



# Mary Kay O'Connor PROCESS SAFETY CENTER

*Making safety second nature.*

## Layer of Protection Analysis

September 22-23, 2009  
14 PDHs/1.4 CEUs

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.

- ❖ 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, Environmental, Financial
  - Qualitative, Semi-quantitative and Quantitative Estimation
- ❖ Independent Protection Layers (IPLs)
  - IPL Criteria
  - Allocation of IPL Credit
  - § BPCS
  - § Operator Response
  - § Pressure Relief Device
  - § Safety Instrumented System (SIS)/Safety Instrumented Function (SIF)
    - Safety Integrity Level (SIL) Assignment
- ❖ Interpreting LOPA Results & Making Recommendations

Register online at: <http://engrevent.tamu.edu/event/100477>

Early registration ends August 25<sup>th</sup>!

*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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