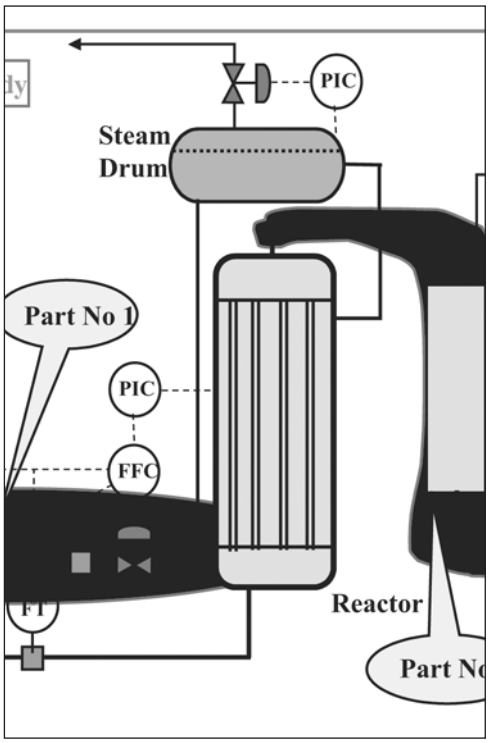
Practical

HAZOPS*

for Engineers & Technicians

*Hazard and Operability Studies



YOU WILL LEARN HOW TO:

- HAZOP as part of risk and safety management
- Strengths and weaknesses of the HAZOP approach
- Optimum team selection and information gathering
- The HAZOP procedure and how to explain it to the team at the first meeting
- Format of workshop records, recommendations and risk ranking
- Tips on leadership styles
- Working with the HAZOP team secretary
- Determining cost effectiveness of remedial measures
- Types of HAZOP and alternatives to a HAZOP
- Popular HAZOP software packages
- Follow-up action file and closeout of actions

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

IDC TECHNOLOGIES

Technology Training that Works

THE WORKSHOP

This 2-day training course concentrates on awareness level training for managers, engineers and technicians in the practical application of hazard and operability workshops (known as HAZOP). Training takes the form of an introductory presentation followed by interactive workshop examples where course participants can obtain an understanding of the HAZOP technique and HAZOP team leaders can practice the required skills. 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 fully recognised and recommended throughout industry by professional engineering institutions, government regulators and insurance companies. It is one of the principle risk management tools required by most government regulators for industrial processes worldwide.

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 training 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, be it in the oil and gas industry, mining, chemical or other processing industries. Consequently this workshop will be of interest to a variety of managers and to most engineering disciplines.

Course 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).

SCOPE OF THE WORKSHOP

The workshop provides training in the techniques of hazard and operability studies that are widely used in industry for the identification of potential hazards in process plant operations. In recent years HAZOP methods have been extended to searching for hazards in operational procedures and in many other fields including electronic controls and emergency planning procedures. HAZOP can be adapted to a wide range of applications to seek out operational failure modes and possible harm to persons, environment or assets.

The workshop demonstrates the relationship (and differences) 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.

In process plant design it includes the identification and effect of failures in process control systems and SCADA systems. An example of CHAZOP (Control System HAZOP) is discussed that considers hazards arising from failures in control systems.

A number of practical exercises support the training information and allow participants to test their understanding of the material provided in the training manual.

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. This workshop shows how information flow from HAZOP supports safety management throughout the life cycle of the plant.

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

DAY ONE

Morning:
HAZOP awareness presentation
Afternoon:
Instruction on HAZOP technique (syndicate workshop)

DETAILED SUMMARY OF DAY ONE

INTRODUCTION
- Course objectives and deliverables
- What is A HAZOP?
- The need for HAZOP

PREPARATIONS FOR AND CONDUCT OF A HAZOP WORKSHOP
- HAZOP type and timing
- Information required and common Problems with data
- Team selection
- Workshop timing, location and ergonomics
- HAZOP preparations and the first meeting
- Selection of nodes
- Introduction to "brainstorming" and use of guidewords
- "Mini HAZOP" example (conducted by instructor)
- Strengths and weaknesses of HAZOP
- Test understanding of basic HAZOP techniques

TEAM MEMBERS' RESPONSIBILITIES
- Study team selection/skills
- Leadership styles
- Introduction to syndicate example 1
- Syndicate example 1 - lessons learned

GOOD HAZOP WORKSHOP RECORDS
- Working with the technical secretary (scribe)
- The role of workshop records
- Types of recommendations
- Introduction to syndicate example 2
- Syndicate example 2 - lessons learned
- Test understanding of basic HAZOP techniques
- HAZOP tips and situations to avoid
- Benefits and disadvantages of HAZOP software packages

DAY TWO

Morning:
HAZOP as part of risk management
Syndicate workshop example
Quality HAZOP reports and action files
Afternoon:
Syndicate workshop examples
Alternatives to HAZOP

DETAILED SUMMARY OF DAY TWO

HAZARD IDENTIFICATION AND RISK MANAGEMENT
- Introduction to "risk ranking"
- Risk acceptability and risk matrices
- Project risk versus long term operational risk
- Syndicate example 3 (risk ranking)
- Syndicate example 3 - lessons learned
- Test understanding of risk ranking
- HAZOP and human risk factors

QUALITY HAZOP REPORTS AND ACTION FILES
- HAZOP report format
- Closeout requirements
- Follow-up action file

COST CONSIDERATIONS
- HAZOP costs and incident costs
- Cost effectiveness of remedial measures

THE LONGFORD INCIDENT

ALTERNATIVES AND COMPLEMENTARY PROCESSES TO HAZOP
- HAZOP on different types of process - batch/semi continuous etc
- HAZOP as alternative to job safety analyses on procedures
- FMEA, HAZID, HAZAN, QRA, safety integrity level analyses etch
- Example of HAZID
- Example of safety integrity level analyses (SIL)
- Introduction to syndicate example 4
- Syndicate example 4 continued
- HAZOP and other risk identification techniques
- Review of team leadership styles/skills
- Final review of main points

COURSE REVIEW AND CLOSURE

PRACTICAL SESSIONS

There are six practical exercises which you will undertake over the two days.