

E-561

▲ Who should attend?

Safety and other discipline engineers (project, process, instrument, architect and operations) involved in the design and implementation of major modifications and projects. It is advantageous that participants have foundation skills in statistical analysis and hazard identification techniques.

▲ Prerequisite

Attend course E-560

or

Have experience covering the topics of course E-560

▲ Duration

5 days

▲ Sessions in English

Nov. 29 - Dec. 03, 2010
Rueil-Malmaison (Paris)

French sessions: F-561

▲ Registration

Fees: € 2,440

Contact:

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▲ Course Coordinator

Dawn BANNER

Ref. **HSE / SAFENG2GB**

At request, this course may be organized for a single company, and tailored to its specific requirements.

SAFETY ENGINEERING

MODULE 2: ADVANCED COURSE

OBJECTIVES

To provide the knowledge and tools to be able to coordinate HSE studies, for the different stages of an Onshore or Offshore Oil & Gas project or major modification.

Upon completion of the course, participants are able to:

- define, measure and predict consequence effects,
- know how to select and design safety systems including firewater, fire and gas detection and over-pressure relief in order to ensure the safe operation of oil and gas facilities,
- understand the principles of inherently safer design,
- perform, as part of a team, risk assessment for major hazards and project evaluation,
- understand the importance of sharing knowledge and the development of a corporate safety memory.

COURSE CONTENT

OVERVIEW	0.25 day
Possible options for the removal or elimination of a hazard The provision or addition of means to control Limitation of inventories of hazardous	
INHERENTLY SAFER PLANT DESIGN	0.25 day
Possible options for the removal or elimination of a hazard The provision or addition of means to control Limitation of inventories of hazardous	
CONSEQUENCE ANALYSIS	0.50 day
Calculations of flare radiation and gas dispersion, explosion overpressure, fire analysis Effects of fires including: jet fires, pool fires, vessel rupture Effects of unignited releases of hydrocarbon gas including: dispersion, flammable gas cloud behavior Effects of flare radiation	
DESIGN AND LAYOUT	0.50 day
Essential factors to consider – process, operation, maintenance, safety Segregation of different risks Separation / safety distances Layout techniques and aids Hazardous area classification Containment of accidents Limitations of exposure to hazardous consequences Hazard assessment of layouts	
DESIGN OF FIRE AND GAS DETECTION SYSTEMS	0.50 day
Selection of Fire and Gas Detector Types Positioning of Fire and Gas detectors Logic associated with the activation of the F&G detectors <i>Worked example</i>	
ACTIVE AND PASSIVE FIRE PROTECTION – FIRE PROTECTION OF PROCESS PLANT	0.50 day
Design of firewater network, calculations for firewater demand Fire protection using water, foam, dry chemicals and inert gas Firewater systems, pump types and selection guidance <i>Practical exercise</i>	
FLARE RELIEF SYSTEM DESIGN	0.50 day
Worked example taking into consideration: Overpressure protection – Pressure relief devices Overpressure protection – Relief system design Flare and vent systems Alternatives to sweeping with hydrocarbon	
LIQUID DRAINAGE	0.25 day
Design and requirements of open and closed drains – Segregation of hazardous and non-hazardous drains	
ESD SYSTEM ARCHITECTURE	0.25 day
Design of ESD systems, Hierarchy of ESD & Actions, Cause & Effects, Emergency Shutdown Logic diagrams	
DESIGN AND ASSESSMENT OF SAFETY INSTRUMENTED SYSTEMS	0.50 day
Examples of safety instrumented systems: Methodology, Example of SIL level determination, Example of HIPS	
EMERGENCY ESCAPE AND RESCUE	0.50 day
Methodology for Emergency Escape & Rescue Analysis (EERA) & Fire & Explosion Risk Analysis (FERA) studies On and off site emergency planning Methodology, data input, assumptions and output <i>Case study</i>	
HUMAN FACTORS AND HUMAN ERRORS	0.25 day
Human factors in process control, Alarm systems, Human error in process plants, Downgraded situations, Emergency situations	
SAFETY DOSSIER	0.25 day
Objectives and contents	