

## SIS Design and Development Workshop (2 days)

This 2 day workshop is intended to take participants through the factors that need to be considered when performing Safety Instrumented Systems (SIS) and Safety Instrumented Function (SIF) designs for low, high and continuous demand mode process sector related applications in line with the international IEC 61508 and IEC 61511 standards.

### Who should attend?

Engineers and systems integrators involved in the development of safety requirements specifications (SRS) and the detailed design of SIS and SIF, including verification calculations for the probability of failure on demand (PFD), probability of dangerous failure per hour (PFH), safe failure fraction (SFF), hardware fault tolerance (HFT) and common cause failures (CCF).

### **The objectives of the workshop are:**

- To develop the SIS safety requirements specification (SRS) and select appropriate devices to meet the requirements;
- Considerations for field elements (do's and don'ts);
- To implement an appropriate SIF design architecture to meet the SRS;
- To perform the PFD, safe failure fraction and hardware fault tolerance calculations;
- To perform PFH calculations for high and continuous demand systems;
- To understand and evaluate the effects of testing and maintenance on SIFs;
- To understand the impact of common cause failures;
- To be able to select and use appropriate reliability data.

It is focused on the design phase which is covered in considerable detail and includes the following topics:

- SIS Design and Development;
- Integrity Specification of a SIF;
- SIS Safety Requirements Specification;
- Selection of Components and Subsystems;
- Proven in Use;
- Field Devices;
- Failures;
- Failure and Reliability;
- Probability of Failure on Demand;
- Demand Modes;
- SIS Implementation (low, high and continuous demand modes);
- Importance of Testing;
- Importance of Maintenance;
- Fractional Dead Times;
- Common Cause Failures;
- Safe Failure Fraction;
- Hardware Fault Tolerance;
- Calculating the PFD for systems with diagnostics;
- Subsystem Safety Integrity;



## TRAINING FOR PROFESSIONALS

- Improving the PFD - Partial Closure Testing;
- Calculating PFH for high and continuous demand systems;
- Reliability data.

Course instruction will be complimented with examples, demonstrations and exercises to equip participants with methods and tools for SIF/SIS design and development for meeting the appropriate IEC 61508/61511 lifecycle requirements.