ISTANBUL-TURKEY

02-06 Mar 2026

Emergency Shut-down Systems ESD

Course Description

INTRODUCTION

Functional process safety involves identifying potential hazardous events that can trigger a chain reaction that could lead to serious or catastrophic consequences. This Safety Instrumentation and Emergency Shut-down Systems training explains the requirements of the international standards IEC 61508 and IEC 61511, for functional safety instrumented system and, covers the entire life-cycle of safety instrumented systems, from determining what risk control systems are required through to decommissioning. This also includes the separation of basic process control systems and safety instrumented systems (SIS), layers independent protection (LOPs), how to determine safety integrity levels (SILs), technology choices and field device issues.

This Safety Instrumentation and Emergency Shut-down Systems training primarily focuses on establishing conceptual and detailed design requirements, hazard analysis techniques, safety requirements specification, and the commissioning, operating and maintenance procedures.

THIS TRAINING WILL HIGHLIGHT:

- **Hazard and Risk Reduction Studies**
- **Explaining Technology an Equipment Choices**
- **Safety Requirement Specifications for an SIS**
- **Selection of Field Devices (Sensors, Programmable Logic Controllers and Valves)**
- **Establishing Operation and Maintenance Procedures**

OBJECTIVES

This training on Safety Instrumentation and Emergency Shut-down Systems is to acquaint instrumentation and control system engineers with the essentials of the IEC 61508 and IEC 61511 safety instrumented systems standards and, how they relate to the safety life cycle of developing and maintaining safety instrumented systems. The fundamental tools will enable delegates to evaluate, design, install and maintain Safety Instrumented Systems (SISs) and to determine their Safety Integrity Level (SILs) requirements.

At the end of this training, you will learn to:

- Understand requirements of the international standards IEC 61598 and IEC 61511
- Apply the IEC 61508 Safety Instrumented System Development 'Safety Life Cycle' model
- Determine the Safety Integrity Level (SIL) using risk assessment methods
- Understand the specifications of emergency shutdown protection requirements
- Establish specification requirements for sensor, programmable logic controller and valves
- Follow Management of Change (MOC) procedures for control of future SIS changes

TRAINING METHODOLOGY

This Safety Instrumentation and Emergency Shut-down Systems training uses a range of approaches for learning, including group activities, exercises and case studies. Key part of the learning process is sharing of experiences and knowledge. Throughout the training , delegates will learn through active participation using exercises and case studies.

Attendees will be able to apply skills learnt from this training at a practical level to identify, develop and implement safety instrumented systems.

- Delegates will gain skills to be able to select technology choices that meets IEC 61508 / 61511
- By using these skills, you can competently implement the SIS safety life cycle

WHO SHOULD ATTEND?

This Safety Instrumentation and Emergency Shut-down Systems training is specifically tailored for anyone involved in the field of emergency shutdown and safety related instrumentation systems according to IEC 61508 and IEC 61511 requirements.

- Personnel who are responsible for the designing, selecting, specifying, installing, operating and maintaining safety instrumentation systems
- Experienced professionals who want to broaden their understanding of safety instrumentation systems (SIS)

This training also suitable to a wide range of professionals but greatly benefit to:

- Design and Electrical Engineers
- Instrument and Process Control Engineers and Technicians
- Mechanical Engineers and Technicians
- Operations and Process Engineers
- Line Managers and Supervisors

COURSE OUTLINE

DAY 1

Introduction to Safety Instrumentation Systems

- Overview of Safety Instrument Functions (SIFs)
- Introduction to Standards IEC 61508 and IEC 61511
- Equipment Under Control (EUC)
- Introduction in Identifying Hazards and Analyzing Risks
- Safety Instrumented Systems (SIS) - Safety Life Cycle Stages
- Overview of Safety Integrity Levels (SIL

DAY 2

Hazards & Risk Reduction

- Identifying Hazards and Risk Analysis Tools
- Process Control vs. Safety Control
- Layers of Protection Models (LOPs)
- Risk Reduction and Risk Ranking Classification
- Determining Safety Integrity Levels (SILs)
- Developing the Safety Requirements Specification

DAY 3

Technology Choices and Reliability Analysis

- IEC 61508 / IEC 61511 Technology Requirements
- Pneumatic Systems
- Relay Systems and Solid-state Systems
- Microprocessor / PLC Systems
- Issues related to System Size and Complexity
- Reliability of Components Databases

DAY 4

Overview of SIS Field Devices

- Importance of Field Devices
- Types of Sensors
- Final Elements (pressure relief and shutdown valves)
- Nuisance Trips, Voting Schemes and Redundancy
- Design requirements for Field Devices
- Installation of Field Device concerns

DAY 5

Safety Systems Engineering

- **Step-by-Step Safety Instrumentation System Development Plan**
- **SIS Functional Testing Procedures**
- **Information Flow and Preparation of Documents**
- **Managing existing and future changes to an SIS**
- **Review of an SIS Design Checklist**
- **Close of Course**

Training Course Prices:

Number of Participants	Course Price
1 participant	KWD 1550.000
2 participants	KWD 1500.000
3 participants	KWD 1450.000
4 participants	KWD 1400.000
5 participants	KWD 1350.000
6 and above participants	KWD 1300.000