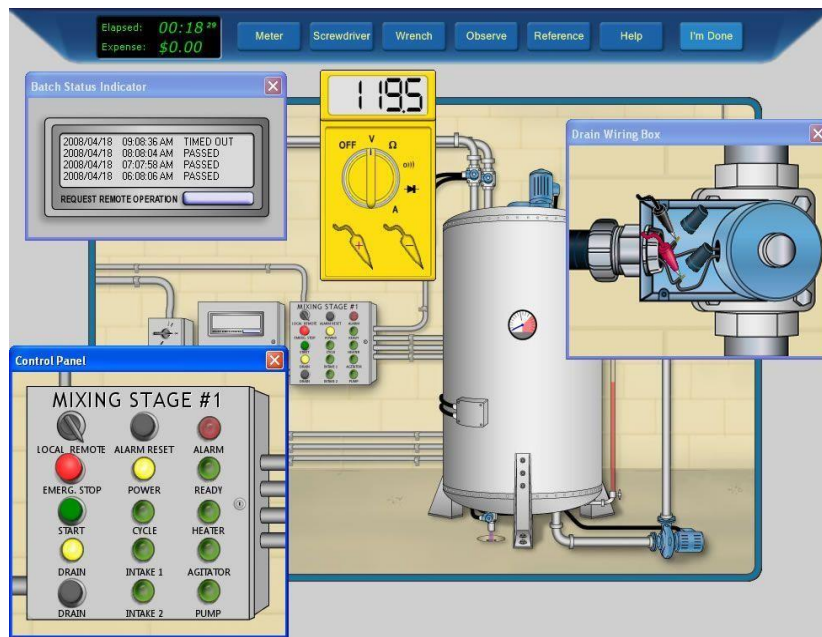




المركز العالمي للتدريب والتطوير
International Centre For Training & Development



ICE025

Industrial Process Control and Measurement



ACTVET
Abu Dhabi Centre for
Technical and Vocational
Education and Training

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Course Introduction:

Have you ever wondered about getting a thorough introduction to the fundamentals of instrumentation, industrial automation and control; thus allowing you to work and perform simple tasks in this key area? In attending this workshop, this could be the opportunity to walk out with a great grounding in the basics of this exciting field which is rapidly changing the way all plants operate. The constant drive to cut costs means that as an operator you will be increasingly having to have more skills and know-how in the plant instrumentation and process control area.

This course represents a tremendous opportunity to gain expertise in all the key areas of the fast growing area of industrial automation. Presented by an expert in the area but who is passionate with getting the key chunks of know-how and expertise across to you in a simple understandable manner which you can immediately apply to your job. This is most definitely not a boring lecture style presentation but an intensive learning experience where you will walk away with real skills as a result of the hands-on practical exercises, calculations, case studies and group sessions to ensure an understanding of the concepts and ideas discussed. You will undertake practical sessions at approximately 20 to 30 minute intervals to maximize the absorption rate.

You will leave this workshop with a strong understanding of the key concepts in instrumentation, process control, SCADA and PLCs.

Course Objectives:

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

- ✓ Extend their understanding of their roles and the key contribution they make to organizational success
- ✓ Review their working relationships and managing network
- ✓ Review and develop their personal organization, communication and interpersonal skills
- ✓ Develop action plan to help themselves, their bosses and other colleagues work in more effective and efficient ways.
- ✓ Able to identify safety hazards in the office and implement better office layout and housekeeping
- ✓ Manage time for him / herself and others as well
- ✓ Improve customer service
- ✓ Organize office systems

Who Should Attend?

This course is intended for anybody with an interest in gaining know-how in the full range of instrumentation, process control, PLCs, SCADA and P&ID documentation, this will range from operators, trades personnel, procurement staff, sales staff, technicians and engineers from other backgrounds/disciplines, such as mechanical, electrical and civil. Even the plant secretary who is keen to have a good understanding of the key concepts would benefit. Managers who are keen to understand the key workings and the future of their plants would also benefit from this training.

Course Outline:

Day 1:

PRE TEST

INTRODUCTION

- Overview of instrumentation and control
- Key building blocks of PLCs and SCADA systems
- Outline of the workshop

INTRODUCTION TO PROCESS MEASUREMENT

- Basic measurement concepts
- Definition of terminology
- Measuring instruments and control valves as part of the overall control system

PRESSURE MEASUREMENT

- Principle of pressure measurement
- Pressure transducers and elements

LEVEL MEASUREMENT

- Principles of level measurement
- Simple sight glasses
- Hydrostatic pressure
- Ultrasonic measurement
- Electrical measurement
- Density measurement

Day 2:

TEMPERATURE MEASUREMENT

- Principles of temperature measurement
- Thermocouples
- Resistance Temperature Detectors (RTD's)

- Thermistors

FLOW MEASUREMENT

- Principles of flow measurement
- Open channel flow measurement
- Oscillatory flow measurement
- Magnetic flow measurement
- Positive displacement
- Ultrasonic flow measurement
- Mass flow measurement

FUNDAMENTALS OF PROCESS LOOP TUNING

- Processes, controllers and tuning
- PID controllers
- Gain, dead time and time constants
- Process noise
- General purpose closed loop tuning method

Day 3:

INTRODUCTION TO CONTROL VALVES

- Introduction
- Definition of a control valve
- Cavitation
- Flashing

DIFFERENT TYPES OF CONTROL VALVES

- Globe valves
- Butterfly
- Eccentric disk
- Ball
- Rotary plug
- Diaphragm and pinch

Day 4:

PLC's, SCADA, AND COMMUNICATIONS

FUNDAMENTALS OF PLCS

- Introduction to PLCs
- Alternative control systems – where do PLCs fit in?
- Why PLCs have become so widely accepted

FUNDAMENTALS OF PLC HARDWARE

- Block diagram of typical PLC
- PLC processor module – memory organization

- Input / output section – module types
- Power supplies

FUNDAMENTALS OF PLC SOFTWARE

- Methods of representing Logic
- Ladder Logic basics
- The basic rules for programming
- Simple PLC programs

INTRODUCTION TO SCADA SYSTEMS

- Fundamentals
- Comparison of SCADA, DCS, PLC and smart instruments
- Typical SCADA installations
- Definition of terms

Day 5:

SCADA SYSTEMS HARDWARE

- Remote Terminal Unit (RTU) structure
- Analog and digital input/output modules
- Master site structure

SCADA SYSTEMS SOFTWARE

- Fundamentals
- Components of a SCADA system
- Software – design of SCADA packages
- Configuration of SCADA systems
- Building the user interface

BASICS OF DATA COMMUNICATIONS BETWEEN PLC AND SCADA SYSTEMS

- Twisted pair cables
- Fibre optic cables
- Public network provided services
- Industrial Ethernet
- TCP/IP
- Fieldbus
- Modbus
- LAN connectivity: bridges, routers and switches
- SCADA network security

DRAWING TYPES AND STANDARDS

- Understanding diagram layouts and formats
- Cross references
- P&ID's fundamentals

CONCLUSION

- Summing up and revision of key concepts
- The future

POST TEST

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Fees:

To be advised as per course location. This rate includes participant's manual, and-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session

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