Grow knowledge and competency through experience with operator training.
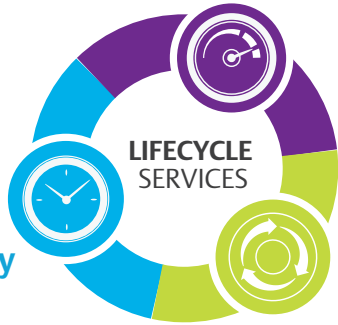
DeltaV™ Operator Training Solutions
Operator training designed to help ensure project certainty.

EMERSON™

Performance

LIFECYCLE SERVICES

Reliability

Maintenance

Lifecycle Dynamic Simulation is a key offering focused on Operator Performance.

LIFECYCLE DYNAMIC SIMULATION

In a project environment where complexity, costs, and change can reduce the certainty of success, you have the power to overcome these challenges. Make training, knowledge transfer, and competency part of the answer.

Skilled personnel solve complex problems, anticipate and eliminate additional costs, as well as accommodate changes so operations run smoothly and consistently.

Drive operational excellence in your facility by fostering the development of talent in your personnel.

DeltaV™ Operator Training Solutions Overview

	DeltaV Operator Training Features	DeltaV Basic Operator Training	DeltaV Essential Operator Training	DeltaV Express Operator Training	DeltaV Elite Operator Training
Basic Training	Instruction	✓	✓	✓	✓
	Instructor Demonstrations	✓	✓	✓	✓
	Hands-On Workshops	✓	✓	✓	✓
	Knowledge Assessments Quizzes	✓	✓	✓	✓
Custom Courseware & Simulation Models	Customer Specific Courseware		✓	✓	✓
	Mimic Tie-Back Modeling		✓	✓	✓
	Customer Specific Simulated Workshops		✓	✓	✓
Deltav OTS Turnkey Solution	DeltaV Operator Training Workstation Hardware / Software			✓	✓
	Control Strategy Verification			✓	✓
	Scenario / Skill Assessments			✓	✓
Lifecycle Dynamic Simulation	Lifecycle Dynamic Simulation			✓	✓
	Project Feasibility Analysis				✓
	Process Design Verification				✓
	Process Modeling				✓
	Optimization and Tuning				✓
	Commissioning and Start-up				✓

DELTAV™

DeltaV™ Basic Operator Training Solutions

OPERATOR TRAINING: GROWING KNOWLEDGE AND COMPETENCY THROUGH EXPERIENCE

DeltaV Basic Operator Training Solution is available in the **traditional classroom** with live instructors and equipment, or in the **virtual classroom environment** with live online instruction and DeltaV distributed control systems (DCS), as well as a new **blended learning environment** that uses state-of-the-art technologies to host training in the cloud.

DELTAV – OPERATOR TRAINING FOR CONTINUOUS OPERATION

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 Display/ 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
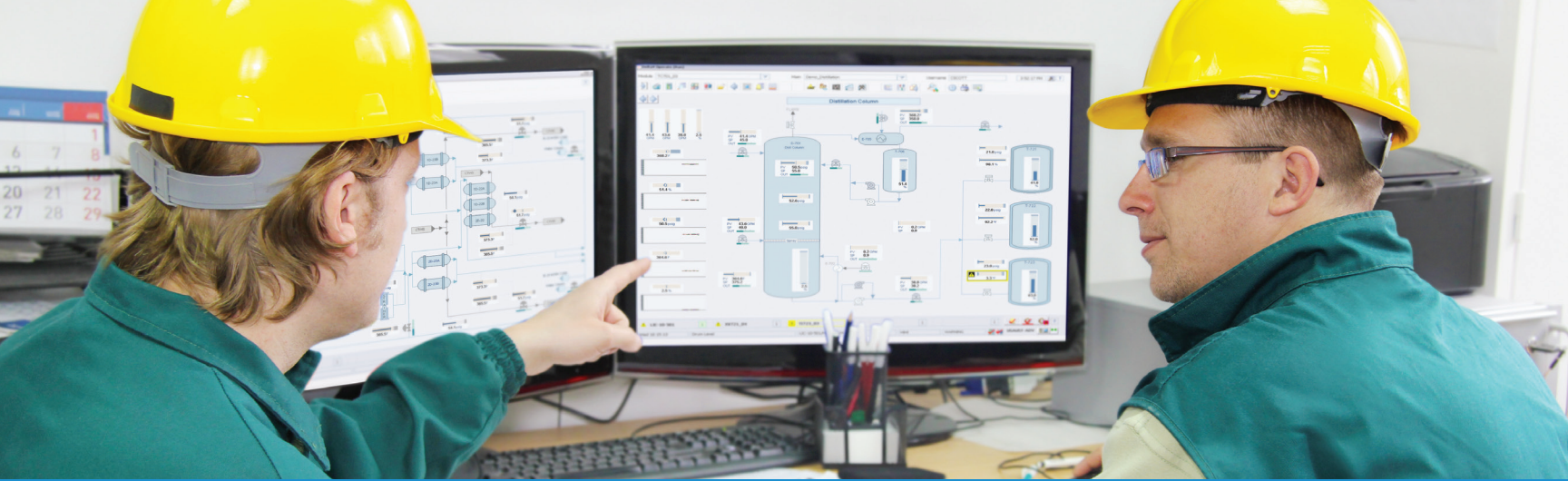
DELTAV – OPERATOR TRAINING FOR BATCH OPERATION

Overview

This 2-1/2 day course uses lectures and hands-on workshops to provide an in-depth overview on operating the DeltaV System. It includes all content in the continuous operation course plus students will:

- Understand basic batch terminology
- Manipulate Unit Module parameters
- Access the Batch Operator Interface
- Run procedures
- Review batch history data topic

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

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DeltaV™ Essential Operator Training Solutions

GROWING KNOWLEDGE AND COMPETENCY THROUGH CUSTOMIZED CURRICULM AND SIMULATION

OPERATOR TRAINING DESIGNED TO HELP ENSURE PROJECT CERTAINTY

The DeltaV™ Essential Operator Training Solution is an affordable and effective training program for your operations personnel. It is a flexible solution that can optionally provide years of training for your workforce via the cloud, without the prohibitive costs of maintaining a training system. DeltaV Essential Operator Training Solution includes instructional materials, customized student curriculum, and workshops all customized to your specific graphics and module types. Student workshops include low fidelity tie-back simulation to demonstrate module functionality and perform workshops.

DeltaV Essential Operator Training Solution is available in the **traditional classroom** with live instructors and equipment, or in the **virtual classroom environment** with live online instruction and DeltaV distributed control systems (DCS), as well as a new **blended learning** environment that uses state-of-the-art technologies to host training in the cloud.

TRADITIONAL CLASSROOM LEARNING ENVIRONMENT (OPTION 1)

The Traditional Classroom option includes one scheduled course conducted by a certified Emerson Educational Services instructor at the customer site, with DeltaV DCS equipment for up to 12 students. Face-to-face instruction provides the best-in-class practice for student interaction and live instructor assistance. An option to increase the number of students is available.

VIRTUAL CLASSROOM ENVIRONMENT (OPTION 2)

The Virtual Classroom option includes one scheduled course conducted by a certified Emerson Educational Services instructor live via the internet, with connection to DeltaV DCS equipment for up to 12 students. An option to increase the number of students is available.

BLENDED LEARNING ENVIRONMENT (OPTION 3)

The Blended Learning option includes recorded instruction and demonstrations by a certified Emerson Educational Services instructor. A dedicated DeltaV system is provided for to up to 25 students and via the cloud. The instruction, demonstrations and DeltaV systems are available 24x7 to each student for period of 12 months after activation. An option to increase the number of students, and expanded length of access to sessions and DeltaV workstations, is available.

DELTAV™

DeltaV™ Essential Operator Training Solutions

COURSE LENGTH: 2 DAYS FOR CONTINUOUS PROCESSES; 2.5 DAYS FOR BATCH PROCESSES

- Fixed Price and Scope (with options available)
- Development Time Required: 6 Weeks for Continuous Processes / 10 Weeks for Batch Processes

TRADITIONAL STUDENT COURSEWARE AND BOOKS

- Student Objectives by Module
- Student Workbooks to Supplement Instructional Delivery
- Integration of Customer-Specific Graphic and Module Types
- Student Workshops Description and Instructions
- Comprehensive Review of Each Course Module's Topic and Content in an Exam Format
- Electronic Media of Curriculum Provided
- 25 Printed Student Manuals (Optional Manuals Available)

INSTRUCTIONAL DELIVERABLE CHOICES

- Traditional Classroom
  - DeltaV DCS sent to the customer site for class to perform workshops and experience hands-on learning practice
- Virtual Classroom
  - DeltaV DCS workstation assigned to each student using GoToMyPC to perform workshops and experience hands-on learning practice with a live instructor
- Blended Learning
  - DeltaV DCS workstation assigned to each student in the cloud to perform workshops and experience hands-on learning and practice
  - Each student will have access to the DeltaV DCS for one year or up to 24 hours run-time on the DeltaV workstation
- Additional time optional and annual renewal available

Cost / Duration
- Fixed Price and Scope
- Six Weeks "Continuous" Development
- 10 Weeks "Batch" Development

Instruction
- 2 Day Continuous / 2.5 Day Batch
- Lectures / Demonstrations
- Review Questions
- Final Exam and Student Tracking (Optional)

Courseware
- Customer-Specific Modules and Graphics
- 25 Printed Manuals
- Electronic Copy

Simulation
- Mimic Tie-Back Model
- Up to 50 Control Modules (> 50 Optional)
- Up to 4 Display Graphics
(For Batch Processes: 100 Control Modules and 6 Display Graphics)

Workshops
- Analog / Discrete Modules
- Regulatory Loop
- Alarms
- Equipment Modules
(For Batch Processes Sequencing: One Operation on One Unit)

Deliverables
- Traditional Classroom
- Virtual Classroom
- Blended Learning

DELTAV SIMULATION FOR WORKSHOPS

- Mimic tie-back simulation for up to 50 (Continuous Processes) / 100 (Batch Processes) Control Modules, with one process area module selected from the customer's database, with I/O simulation to demonstrate module functionality and perform workshops. (More modules optional)
- Use of up to 4 graphic displays for continuous processes / 6 for batch processes (Sequencing for equipment modules optional)

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DeltaV™ Express Operator Training Solutions

GROWING KNOWLEDGE AND COMPETENCY THROUGH SCENARIO-BASED TRAINING

OPERATOR TRAINING HELPS ENSURE SUCCESS

The DeltaV™ Express Operator Training Solution (OTS) is a complete turnkey solution with a fixed scope and a fixed cost. This entry-level dynamic simulation solution includes a process-specific, dynamic simulation-based training platform engineered to provide a fast track, yet long-term, training solution for your operations personnel.

DeltaV Express OTS contains all of the activities of a conventional project, but covers a specific scope of the process with an identical user interface to match your facility. Express OTS includes a customized medium fidelity process model, detailed curriculum courseware, model acceptance and factory acceptance testing activities, design documentation, as well installation and training services. Training in scenarios and malfunctions are included, as are instructor tools for training management.

A FAMILIAR LEARNING ENVIRONMENT

The DeltaV Express OTS simulation environment is identical to your existing or newly configured production system environment. A copy of the system configuration is integrated with the process model. This enables the functionality of the live automation system and the training system to be identical, yet completely non-intrusive. Though focused on a specific scope of the process, the user interface environment can be expanded upon as required and as the process evolves.

Mimic simulation software — Emerson's Dynamic Simulation — builds a world for your operators as they learn experientially. It's a world that looks exactly like your production facility, with the identical design as your process automation system.

- Training & Competency Assessment
- Faster Commissioning & Start-up
- Efficient Regulatory Compliance
- Safer & More Efficient Operations
- Secure Test-bed for New Technology

The DeltaV Express OTS is a complete turnkey solution for improved operator performance.

DELTAV™

DeltaV™ Express Operator Training Solutions

MORE THAN TRAINING

Throughout the four-month Express OTS schedule, the following key activities are covered:

- Up to 800 DeltaV control modules
- Mimic medium fidelity process model
- Virtualized hardware infrastructure
- Integrated instructor functionality
- 30 malfunctions
- 5 scenarios
- Automated training reports
- Model development
- Model Acceptance Test (MAT), Factory Acceptance Test (FAT), and Site Acceptance Test (SAT)
- Train the trainer
- Documentation

CUSTOMIZED CURRICULUM AND COURSEWARE

The DeltaV Express OTS curriculum and courseware includes process configuration and workshops specific to your processes. DeltaV Express OTS will enable operations personnel to:

- Understand the process and DeltaV controls.
- Manipulate control module parameters to operate the process.
- Rationalize and manage alarms.
- Monitor process performance and optimize control system responses.
- View real-time and historical trends.
- Use best practices for handling abnormal situations.
- Know start-up and shut down procedures.
- Use the training system for development and testing. Personnel skills on DeltaV system operation are verified through hands-on proficiency practice and evaluation of performance to standards. Personnel learn how to respond to demands of initialization, failure scenarios and malfunctions. Training reports are auto-generated for review by the instructor.

Cost / Duration	Instruction
• Fixed price and scope • 16 weeks	• MAT • FAT • SAT

Courseware	Simulation
• Customer-Specific Modules and Graphics • 25 Printed Manuals • Electronic Copy	• Mimic Medium Fidelity Process Model • One Unit • Up to 800 Control Modules • 30 Malfunctions • Five Scenarios

Workshops	Deliverables
• Process Performance and Response • Abnormal Situation Response • Start-up and Shut Down Procedures	• DeltaV Process Models • DeltaV Virtual Studio • Workstation hardware/ software Installation • Documentation

DeltaV Express OTS is an effective platform for training operations personnel.

TRAINING TOOLS

Your Express OTS package includes a virtualized DeltaV hardware infrastructure which can expanded as required in the future.

The following is included within the fixed cost-fixed scope solution:

- Dell host server
- DeltaV Virtual Studio
- One Professional PLUS station
- One application station
- One operator station
- Dual widescreen monitors
- Keyboard and mouse

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DeltaV™ Elite Operator Training Solutions

GROWING KNOWLEDGE AND COMPETENCY THROUGH LIFECYCLE DYNAMIC SIMULATION

IMPROVED PROJECT CERTAINTY

Lifecycle Dynamic Simulation has become a key component to improve project execution, reduce risk, improve project deliverables, and contribute to perfect execution on projects.

Lifecycle Dynamic Simulation System is a dynamic verification tool for process design, process controls and process optimization during the lifecycle of the plant and the project.

FEASIBILITY ANALYSIS AND PROCESS DESIGN BEGIN THE PROJECT

The beginning phase of using dynamic simulation for project certainty and perfect execution is design.

Process engineers use dynamic simulations to size equipment, verify E&I, explore control philosophies, conduct engineering studies, and evaluate alternative designs all intended to provide the best operating unit for the requirements and the business. Having a well thought out and verified design is the foundation for company safety and production need going forward.

COMMISSIONING AND START-UP/OPERATIONS

The next phase of use for dynamic simulation is during ICSS design, commissioning, startup, and initial operation.

Engineers use dynamic simulation to validate the control configuration, pre-test the SIS configuration, pre-tune control loops, run an integrated operational test optimization, provide pre-commissioning and commissioning support and train operator on start-up and abnormal situations.

MAINTENANCE, PLANT MODIFICATIONS AND OPTIMIZATION

The final phase of the lifecycle of dynamic simulation use is system expansion, and optimization of the running facility.

The Training Manager and Plant Engineers continue to use dynamic simulation along with the Operator training system to maintain certification, test plant modifications and to optimize the operation. Investigation of abnormal situation and adding training for this keep the system current and a viable tool for plant operation.

Project Feasibility Analysis → Process Design → ICSS Configuration → Commissioning/Start-up → Operation/Maintenance and Support → Plant Modifications

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DeltaV™ Elite Operator Training Solutions

The six highlights of Elite OTS are listed below. Project Certainty is improved when configurations can be tested, operators can be trained, startups can be practiced, configuration code can be verified, and when plants can be improved last-minute without schedule impact.

Engineering Test Tools for Perfect Project Execution

Efficient Regulatory Compliance

Faster Commissioning & Smoother Start-ups
Faster Commissioning & Smoother Start-ups

Operator Training

Safer Optimized Operations

Tool for Plant Improvement

Benefits and features of the Elite operator training solution are outlined below.

Design Studies	**Training Program**	**Model**
• FEED Studies • Validate Design • Verify Equipment Sizing • Evaluate Alternative Control Strategies	• Instructor Led • Qualitative and Quantitative Testing • Grading and Scoring • Classroom or Virtual • Customer Courseware • 3D AR for Outside Operators	• High Fidelity • Medium Fidelity • Multiple Process Simulation Software Options
Commissioning and Start-up	**ICSS Verification**	**Operation and Maintenance**
• Verify Operating Procedures • Abnormal Scenario Response • Malfunctions Practice • Pre-Tune Controllers • Start-up and Shutdown Testing	• Test Configuration and Graphics • Test Start-up Procedures • Test Complex and Integrated Controls • Test Batch Operations	• Operation Training • SIS and HMI Function Responses • De-bottlenecking Studies • Assess New Changes

EMERSON™

Drive operational excellence in your facility by fostering the development of talent in your personnel.

Achieve Operational Excellence through Development, Testing, and Training Simulation. Comprehensive DeltaV system simulation for development, testing and training applications.

Learn more at: **www.emerson.com/DeltaVsimulation.**

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