

Layers of Protection Analysis (LOPA)

Purpose

To gain an understanding of the technique, application and limitations of LOPA. This course covers the different variations of the LOPA methodology: single cause, multiple cause, simple and complex. It does not provide detailed LOPA facilitator training but does cover the skills needed and the work that the facilitator must do as part of the LOPA. Students will have the opportunity to practise the technique.

At the end of the course you will be able to

1. Apply the different variations of the LOPA technique
2. Critically review the LOPA technique and examples of output
3. Analyse how the LOPA technique can be applied at the different stages of a project's lifecycle such as FEED, detailed design, revalidation and decommissioning
4. Prepare for a LOPA workshop, determine the skills and actions necessary to lead a LOPA and how to generate a LOPA report

Outline content

- Introduction to risk assessment
- LOPA terminology
- Information required for LOPA and review of HAZOP worksheets
- LOPA – hazard consequences and target mitigated event likelihood
- LOPA – hazard causes and frequencies
- LOPA – independent protection layers and probability of failure on demand
- LOPA – conditional/event modifiers
- Application of the LOPA variations: (i) single cause, (ii) multiple cause, (iii) simple and (iv) complex
- Carrying out SIL Classification using LOPA
- Recording methods, software, reporting and close-out
- Common failings of LOPA
- Limitations of LOPA
- Leading LOPA teams

Recommended prior study

Education, skills or experience equivalent to undergraduate level

Risktec modules: *Principles of Risk Management; Hazard Identification, HAZOP*

Who should attend

Project Managers, Operation Managers, Process Engineers, Operators, HSE advisors and risk management practitioners.

Delivery Methods

Face-to-face, Distance Learning, or Blended Learning

Levels of Assessment

- Attendance only
- Assessment by Risktec
- Postgraduate Qualifications: PgCert, PgDip and MSc

Assessment details

Postgraduate programmes: activities and assignment (total about 80 hours)

Module details

Level: Masters
Duration: 2 days (F2F), or
8 weeks (Postgraduate DL),

Price

For prices and further information, or to book a course, please contact **Vicky Billingham** at training@risktec.tuv.com

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