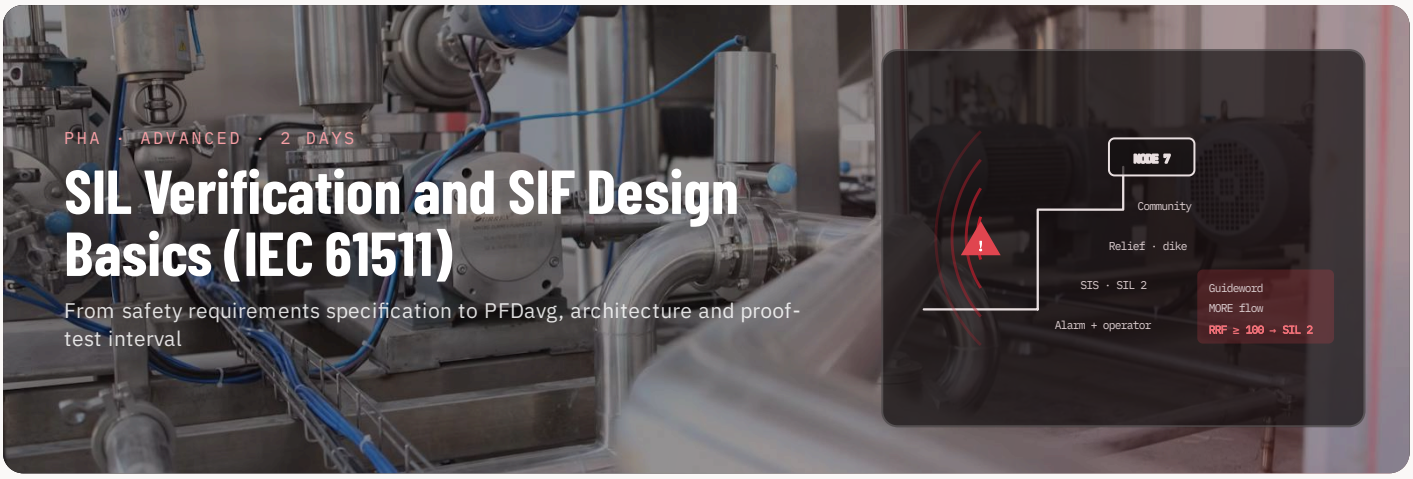

PHA · ADVANCED · 2 DAYS

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.

Book this course or build a custom curriculum
On-site at your plant or virtual · in-house groups · competency assessment included

sales@cerasus.ai · +974 5506 2743
Cerasus Technologies QFZ LLC · Ras Bufontas Free Zone · Doha, Qatar