After the Hazards Analysis: Semi-Quantitative Risk Analysis to Derive Controls Using Layer of Protection Analysis (LOPA)

Presenter:

Kelsey Forde, CIH CSP CHMM

Parvati Consulting LLC

Timothy Stirrup, REM ASP CHMM

Parvati Consulting LLC

Description:

Layer of protection analysis (LOPA) is a recently developed, simplified method of risk assessment that provides the much-needed middle ground between a qualitative process hazard analysis and a traditional (and typically expensive) quantitative risk analysis. LOPA is a semi-quantitative methodology used to identify safeguards that meet the criteria for an independent protection layer (IPL). LOPA is a powerful analytical tool for assessing the adequacy of the protection layers used to mitigate process risk.

LOPA builds upon well-known process hazards analysis techniques, applying semi- quantitative measures to both the evaluation of the frequency of potential incidents, as well as the probability of failure of the protection layers. Beginning with an identified accident scenario, LOPA uses simplifying rules to evaluate initiating event frequency, independent layers of protection, and the consequences, to provide an order-of-magnitude estimate of risk. LOPA has also proven to be an excellent approach for determining the level of safety integrity necessary for an instrumented safety system, an approach that is endorsed in the instrument standards. Because of its simplified, quicker risk assessment approach, LOPA is destined to become a widely used technique. The presentation provides an overview of the LOPA process, with the addition of key highlights on the understand and use LOPA.

Learning Outcomes:

Upon completion of this presentation, attendees will be able to:

- Evaluate the use of LOPA as technique for control derivation.
- Use LOPA in support of Safety Integrity Level determinations.

Practical Application:

After the Hazards Analysis: Semi-quantitative Risk Analysis to Derive Controls Using Layer of Protection Analysis (LOPA) presentation will aid the industrial/occupational hygiene professional in identifying adequacy of preventative and mitigating controls. The introduction to this semi-quantitative method will prove fruitful for identifying the effectiveness and safety integrity levels (SIL) for controls derived from traditional hazards analysis techniques. The incorporation of LOPA techniques will help the industrial/occupational hygiene professional upgrade their outdated hazards analysis for the current decade.