

Introduction to Functional Safety and Safety Instrumented Systems (0.5 day or 1 day)

This workshop can be customised for a 0.5 day or 1 day duration and will take participants through the fundamental principles of IEC 61508 and IEC 61511. It will include the concept of process hazard analysis and SIL determination risk assessment with the main focus on the Layer of Protection Analysis (LOPA) method. Participants will also be given the basic principles of safety instrument system design and shown the importance of testing and maintenance of such systems. This is the ideal workshop for preparation for the Functional Safety Engineer courses.

Who should attend?

Process engineers, safety engineers, instrument engineers and operations people involved with maintaining the integrity of process plant, or with design, development and maintenance of safety instrumented systems for process plant protection.

The objectives of the workshop will cover:

- An overview of the safety lifecycle;
- An understanding of the concepts and objectives of process hazard analysis;
- An understanding of the concepts and objectives of risk assessment;
- The analysis of safety, asset and environmental risk;
- Qualitative and quantitative methods of risk assessment;
- An understanding of the ALARP principles;
- Setting tolerable risk targets;
- An overview of Risk Matrices;
- An overview of Risk Graphs;
- The principles of Layer of Protection Analysis (LOPA);
- Hands on experience with the LOPA risk assessment method;
- Calibration of LOPA risk assessment for different consequences;
- Analysis of cause events and likelihood data;
- Cause and consequence scenarios;
- Independent protection layers and associated rules;
- An understanding of the differences between risk prevention and risk mitigation;
- Assigning values to risk reduction layers;
- Safety, Asset and Environmental conditional modifiers;
- Avoiding common cause issues (double dipping);
- SIS design and development;
- The PFD calculation;
- An understanding of 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.

The workshop will use numerous practical examples and team exercises drawn from real life experience to stimulate a realistic hazard and risk assessment experience. The LOPA methodology will be based on IEC 61511, and *'Layer of Protection Analysis Simplified Risk Analysis; American Institution of Chemical Engineering ISBN 0-8169-0811-7.*