

DAY 1

Review of Process Control and Introduction to DCS

- Review of sensors, instrumentation, and process control systems
- Control Algorithms
 - Proportional (P)
 - Proportional and Integral (PI)
 - Proportional, Integral, and Derivative (PID)
- Distributed Control Systems: Introduction
- Overview, Features, Advantages, Where used
- Functions, Architecture, I/O, components,
- Hardware, software, system interfacing
- Programmable Logic Controller (PLC) – brief overview
- supervisory control and direct digital control
- Supervisory Control and Data Acquisition (SCADA) – brief overview
- DCS, PLC and SCADA compared

DAY 2

DCS Configuration and Networking

- Distributed Control Systems: Structure and Configuration
- DCS block diagrams, components, architecture, redundancy concepts
- DCS hardware configuration
- DCS Hardware & Software Internals
 - Process variables, software variables, tags
 - Human Machine Interface (HMI)
 - Alarms, Trends
 - Databases
- Basic DCS Controller Configuration
- Sequential Controllers for Batch Processing
- Controllers for Continuous Processes: Function Blocks
- Hierarchical Structure of control systems: ISA-95
- Data Communications and Networking

- Signal Transmission
- Physical Network Structures
- Logical Network Structures
- Communication Standards
- Fieldbus Operation: Foundation Fieldbus, Profibus
- Wide Area Network (WAN) communications: Modbus
- Control in the Field (CIF)
- DCS applications and case study (Oil & Gas)

DAY 3

HMI, Alarms, and DCS Operation

- Human Machine Interfaces: Introduction, features, requirements
- Plant mimic and animation
- DCS Operator Stations
- Interface Categories
- Recorders, Loggers, Trend Displays, and Data Archiving
- HMI in the Control Room and in the Field: Mobile and remote devices
- Alarm Management
 - Key Requirements
 - Alarm System Functions
- Alarms philosophy, control & Management
- Development and Applications, Logs, trends and reports
- DCS Operation
- Operational view of DCS
- Role of operators
- Integration and Optimization of DCSs
- DCS Configuration
- DCS Integration

DAY 4

Maintenance and Troubleshooting

- Maintenance Considerations
- Maintenance Requirements: System and Components

- Procedure for Checking Control Loop Calibration
- Identify proper tools and test equipment for troubleshooting

Troubleshooting

- Proper troubleshooting methods
- Identify typical communication malfunctions and faults
- Identifying failures, malfunctions, and faults
- Diagnostics through DCS Modules, and Programs (code)
- Diagnostics through Internal internal Variables and Bits of DCS
- Diagnostics of Communication faults

DAY 5

Advanced Process Controllers

- - Feed forward Control
 - Cascade Control
 - Statistical Process Control
- Basics of advanced process control and optimization
- Latest DCS Trends
 - Monitoring and control in the Field
 - Industrial Internet
 - Internet of Things
 - Mobile and remote devices
- Cloud Processing
 - Monitoring and control in the Cloud