

Valmet DNA DCS Engineering

COURSE CONTENT

GET IN TOUCH



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About Course

Valmet DNA DCS Engineering Training provides a structured understanding of engineering activities involved in configuring and supporting Valmet DNA-based process automation systems. The curriculum covers system architecture, engineering tools, I/O configuration, control applications, process control strategies, operator interfaces, alarms, communication, diagnostics, and project implementation. Practical exercises connect individual engineering concepts with realistic plant automation requirements, making the training relevant for professionals involved in DCS engineering, commissioning, maintenance, and process control.

Module 1: Introduction to Valmet DNA DCS

- ✓ Overview of Distributed Control Systems
- ✓ Introduction to Valmet DNA
- ✓ Valmet DNA applications in process industries
- ✓ DCS engineering concepts
- ✓ Control system hierarchy
- ✓ Engineering and operator environments
- ✓ Overview of the engineering lifecycle

Module 2: Valmet DNA System Architecture

- ✓ Valmet DNA architecture overview
- ✓ System nodes and major components
- ✓ Process control environment
- ✓ Operator environment
- ✓ Engineering stations
- ✓ Application and information servers
- ✓ Network architecture
- ✓ Data flow within the control system
- ✓ Redundancy concepts and system availability

Module 3: Engineering Environment and Tools

- ✓ Introduction to the engineering environment
- ✓ Engineering database concepts
- ✓ Project structure and organization

- ✓ Navigation within engineering tools
- ✓ Engineering objects and libraries
- ✓ Object properties and configuration
- ✓ Naming conventions
- ✓ Copying and reusing engineering objects
- ✓ Engineering data management
- ✓ Configuration documentation

Module 4: Process I/O and Hardware Configuration

- ✓ Process I/O architecture
- ✓ Analog input and output signals
- ✓ Digital input and output signals
- ✓ I/O channel configuration
- ✓ Signal definitions and attributes
- ✓ Signal scaling and engineering units
- ✓ Input signal processing
- ✓ Output signal handling
- ✓ Status and quality information
- ✓ Hardware-to-software signal mapping
- ✓ I/O verification concepts

Module 5: Process Control Application Engineering

- ✓ Process control application structure
- ✓ Function-based control engineering
- ✓ Creating control applications

- ✓ Application modules and objects
- ✓ Signal connections
- ✓ Logic functions
- ✓ Arithmetic and calculation functions
- ✓ Comparators and selectors
- ✓ Timer and counter functions
- ✓ Application execution principles
- ✓ Application modification
- ✓ Configuration checking and validation
- ✓ Reusable engineering concepts

Module 6: Control Loops and Regulatory Control

- ✓ Regulatory control fundamentals
- ✓ Feedback control concepts
- ✓ PID control configuration
- ✓ Process variable configuration
- ✓ Setpoint handling
- ✓ Controller output configuration
- ✓ Manual and automatic operating modes
- ✓ Controller limits
- ✓ Cascade control concepts
- ✓ Ratio control concepts
- ✓ Split-range control overview
- ✓ Controller tracking
- ✓ Loop testing and verification
- ✓ Control loop troubleshooting

Module 7: Sequence and Interlock Engineering

- ✓ Sequence control fundamentals
- ✓ Sequential process operations
- ✓ Start and stop sequences
- ✓ Step and transition concepts
- ✓ Conditional logic
- ✓ Equipment permissives
- ✓ Process interlocks
- ✓ Trip logic
- ✓ Motor and equipment control logic
- ✓ Failure handling
- ✓ Sequence status monitoring
- ✓ Testing sequence applications
- ✓ Troubleshooting sequence logic

Module 8: Operator Interface and Display Engineering

- ✓ Operator interface architecture
- ✓ Principles of process visualization
- ✓ Process display configuration
- ✓ Display objects and graphical elements
- ✓ Dynamic process values
- ✓ Equipment status representation
- ✓ Operator command functions
- ✓ Faceplates and control dialogs
- ✓ Navigation between process displays

- ✓ Display hierarchy
- ✓ Process overview displays
- ✓ Detailed operating displays
- ✓ Testing operator interactions
- ✓ Display engineering practices

Module 9: Alarm, Event, and Trend Configuration

- ✓ Alarm management concepts
- ✓ Process alarm configuration
- ✓ Alarm limits and priorities
- ✓ Alarm states
- ✓ Alarm acknowledgement concepts
- ✓ Alarm presentation
- ✓ Event configuration
- ✓ Event monitoring
- ✓ Historical process information
- ✓ Trend configuration
- ✓ Real-time trends
- ✓ Historical trends
- ✓ Selecting process variables for trending
- ✓ Using alarms and trends for process analysis

Module 10: Communication, Networks, and System Integration

- ✓ DCS communication fundamentals
- ✓ Valmet DNA network concepts
- ✓ Communication between system nodes
- ✓ Process network considerations
- ✓ Data exchange principles
- ✓ Integration with field devices
- ✓ Interface concepts for external systems
- ✓ Industrial communication protocols overview
- ✓ OPC communication concepts
- ✓ Communication diagnostics
- ✓ Network fault identification
- ✓ Integration considerations for plant systems

Module 11: Diagnostics, Testing, and Troubleshooting

- ✓ System diagnostic concepts
- ✓ Engineering diagnostics
- ✓ Process application diagnostics
- ✓ Signal monitoring
- ✓ I/O troubleshooting
- ✓ Control loop troubleshooting
- ✓ Sequence and logic troubleshooting
- ✓ Communication diagnostics
- ✓ Alarm-related troubleshooting

- ✓ Identifying configuration errors
- ✓ Online monitoring concepts
- ✓ Application testing
- ✓ Fault isolation techniques
- ✓ Engineering change verification

Module 12: Engineering Project, Commissioning, and Best Practices

- ✓ DCS project engineering workflow
- ✓ Understanding project requirements
- ✓ Engineering database preparation
- ✓ Control philosophy implementation
- ✓ I/O engineering workflow
- ✓ Application configuration workflow
- ✓ Display engineering workflow
- ✓ Engineering review and validation
- ✓ Factory Acceptance Test (FAT) concepts
- ✓ Site Acceptance Test (SAT) concepts
- ✓ Loop checking
- ✓ Functional testing
- ✓ Commissioning activities
- ✓ Engineering change management
- ✓ Backup and configuration management
- ✓ Project documentation
- ✓ Handover considerations

- ✓ Practical engineering scenario