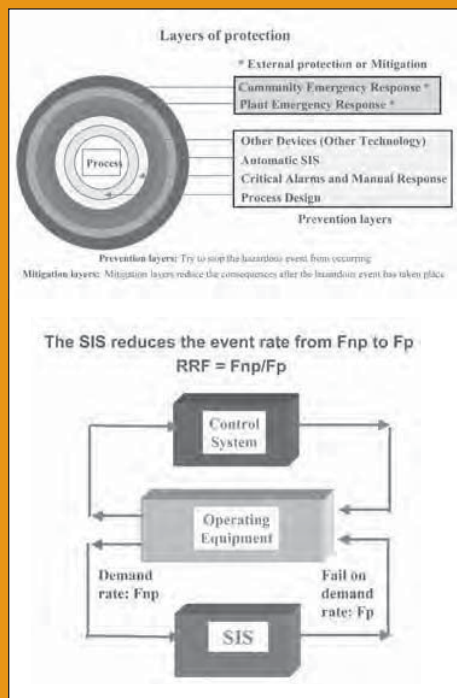


PRACTICAL HA OPS FOR ENGINEERS AND TECHNICIANS

Hazard and Operability Studies



WHAT YOU WILL LEARN:

- The principles of hazard and operability studies
- Planning and timing of HAZOP studies as part of safety management
- How to structure your plant operations into parts for study
- How to generate and test deviations from design intent
- Strengths and weaknesses of the HAZOP approach
- Optimum team selection and information gathering
- Format of workshop records, recommendations and risk ranking
- Tips on leadership styles
- Follow-up reporting and closeout of actions
- Safety instrumented systems and how they relate to HAZOP
- Hazard analysis methods of FMEA and fault trees

WHO SHOULD ATTEND:

- Process engineers, plant engineers, technicians and supervisors involved in new projects or in the modification or upgrading of existing plants
- Trainee HAZOP team leaders
- Loss prevention officers
- Plant managers, project managers and planners seeking an awareness of the role of HAZOP in overall safety management
- Instrument and electrical engineers, process control engineers and system integrators who are likely to be participants in HAZOP or who will be asked to engineer safety control systems
- Commissioning engineers, plant supervisors and process maintenance technicians



The Workshop

This two-day workshop concentrates on awareness level training for managers, engineers and technicians in the practical application of hazard and operability studies (known as HAZOP). HAZOP is widely used for identifying hazards in an industrial process and for assessing the potential consequences where there are risks of harm to persons, the environment or to assets.

The HAZOP technique is recommended by professional engineering institutions, government regulators and insurance companies and is one of the principle risk management tools. HAZOP is applied at both the design stage and throughout the life of a process plant, where it supports the safety management and (where applicable) the validation of the plant safety case. HAZOP is also an essential technique when reviewing modifications and upgrades to existing plant.

This workshop introduces the basics of the HAZOP technique and discusses its relationship with other safety (risk) management tools. HAZOP can be applied to any process industry, onshore or offshore, including oil and gas, mining, chemical or other processing industries. The relationship between HAZOP and other risk management techniques such as HAZID, hazard analysis, FMEA, fault tree analysis and the Safety Integrity Levels (SIL) of instrumented systems will also be demonstrated. This workshop will be of interest to a variety of managers and to most engineering disciplines.

Workshop examples include the design of new process plant and modifications to existing process plant. It involves the study of process flow-sheets and Process and Instrumentation Diagrams (P&IDs). Hazard studies interact closely with process design and safety engineering solutions in the critical stages of engineering projects. Understanding these interactions assists engineers and technicians to plan their work efficiently and to contribute effectively to the reduction of risks in the workplace.

The HAZOP techniques and safety system practices described in this workshop are based on the latest international practices including the guidelines in IEC 61822 for HAZOP studies.

The Program

INTRODUCTION

- Workshop outline and objectives
- References to guides and standards
- Glossary of terms

INTRODUCTION TO HAZOP

- Outline of HAZOP method
- Scope of study
- Timing and purposes

HAZARD STUDIES AND RISK MANAGEMENT

- The need for quality assurance in hazard studies
- The process hazard study lifecycle and the six levels of studies
- Principles of risk management
- Legal requirements for hazard studies, US and EU regulatory frameworks

TYPICAL HAZOP WORKSHOP

- Step by step introduction to the activities of a HAZOP workshop
- Timing and duration of the study
- Documents required
- Team membership and duties
- Outline of the examination phase
- Recording, reporting and follow up

EXAMINATION PHASE METHODS

- Defining the system and selecting the parts for study
- Elements and parameters
- Generating deviations with guidewords and a matrix
- Guideword examination procedures and responses
- Worked examples of continuous and batch process studies
- Control HAZOPS
- Software tools for the examination and reporting phases

PLANNING AND LEADERSHIP OF HAZOPS

- Organising the study, planning, scoping and objectives
- The team leader's skills and duties
- Essential members of the team and their roles
- Conducting the study sessions, dealing with problems
- Using additional checklists for operability
- Contents of the HAZOP study report
- Tips for the facilitator

FROM HAZOPS TO SIL

- The relationship between hazard studies and safety instrumented systems
- Risk reduction concepts and the risk matrix
- Concepts of tolerable risk and the ALARP principle
- Layers of protection
- The role of safety instrumented systems in risk reduction
- The meaning of SIL and how it relates to safety and cost
- SIL determination methods and the input from HAZOPS

HAZARD ANALYSIS METHODS

- The reasons for hazard analysis
- Failure modes and effect analysis method
- Fault tree and event tree analysis methods
- Adding risk reduction measures to the fault tree

SUMMARY, OPEN FORUM AND CLOSING

Practical Sessions

This is a practical, hands on workshop enabling you to work through practical exercises which reinforce the concepts discussed.

There are six practical exercises, which you will undertake, some of them in groups, all intended to provide experience in hazard studies and hazard analysis.

