Safety in Plant Operation

Overview

AUDIENCE
Operating personnel (engineers, shift leaders and/or operators) in refineries and petrochemical/chemical plants; any staff involved in operations (maintenance, SHE department).

PURPOSE
This course provides trainees with a better understanding of product and equipment risks in order to ensure safe operation.

LEARNING OBJECTIVES
Upon completion of the course, participants will be able to:
- identify and assess the risks inherent to product handling, equipment use and operations,
- measure the possible consequences on safety, health and the environment,
- apply recommended preventive measures,
- adopt the most appropriate behavior to counter risks.

PREREQUISITE
No prerequisites for this course.

WAYS AND MEANS
Workshop: preparation of shutdown, decommissioning or/and commissioning, start-up procedure for a typical unit.
Case studies and analysis of incidents and accidents.

OBSERVATION
This course is also available in Dutch, Italian and Spanish.

Agenda

PLANT OPERATIONS & SAFETY
Hazard and risk identification.
Safety, health, environmental consequences.
Risk management: technical, organizational and human aspects.

PRODUCT-RELATED RISKS
Flammability:
Explosive atmosphere: combustible products (gaseous, liquid and solid). Oxidizers. Ignition sources; flames, self-ignition temperature, sparks and static electricity, pyrophoric products, etc.
Preventive measures and precautions: during normal conditions, during draining and sampling; in the event of leaks; with regard to storage tanks; during loading and unloading; during repair work.
Risks and precautions related to BLEVE.
Chemical and physical hazards involving personnel:
Burns caused by heat sources and chemical products.
Fluid behavior and related risks:
Pressure in a vessel and consequences of an increase or decrease in temperature: thermal expansion, vaporization, collapsing due to vacuum, freezing due to pressure drop, etc.
Risk assessment and preventive measures.
Pressure equipment related risks.
Main risks.
Preventing of risks through the correct use of safety equipment and devices.
Corrosion hazards and monitoring.

SAFETY IN PROCESS OPERATIONS
Preparation of shutdown, decommissioning or/and commissioning, start-up procedure for a typical unit.
Precautions and risks related to the use of utilities: inert gases, liquid water, steam, air, gas oil, fuel gas.
Safety related to blowdown and drainage toward: flare, slops, tanks, oily water…
Blinding (lockout/tagout) procedures: conditions for installing blinds or spades.
Degassing-inerting: steam, nitrogen, water, vacuum, work permits…
Entry into vessels. Atmosphere analysis: oxygen content, explosivity, toxicity.
Start-up: checks, accessibility and cleanliness, line up, nitrogen-, water-, steam- or vacuum deaeration.
Tightness testing; commissioning and start-up.

HUMAN BEHAVIOR & SAFETY MANAGEMENT
Human factors. Safety barriers, compliance with procedure, risk of routine.
Employees’ involvement: commitment and responsibility.
Available tools to improve safety: procedures, risk assessment, safety meetings, accident investigation and reporting, audits, field observations, emergency drills.