

Implementing Safety Review

HAZID, HAZOP, LOPA, ...

4.00 days

SEC/HAZOP-E

Overview

AUDIENCE

Staff involved in process design, facilities operation, maintenance and safety, whose duty is to implement or participate in process hazard reviews, for new and/or existing facilities.

PURPOSE

This course provides a deeper knowledge of selection and implementation of process hazard reviews.

LEARNING OBJECTIVES

Upon completion of the course, participants will be able to:
take an active part in the process hazard reviews/methodologies,
prepare process hazard reviews, organize the review team, identify participants based on their experience and background and define their individual task,
select and prepare reviews, adapted to the context.

PREREQUISITE

Ability to read PFD's and PID's.

WAYS AND MEANS

Simulation of hazard reviews on simple processes: HAZID, HAZOP, LOPA.
Construction of a bow tie and calculation of occurrence frequencies.
Short exercises using risk matrix.

Agenda

RISK & ACCEPTABILITY CRITERIA

0.50 d

Hazard representation.
Risk matrix, impact on workers, assets and the environment.
Risk and hazard concepts, gravity and probability levels. Acceptable residual risk for people, environment and assets.
Safety reviews:
Objectives and implementation during the various project phases or on existing facilities.
Integration of findings into design of facilities - Integration in QRA study - Design of safety barriers:
Selection of the most appropriate methodology, in accordance with the context: new project, existing facilities and revamping, updating of previous studies, operating permit.

QUALITATIVE & SEMI-QUANTITATIVE METHODS

2.25 d

HAZID: HAZards IDentification (preliminary hazards analysis, design review, constructibility).
HAZOP: HAZard and OPerability analysis. Quantified HAZOP.
What-if and check-list methods: comparison with HAZOP method, pros & cons.
Implementing the methods: organize and prepare. Plan and lead the review.
Preparation of the report, follow-up, monitoring and close out of the findings.

QUANTITATIVE METHODS

1.25 d

Bow tie: principles, construction and use. Safety barriers. Frequency calculation.

Quantitative Risk Assessment (QRA): selection of scenarios, evaluation of consequences and probability.

Layer Of Protection Analysis (LOPA): principles, Independent Protection Layers (IPL) identification), Safety Integrity Level (SIL),