Safety

LOPA (Layer of Protection Analysis)

Consultant / Trainer:

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Layer of Protection Analysis (LOPA) is a simplified quantitative tool for assessing risk of scenarios already identified. HAZOP studies often yield a number of scenarios that need further elaboration in order to demonstrate achieving the target risk. LOPA, being the industry standard, is an easy-tounderstand tool to identify, assess, challenge and document existing risk reduction conditions and safeguards. It shows whether risk targets are met or exceeded and provides a rational allocation of equipment and personnel. ermination.

Participants

This **Petrogenium.** course can be tailored for awareness/inexperienced staff, for intermediate and for experienced personnel. Furthermore the course can be customized for a specific refinery, plant orunit. The option for post-course consultancy/help-desk support is also available.

Participants may include:

- HSEQ professionals
- Process/Process Control engineers
- Maintenance managers
- Production managers
- Consultants

Learning Objectives

- Understanding LOPA Study Methodology
- Participating in, Leading and Organising HAZOP Studies
- Revalidating HAZOP Studies
- Understanding PFD and SIL of safeguards

Programme

Day 1

- Concept of Independent Protection Layers
- What is LOPA – Comparison with other risk analysis methods
- Purpose and benefits of LOPA
- Risk Acceptance Criteria
- Options for Risk Reduction – relation to Risk Acceptance Criteria – different types of IPLs
- Developing scenarios, severity and linking to the risk criteria
- Identifying Initiating Events and Enabling Conditions
- Determination of Initiating Event Frequency
- Conditional Modifiers
- Identifying Independent Protection Layers – Requirements for IPLs
- Determining the Mitigated Frequency of Scenarios
- Determining scenario risk acceptance
- Determination of Probability of Failure on Demand (PFD) and Safety Integrity Level (SIL) of existing safeguards.
- Determination of further risk reduction, allocation to IPLs