



المركز العالمي للتدريب والتطوير
International Centre For Training & Development



ICE034

Emergency Safety Shutdown Systems (ESD) Applications



ACTVET
Abu Dhabi Centre for
Technical and Vocational
Education and Training

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Course Introduction:

This course will provide the participants with the knowledge necessary to gain and enhance their operational aptitude in the area of safety systems. It will cover the operation and basic hardware of Safety Instrumented Systems (SIS), Total Plant Shutdown Systems (TPS), Emergency Shutdown Systems (ESD), Process Shutdown Systems (PSD), and Unit Shutdown Systems (USD).

An introduction of the different systems, as well as the design philosophy of the SIS will be provided. Differentiation between function of the control system versus the SIS will be discussed, as well as the levels of protection with respect to the risks present. Evaluating and functionally testing of an SIS will also be covered. Attendees will learn how changes to the SIS must be managed to ensure reliability.

The purpose of this course will be to develop in participants a working knowledge of various safety systems including an introduction to the TPS, ESD, PSD, and USD systems. Permissives and interlocks are the basis of these systems and will be covered, along with logic solvers, which are an important part of shutdown systems.

Course Objectives:

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

- Be made aware of the important step in designing the SIS system, which is to establish the risks involved in operating the plant
- Familiarize the procedures that must be in place to continually evaluate, manage changes, and assess the reliability of the SIS
- Be exposed to how SIS can be divided into the TPS, ESD, PSD, and USD systems, as well as how these systems rely on the appropriate hardware and software to maintain reliably
- Learn how the SIS provides protection, as a whole, to the plant in the event of an uncontrollable situation
- Hindsight, as well as foresight, must be employed in the design of the SIS system. The process control system must be separate from the SIS.
- Learn about the SIS and how it is divided into various levels to ensure the safe operation of the plant
- Will become familiar with the characteristics of typical TPS, ESD, PSD, and USD systems.
- Familiarize the standards in alarm systems will be covered and the use of redundancy will be demonstrated to ensure shutdown system reliability.
- Well aware of the importance of resetting, testing, and bypassing procedures will be identified
- Learn how the shutdown systems will operate in a facility specific application

Who Should Attend?

This course is mainly targeted to process operators, process technologists, and laboratory and maintenance personnel. The course can also be applicable to employees working with equipment and materials purchasing, equipment procurement, job planning, as well as immediate supervisors to the working technicians.

Course Outline:

5 Days

SIS

- Introduction to SIS
- Design life cycle
- Process control vs safety control
- Protection layers
- Safety integrity levels

SIS, TPS, ESD, PSD, and USD

- Introduction to TPS, ESD, PSD, and USD
- Permissives and interlocks
- High reliability logic solver
- Discussions of the SIS will continue and expand to topics of evaluating risk, initial system evaluation, functional testing, managing changes, and determining system reliability.

TPS, ESD, PSD, and USD

- Failure modes
- Alarms
- Redundancy (TMR)
- Resetting testing and bypassing
- Documentation and cause and effect drawings
- Standards in alarm systems will be covered and the use of redundancy will be demonstrated to ensure shutdown system reliability
- The use of cause and effect drawings will be demonstration

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 Certificate:

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

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