PROFESSIONAL CERTIFICATE OF COMPETENCY IN

SAFETY INSTRUMENTATION SYSTEMS
FOR PROCESS INDUSTRIES

12 MODULES OVER 3 MONTHS
For upcoming start dates, please view our program schedule at:
http://www.eit.edu.au/schedule

WHAT YOU WILL LEARN:

• Fundamentals of risk assessment and the role of safety regulations
• Principles of risk reduction by Safety Instrumented Systems (SIS)
• The differences between a basic control system and an SIS
• The principles and application of the safety life cycle for project management
• The meaning and implications of Safety Integrity Levels (SILs)
• How to use fault tree analysis to predict accident rates and failure rates
• How to design the SIS to meet IEC requirements for SIL targets
• Failure modes and the concepts of fault tolerance
• How to calculate failure probabilities for single and redundant SIS designs
• Process hazard study methods including HAZOP
• How SIL targets are determined
• The roles of standards IEC 61508 and IEC 61511
• The role of alarms in safety critical applications
• Key features of safety certified PLCs
• Methods for avoidance of spurious trips
• How to optimize proof testing intervals
• How to select instruments and controllers suitable for safety systems
• How to manage the application software project for your safety system

SECURE YOUR PLACE NOW!
Contact enquiries@eit.edu.au for an enrolment form or more information.

Presented by
Hashemi Ford
BE (Hons)(Elec) ME(Elec)
Principal Engineer
**PRESENTED BY**

**HASHEMI FORD**

BE (Honrs)| Elec  ME| Elec  Principal Engineer

Hashemi has over 20 years international experience in electrical power industry with a focus on modelling, analysis, planning and operation of power systems including distribution, sub-transmission and transmission networks. He has been involved in modelling and analysis of major projects including HVDC interconnectors and Wind farms and has valuable experience and knowledge of Safety Instrumented Systems in hazardous processes.

Currently Hashemi is working as a Principal Engineer for a power utility in Australia as well as teaching as a part time lecturer for EIT.

*Please note: Lecturers are subject to change.*

**12 MODULES OVER 3 MONTHS**

**OVERVIEW:**

This program is for engineers and technicians who wish to develop their knowledge of the design and implementation of safety instrumented systems in industrial processes.

Safety control systems are widely used in hazardous processes to protect people, the environment and equipment against serious harm. Many countries look for compliance to international standards IEC 61508 and IEC 61511 as a benchmark of acceptable quality in design and management of safety controls.

This program will explain the key requirements of the IEC 61511 standard for all stages of the safety project from hazard and risk assessment studies through to hardware and software engineering and on to the maintenance and proof testing regimes.

Practical examples and discussions will assist you to develop your skills in this most important area of instrument engineering.

| Module 1: Overview of Safety Instrumented Systems | Module 7: Selecting instruments for safety duties |
| Module 2: Safety life cycle models | Module 8: Reliability analysis |
| Module 3: Hazard study methods | Module 9: Safety-certified PLCS |
| Module 4: Risk reduction by SIS | Module 10: Application software for safety duties |
| Module 5: SIL determination methods | Module 11: Documentation and management |
| Module 6: Designing SIS structures | Module 12: Diagnostics and proof testing |

**INCLUDES 4 FREE REFERENCE MANUALS**

**VALUED AT OVER US$400**

You will receive 4 of our up-to-date technical eBooks to add to your library.

- Practical Safety Instrumentation Emergency Shutdown Systems
- Practical HAZOPs for Engineers and Technicians
- Practical Intrinsic Safety for Engineers and Technicians
- Practical Hazardous Areas for Engineers and Technicians

Received upon completion.

All materials required for the program will be provided electronically, in smaller, easy-to-read sections.

*Please Note: eBooks are available in hard copy at 50% of the recommended retail price. Contact us for pricing details.*
PROGRAM OUTLINE

MODULE 1: Overview of Safety Instrumented Systems
- Safety system basics with an example SIS
- Hazards, risks and risk reduction
- Principles of safety management
- Functional safety standards IEC 61508/61511
- Setting SIL targets
- Designing to meet SIL targets
- Cost of ownership

MODULE 2: Safety Life Cycle Models
- Purpose of life cycle models
- IEC 61511 requirements
- Step by step activities

MODULE 3: Hazard Study Methods
- Hazard studies and project stages
- Hazard identification methods
- HAZOP method
- Developing SIS requirements
- Fault tree analysis

MODULE 4: Risk Reduction by SIS
- Deciding risk targets
- Principle of ALARP and tolerable risk
- Layers of protection and role of alarms
- Risk reduction models
- Preparing a safety requirements specification

MODULE 5: SIL Determination Methods
- Quantitative and risk matrix methods
- Risk graphs
- Layers of protection analysis
- Practical examples

MODULE 6: Designing SIS Structures
- Design procedure steps
- IEC 61511 guidelines
- Architectures and fault tolerance
- Choosing the right structures for the job

MODULE 7: Selecting Instruments for Safety Duties
- Switches versus transmitters
- Failure modes of sensors and actuators
- Minimizing dangerous failures
- Qualification by design and certification
- Qualification by prior use
- Smart instruments and diagnostic coverage

MODULE 8: Reliability Analysis
- Purposes of reliability calculations
- SIS failure modes, safe and dangerous
- Formulae and how to use them
- Worked examples
- Obtaining reliability data and the problems
- Review of software tools

MODULE 9: Safety-Certified PLCs
- Logic solvers, old and new
- Development of safety PLCs
- Hardware and software features
- Review of industry types
- Communications and networking
- Integrated basic and safety control

MODULE 10: Application Software for Safety Duties
- The problem with software
- IEC software life cycle models
- Application software steps
- Factory acceptance testing
- Quality assurance and certification

MODULE 11: Documentation and Management
- Documents needed for the SIS project
- Verification and validation
- Operations
- Management of change

MODULE 12: Diagnostics and Proof Testing
- Proof testing and why it is needed
- Testing of sensors
- Partial closure testing of valves
- Optimising the proof test interval

PRACTICAL EXERCISES
Throughout the program you will participate in hands-on exercises using simulation software or remote labs, which will help you put theory to practice immediately!

HARDWARE AND SOFTWARE REQUIREMENTS
All you need to participate is an adequate Internet connection, PC, speakers and a microphone. The software package and setup details will be sent to on the program start date.

ENTRANCE REQUIREMENTS
Some practical work experience in some of these topics would obviously be advantageous.

CERTIFICATION
Participants completing and achieving at least 50% or more in each assignment, as well as attending 65% of the live webinars, will receive the Engineering Institute of Technology Professional Certificate of Competency in Safety Instrumentation Systems for Process Industries.

ON-SITE TRAINING
We can provide our training at the venue of your choice. On-site training can be customised and by bringing the trainer to site the dates can be set to suit you!

“The Customer is Always Right” – so tell us what you need and we will design a training solution at your own site.

For a FREE detailed proposal please contact Kevin Baker via email: training@idc-online.com