

INTRODUCTORY TRAINING COURSE RIR-101E (8 HOURS)


# PRELIMINARY HAZARD ANALYSIS FOR THE PROCESS INDUSTRY

PHA TECHNIQUES: HAZID AND HAZOP



ONLINE  
LIVE EVENT

**tec**sa



This 8 hour training course provides an overview of the main techniques of preliminary hazard analysis (PHA) for the industrial safety of plants in the chemical process industry both onshore and offshore. The introductory course is aimed at HSE managers, plant designers and process engineers, instrumentation and automation engineers, safety consultants and risk analysts as well as all those who are called to participate in HAZID and HAZOP sessions.



## GOALS

The course, held by experienced risk analysts and operating for years in the process industry, aims to provide the basic elements for the selection of a methodology to conduct a preliminary analysis of hazards which is presented to students in its essential lines.

The training activity moves its steps from the illustration of the life cycle of industrial risk concept, from the principles underlying the intrinsic safety in the design and modification of plants, from the documentation necessary to conduct preliminary analysis of the hazards available in the design and operation phases. The HAZID, HAZOP methodologies are presented by means of a number of examples. For each of them are identified the key principles from the recognized international standards and the application procedure from the design phase of the analysis to the management phase of the recommendations. Particular attention will be paid to the management of the results and recommendations so that the analysis activities can be consistent and effective in the following assessment phases. Through appropriate hints, the teacher will also show the link between the preliminary analysis and the subsequent steps of quantitative development of hypotheses and accident scenarios (fault trees and event trees as well as LOPA analysis), the in-depth functional safety activities (SIL studies according to the technical standards IEC 61508 and IEC 61511) and those studies aimed at identifying and selecting alarms and safety critical elements (SECE). The discussion is completed by some notes on the criteria for risk acceptability (ALARP) and evaluation of options through the application of cost-benefit analysis.



## LANGUAGE AND TIME ZONE

- Course will be delivered in english.
- Time zone is "GMT+1". Sessions will be held from 9.00 to 13.00 and from 14.00 to 18.00.

**Sessions will be recorded and made available to all registered students.**



## TOPICS

- Principles of industrial risk.
- Independent Protection Layers (IPLs) to achieve safety.
- Role of the Preliminary Hazard Analysis (PHA).
- PHA: information and documentation to conduct a successful assessment
- The industrial risk life cycle and its management with an ISO 31000 compliant approach.
- Inherent safety concepts during initial design phases.
- PHA elements: causes, consequences, protections, top-events.
- Risk: frequency, magnitude, risk matrix, acceptability criteria (ALARP).
- Preparation of a PHA study.
- The analysis techniques and their technical reference standards:
  - HAZID (HAZard Identification);
  - HAZOP (HAZard & OPerability analysis).
- The importance of systematicity and documented evidences.
- The possibilities to extend HAZID and HAZOP to semi-quantitative assessments.
- Towards LOPA approach for cause-consequences pairs.
- The life cycle of the analysis and supporting documentation.
- Management of results and recommendations.
- The communication of the results (including explicative Bow-Tie diagrams).
- PHA periodic review.



## CASE STUDIES

Topics of the course are developed by the teacher using examples and real case studies derived from professional experience from the process industry.



## TOOL

The illustration of the methodologies and the development of the case studies will be supported by the use of the PHAx tool, part of the exSILentia suite of Exida L.L.C. company of which TECSA S.r.l. is Channel Partner for Italy.



## DELIVERY

Course will be delivered online in two sessions (from 9.00 to 13.00 and from 14.00 to 18:00 GMT+1) by distance learning in live mode on the established date. Each participant (in case of impossibility to attend at the defined hour) will be allowed access to the lesson recorded on-demand via the platform for 30 days.

At the end of the course a certificate of participation will be issued.



## LEARNING MATERIAL

Video will be recorded for the registered participants and they will be given the following material:

- slides;
- simplified flowcharts (PFDs), P&IDs, cause-effect diagrams, MSDS, plans and HAZID/HAZOP worksheets of the examples / case studies developed, in Adobe Acrobat PDF format.



## INDIVIDUAL STUDY ACTIVITIES

Each participant, at the end of the course, will be provided with an examination to verify the learning level and a case study to be optionally returned in 60 days to evaluate the skills acquired.





## TEACHER

The course will be held by Prof. **Luca Fiorentini**, director in TECSA S.r.l. He is an internationally recognized expert in the field of industrial, process safety and fire engineering. He is owner and CEO of TECSA S.r.l. He is senior process safety, HSE, fire engineering and reliability consultant. Fiorentini has experience in QRA (Hazop, LOPA, FTA, ETA, Consequence analysis), CFD and FEM methods, RAM analysis and industrial risk assessment for a number of industries: major hazard industries, refineries, chemical and petrochemical plants, liquid hydrocarbons and LPG storage farms, oil and gas onshore installations and offshore platforms, steel works plants, food processing facilities, pharmaceutical and fine chemicals production plants, hospitals and health care facilities, ports and piers. He is an expert of fire engineering and fire risk assessment. Fiorentini is a recognized forensic engineer and investigator for fires, explosions and industrial and marine accidents. He is the author of several books, articles and conference papers as well as a reviewer for a number of scientific magazines. Among the publications, the best selling and unique volume "Principles of forensic engineering applied to industrial accidents", 2019, Wiley (UK), ISBN: 978-1118962800. He is Certified Functional Safety Professional (CFSP), Certified Fire & Gas Professional (FGP), Automation Cybersecurity Professional (CSP) and Alarm Management Professional (ALM) by Exida. For PECB international certification organization, he is certified trainer for Risk Management (ISO 31000), Accident Investigation and Root Cause Analysis courses, as well as he is a certified Senior Lead Risk Manager ISO 31000. He is member of several international technical committees for NFPA and SFPE, as well as Senior Member of AIChE. He is also founder of MFCforensic ([www.mfcforensic.it](http://www.mfcforensic.it)), a forensic engineering company dedicated to fires & explosions and to industrial accidents.



## COST

REGISTRATION OPTIONS

VAT INCLUDED

**COST (8 hours)**

**400 €**

**Early booking** (WITHIN 1 MONTH FROM THE COURSE DATE)

**350 €**

Payment will be processed using PayPal / Credit Card during the enrollement process.



Tecsa S.r.l. is a specialized consulting company, founded in 1979, operating both nationally and internationally in the fields of process safety, health and safety in the workplace, environment, safety and fire prevention engineering, management systems and forensic engineering. In the national and European field it has long obtained recognition and visibility as well as a leadership position. Consulting services are offered to a variety of organizations operating in different sectors including oil & gas, industry, complex infrastructures and energy networks, critical transport infrastructure and military installations and assets.



CHANNEL  
PARTNER