Layers of Protection Analysis (LOPA)

Instructor: Ms. Angela Summers

Course Description
This course discusses the fundamentals of Layers of Protection Analysis, including the risk tolerance criteria, key criteria, and methodology options. The course presents a series of examples in a workshop format to illustrate the methodology.

Curriculum
Overview of the Relevant Standards and Guidelines
• OSHA 29 CFR 1910.119
• CCPS LOPA: Simplified Risk Assessment
• IEC 61508 & ANSI/ISA 84.01-2004 (IEC 51511)
Risk Tolerance Criteria
Preparation for LOPA
• LOPA Methodology
• The LOPA Team
Scenario Development
• Component of a Scenario
• Inherently Safe Considerations
Initiating Causes/Effects
• Identification
• Estimation of Frequencies
• Basic Process Control Systems (BCPS)
• Mechanical Failure
• Human Error
Consequence Severity
• Safety, Environment, Financial
• Quantitative, Semi-quantitative and
Quantitative Estimation
Independent Protection Layers (IPLs)
• IPL Criteria
• Allocation of IPL Credit
• BPCS
• Operator Responses
• Pressure Relief Device
• Safety Instrumented System (SIS)
  - Safety Instrumented Function (SIF)
  - Safety Integrity Level (SIL)
Assignment
Interpreting LOPA Results & Making Recommendations

Dates
September 22nd-23rd, 2009

Location
SIS-TECH Solutions, LP

Established in 1995, the Mary Kay O'Connor Process Safety Center conducts programs and research activities that enhance safety in the chemical process industries. The center's educational activities promote safety as second nature to everyone in the industry. In addition, the center develops safer processes, equipment, procedures and management strategies to minimize losses within the processing industry.

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