

HSE in Maintenance & Construction Activities

5.00 days

HSE/WORKGB

Overview

AUDIENCE

Engineers, technicians and operators involved in the supervision of construction and maintenance of Oil & Gas field processing facilities.

PURPOSE

This course provides a thorough understanding of risks related to products, equipment and different operations involved in the execution of construction/maintenance works.

LEARNING OBJECTIVES

Upon completion of the course, participants will be able to:

- identify the hazards and assess the risks associated to a construction/maintenance work,
- plan the adequate resources to carry out activities adopting best industry practices,
- describe the main elements and responsibilities of the Permit To Work (PTW) system,
- identify the environmental impacts of the activity and to plan the appropriate mitigation measures,
- identify the main HSE challenges associated with the management of contractors,
- lead a team carrying out a safety audit of construction/maintenance works.

PREREQUISITE

No prerequisites for this course.

WAYS AND MEANS

Several applications and illustrations.
Several case studies and teamwork sessions.

Agenda

OPERATIONS & HSE

Hazards and risks incurred - Consequences.
Risk management means: equipment, organizational and human aspects.

0.25 d

MAIN HAZARDS OF HYDROCARBON PROCESSING

Flammability: flame ignition and propagation principles; types of combustibles, oxidizers and most common ignition sources in process facilities.
Toxicity: exposure limits; specific hazards associated to H₂S; use of Safety Data Sheet (SDS).
Fluid behavior and related hazards: vessel pressure, consequences of temperature variation (thermal expansion, vaporization, vacuum, water hammer).

0.50 d

RISK ASSESSMENT TOOLS - JOB SAFETY ANALYSIS

Fundamentals of risk assessment process.
Job Safety Analysis (JSA) procedure and steps.
JSA exercise.

0.50 d

PERMIT TO WORK SYSTEM PROCEDURE

0.50 d

Permit To Work (PTW) system. Objectives. Roles & responsibilities.
Main elements of PTW system. Typical approval process and information flowchart.
Master permit and associated certificates.
Management of shift and rotation handover. Permit renewals.
New technologies applied to PTW system. Digital PTW.

HAZARD IDENTIFICATION & RISK ASSESSMENT OF MAINTENANCE & CONSTRUCTION WORKS

1.50 d

Risk assessment and recommended mitigation measures associated to:
Lifting: manual and mechanical.
Work at Height/Over water/Diving.
Use of tools: sand blasting, lifting, chemical and HP cleaning, hydraulic tests, flexible pipes, welding tools, milling...
Radioactive sources: hazards, markers, use.
Electrical equipment: electrical classes, hazards, habilitation, consignment, personnel protection.
Confined space works: ventilation, gas detection, oxygen content of air, penetration, evolution of hazard during works, supervision.
Hydrostatic testing.
Welding/Grinding/Cutting.

ENVIRONMENTAL MANAGEMENT IN MAINTENANCE & CONSTRUCTION OPERATIONS

0.50 d

Main concepts.
Tools for environmental management.
Potential environmental impacts in maintenance and construction operations.
Waste management principles and strategies for planning and implementation.

ORGANIZATIONAL FRAMEWORK - HUMAN FACTORS

0.50 d

Introduction to HSE Management system.
SIMultaneous OPerationS (SIMOPS) management.
Management of change.
Downgraded situations.
Learning from incidents and accidents: near misses, reporting and cause tree analysis.
Human factors in risk management, safe and unsafe habits, motivation, exemplarity, difficulties in improving safety results.

HSE MANAGEMENT OF CONTRACTORS

0.25 d

Contractor management as a key element of HSE Management system.
Definition of elements for HSE contractor management from selection process to final performance evaluation.
HSE risk assessment of contract scope.

AUDITS - MEANS OF IMPROVING THE HSE PERFORMANCE

0.50 d

Objectives of an audit.
Pre-audit preparations: audit boundaries, expectations, audit checklists, audit plans.
Audit: findings versus expectations.