

# Risk Analysis & Assessment

## HSE018

### Course Description

While many risk management decisions can reasonably be based on HAZOP's, What-If studies and other qualitative risk assessments, some decisions may be so expensive as to warrant a closer review. Quantitative Risk Assessment (QRA) provides that additional level of scrutiny. Compared to qualitative studies, QRA's result in improved consistency and reduced subjectivity in providing a rational decision making process for managing process safety.

This course examines the relationship of consequences and their frequencies in understanding and assessing risk. This is presented in both a philosophical and numerical perspective. Techniques to numerically evaluate risks are then presented. The techniques that will be presented are: Layer of Protection Analysis (LOPA), Fault Tree Analysis (FTA) and Chemical Process Quantitative Risk Analysis (CPQRA).

### Course Goal

To enhance the participants' knowledge, skills and abilities necessary to understand and apply the quantitative risk analysis techniques.

### Course Objectives

By the end of this course, participant will be able to:

- Understand the Role of QRA in managing risk.
- Understand risk standards.
- Apply Quantitative Techniques in establishing failure rate data.
- Select an appropriate quantitative risk tool.
- Overview and apply of LOPA.
- Overview and apply of FTA.
- Overview and apply of CPQRA.

### Who Should Attend

Managers, engineers and others with responsibility for evaluating hazards and/or for making decisions to manage these hazards.

### Course Duration

5 Working Days



## Course Outlines

### 1. Fundamentals of Risk Assessment

- Understanding Risk.
- Establishing Risk Standards.
- Converting failure rate to failure upon demand.

### 2. Layer of Protection

- Analysis Principals of LOPA.
- Fundamental of Safety Systems.
- Developing LOPA scenarios.

### 3. Fault Tree Analysis

- Overview of FTA.
- Developing a fault tree.
- Developing an event tree.
- Quantifying fault/event tree.

### 4. Chemical Process

- Quantitative Risk Analysis.
- Overview of CPQRA.
- Evaluating societal and geographic risk.

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