



# IE074: Safety Instrumented System (SIS) and ESD Systems for Process Industries: *IEC65111 & IEC 61508*



## Training Description:

This 5-day course is "Instructor-Led Training" will explore the principles and standard of an intensive practical and valuable exposure to the most vital, up-to-date information and practical know-how to enable you to participate in hazard studies and specify, design, install and operate the safety and emergency shutdown systems in your plant, using international safety practices.

This course will provide you with a broad understanding of the latest safety instrumentation practices and their applications to functional safety in manufacturing and process industries.

## Training Objectives:

**By the end of the training, participants will be able to:**

- ✓ Expand their practical knowledge in the application of safety instrumented systems (SIS) as applied to industrial processes
- ✓ Develop their knowledge of the latest standards dealing with each stage of the safety life cycle from the initial evaluation of hazards to the detailed engineering and maintenance of safety instrumented systems
- ✓ Acquire the ability to plan hazard and risk assessment studies, then design, implement and maintain the safety systems to ensure high reliability
- ✓ Assist their company to implement functional safety measures to international standards
- ✓ Understand the ability to transfer the "Data" to be technical "Skill"
- ✓ Understand the "Culture" of inspection of electrical system

## Training Designed for:

This course is intended for Instrumentation and Control Engineers and Technicians, Design, installation and Maintenance Engineers and Technicians in the process industries, Managers and sales professionals employed by end users, Systems Integrators, Systems Consultants, Consulting Electrical Engineers, Plant Engineers and Instrument Technicians, Operations Technicians, Electrical Maintenance Technicians and Supervisors, Instrumentation and Control System Engineers, Process Control Engineers and Mechanical Engineers.

## Training Program:

### DAY ONE:

- ❖ **Pre-Test**
- ❖ **Introduction**
  - A review of the fundamentals in safety instrumentation focusing on a discussion on hazards and risks, safety systems engineering, and introduction to the IEC 61508 and ISA S84 standards
  - A concluding review of the safety life cycle model and its phases
- ❖ **Hazards and Risk Reduction**
  - An examination of basic hazards, the chemical process, hazards studies, the IEC model, protection layers, risk reduction and classification and the important concept of the safety Integrity Level (SIL)



#### DAY TWO:

- ❖ **Hazard Studies**
  - A review of the outline of methodologies for hazard studies
- ❖ **Safety Requirements Specifications**
  - A discussion and guide to preparing a Safety Requirement Specification (SRS)

#### DAY THREE:

- ❖ **Technology Choices and The Conceptual Design Stage**
  - An examination of how to get the concepts right for the specific application and choosing the right type of equipment for the job, not the particular vendor but at least the right architecture for the logic solver system and the right arrangement of sensors and actuators to give the quality of system required by the SRS
- ❖ **Basic Reliability Analysis Applied to Safety Systems**
  - This discusses the task of measuring or evaluating the SIS design for its overall safety integrity

#### DAY FOUR:

- ❖ **Safety in Field Instruments and Devices**
  - This module examines the range of instrumentation design techniques that have accumulated in the industry through experience that began a long time before the days of PES and the high-performance logic solvers
- ❖ **Engineering the Safety System: Hardware**
  - An examination of two aspects of engineering work for building an SIS. Firstly, there is a look at some aspects of project engineering management and secondly some basic engineering practices
- ❖ **Engineering the Safety System: Software**
  - Guidance is provided here on how to deal with the application software stages of an SIS project with an examination of some of the basic concepts and requirements that have been introduced in recent years to try to overcome the major concerns that have arisen over the use of software in safety applications
- ❖ **Overall Planning: IEC Phases 6, 7 and 8**
  - A brief look at the planning boxes marked in on the IEC safety life cycle
- ❖ **Installation and Commissioning (IEC Phase 12)**
  - This module tracks the safety system from its building stage through factory acceptance testing, delivery and installation and into final testing for handover to the operating team

#### DAY FIVE:

- ❖ **Validation, Operations and Management of Change (IEC Phases 13, 14 and 15)**
  - A discussion on validation, operations and maintenance
- ❖ **Justification for a Safety Instrumented System**
  - In practice engineers and managers have to make choices on the type, quality, and costs of the safety solutions available within the constraints imposed by the essential safety requirements
- ❖ **Course Conclusion**
- ❖ **Post-Test and Evaluation**



## Training Requirements:

“Hands-on practical sessions, equipment and software will be applied during the course if required and as per the client’s request.”

Please note that the above topics can be amended as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

## Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Software & General Discussions
- Pre and Post Test

## Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

## Training Fees:

**As per the course location** - This rate includes participant’s manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

## Training Timings:

### Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

**For training registrations or in-house enquiries, please contact:**

**Aisha Relativo:** [aisha@cmc-me.com](mailto:aisha@cmc-me.com)

Tel.: +971 2 665 3945 or +971 2 643 6653 | Mob.: +971 52 2954615

Training & Career Development Department

