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
Date Communication
DCS Highway
Priority for System Devises
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 Liking
Alarm Reporting, Types of Alarm Generated and Acceptance of Alarms
Reporting, Trending and Logging on a DCS System
DCS Configuration
System Date 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