TRAINING CATALOGUE · CATEGORY A

Process Hazard Analysis

Leading, scribing and applying HAZOP, HAZID, LOPA, SIL determination and verification, bow-ties and facility siting - the studies that define a plant's safeguards.

10 COURSES

13.5 TRAINING DAYS

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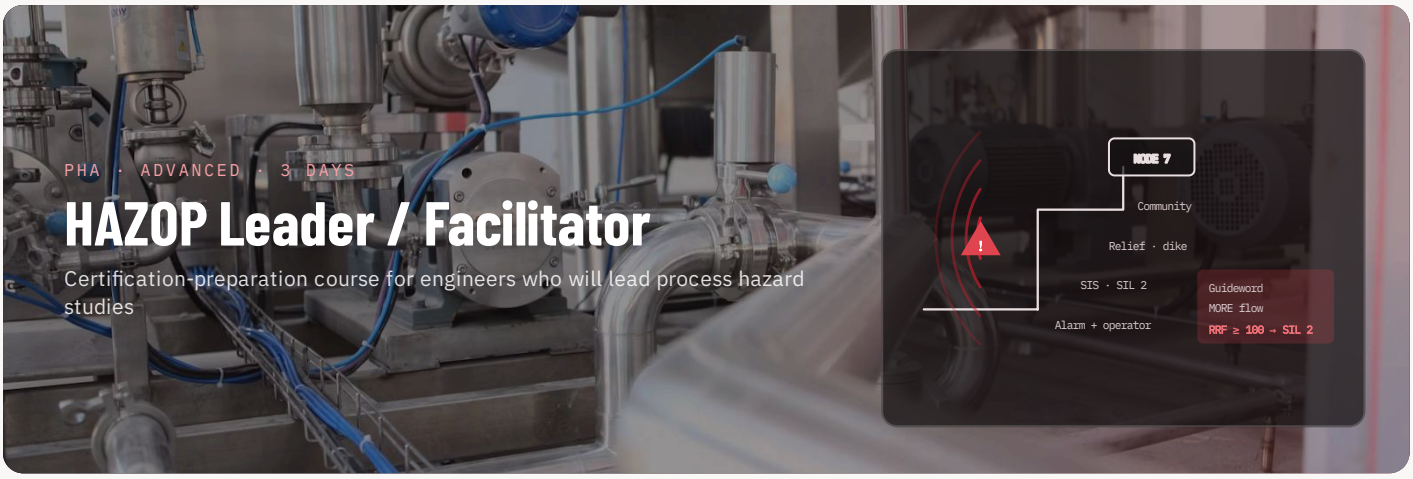
Category A · Process Hazard Analysis

CODE	COURSE	DURATION	LEVEL	PRIMARY AUDIENCE
A · Process Hazard Analysis				
TR-A01	**HAZOP Leader / Facilitator** Certification-preparation course for engineers who will lead process hazard studies	3 days	Advanced	Process
TR-A02	**HAZOP Team Member & Scribe** How to contribute, challenge and record so the study is worth the team's time	1 day	Foundation	Operations
TR-A03	**HAZID, What-If and Checklist Techniques** Selecting and running the lighter hazard-identification methods across the project lifecycle	1 day	Foundation	Process
TR-A04	**LOPA — Layer of Protection Analysis and IPL Credit Rules** Semi-quantitative risk assessment from HAZOP scenario to SIL target	2 days	Intermediate	Process safety
TR-A05	**SIL Determination — Risk Graph, LOPA, Risk Matrix** Choosing and calibrating the target-SIL method under IEC 61511-3	1 day	Intermediate	Process safety and instrument engineers
TR-A06	**SIL Verification and SIF Design Basics (IEC 61511)** From safety requirements specification to PFDavg, architecture and proof-test interval	2 days	Advanced	Instrument
TR-A07	**Functional Safety Lifecycle — IEC 61508/61511 Overview** What the standards require, who owns each phase and where sites fall short	1 day	Foundation	Engineers
TR-A08	**Bow-Tie Analysis and Barrier Management** Turning major-accident hazards into barriers people can own, verify and report on	1 day	Intermediate	Process safety engineers
TR-A09	**PHA Revalidation and Management of PHA Actions** Keeping the hazard analysis current and closing what it found	½ day	Intermediate	PSM coordinators
TR-A10	**Facility Siting and Occupied Buildings (API RP 752/753)** Assessing and managing the risk to people in control rooms, workshops and portable buildings	1 day	Intermediate	Process safety engineers



PHA · ADVANCED · 3 DAYS

HAZOP Leader / Facilitator

Certification-preparation course for engineers who will lead process hazard studies

DURATION	LEVEL	FORMAT	LANGUAGE	MAX. PARTICIPANTS
3 days	Advanced	On-site classroom · virtual instructor-led	English	16

2 recorded practice sessions

60 % of time in workshop

1 competency assessment

Overview

A HAZOP is only as good as the person leading it. This course takes experienced engineers through the full facilitation cycle — node definition, guideword discipline, team dynamics, safeguard crediting and action quality — using real refinery and petrochemical P&IDs. Participants lead recorded practice sessions and receive individual feedback against the competencies expected of a certified HAZOP leader.

Learning outcomes

- Plan a study: scope, node breakdown, team composition, schedule and information requirements
- Apply guidewords and parameters systematically without losing the team's attention
- Judge when a safeguard may be credited and when it may not
- Write causes, consequences and recommendations that survive an audit
- Manage difficult sessions: dominant members, scope creep, design-freeze pressure
- Close out: report structure, action tracking, revalidation triggers

Who should attend

Process, safety and project engineers who will lead HAZOP, HAZID and revalidation studies; PSM coordinators

Course outline

DAY 1

HAZOP purpose and regulatory context · IEC 61882 methodology · study preparation and node definition · guideword/parameter matrices · recording standards

DAY 2

Safeguard and IPL logic · linking HAZOP to LOPA and SIL · facilitation skills and team management · practice session 1 on a live P&ID with feedback

DAY 3

Batch and procedural HAZOP · revalidation and cyclic reviews · reporting and action management · practice session 2 · competency assessment

Standards referenced

IEC 61882 · IEC 61511 · OSHA 29 CFR 1910.119(e) · CCPS Guidelines for Hazard Evaluation Procedures

Tools & exercises

Hands-on with CeraPHA Studio for worksheets, safeguard library and action register

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
Three or more years of plant or design experience and participation in at least two HAZOP studies

CERTIFICATION
Certificate of completion with competency assessment result; preparation for TÜV-style HAZOP Leader examinations

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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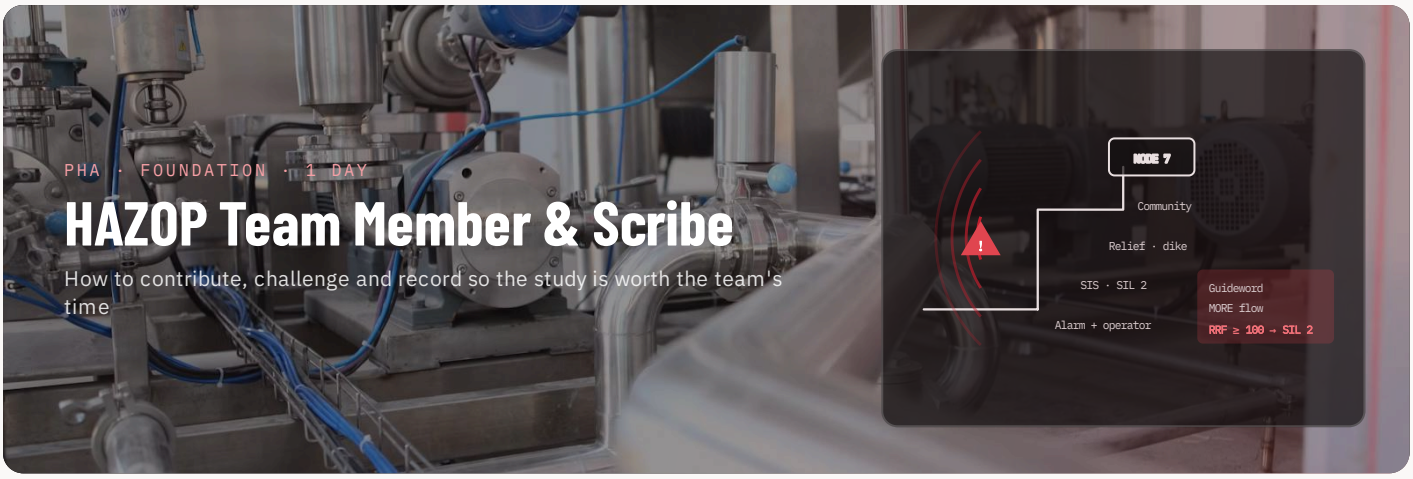

PHA · FOUNDATION · 1 DAY

HAZOP Team Member & Scribe

How to contribute, challenge and record so the study is worth the team's time

DURATION	LEVEL	FORMAT	LANGUAGE	MAX. PARTICIPANTS
1 day	Foundation	On-site classroom · virtual instructor-led	English	16

4 nodes recorded live

50 % of time at the worksheet

1 recording-quality check

Overview

A HAZOP team spends most of its week waiting for someone to explain what a guideword means or why the safeguard they named was not credited. This course prepares team members to arrive knowing the method, the vocabulary and what the leader needs from them, and prepares scribes to record causes, consequences and safeguards in a form the study can actually use. Half the day is spent recording real nodes from participants' own units.

Learning outcomes

- Explain the purpose of a HAZOP and how the outcome is used downstream in LOPA, SIL and MOC
- Interpret guideword and parameter combinations and offer credible deviations
- State causes, consequences and safeguards precisely instead of as opinions
- Recognise which safeguards qualify as protection layers and which do not
- Record a worksheet that a reader outside the room can follow
- Prepare for a study: drawings, operating data, incident history and questions to bring

Who should attend

Operations, maintenance, instrument and process engineers and supervisors nominated to HAZOP teams; engineers and technical assistants who will scribe

Course outline

MORNING

What the regulator and the site expect of a HAZOP · IEC 61882 method and terminology · nodes, design intent and deviations · causes, consequences and safeguards · the difference between a safeguard and an IPL

AFTERNOON

Recording conventions and worksheet quality · writing recommendations that can be closed · scribing in CeraPHA Studio · live recording of four nodes from participants' P&IDs · recording-quality check and feedback

Standards referenced

IEC 61882 · OSHA 29 CFR 1910.119(e) · CCPS Guidelines for Hazard Evaluation Procedures

Tools & exercises

Worksheets recorded in CeraPHA Studio with the guideword templates and safeguard 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
Ability to read a P&ID

CERTIFICATION
Certificate of completion; recorded as HAZOP team-member training for the site training matrix

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

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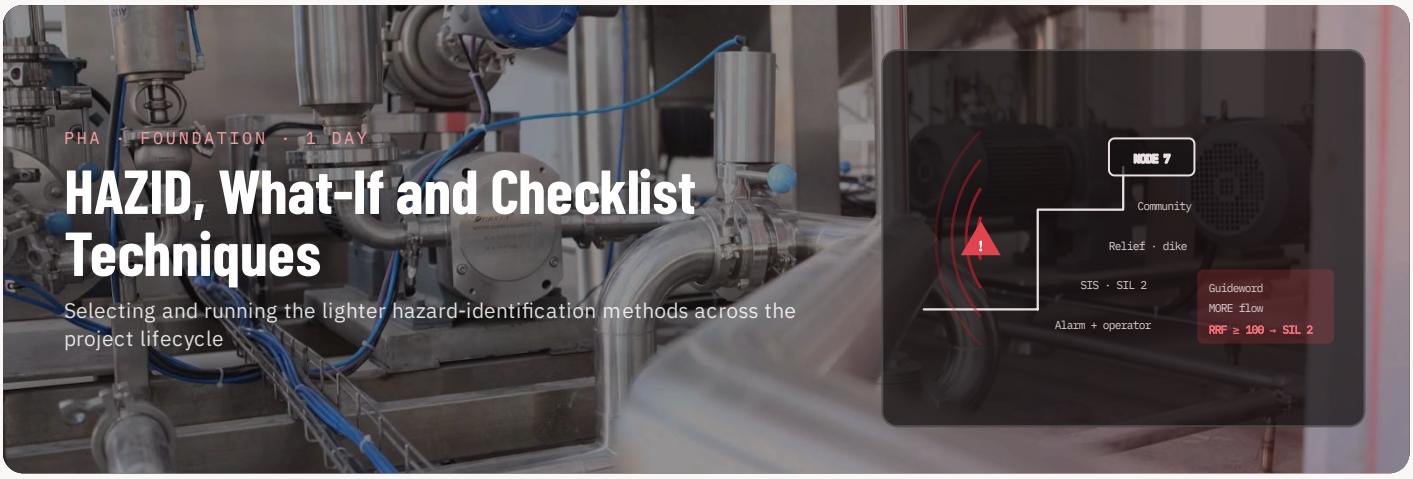

PHA · FOUNDATION · 1 DAY

HAZID, What-If and Checklist Techniques

Selecting and running the lighter hazard-identification methods across the project lifecycle

DURATION	LEVEL	FORMAT	LANGUAGE	MAX. PARTICIPANTS
1 day	Foundation	On-site classroom · virtual instructor-led	English	16

3 techniques applied to one plant

1 checklist built for your site

1 method-selection guide

Overview

Not every question deserves a HAZOP. HAZID at concept stage, What-If reviews for changes and checklists for start-up and routine tasks each find hazards a guideword study would miss or reach too late. The course covers when each technique is the right choice, how to structure and facilitate it, how to record the result so it links to the later HAZOP, and how to keep a checklist from becoming a tick-box exercise.

Learning outcomes

- Choose the hazard-identification technique that suits the lifecycle stage and the decision being made
- Plan and run a HAZID with a hazard/guideword register suited to the facility
- Facilitate a structured What-If review for a change or a non-standard operation
- Build and maintain checklists that ask about the site's real hazards
- Record results in a register that feeds the HAZOP, the risk register and MOC
- Judge when a lighter study has found something that needs a full HAZOP or a consequence model

Who should attend

Process, safety, project and operations engineers who run or take part in hazard identification at concept, FEED, MOC and operations stages

Course outline

MORNING

Hazard identification across the lifecycle · HAZID structure: hazard categories, guidewords and register · facilitation and team composition · HAZID exercise on a concept plot plan · linking HAZID to ENVID and HAZOP

AFTERNOON

What-If and What-If/Checklist method · running a What-If on an MOC package · checklist design and pitfalls · building a site checklist from incident history · recording in CeraPHA Studio and report expectations

Standards referenced

IEC 31010 · ISO 17776 · IEC 61882 · CCPS Guidelines for Hazard Evaluation Procedures · OSHA 29 CFR 1910.119(e)

Tools & exercises

Registers and worksheets recorded in CeraPHA Studio; checklist templates supplied

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
None; some plant or project experience helpful

CERTIFICATION
Certificate of completion

INSTRUCTORS
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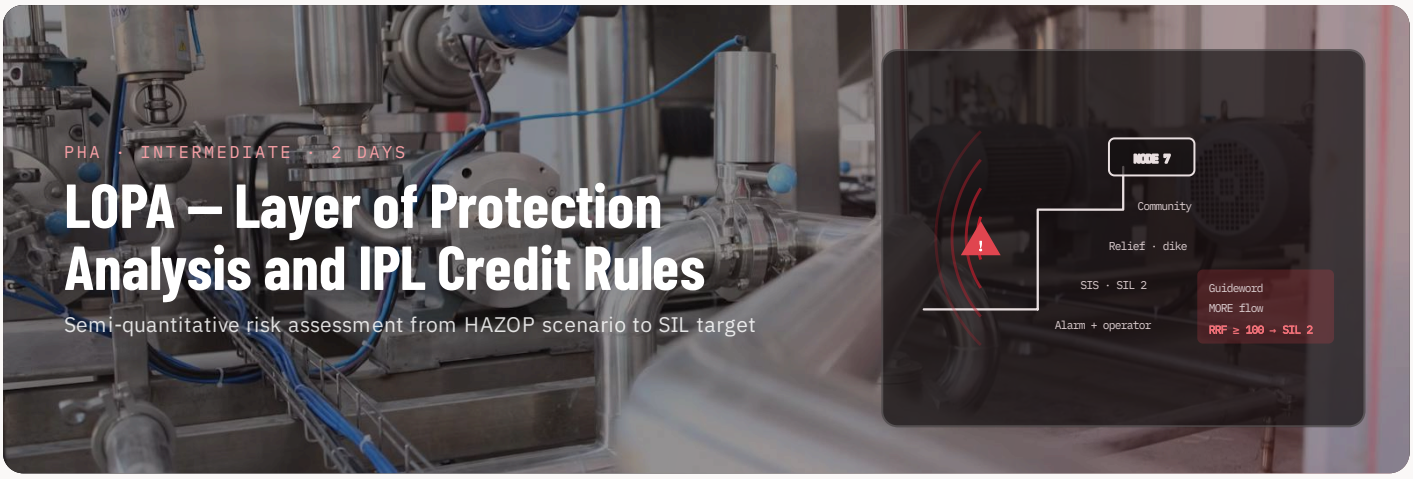

PHA · INTERMEDIATE · 2 DAYS

LOPA — Layer of Protection Analysis and IPL Credit Rules

Semi-quantitative risk assessment from HAZOP scenario to SIL target

DURATION	LEVEL	FORMAT	LANGUAGE	MAX. PARTICIPANTS
2 days	Intermediate	On-site classroom · virtual instructor-led	English	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.

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PHA · INTERMEDIATE · 1 DAY

SIL Determination — Risk Graph, LOPA, Risk Matrix

Choosing and calibrating the target-SIL method under IEC 61511-3

DURATION	LEVEL	FORMAT	LANGUAGE	MAX. PARTICIPANTS
1 day	Intermediate	On-site classroom · virtual instructor-led	English	16

3 methods applied to the same SIFs

8 SIFs classified in the workshop

1 method-calibration record

Overview

IEC 61511 allows several routes to a SIL target and each gives a different answer unless it has been calibrated to the same tolerable risk. The course explains the risk graph, calibrated risk graph, risk matrix and LOPA methods, how to calibrate them against the site's risk criteria, and how to run a SIL classification workshop that produces a consistent, documented target for every SIF. Participants classify eight SIFs by three methods and compare the results.

Learning outcomes

- Explain what a SIL target means and how it is used in SIF design and verification
- Apply the risk graph and calibrated risk graph with defensible parameter definitions
- Use a risk matrix and LOPA for the same SIF and reconcile the results
- Calibrate a method against the site's individual and societal risk criteria
- Run a SIL classification workshop with the right team and information
- Record the classification so it survives audit and revalidation

Who should attend

Process safety and instrument engineers, HAZOP and LOPA leaders, SIS responsible engineers and PSM coordinators

Course outline

MORNING

SIL targets in the IEC 61511 lifecycle · consequence, frequency, occupancy and avoidance parameters · risk graph and calibrated risk graph · risk matrix approaches · calibration against tolerable risk criteria

AFTERNOON

LOPA as a SIL determination method · reconciling method disagreements · classification workshop on eight SIFs in CeraPHA Studio · demand rate, mode of operation and RRF · documenting the SIL target and safety requirement inputs

Standards referenced

IEC 61511-3 · IEC 61508-5 · ANSI/ISA-84.00.01 · CCPS Layer of Protection Analysis

Tools & exercises

Classification exercises in CeraPHA Studio's SIL determination module

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
HAZOP participation; LOPA course (TR-A04) or equivalent recommended

CERTIFICATION
Certificate of completion

INSTRUCTORS
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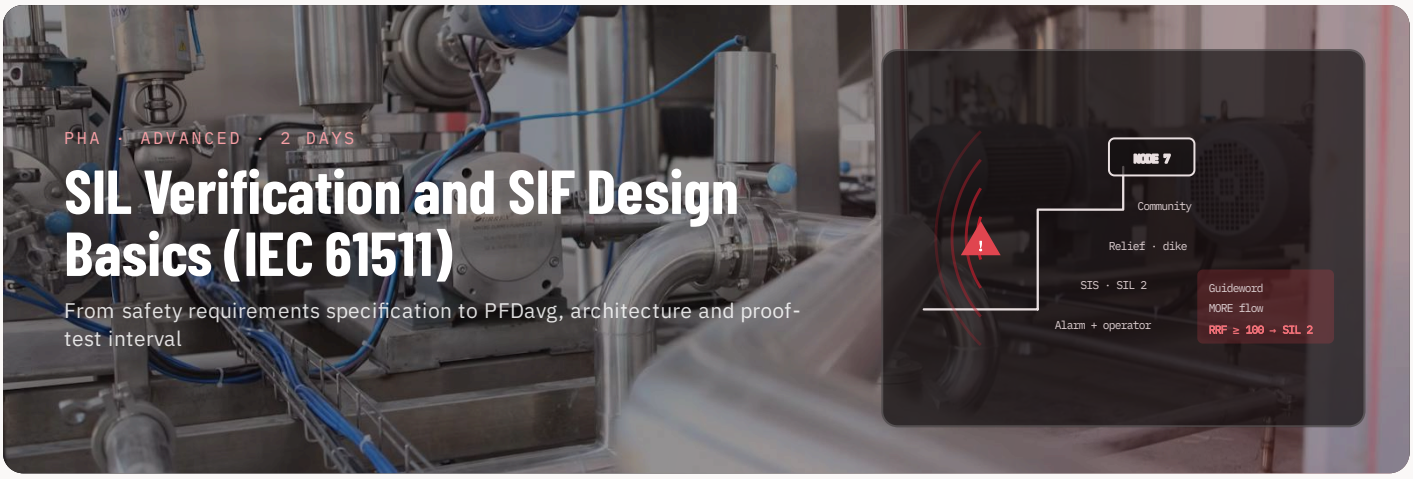

PHA · ADVANCED · 2 DAYS

SIL Verification and SIF Design Basics (IEC 61511)

From safety requirements specification to PFDavg, architecture and proof-test interval

DURATION	LEVEL	FORMAT	LANGUAGE	MAX. PARTICIPANTS
2 days	Advanced	On-site classroom · virtual instructor-led	English	16

6 SIFs verified end to end

3 architectures compared

1 SRS template

Overview

A SIL target is a promise; verification is where it is checked. The course takes the SIF from the safety requirements specification through sensor, logic-solver and final-element selection, failure-rate data, PFDavg calculation, architectural constraints and systematic capability, to the proof-test interval and coverage that keep it in SIL for the life of the plant. Six SIFs are verified end to end with the calculations shown, not just the tool output.

Learning outcomes

- Write a safety requirements specification that a designer and a verifier can both use
- Select failure-rate data from certificates, OREDA and site records and justify it
- Calculate PFDavg for 1oo1, 1oo2, 2oo3 and mixed architectures including common cause
- Apply hardware fault tolerance and route 1H/2H architectural constraints
- Set proof-test intervals and coverage and see their effect on achieved SIL
- Recognise systematic failure sources and the role of prior-use and certified devices

Who should attend

Instrument, control and functional-safety engineers who design, verify or assess safety instrumented functions; SIS maintenance leads

Course outline

DAY 1

IEC 61511 realisation phase · safety requirements specification content · sensor, logic-solver and final-element selection · failure modes and failure-rate data · diagnostics, safe and dangerous failures · PFDavg by simplified equations

DAY 2

Voting architectures and beta-factor common cause · hardware fault tolerance and route 1H/2H · systematic capability and prior use · proof-test interval, coverage and partial-stroke testing · verification of six SIFs in CeraPHA Studio · design review and hand-over to operations

Standards referenced

`IEC 61511-1 / -2` `IEC 61508-2 / -6` `ANSI/ISA-84.00.01` `ISA-TR84.00.02` `ISA-TR84.00.03`

Tools & exercises

Verification calculations in CeraPHA Studio with independent hand checks

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
Instrumentation background; SIL determination course (TR-A05) or equivalent

CERTIFICATION
Certificate of completion with competency assessment result; supports application for TÜV or exida functional-safety examinations

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

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PHA · FOUNDATION · 1 DAY

Functional Safety Lifecycle — IEC 61508/61511 Overview

What the standards require, who owns each phase and where sites fall short

DURATION	LEVEL	FORMAT	LANGUAGE	MAX. PARTICIPANTS
1 day	Foundation	On-site classroom · virtual instructor-led	English	16

16 lifecycle phases explained

1 role-and-responsibility map

1 gap check against your FSMS

Overview

Most of the people who influence whether a SIS works — operators who bypass it, technicians who test it, engineers who change the set-point — have never read IEC 61511. This course explains the safety lifecycle from hazard analysis to decommissioning in plain language, what each phase produces, who is responsible, and how functional safety management, competence and assessment hold it together. It ends with a gap check against the site's own functional safety management system.

Learning outcomes

- Describe the IEC 61508 and IEC 61511 lifecycle phases and their deliverables
- Explain SIL, PFDavg, demand mode and proof testing without the mathematics
- Identify the responsibilities of operations, maintenance, engineering and management in each phase
- Recognise how bypasses, MOC and proof-test deferrals affect achieved SIL
- Explain functional safety management, competence and assessment requirements
- Locate the gaps in a site's functional safety management system

Who should attend

Engineers, supervisors and managers who touch a safety instrumented system without being SIS specialists: process, operations, maintenance, projects, HSE and asset integrity

Course outline

MORNING

Why functional safety standards exist · IEC 61508 and IEC 61511 relationship and scope · analysis phase: hazard and risk assessment, allocation, SRS · realisation phase: design, verification, installation and validation · SIL, PFD, demand mode and RRF explained

AFTERNOON

Operation and maintenance phase: proof testing, bypasses, demand recording · modification and decommissioning · functional safety management, competence and assessment · what an FSA looks for · gap check against the site's FSMS and lifecycle records

Standards referenced

IEC 61508-1 · IEC 61511-1 · ANSI/ISA-84.00.01 · OSHA 29 CFR 1910.119 · CCPS Guidelines for Safe and Reliable Instrumented Protective Systems

Tools & exercises

Lifecycle records and SIF register illustrated in CeraPHA Studio; no software skills required

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
None

CERTIFICATION
Certificate of completion; awareness-level evidence for functional safety competence records

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

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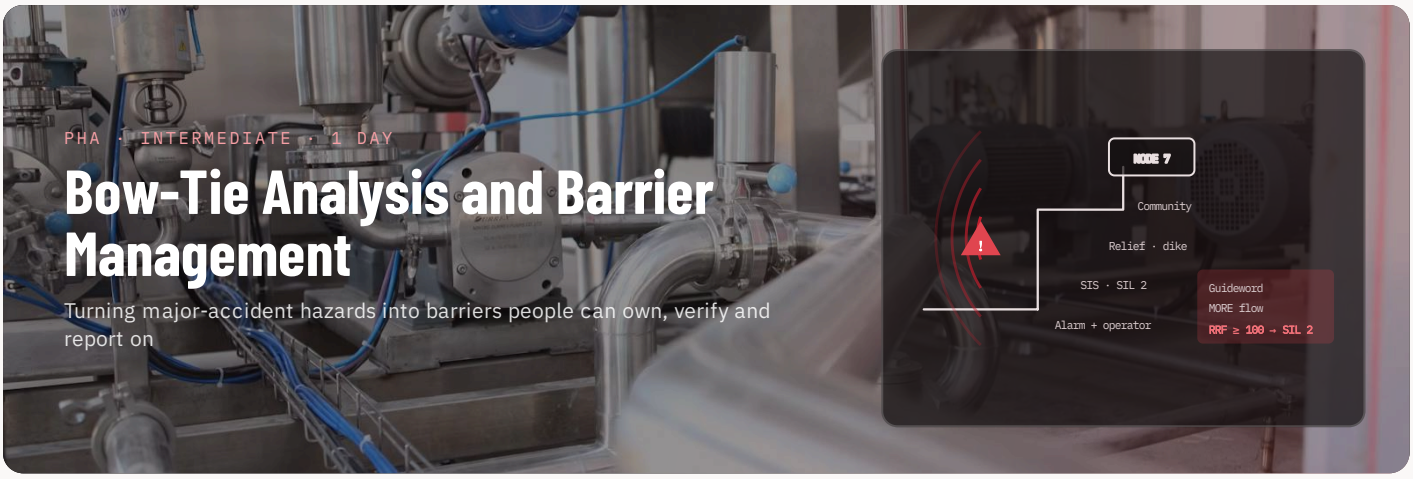

PHA · INTERMEDIATE · 1 DAY

Bow-Tie Analysis and Barrier Management

Turning major-accident hazards into barriers people can own, verify and report on

DURATION	LEVEL	FORMAT	LANGUAGE	MAX. PARTICIPANTS
1 day	Intermediate	On-site classroom · virtual instructor-led	English	16

4 bow-ties built for your MAHs

1 barrier-criteria checklist

1 barrier-status dashboard concept

Overview

A bow-tie makes a major-accident scenario visible in a way a HAZOP worksheet never will: the threats on the left, the top event in the middle, the consequences on the right and, on every line, the barriers that must work. The course covers building bow-ties to the CCPS/EI method, deciding what qualifies as a barrier, assigning ownership and performance standards, and using the diagrams for barrier-status reporting, incident review and communicating with the workforce. Participants build four bow-ties for their own major-accident hazards.

Learning outcomes

- Define top events and threats at the right level of abstraction
- Distinguish barriers from degradation factors and safeguards that are not barriers
- Apply barrier criteria: effective, independent, auditable
- Assign barrier owners, performance standards and verification activities
- Link bow-ties to HAZOP, LOPA, SCE lists and the incident-investigation process
- Use bow-ties for barrier-status reporting and workforce engagement

Who should attend

Process safety engineers, HSE leads, operations and maintenance managers, safety-case and Seveso report authors, barrier owners

Course outline

MORNING

Major-accident hazards and the Swiss-cheese model · bow-tie anatomy: hazard, top event, threats, consequences · barrier criteria and common errors · degradation factors and degradation controls · building the first bow-tie for a site MAH

AFTERNOON

Barrier ownership, performance standards and assurance · barrier management systems and status reporting · bow-ties in Seveso reports and safety cases · linking to HAZOP, LOPA and SCE records in CeraPHA Studio · three further bow-ties and review

Standards referenced

CCPS / EI Bow Ties in Risk Management · IEC 31010 · ISO 17776 · EI Guidance on Process Safety Barriers · Seveso III Directive

Tools & exercises

Diagrams built in the participants' bow-tie tool of choice; barriers cross-referenced to HAZOP and LOPA records in CeraPHA Studio

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
Familiarity with the site's major-accident hazards; HAZOP participation helpful

CERTIFICATION
Certificate of completion

INSTRUCTORS
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PHA · INTERMEDIATE · ½ DAY

PHA Revalidation and Management of PHA Actions

Keeping the hazard analysis current and closing what it found

DURATION	LEVEL	FORMAT	LANGUAGE	MAX. PARTICIPANTS
½ day	Intermediate	On-site classroom · virtual instructor-led	English	16

3 revalidation approaches compared

1 action-register health check

1 revalidation plan for your unit

Overview

A PHA that is five years old and an action register with 300 open items are the two findings that appear in almost every PSM audit. This half-day session explains the revalidation options — update, redo or a combination — how to choose based on the change history, incident record and quality of the previous study, and how to run a revalidation that does not repeat the original three weeks. The second half addresses the action register: writing closable actions, risk-ranking, tracking and what 'resolved' has to mean.

Learning outcomes

- Choose between update, redo and hybrid revalidation using documented criteria
- Assemble the revalidation inputs: MOCs, incidents, audit findings, prior study quality
- Plan and staff a revalidation to the scope it needs, not the scope of the original
- Write recommendations that an owner can implement and an auditor can close
- Rank, track and report open actions with clear resolution criteria
- Keep PHA records in a state that supports MOC and the next revalidation

Who should attend

PSM coordinators, PHA leaders, unit engineers and action owners responsible for the five-year revalidation and the PHA action register

Course outline

SESSION 1

Regulatory basis for revalidation · study quality review and change history · update versus redo decision · running an efficient revalidation · revalidation plan for a participant's unit

SESSION 2

Recommendation quality and the resolution options · risk-ranking and due dates · action tracking and escalation · closing actions with evidence · action-register health check in CeraPHA Studio

Standards referenced

OSHA 29 CFR 1910.119(e)(6)
CCPS Guidelines for Revalidating a Process Hazard Analysis
IEC 61882
EPA 40 CFR 68.67

Tools & exercises

Revalidation pack and action register handled in CeraPHA Studio

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
PHA participation; responsibility for a PHA or action register

CERTIFICATION
Certificate of completion

INSTRUCTORS
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PHA · INTERMEDIATE · 1 DAY

Facility Siting and Occupied Buildings (API RP 752/753)

Assessing and managing the risk to people in control rooms, workshops and portable buildings

DURATION	LEVEL	FORMAT	LANGUAGE	MAX. PARTICIPANTS
1 day	Intermediate	On-site classroom · virtual instructor-led	English	16

1 siting study on your plot plan

3 hazard types: explosion · fire · toxic

1 building risk register

Overview

Texas City put facility siting on every refinery's agenda; API RP 752, 753 and 756 tell you how to do it, but not how to make the decisions. The course covers identifying occupied buildings, selecting the explosion, fire and toxic scenarios, applying consequence-based, risk-based and spacing-table approaches, and deciding what to do when a building fails the criteria: relocate, strengthen, reduce occupancy or accept. A siting study is carried out on the participants' own plot plan.

Learning outcomes

- Identify buildings in scope and classify them by occupancy and function
- Select credible explosion, fire and toxic scenarios for a siting study
- Apply consequence-based, risk-based and spacing-table approaches and know their limits
- Interpret overpressure, radiation and toxic contours against building damage levels
- Evaluate portable and tent buildings under API RP 753 and 756
- Produce a building risk register with prioritised, defensible actions

Who should attend

Process safety engineers, plant layout and civil engineers, project managers, facilities and HSE staff responsible for occupied buildings

Course outline

MORNING

Lessons from Texas City and Flixborough · API RP 752, 753 and 756 scope and criteria · building inventory and occupancy · scenario selection for explosion, fire and toxic · building damage levels and occupant vulnerability

AFTERNOON

Consequence-based versus risk-based approaches · siting study on the participants' plot plan in CeraImpact · mitigation: relocation, blast-resistant design, occupancy limits · portable buildings and temporary structures · building risk register and management of change

Standards referenced

API RP 752 · API RP 753 · API RP 756 · CCPS Guidelines for Evaluating Process Plant Buildings · ASCE Design of Blast-Resistant Buildings in Petrochemical Facilities

Tools & exercises

Siting study run in CeraImpact on the participants' georeferenced plot plan

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
Consequence Modelling Fundamentals (TR-B01) or equivalent

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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