

Automation Project Engineering

COURSE DESCRIPTION:

Automation systems are being extensively used in almost all industries including oil and gas, petrochemicals, fertilizer, chemical, power, steel, food & beverages, cement, etc. for monitoring, regulatory and sequential control, safety, advance process control, reports and various other tasks including that of connectivity to office automation for Enterprise Resource Planning (ERP). An appropriate automation is a prerequisite for being competitive in the global market. As for most of the automation systems, the technical possibilities provided have grown dramatically during last few years. However the techniques to specify customer and user requirements in terms of functionality, performance etc. are not very well developed. An appropriate automation project design and engineering is necessary to ensure the best performance. It means that the automation engineering has to be driven by the team of experts from various departments viz. process, operations, maintenance, projects, instrumentation, electrical, mechanical and piping etc. in co-operation with the automation vendor. This is an introductory course, which aims to build a good understanding about the basics of Automation Project Engineering and it focuses on providing the practical aspects of detailed design for field instrumentation, control panel and control system integration.

COURSE OBJECTIVES

Upon Completion of this course the participant will be able to

- Understand role of automation & understand ingredients for successful automation
- Learn automation project stages and team responsibilities
- Develop knowledge about instrumentation documentation including P & ID, instrument specifications, instrument index sheets, hook up diagrams etc.
- Learn field instrumentation documents including loop wiring diagrams, junction box schedule, cable schedule, instrument installation sketches etc.
- Learn control panel drawings including panel wiring diagrams, panel layout and design, GA and cutout drawings etc.
- Understand project engineering and management techniques and related documentation including project S curve, MTO, progress reports and review techniques, quality management, documents version control, vendor co-ordination etc.
- Have a brief exposure to Hierarchical Structure of Automation and Control Systems

WHO SHOULD ATTEND

Instrumentation, Electrical, Mechanical and Process Engineers, Project Engineers, Maintenance Engineers and Supervisors interested to work in the field of Automation and Process Control. The course will also definitely be beneficial for the all the other department people concerned with the plant operations, production, maintenance and safety. It would be also useful for the procurement and quality personnel.

Training Methodology

Training will be delivered through lectures and demonstration with emphasis on practical examples and case studies. Experienced instructor is provided to guide the participant using demonstrations and hands on lab exercises so that they are prepared to work confidently in the field of automation.

THE INSTRUCTOR

Mr. Sudhir Panditrao

The faculty for this course, Mr. Sudhir Panditrao has done his graduation and masters in instrumentation engineering with specialization in process instrumentation.

During his professional career spanning 22 years, Mr. Panditrao has worked in the areas of instrumentation and automation design, detailed engineering, projects, installation and commissioning at site for variety of industry applications. He has experience of working in the Middle East as a profit center head that included international projects, sales

and marketing in instrumentation and industrial packaging. He has worked as a consultant to various leading international organizations.

Mr. Panditrao has carried out training in the areas of instrumentation, industrial automation, PLC, DCS, SCADA, advanced process control, automation project engineering etc. for many professionals, students and professors from several leading companies, engineering colleges and institutes. He has worked as an Asst. Professor with one of the leading technical institutes and has published many papers. He has presented a paper at IEEE Conference on Advance Process Control at Vancouver, Canada in May 2005.

COURSE OUTLINE

Module 1

Evolution of Process Control/ Automation

Role of automation

Ingredients for successful automation

Current Scenario - PLC, SCADA and DCS based automation

Hierarchical Structure of Control Systems

Automation project stages and team responsibilities

Development of URS and FDS

Module 2

Instrumentation documentation

P & ID

Instrumentation symbols

Instrument specifications

Instrument index sheet

Hook up diagrams

Calibration records

Test and inspection reports

Module 3

Field instrumentation documents

Loop wiring diagrams

Junction box schedule

Cable specifications

Cable trays, accessories and fittings

Cable schedule

Instrument installation sketches, accessories and fittings

Instrument air-piping layout, accessories and fittings

Module 4

Control panel drawings

Panel and field wiring

Panel layout and design

GA and cutout drawings

Power distribution

Control system documents

Control panel design, specifications and selection

Module 5

Project engineering and management techniques

Project planning, project S curve

MTO, BOM

Progress reports and review techniques

Quality management

Documents version control

Vendor co-ordination

Installation and commissioning procedure

Loop checking

FAT, SAT

Performance monitoring