
TRAINING COURSE

Advanced hazard assessment techniques for SIL determination (T242C)

Management of risk and the demonstration of appropriate risk reduction measures - IEC 61508 and IEC 61511.

[7th-11th November 2022 - Teesside, ABB Office](#)



Advanced hazard assessment techniques for SIL determination (T242C)

Management of risk and the demonstration of appropriate risk reduction measures are becoming increasingly important in industry today. This can be relevant to compliance with aspects of legislation, such as COMAH, and in the application of standards such as IEC 61508 and IEC 61511.

This course is designed for those who need to understand the causes and sequence of failure that can lead to significant hazardous events occurring and be able to identify the key contributors to the level of risk - to people, business or the environment.

Topics include:

- Calculation of hazardous event frequencies
- Assessment of risk reduction from protective systems and Safety Integrity Levels (SIL)
- Criteria for tolerable levels of risk
- Assessment of demand frequency on protective systems

Duration

5 days

Price

Member of IChemE - £2200 + VAT

Non-Member - £2320 + VAT

The benefits

The effective use of the techniques allows questions to be answered in the areas of safety, health and environment; asset management and maintenance; loss prevention; new investment.

Typical attendees would be:

- Process design engineers
- Electrical, control and instrument engineers
- Safety managers and advisors
- Works or technical managers with responsibility for managing risk
- Leaders of HAZOP studies

Typical attendees would probably have:

- Some experience of design and plant operation
- An analytical and structured approach to problem solving

The course

On completion of the course you should be able to demonstrate a working knowledge of SIL and hazard assessment including:

- Logical analysis, using fault tree techniques of scenarios leading to hazardous events
- Use of data and its application to predict the likelihood of a hazardous event
- Development of practical hazard criteria
- Handling of dependent or common mode failures
- Basic human error assessment
- Applying basic SIL and hazard assessment in a variety of situations to help in making more effective and cost effective decisions

This course is also suitable as a basic qualification for those wanting to become hazard and reliability analysts.

Syndicate topics:

- Working with logic gates
- Use of the basic techniques to assess the potential frequency of hazardous events
- Logic diagram development and effect of proof testing
- Logic diagram development and effect of elements common to control and protective systems
- Logic development and use of data
- Use of event trees
- Failure rate for multiple plant items - development of logic
- Use of truth tables in analysing different plant arrangements
- Cost effective decision taking in controlling hazards
- Logic diagram development and the relative merits of shared elements and independent control and protective systems
- Use of minimum cut-sets to analyse complex protective systems
- Risk calculation for various operator situations

Course tutors

Stephen Beedle, is a Senior Consultant in the Process Safety Group, working in the areas of risk assessment, process hazard review and COMAH. Stephen is an accredited hazard study leader and has been a course tutor on the ABB hazard study leaders course for several years.

Rachel Spoonley is a Senior Safety Consultant for ABB. She has a degree in Chemical Engineering with over 30 years' experience in a variety of roles in the process industries. She has worked in design and operations for a range of industries from continuous bulk chemical and batch chemical manufacture, to utilities and effluent treatment. Rachel has been a HAZOP and LOPA leader in chemicals, oil and gas and the power sector for over ten years.

Agenda

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| - International standards - IEC 61508/61511 | - Consequence assessment |
| - Risk and criteria | - Layer of Protection Analysis (LOPA) |
| - Risk assessment | - Syndicate exercises |
| - Event tree analysis | - Guided exercise - development of fault trees to assess hazards |
| - Reliability concepts of elements and states | - Syndicate exercises |
| - Use and collection of reliability data | - Syndicate exercises |
| - Trip system overview | |
| - Protective systems mathematics and assessment techniques | - Failure dependency - key issues regarding dependent failure |
| - Limiting factors in PFDavg - common cause failures etc. | - Syndicate exercises |
| | - Intro to hazard study 2 quantification exercise |
| - Syndicate exercise - applying the principles learned over the week | |

ABB reserve the right to amend the course agenda.

How to book

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