

Effective ERS Design – Elective Module 3

Risk-Based Techniques for Overpressure Analysis

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Overview

The Risk-Based Techniques for Overpressure Analysis module provides an introduction to a risk-based approach for design of High Integrity Pressure Protection Systems to minimize flare load.

Topics

- ◆ Failure Data and Risk Tolerability
- ◆ Safety Integrity Level (SIL) Gap Analysis
- ◆ Risk-Based Flare System Analysis Incorporating HIPPs
- ◆ SIL Validation Analysis Using FTA

Participants

This module is ideally suited to Emergency Relief System and Flare Header designers .

Course Materials and Fee

Attendees will receive presentation summaries on ERS design issues specific to different industries and production units.

Fee: \$300

Fees for course includes lunch and refreshments. They do not include hotel accommodations or travel, which are each participant's responsibility.

Course Outline

One Day Course 8:00 AM to 5:00 PM

Failure Data and Risk Tolerability—8:00 AM to 9:45 AM

Presentation establishes the foundation for risk-based analysis by reviewing types and sources of failure data. Covers the importance of establishing a suitable tolerability target for risk-based decision making. Examples of hazard impact criteria and hazard event criteria including vessel overpressure targets will be presented.

Safety Integrity Level (SIL) Gap Analysis—10:00 AM to 12:00 PM

A presentation of the application of Level of Protection Analysis (LOPA) and Fault Tree Analysis (FTA) to establish the frequency of overpressure events that result in activation of emergency relief devices. A discussion on the use of High Integrity Pressure Protection (HIPP) Systems to address the SIL gap (difference between release event frequency and risk tolerability target).

Risk-Based Flare System Analysis Incorporating HIPPs—1:00 PM to 2:45 PM

Discussion of risk-based approaches for determining candidate relief loads for application HIPP systems and assigning SIL requirements. Demonstration of the risk-based technique to establish the minimum tolerable flare design load with the addition of HIPPs to selected equipment.

SIL Validation Analysis Using FTA—3:00 PM to 5:00 PM

A presentation on the use of fault tree analysis to perform SIL verification on HIPP systems per ANSI/ISA Standard 84.00.01-2004 (IEC 61511-1 MOD). Study examples of SIL 1 and SIL 3 incorporating common cause failure will be examined.