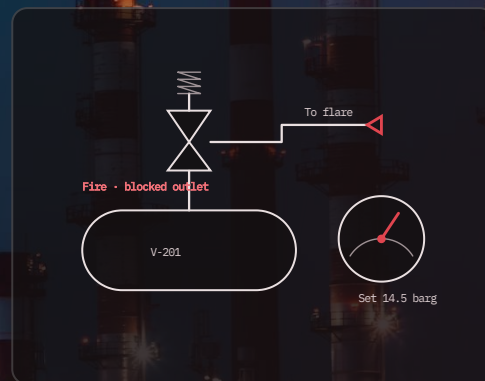


RELIEF SYSTEMS · INTERMEDIATE · 1 DAY

Flare and Vent System Design (API 521)

Header hydraulics, knock-out drums, flare tips and radiation for new and modified disposal systems



DURATION
1 day

LEVEL
Intermediate

FORMAT
On-site classroom · virtual instructor-led

LANGUAGE
English

MAX. PARTICIPANTS
16

1

flare-network case built end to end

5

global scenarios analysed

3

radiation and dispersion checks

Overview

A correctly sized PSV discharging into an undersized header is still an unprotected vessel. This course covers the disposal side of relief: defining global scenarios, building the flare load summary, sizing headers for back-pressure and Mach limits, and designing the knock-out drum, seal, tip and stack so that radiation, noise and dispersion are acceptable. Participants build one complete flare network case from load summary to stack height.

Learning outcomes

- Define global relieving scenarios (total power failure, cooling water failure, fire zones) and build a load summary
- Size flare and vent headers for allowable back pressure, Mach number and noise
- Design knock-out drums and liquid seals for the governing liquid load
- Select flare tip type and estimate radiation, stack height and sterile radius
- Check flashback, purge, air ingress and low-flow smoking conditions
- Assess the impact of a new tie-in on an existing flare system

Who should attend

Process and project engineers designing or modifying flare and vent systems; relief engineers moving from single-valve sizing to the collection network

Course outline

MORNING

Disposal system philosophy and API 521 structure · global scenario definition and fire zoning · load summary and simultaneity · header hydraulics: back pressure, Mach, temperature and material limits · segregated wet, dry and acid headers

AFTERNOON

Knock-out drum and seal drum sizing · flare tip selection and radiation calculation · stack height, dispersion and noise · purge, flashback and smokeless operation · adding a new relief source to an existing network · worked case in CeraVent

Standards referenced

API 521 API 537 API 520 Part II ASME BPVC Section VIII
NFPA 30

Tools & exercises

Network hydraulics and radiation calculations worked in CeraVent

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

Relief sizing basics (TR-C01 or equivalent); familiarity with compressible flow

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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