

Effective ERS Design – Elective Module 2

Best Practice for Managing Chemical Reactivity

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Overview

The Best Practice for Managing Chemical Reactivity module provides an overview of the hazards of chemical reactivity, assessment of reactive scenarios, and screening and experimental techniques utilized for modeling kinetic data. Special emphasis is placed on the ongoing industry debate on managing chemical reactivity.

This module will help process / safety engineers and managers better understand and address the considerable risks associated with reactive chemicals ERS design.

Topics

- ◆ Reactivity Hazards and Regulatory Initiatives
- ◆ Assessing Reactivity Hazards – A Systematic Approach
- ◆ Overview of Experimental Techniques
- ◆ Detailed Analysis and Modeling Reactive Data
- ◆ Case Studies
- ◆ Using SuperChems for Reactive Systems

Participants

This module is ideally suited to process industry professionals involved in the design and audit of emergency relief systems for reactive chemicals.

Course Materials and Fee

Attendees will receive presentation summaries, exercises, and data for techniques currently employed in ERS design for reactive systems.

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

Reactivity Hazards and Regulatory Initiatives — 8:00AM to 9:15AM

An introduction to reactivity hazards and the ongoing industry debate on reactivity management. Topics include recent reports issued by the US Chemical Safety and Hazard Investigation Board (CSB), the NJ TCPA and the Reactivity Management Roundtable (RMR).

Assessing Reactivity Hazards - A Systematic Approach — 9:15AM to 10:00AM

A discussion on a systematic approach to and resources available for assessing reactivity hazards. Topics include Bretherick's, NOAA, SuperChems Reactivity Expert System, ioHAZMAT, and other useful literature and industry resources.

Overview of Experimental Techniques — 10:30PM to 11:30PM

A discussion on common experimental techniques such as flammability, calorimetry, dust explosion, blast cap testing, relevant ASTM E27 standards, and interpretation of results.

Detailed Analysis and Modeling Reactive Data — 1:00PM to 2:00PM

A discussion on extracting thermodynamic and kinetic information from calorimetry data and the application of this information for advanced consequence analysis. Topics include model development, stoichiometry generation, scaling of data for larger systems, effluent design for reactive systems, and explosion modeling.

Case Studies — 2:00PM to 3:00PM

A review of a prominent incidents caused by runaway reactions (Morton, Concept Sciences) and lessons learned.

Using SuperChems for Reactive Systems — 3:15PM to 4:30PM

A demonstration of SuperChems' capabilities for reactive systems ERS design including sample problems. Topics include reaction definition, mixture formulations, headers and sub-header connections to vessels, and reactivity expert system.

Wrap-up Discussion — 4:30PM to 5:00PM