority basis. Approval of applications does not constitute an endorsement of any training provider or particular training course or program. Previous approval of a training provider does not guarantee approval in the future. All applications are assessed on a case-by-case basis. Please note that all decisions regarding the eligibility of employers, participants, training providers, training programs and reimbursable costs will be made by the Ministry of Jobs, Tourism and Skills Training (“Ministry”) at the Ministry’s sole discretion. Where the Ministry determines that there is a real or perceived conflict of interest in the choice of participants, training providers and/or training programs, the Ministry reserves the right to deny an application or a claim on that basis. Refer to Appendix D for examples of situations where the Ministry may deem a conflict of interest. Quality Assurance sampling and audits will be used to verify information provided. The Ministry reserves the right to contact participants, trainers or any other person in order to substantiate reimbursement claims, training activities, records or other related matters.

Important Information Regarding CJG Applications

Effective April 1, 2017, applications to the Canada-BC Job Grant program will need to be submitted through a new CJG administration system. Applications to the Refugee Fund as well as those from Organizations Acting on Behalf of Employers will continue to be accepted through email/PDF forms until an update to the system is released. The new CJG administration system will streamline the application process for employers by creating an electronic platform for the submission of applications, agreements and claims. Employers will be able to create, copy, and save applications.

To access this new system, all applicants to the CJG will require a Business BCeID account. While it takes 15 minutes to complete the application process for a BCeID, it can take up to 3 weeks to receive your BCeID. If you already have a BCeID, you do not need to do anything further. If you do not have a BCeID, please ensure you apply as early as possible to avoid any delays in the CJG application process after March 31, 2017. For information and instructions on registration for BCeID, please click on the link: https://www.bceid.ca/register/

*Applications continue to be accepted for applications with training start dates between now and March 31, 2017, for all streams until those targets are met.
How to Apply

Application Instructions

NOTE: Before applying, please review Eligibility Criteria to ensure eligibility requirements have been met.

As email communication is used during the application process, please ensure your email is set to receive correspondence from the CJG so it is not diverted to your junk mail folder.

Employer Applications

1. The employer completes all fields electronically in the application form.

2. The employer signs the application. Note: a designated signing authority cannot sign the application on behalf of the employer if the training is for the designated signing authority.

3. The employer submits the application form with any required attachments as a scanned PDF to CIGApplication@gov.bc.ca (e.g., if the employer chooses a private trainer the employer would scan both the application form and training provider information).

4. Once all documentation has been received, the employer will receive a reference number for future communication. The employer will be notified of a decision within 60 business days of submission.

5. Upon approval of an application, the Ministry will send the Agreement to the employer as well as a reimbursement claim package including instructions. The employer must read, agree to the terms and conditions of the grant, sign and return the Agreement to CIGAgreement@gov.bc.ca within the specified time.

6. Train the employee(s).

Organizations Acting on Behalf of Employers

In this situation, the organization applies on behalf of a group of employers and the organization becomes the applicant and agreement holder.

- The organization completes all fields electronically in the Organization Acting on Behalf of Employers Application form.

- The organization provides employers with the Employer Certification Form and Participant Information Form (PIF) for completion.

- The organization electronically signs the Organization Acting on Behalf of Employers Application form and gathers the electronically signed Employer Certification Form(s).

- The organization submits the application form, Employer Certification Forms, and any attachments as a scanned PDF (e.g., if the employer chooses a private trainer the organization would scan both the application form and training provider information) to CIGApplication@gov.bc.ca

- Once all documentation has been received, the organization will receive a reference number for future communication. The organization will be notified of a decision within 60 business days of submission.
Upon approval of an application, the Ministry will send the Agreement to the organization as well as a reimbursement claim package with full instructions on how to complete. The organization must read, agree to the terms and conditions of the grant, sign and return the Agreement to CIGAgreement@gov.bc.ca within the specified time.

The organization or employer delivers training according to the training plan.

Submission requirements for Participant Information Forms

Participant Information Forms (PIFs) are required at the time you submit your claim for reimbursement. Find submission instructions below.

For Participants who are currently Employment Insurance or Income Assistance Clients, Participant Information Forms are required no less than 5 business days prior to the start of training. Refer to the CIG General Criteria for details.

Reimbursement claims will not be processed until all Participant Information Forms have been received.

Reimbursement claims must be submitted within 30 business days after training starts. Visit the How To Claim for Reimbursement page for instructions.

Instructions for submitting Participant Information Forms

Each participant must fill in their own Participant Information Form (PIF) electronically, NOT by hand. Each question must be answered for the form to be complete. The form should then be uploaded to the secure upload site.

Because the form collects personal and other sensitive information, the Participant must submit the Participant Information Form to the Ministry using the secure upload site: https://canadajobgrantupload.jtst.gov.bc.ca

*Please click here to visit the Government of British Columbia website for more information.*
Saskatchewan Job Grant

What is Canada Job Grant?

The Canada Job Grant helps employers train new or existing employees for jobs that need to be filled. This flexible program is designed to meet the needs of businesses of all sizes, in all industries and regions.

The Canada-Saskatchewan Job Grant is an employer-driven program that:

- Helps businesses and non-profit organizations train new or existing employees for available jobs.
- Provides more opportunities for unemployed and underemployed workers to receive training.

Through the program, the employer contributes one-third of the training cost, and federal and provincial governments contribute the remaining two-thirds.

Benefits

Employers:

- Select the trainees and the training program.
- Pay one-third of the eligible training costs.

Employ the trainee at the end of training.

Employers can make multiple grant applications to a maximum of $250,000 annually, and up to $10,000 per individual trainee.

Eligibility

Employers:

Private and not-for-profit sector employers are eligible.

Publicly funded organizations such as health regions, post-secondary training institutions, public libraries, municipalities and school divisions are not eligible under the program.

Trainees:

- Must be a Canadian citizen or permanent resident.
- Both new and existing employees are eligible.

Training costs

- Tuition fees charged by the training provider,
- Other mandatory student fees,
- Textbooks,
- Learning materials fees, and
- Examination fees
Training

Training is flexible. Employers choose the training program and mode of delivery that will meet their needs under the following requirements:

- Must be delivered by a third party not affiliated with the employer applicant;
- Must be a minimum of 24 hours in length and completed within a 52 week period;
- Must result in a credential (record of completion, certificate, grade, etc.); and
- Must not replace an employer’s existing investment in training.

Trainers

Third-party trainers could include:

- Post-secondary education institutions,
- Private vocational schools, trade unions and
- Private industry trainers.

How to Apply

Interested employers can use the Eligibility Checklist self-assessment tool to determine eligibility.

Forward the checklist to your local Labour Market Services (LMS) office.

LMS staff will contact you to assist with the completion of the application, and you can proceed with training upon notification of approval.

Eligibility checklist

- Employers are registered in Saskatchewan or a business operating in Saskatchewan.
- Employers confirm that the trainee will be employed upon completion of training and the job is located in Saskatchewan.
- The trainees chosen are Canadians or permanent residents.
- Training is offered by an external, third party training agency. Training is a minimum of 24 hours in length, completed within a 52 week period.
- Training will not be used to maintain a worker’s existing professional designation. Eligible funding for reimbursement consists of:
  - tuition fees
  - mandatory student fees
  - textbooks, software and other required materials
  - examination fees
- Employer is contributing a minimum of 1/3 of total eligible training costs. Small employers (employers with up to 50 employees) may be able to apply trainee wages towards a portion of their contribution.
- The grant will not replace an employer’s existing investments in training.

Please note that the maximum government contribution to a Canada-Saskatchewan Job Grant is $10,000 per trainee. Training costs incurred prior to a CSiG approval are not eligible. If you meet the above requirements, please send this checklist to your local Labour Market Services office listed below. Labour Market Services will contact you to start your application.

*Please click here to visit the Government of Saskatchewan website for more information.*