

# Safety Integrity Practices

## HSE067

### Course Description

This course focuses on the principles and practices of safety integrity in high-risk industries, particularly in areas such as oil and gas, chemical, and energy sectors. It provides an in-depth understanding of safety integrity levels (SIL), the application of risk management frameworks, and how to implement and maintain effective safety systems to ensure the protection of personnel, assets, and the environment. Participants will learn the key elements of Safety Integrity Practices, including hazard analysis, risk assessment, and safety system design, while also focusing on best practices to meet international safety standards and regulations.

### Course Objectives

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

- Understand the concept of safety integrity and its importance in high-risk industries.
- Define and apply Safety Integrity Levels (SIL) in the design and assessment of safety systems.
- Conduct hazard analysis and risk assessments to determine the appropriate safety integrity levels.
- Develop and implement safety systems that meet regulatory requirements and industry standards.
- Evaluate and maintain safety system performance through regular testing and audits.
- Implement continuous improvement strategies to enhance safety integrity over time.
- Ensure the effective communication of safety system performance and compliance to stakeholders.

### Who Should Attend

- Safety engineers, safety managers, and risk management professionals involved in safety system design and implementation.
- Engineers and technical personnel working in high-risk industries such as oil and gas, chemical, and energy sectors.
- Operations managers, project managers, and team leaders involved in safety-critical systems.
- Professionals responsible for ensuring compliance with safety integrity standards and regulations.
- Anyone interested in understanding the role of safety integrity in risk management and operational safety.

### Course Duration

5 Working Days

## Course Outlines

### 1. Introduction to Safety Integrity

- Overview of safety integrity and its importance in high-risk industries.
- Regulatory frameworks and the role of safety integrity in compliance.
- The relationship between safety integrity, risk management, and operational safety.

### 2. Safety Integrity Levels (SIL)

- Defining Safety Integrity Levels (SIL) and their application in safety systems.
- Understanding the criteria for determining SIL and the methodology behind it.
- The role of SIL in the design, operation, and assessment of safety systems.

### 3. Hazard and Risk Assessment for Safety Integrity

- Techniques for conducting hazard analysis and risk assessments (e.g., HAZOP, FMEA, Fault Tree Analysis).
- Identifying and evaluating risks to determine the appropriate SIL.
- Calculating risk reduction requirements and selecting safety systems accordingly.

### 4. Designing Safety Systems to Meet SIL Requirements

- Key components of safety systems: hardware, software, and procedures.
- Designing systems that meet required SILs for different safety functions.
- Safety instrumented systems (SIS) and their role in risk mitigation.

### 5. Functional Safety and System Performance

- Principles of functional safety and its impact on system design and operation.
- Safety performance monitoring, testing, and verification.
- Maintaining safety systems: periodic testing, audits, and updates.

### 6. Safety System Lifecycle Management

- Managing the lifecycle of safety systems: from concept to decommissioning.
- Implementing safety integrity practices at each phase of the lifecycle.
- Continuous improvement strategies for maintaining safety performance.

### 7. Compliance with Safety Integrity Standards

- Overview of international safety standards (e.g., IEC 61508, IEC 61511, ISO 26262).
- Ensuring compliance with industry regulations and safety standards.
- Documentation and reporting requirements for safety integrity.

## **8. Safety System Audits and Maintenance**

- Conducting safety system audits to ensure compliance and performance.
- Maintenance strategies to enhance system reliability and safety.
- Case studies of successful safety system audits and lessons learned.

## **9. Safety Integrity Reporting and Communication**

- Reporting safety system performance to stakeholders, regulators, and management.
- Communicating risk assessment findings and safety system effectiveness.
- Ensuring transparency and stakeholder engagement in safety management practices.

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