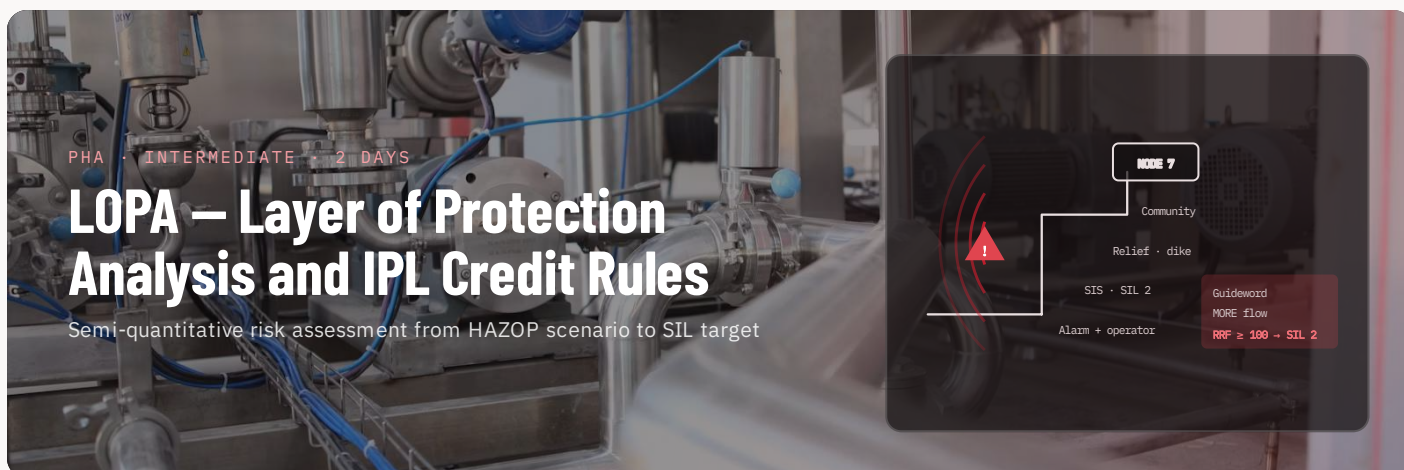




DURATION
2 days

LEVEL
Intermediate

FORMAT
On-site classroom · virtual instructor-led

LANGUAGE
English

MAX. PARTICIPANTS
16

10
LOPA scenarios worked

1
IPL credit rulebook

1
calibration exercise against site criteria

◆ Overview

LOPA is where a HAZOP scenario becomes a number that decides whether a SIF is needed and at what SIL. The method is simple; the mistakes are in the details — initiating-event frequencies taken from the wrong table, safeguards credited that are not independent, conditional modifiers applied twice, tolerable-frequency criteria nobody has agreed. The course works through scenario selection, frequency and probability data, IPL qualification rules and documentation, then runs ten scenarios from real HAZOP worksheets.

◆ Learning outcomes

- Select LOPA scenarios from a HAZOP and define them with a single cause and consequence
- Assign initiating-event frequencies from recognised data sources and site history
- Apply the independence, effectiveness, auditability and specificity tests before crediting an IPL
- Credit BPCS loops, alarms with operator response, relief devices and mitigation layers correctly
- Use enabling conditions and conditional modifiers without double counting
- Set tolerable-frequency targets and derive SIL targets and gap-closure options

◆ Who should attend

Process safety, process and instrument engineers who perform or review LOPA; HAZOP leaders; SIS engineers who receive LOPA results

◆ Course outline

DAY 1

LOPA in the PHA and IEC 61511 lifecycle · scenario definition and consequence categories · initiating events and frequency data · enabling conditions and conditional modifiers · tolerable risk criteria and risk matrices · IPL qualification rules

DAY 2

Crediting BPCS, alarms, relief, dikes and F&G · human IPLs and time to respond · common-cause and shared components · SIL target derivation and gap closure · worked scenarios in CeraPHA Studio · documentation, review and revalidation of LOPA records

◆ Standards referenced

CCPS Layer of Protection Analysis

CCPS Guidelines for Initiating Events and Independent Protection Layers

IEC 61511-3

ANSI/ISA-84.00.01

OSHA 29 CFR 1910.119(e)

◆ Tools & exercises

Scenarios worked in CeraPHA Studio using its LOPA module and IPL library

◆ What's included

- ✓ Course manual and slide pack
- ✓ Software access for the course
- ✓ Post-course Q&A with the instructor
- ✓ Exercise and case-study pack
- ✓ Competency quiz and certificate
- ✓ Templates used in the exercises

PREREQUISITES

Participation in at least one HAZOP; basic probability arithmetic

CERTIFICATION

Certificate of completion

INSTRUCTORS

Practising engineers — TÜV HAZOP Leader, CCPSC and IEC 61511 Functional Safety certified — with 200+ years of cumulative plant experience.

Book this course or build a custom curriculum

On-site at your plant or virtual · in-house groups · competency assessment included

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