

CONSEQUENCE & RISK · INTERMEDIATE · 1 DAY

Dust and Reactive-Chemical Hazards

Recognising, assessing and controlling the hazards that HAZOP guidewords miss



DURATION
1 day

LEVEL
Intermediate

FORMAT
On-site classroom · virtual instructor-led

LANGUAGE
English

MAX. PARTICIPANTS
16

2

hazard families in one day

1

dust hazard analysis walkthrough

1

reactivity screening on your chemicals

Overview

Combustible dust and reactive chemistry are the hazards most often absent from a hydrocarbon site's PHA, and both have produced fatal explosions in plants that thought they were low risk. The morning covers dust explosibility, the dust hazard analysis required by NFPA 652/660 and the prevention and protection measures of NFPA 68 and 69. The afternoon covers reactive-chemical screening, incompatibility, thermal runaway and the design and operating controls that keep a reaction inside its envelope.

Learning outcomes

- Interpret dust explosibility data: Kst, Pmax, MIE, MEC and layer ignition temperature
- Carry out a dust hazard analysis on a process handling combustible powder
- Select prevention and protection: inerting, venting, suppression, isolation, housekeeping
- Screen chemicals and mixtures for reactivity and incompatibility hazards
- Assess thermal runaway potential from calorimetry data and set safe operating limits
- Bring dust and reactivity scenarios into the site PHA and MOC process

Who should attend

Process, safety and operations engineers on sites handling powders, polymers, catalysts, monomers, peroxides or other reactive materials; PHA leaders

Course outline

MORNING

Dust explosion mechanisms and case histories · explosibility parameters and testing · dust hazard analysis to NFPA 652/660 · deflagration venting, suppression and isolation (NFPA 68/69) · housekeeping, ignition sources and Ex equipment

AFTERNOON

Reactive-chemical case histories · reactivity screening and compatibility matrices · calorimetry: DSC, ARC and what the data mean · runaway reaction scenarios and emergency relief basis · operating controls, safe limits and PHA integration · reactivity screening on participants' chemicals

Standards referenced

NFPA 652 / NFPA 660 NFPA 68 NFPA 69 NFPA 654

CCPS Essential Practices for Managing Chemical Reactivity Hazards

HSE HSG143

Tools & exercises

Worked exercises with published explosibility and calorimetry data; screening templates supplied

What's included

- ✓ Course manual and slide pack
- ✓ Software access for the course
- ✓ Post-course Q&A with the instructor
- ✓ Exercise and case-study pack
- ✓ Competency quiz and certificate
- ✓ Templates used in the exercises

PREREQUISITES

Chemical or process engineering background

CERTIFICATION

Certificate of completion

INSTRUCTORS

Practising engineers — TÜV HAZOP Leader, CCPSC and IEC 61511 Functional Safety certified — with 200+ years of cumulative plant experience.

Book this course or build a custom curriculum

On-site at your plant or virtual · in-house groups · competency assessment included

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