



MIDWEST OIL & GAS
ENGINEERING

IChemE

Approved Course



Safety *Instrumented* **S**ystems

SIS

Designers Course



Dubai

9 - 13 March 2008

HAZ 15 08™

This 4 day **SIS** Event is
a Must for Every Instrumentation and
Process Control Engineer and Technician

Safety Instrumented Systems -Designers Course-

Who Should Attend?

- Supervisory personnel responsible for SIS design standards
- SIS designers, installation and maintenance engineers
- Instrumentation and control engineers & technicians
- Process design engineers
- Process programmers
- System integrators
- Other personnel responsible for maintaining safety or critical control systems

You Will Learn to:

- Correctly design SIS to meet a specific SIL
- Differentiate between process control and safety control
- Understand the design basis of recent standards, guidelines and recommended practices including ANSI, ISA & IEC
- Evaluate process risk levels
- Determine safety integrity levels (SIL s) using a variety of techniques
- Determine optimum system test intervals
- Satisfy the documentation requirements for process safety management, regulations and industry standards

“Designing a SIS that is safe and complies with the standards is your license from the regulators (OSHA, EPA) to operate your business”

Don Hammond ISA subcommittee chairman

Description

SIS has been used for many years to perform safety instrumented functions in chemical, petro-chemical and process plants as well as non-nuclear power energy generation. In order for instrumentation to be effectively used for safety instrumented functions, it is essential that instrumentation achieves certain minimum standards and performance levels.

Engineers involved with a process unit that utilize SIS to prevent or mitigate potentially unsafe conditions need to be aware of the new requirements within ANSI/ISA S84.01-1996.

To reach this standards, new SIS for the process industry sector should be utilized. The standard addresses specifications required to determine safety integrity levels for an application.

This course focuses on the engineering requirements for the specification, design, analysis and justification of SIS in the process industry.

What Previous Delegates have Said

“The course give a simple approach to a complicated problem”

Jane Price –Process Engineer-

“The course was delivered in a good step by step stages”

Neil Tate –Instrumentation Technician-

Safety Instrumented Systems -Designers Course-

Course Syllabus

Day 1

Introduction and Background

- The context of the standard
- The safety lifecycle

Background to SIL determination

- Hazard Identification
- Hazard Rate
- Risk Reduction Layers
- Non SIS
- SIS & SIL
- High demand / Low demand
- HAZOP & HAZOP Software
- Risk Graphs
- Event Trees
- Cause and Effect Matrix

Day 2

Safety Instrumented Systems

- Functional Specification
 - Data
 - Process Parameters
 - Physical Environment
 - Regulatory Requirements
 - Clients
 - Standards
 - Design
 - Documentation
 - Vendors
 - Proven in Use / Certified
 - Training / Skill level
 - Configuration / Documentation
 - Spares and Service requirements
- Requirements
 - EUC Safe State and path to Failure mode determination
 - Control Concepts- reduced demand rate
 - Warning Alarms, Limitation of control envelope, operational procedures.
 - Safety Functionality
 - Action Requirements
 - Values / Tolerance & Response Time
 - Common mode failures
 - Identification of Diversity

Day 3

Realisation

- 61508 / 61511 / ISA 84
- Constraints and Requirements per SIL
 - Sub system Technology
 - Sensor
 - Operated Element (EUC)
 - Logic Solver
 - Detailed Design
 - Dual redundancy
 - Triple redundancy
 - Voting systems
 - Power Supplies / wiring / process connections etc
 - Technical data
 - HMI
 - On-line testing
 - Safety Availability Analysis
 - Dissemination into sub systems
 - Reliability data
 - Diagnostic Coverage
 - Safe Failure fraction
 - Common Mode

Day 4

- EUC On-Stream Analysis (spurious outages)
- Proof Testing
 - Extent of impact on achievable SIL
 - Procedures
 - On-line facilities and control
- Installation / pre-commissioning and validation
- Management of safety
 - Documentation control
 - Proof Testing
 - Specification
 - Scheduling
 - Non conformance
 - Corrective action
 - Recording
 - Reporting
 - Maintenance
 - Effect of maintenance envelope on achieved reliability
 - Design change control

Course Faculty

Mr David Barlow MA (ATS), MChemE

Mr. Barlow is a senior consultant with MidWest Oil & Gas Engineering with over 25 years experience in the oil, gas and petrochemical industry, predominantly **on Class I COMAH registered installations**. He has specialist expertise on **process control** gained through the execution of many high profile projects for various operations from the design stage to commissioning.

David has specialist knowledge on:

High Pressure Systems (in excess of 110 barg)

Fractional Distillation

Gas Liquid Reactors

Cracking Furnaces

Compression Systems

Refrigeration Systems

As well as the **latest FOXBRO Distributed Control Systems (DCS)**.

During his career, Mr. Barlow has held several **senior positions** within major oil and gas companies such as **EXXON Mobile** where he was **process lead Technical Manager** on all process units with responsibility for P & ID, hydraulic checks, instrumentation and equipment specification, **design of safety instrumented systems** as well as **the implementation of SIL's**. He has also chaired many HAZOP studies, and the following are only few to mention.

Gas scrubber for BHP Billington offshore Douglas field operation

Distillation column for Shell Stanlow refining

First offshore skid mounted de-aeration unit for BP-AMOCO

65 tpd waste treatment unit for Onyx Paux

Boilers and heat exchangers for process water treatment at Solnas on merseside

David also conducted the analysis and implementation of the IEC61508 and S84.001 standards for the likes of **Elf Kvaerner Norway, Saudi ARAMCO, Shell Nigeria, Shell Expo, BP** and others. He is a member of the IChemE's safety and loss prevention group and a member of the 61508 association education working group.

During the past 6 years, he has been **developing training procedures** and training materials for the industry, both theoretical and hands-on to improve operating and technical safety standards by developing guidance under BS EN 61508 and the process industry guidance IEC61511.

Recently, David **has developed and implemented technical training systems for Amerada Hess south Arne Platform** including material and assessment criteria and the design and development of training policies in line with international standards. He has also **developed a FOXBORO simulation model in order to train control operators**.

Mr. Barlow **holds NVQ levels 1,2 & 3** and is an **NVQ D32/D33 qualified assessor and verifier**. He is also an **IChemE member** and holder of an **ILM certificate** and is **accredited** by the health and safety executive (**HSE**), the British standard Institute (**BSI**) and the International Rating Systems (**ISRS**)

REGISTRATION FORM

Please use a separate form for each attendee

Safety Instrumented Systems -Designers Course-	Register Now
Registration Closing Date: 24th Feb. 2008	Limited Number of Seats Available per session
Get 10% discount for second and subsequent attendees from same company	Dedicated Registration FAX LINE 00 44 (0)7075707602
Course fee : USD 2950 Paid on registration	P.O. Box 365, LS6 2WP United Kingdom Tel: 00 44 (0)7903479511
Name:.....Position:.....	
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Tel:.....Fax:.....	
E-mail:.....	
Payment Details	
<input type="checkbox"/> I enclose a check for USD.....payable to MidWest Gas & Oil Consultancy	
<input type="checkbox"/> Please invoice my company	
Contact person:.....Position:.....	
Tel:.....Fax:.....E-mail:.....	

Cancellations

For written cancellations received at least 2 weeks before class start a credit for future courses will be offered, less USD 240 processing fee. Substitutions are welcomed. Full fee is charged for cancellations less than two weeks before the starting date.

Accommodation is not included in the course fee, but MWO&G Engineering negotiate a discounted rate for a limited number of rooms. If you require this service, please check the box

Schedule

Course registration will be at 08:00 on first day with course start at 08:30 prompt. Refreshment breaks will be at appropriate times with lunch served after day conclusion at 15:30

Course fees will cover for faculties, tuition, complete course materials, practice exercises & workshops, evening consultations and daily refreshments & lunches.

MWO&G reserve the rights the change faculty or/and venue