Training - Introduction to Process Safety Engineering

SAFENRC-EN-P | Face-to-face only | 5 days

This course provides an overview of safety reviews in a project and highlights the main principles to design and maintain the prevention, mitigation and protection barriers

Level

Knowledge

Public

Managers, engineers, technicians in charge of the design, the modification, the maintenance or the operation of industrial facilities

Objectives

Attendees will be able to implement the following skills:

- Be instrumental in the safety reviews done during a project or plant modification
- Improve process safety practices and reinforce the integration of the human factor from the design stage
- Strengthen the integration of the human factor from the design stage

Pedagogical & technical resources

The pedagogy is active and builds on the experience of the participants and the knowledge of the site:

- several exercises and applications (50% case studies or tutorial exercises), with a "rolling case" on a typical processing unit
- safety impact of a simple modification
- identification of safety barriers with the impact of their maintenance on their effectiveness
- a number of visual aids: videos, learning from incidents (Texas City, Buncefield, Achinsk...)

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

No prerequisites are necessary to follow this course

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

RISK IDENTIFICATION — 1.25 days

Risk identification and acceptability with respect to people, environment and assets - Hazard and risk - Residual risk - Risk assessment matrix.

© IFPTraining

Review of hazardous phenomena: gas dispersion, toxic release, thermal radiation, overpressure blast.
Preliminary risk quantification: evaluation of risk consequences (grass root project or revamping) based on HAZID/HAZOP reviews.

INHERENT SAFETY DESIGN & LAYOUT OPTIMIZATION — 0.5 day

Layout optimization based on safety reviews: safety distances, fire zones, deluge zones.
Reducing hazardous inventories, leak control systems, disposal system (flare, diked area...) and drainage systems, equipment sealing.

TYPE OF SAFETY BARRIERS — 0.25 day

Safety barriers: technical, organizational, human; prevention, mitigation, protection, active, passive. Criteria of safety barriers' efficiency.

PREVENTION BARRIERS — 1.5 days

Pressure equipment and atmospheric storage tanks: selection of material of construction, corrosion, pressure resistance - Piping classes.
Overpressure and negative pressure protection: pressure safety valves, rupture discs: selection criteria, design, implementation, inspection.
Safety Instrumented Systems (SIS) and Safety Integrity Level (SIL) - Typical architecture of Safety Instrumented Systems: hierarchy, interaction with process control system and Fire & Gas system.
Flammability control: minimizing ignition sources, hazardous area classification, equipment selection and location in hazardous areas.

DETECTION, MITIGATION & PROTECTION SYSTEMS — 0.75 day

Fire and gas detection system: technology of sensors, selection and location - Cause and effect matrix, voting - Relationship with mitigation systems.
Passive fire and blast protection: description of material, location, monitoring and inspection - Identification of surface/elements to be protected.
Active firefighting systems: extinguishing agents (water, foam, dry chemicals, inert/inhibition gas).
Fixed systems with water or foam: elements of the fire main system (main ring, fire water pumps, consumers, water tank, foam solution), application rate.

DAY-TO-DAY INDUSTRIAL RISK MANAGEMENT — 0.75 day

Human factors: functioning of the human being - Examples of systems embedding human behavior or human error: equipment accessibility, plant ergonomics, graphic display design, alarm management...
Management Of Change (MOC): technical, organizational and human expertise (reliability of documentation, suitability/application of the procedures, corporate's specifications...).
Maintaining the efficiency of the barriers - Example of a risk management tool: the bow tie.

To French entities : IFP Training is referenced to DataDock ; you may contact your OPCO about potential funding.
Please contact our disabled persons referent to check the accessibility of this training program : referent.handicap@ifptraining.com

© IFPTraining