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Course Name

Distributed Control System (DCS) Application, Operation & Troubleshooting

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Sector Name

Instrumentation & Controls

Document Type

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Distributed Control System (DCS) Application, Operation & Troubleshooting

Course Introduction

The Distributed Control System (DCS) Training Course is designed for engineers, technicians, and industrial professionals who want to master process automation and control systems. DCS technology is widely used in industries such as oil & gas, power generation, chemical, and manufacturing for monitoring and controlling complex processes.

This course covers essential topics including DCS architecture, system configuration, process control, and instrumentation integration, enabling participants to understand how distributed systems operate to maintain stability and efficiency. Learners will explore key components such as controllers, input/output modules, communication networks, and operator interfaces.

Participants will also gain practical knowledge in troubleshooting, system calibration, performance monitoring, and process optimization, which are critical for ensuring safe and reliable operations. The training emphasizes hands-on scenarios and real-world applications to help professionals develop problem-solving skills for industrial automation challenges.

Additionally, the course addresses alarm management, safety interlocks, control strategies, and regulatory compliance, allowing organizations to maintain operational excellence while reducing

downtime and risk. Participants will understand how DCS contributes to enhanced process control, productivity, and operational efficiency.

This program is ideal for control engineers, instrumentation engineers, process engineers, and industrial automation professionals who want to implement and manage distributed control systems effectively in modern industrial environments

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Target Audience

✓ Control & Instrumentation Engineer
✓ Controls Technologist
✓ Instrumentation Technician / Systems Control Tech
✓ Senior Control & Instrumentation Engineer
✓ Maintaining Equipment Engineer
✓ Facilities I&E / Controls Engineer
✓ Offshore Instrumentation Engineer

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Learning Objectives

- ✓ Participants will be able to understand the principles of maintenance and troubleshooting of (DCS) hardware and software, diagnose (DCS) component status, and also manage and respond to process interface, including Operation and Monitoring.
- ✓ To be able to program to develop a monitoring interface system.
- ✓ Engineering programming including Function Block and Human Machine Interface, access operator interface display, to manipulate various control modules, operating system trending, manage and respond to process alarm/event, monitor process performance, view real-time and historical trend data, diagnose (DCS) component status, etc.

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Course Outline

✓ 01 Day One

Module (01) Review of Classic Computer Control with Analog System:

- ✓ Supervisory set point control
- ✓ Direct Digital Control
- ✓ Computer /Manual & Computer /Manual /Automatic Station
- ✓ Pulse count/pulse Duration computer I/Q

Module (02) Evolution to DCS:

- ✓ DCS versus SCADA and PLC System
- ✓ The microprocessor and networking technologies
- ✓ Evolution to DCS (continued)

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Course Outline

✓ 02 Day Two

Module (03) Basic DCS Architecture:

- ✓ Levels of communication
- ✓ Controllers, I/Q
- ✓ Operator consoles (HMI)
- ✓ Security (redundancy, single loop integrity, etc
- ✓ Error checking and reporting

Module (04) Network technologies:

- ✓ Polling, Token Ring
- ✓ Exception Reporting

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Course Outline

✓ 03 Day Three

Module (05) Controllers:

- ✓ Basic Control
- ✓ Basic Control Theory
- ✓ Types of DCS controllers
- ✓ Single / Dual loop
- ✓ Multi loop
- ✓ Redundancy Schemes
- ✓ CPU, Memory, Function Code libraries
- ✓ Multi-tasking, scanning priorities, rates
- ✓ I/Q Data bus control
- ✓ Peer-to-peer communication
- ✓ Communication with HMI
- ✓ Control Algorithms, function codes
- ✓ Tag Driven vs. Address Driven systems
- ✓ Configuration Tools
- ✓ Controllers Maintenance
- ✓ Controllers Troubleshooting & Repair

Module (06) Process Control Units:

- ✓ I/Q Backplanes

- ✓ Communication Modules
- ✓ Network Redundancy
- ✓ I/Q Types
- ✓ I/Q Redundancy
- ✓ Intrinsic Safety
- ✓ Active & passive barriers
- ✓ Other techniques

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✓ 04 Day Four

Module (07) Operator Interface (HMI):

- ✓ Process Display
- ✓ Graphic Displays
- ✓ Faceplate Displays
- ✓ Trend Displays
- ✓ Alarm Displays
- ✓ Historical Displays
- ✓ Operator Keyboards
- ✓ Layout, functionality
- ✓ Pointing devices
- ✓ Touchscreen
- ✓ Mouse, Trackball

Module (08) Operator Interface Architecture:

- ✓ Graphical configuration
- ✓ Historical Database
- ✓ Trending system (Real-time, historical)
- ✓ Scanning, polling, and exception reports
- ✓ Open system (Upper network connection)

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✓ 05 Day Five

Module (09) Interfacing to the DCS:

- ✓ Computer Interface
- ✓ Data throughput rates
- ✓ Communication standards
- ✓ Drivers
- ✓ PLC Interfaces
- ✓ Drivers
- ✓ OPC Standard
- ✓ Types of data
- ✓ Batch controller interfacing
- ✓ Recipes
- ✓ Batch languages
- ✓ Partitioning between computer and controller (recipe storage)
- ✓ Power system integrity
- ✓ Configuration retention
- ✓ Initialization, synchronization of the system after a loss of power

Module (10) System Diagnostics:

- ✓ Error message
- ✓ Problem isolation

- ✓ Error message
- ✓ Problem isolation

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
June 28, 2027	July 2, 2027	5 days	4950.00 $	Spain , Madrid
Sept. 21, 2026	Sept. 25, 2026	5 days	4250.00 $	UAE , Dubai
Dec. 14, 2026	Dec. 18, 2026	5 days	4250.00 $	UAE , Abu Dhabi
March 15, 2027	March 19, 2027	5 days	4250.00 $	UAE , Dubai

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