DISTRIBUTED CONTROL SYSTEMS (DCS)

TRAINIT ACADEMY

COURSE TITLE

DISTRIBUTED CONTROL SYSTEMS (DCS)

COURSE DATE/VENUE

14 - 18 April, 2019

Dubai, UAE

COURSE REFERENCE

ICE103

COURSE DURATION

05 Days

DISCIPLINE

Instrumentations & Control Engineering

COURSE INTRODUCTION

The course is design for operation staff, so the operator will learn the fundamental of DCS and how to monitor and control the site process operation through the DCS at control room

This course will cover the practical applications of the modern distributed control system (DCS). Whilst all control systems are distributed to a certain extent today and there is a definite merging of the concepts of DCS, Programmable Logic Controller (PLC) and SCADA.

COURSE OBJECTIVE

Upon successful completion of this course, the delegates will be able to:

- ✓ DCS function in Fertilizer, petrochemical and Oil/Gas facilities.
- ✓ DCS main elements.
- ✓ Distributed control system architecture.

- ✓ Control loop concept as a control blocks.

- ✓ Typical continuous control loop (Analogue loop).

- ✓ Typical Discrete control loop.

- ✓ DCS power supply.

- ✓ Power interruption effect on DCS.

- ✓ Advantages and disadvantages of DCS.

- ✓ DCS alarm management system.

- ✓ DCS Loop Drawing, typical examples.

- ✓ LERPCU Cabinet typical layout.

- ✓ PCU cabinet architecture.

- ✓ Review sensors, instrumentation, and process control

- ✓ Cover DCS Organization and operation

- ✓ Summarize the most important Networking, HMI, and Alarm features of DCSs

- ✓ Highlight Maintenance and Troubleshooting procedures and issues

- ✓ Review Advanced Process Controllers in DCSs

- ✓ Cover Latest trends related to DCSs

COURSE AUDIENCE

This course is intended for DCS operators, Control Room Operation Staff, site Operators in the industrial field like fertilizer, petrochemicals

The course can be as refresh for managers, engineers, and technicians requiring knowledge of sensors, control, and automation in a distributed control environment. A section on maintenance and troubleshooting methods is also included. Personnel in operations will also find this an invaluable course.

COURSE CONTENT

Day 1 Select the Precise Process Control System

- ➢ Types of Industrial Control systems

- ➢ Distributed Control Systems (DCS) or Programmable Logic Controllers (PLC)

- ➢ Benefits of Selecting the "Right" Automation Technolog

- ➢ system architectures

- o Field devices
- o Input/output modules
- o Controllers
- o Human machine interface (HMI)
- o Engineering „ Supervisory control
- o Business integration
- ➢ The Seven Questions to Ask Yourself Before Choosing a System
- ➢ How to Select a Process Control System for a Hybrid Application

Day 2 Review of Process Control and Introduction to DCS

- Review of sensors, instrumentation, and process control systems
- Control Algorithms
- Distributed Control Systems: Introduction
- Overview, Features, Advantages, Where used
  - o Functions, Architecture, I/O, components,
  - o Hardware, software, system interfacing
- supervisory control and direct digital control
- Supervisory Control and Data Acquisition (SCADA)
- Brief overview of DCS, PLC and SCADA compared

Day 3 DCS Configuration and Networking

- The Distributed Control Concept
- DCS Database
- Inputs
- Outputs
- Other Elements
- Distributed Control Systems: Structure
- Data Communications
- Data 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
- Data Communications and Networking

Day 4 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

Day 5 DCS Operation

- Operational view of DCS
- Role of operators
- Integration and Optimization of DCSs
- DCS Configuration
- DCS Integration
- Alarms phylosophy, control & Management
- Development and Applications, Logs, trends and reports
- Procedure for Checking Control Loop Calibration
- Maintenance Considerations
- Maintenance Requirements: System and Components
- Proper troubleshooting methods
- Identify typical communication malfunctions and faults

- Identifying failures, malfunctions, and faults
- Diagnostics through DCS Modules, and Programs (code)
- Diagnostics of Communication faults

COURSE CERTIFICATE

TRAINIT ACADEMY will award an internationally recognized certificate(s) for each delegate on completion of training.

COURSE FEES

$4,150 per Delegate. This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

COURSE METHODOLOGY

The training course will be highly participatory and the course leader will present, guide and facilitate learning, using a range of methods including formal presentation, discussions, sector-specific case studies and exercises. Above all, the course leader will make extensive use of real-life case examples in which he has been personally involved. You will also be encouraged to raise your own questions and to share in the development of the right answers using your own analysis and experiences. Tests of multiple-choice type will be made available on daily basis to examine the effectiveness of delivering the course.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Case studies & Practical Exercises
- 10% Role Play
- 10% Videos, Software or Simulators (as applicable) & General Discussions