

DISTRIBUTED CONTROL SYSTEMS (DCS) (REF:OTSDCS001)

Course Objectives

To gain a detailed understanding of the Distributed Control Systems.

Course Description

This course will cover the practical applications of distributed control systems. Included is the relationship between programmable logic controllers and the DCS. Further included is the importance of Human Computer Interfaces (HMI) and advanced control strategies, which would not be possible without the application of a computer. This course is non-specific but will include a number of manufacturers DCS systems, such as Honeywell TDC rage. Each delegate will receive a comprehensive course manual. The concept of field buses is introduced with some study of Foundation of assets management as a tool for proactive maintenance systems.

Who Should Attend

This course is intended for engineers and technicians requiring knowledge of automation and distributed control. A section on trouble shooting methods is also included. Personnel in operations will also find this an invaluable course.

Pre-Requisites

All Attendees should have a sound power generation and electrical background.

Course Outcome

At the end of this course you will be able to maintain a distributed control system.

Course Outline

Day 1

Introduction

Computer Interfacing

Interfacing of a Computer to a Control Loop
Computer Supervisory Control System
System Elements
Differences Between DCS, DDC and CSC Systems
Layout of a DCD System including communication paths
Data Communication
DCS Highway
Priority for System Devices
Polling Techniques
Error Checking Techniques
Basic Controller
Identifying Circuit Boards
Central Processing Unit (CPU)
Types of Memory Used

Day 2

Basic DCS Controller Configuration

Control Modes Available within each controller slot
Tracking and Initialisation in Control slot used for Cascade Control
Past Mode Recall
Control Algorithms
Advanced Controllers
Digital Capabilities of Advanced Controllers
Sequential Programs for Batch Processing
Advanced Controller in Modulating Control Application
Logic Block Functions in the Advanced Controller



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Day 3

Uninterrupted Automatic Control

- Basic and Advanced Controllers in a UAC System
- Reverse Controller in UAC Systems
- Data Paths in a UAC System
- Prioritised Redundancy in DCS
- Process Units
- The Process unit as a data highway within a DCS
- The Process of Analog, Digital and Counter Input Data
- The Process Unit as an Output Device (Generation of analog and digital outputs)
- The operator Interface
- The Operators Process Window
- Multiple Video Display Units
- Operator Display Configurations
- Keyboard Entry of data
- Touch Screens

Day 4

Advanced DCS Systems

- Limitations of a Data Highway Based DCS
- Fieldbuses
- Foundation Fieldbus and Siemens Profibus
- The Use of Local area Networks
- Gateway Modules as a means of Communication
- Other LAN based Modules
- Distributed Control System Reporting
- Multi-Screen displays, Cross Screen Invocation and Linking
- Alarm Reporting, Types of Alarm Generated and Acceptance of Alarms
- Reporting, Trending and Logging on a DCS System
- DCS Configuration
- System Data Files
- Data Configuration/ DCS area Database
- Multiple personalities attached to operators parameters
- Security measures as attached to Operating Parameters

Day 5

Advanced Control Strategies

- Box Level Control
- Sequence Programs Linked to Control from Data Highway Box Level
- Practical Examples of Level 2/3 Control
- Maintenance Considerations
- Maintenance Requirements of System and System Elements
- Procedure for Checking Control Loop Calibration
- IN-built Diagnostics and Maintenance Diagnostic Routines
- Requirements for Installation of UPS System

Course Review and Feedback

