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COURSE BROCHURE

Pressure Relief Valve Selection, Sizing and Testing Training Course

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Pressure Relief Valve Selection, Sizing and Testing is a 1-week training course for marine, terminal and plant engineers and maintenance planners who specify, set and overhaul relief devices, and it produces a relief device register and sizing file. A relief valve is often the last barrier before a vessel ruptures, yet many are undersized, wrongly set or overdue for testing. Jupiter Prime Training runs this course on pressure relief valve selection and sizing.

Why Pressure Relief Valve Selection and Sizing Matter Now

Three forces bring overpressure protection back into focus. Process changes, new cargoes and re-rated equipment alter relieving loads, yet the valve fitted years ago often stays unchanged. Classification societies, insurers and terminal owners increasingly ask for a documented basis for each set pressure and orifice. Maintenance teams, meanwhile, face pressure to extend test intervals without evidence that valves still lift and reseat correctly. A site that can show why every valve is the right size and when it was last proved avoids ruptures and costly shutdowns; one that cannot faces findings and real hazard. The course draws on recognised codes and recommended practices for pressure relieving systems.

Who Gains Most from Pressure Relief Valve Selection and Sizing

- Those who calculate relieving loads and choose valve types
- Those who set, overhaul and bench test relief valves
- Those who maintain relief device registers and test schedules
- Those who review changes that may alter overpressure scenarios
- Those who sign off valves on boilers, receivers and cargo systems

A ship manager or terminal operator gains most when its design engineers, valve overhaul staff and maintenance planners attend together.

Pressure Relief Valve Selection and Sizing Capabilities

Participants learn to justify every relief valve from the overpressure case through to the last bench test.

- Assess overpressure scenarios such as blocked outlet, fire and tube rupture — process safety lead
- Calculate required orifice area for gas, steam and liquid relief — design engineer
- Specify valve type, materials and back-pressure arrangement — procurement and overhaul shop
- Test set pressure, blowdown and seat tightness on a bench rig — valve technician
- Weigh inlet pressure loss and outlet back pressure against valve stability — integrity engineer
- Build a register that links each valve to its sizing basis and test history — class surveyor

Key Pressure Relief Valve Selection and Sizing Terms

- Set pressure — the inlet pressure at which a relief valve is adjusted to start opening.
- Overpressure — the pressure rise above set pressure needed for the valve to reach full lift.
- Blowdown — the difference between set pressure and the pressure at which the valve closes again.
- Back pressure — pressure at the valve outlet, from the discharge system, that can affect capacity and stability.
- Relieving load — the flow a valve must discharge in the governing overpressure scenario.
- Chatter — rapid opening and closing of a relief valve that damages the seat and reduces capacity.

Pressure Relief Valve Selection and Sizing Day by Day

Day 1: Overpressure Protection Basics

- Overpressure Causes on Ships and Terminals — Fire, Blocked Outlet, Thermal Expansion
- Relief Device Types — Spring-Loaded, Pilot-Operated and Bursting Discs
- Code Principles for Relieving Systems — Accumulation and Set Pressure Limits
- Marine Applications — Boilers, Air Receivers and Cargo Tanks
- Relief Device Nameplate and Data Sheet — Reading the Valve Record

Day 2: Relieving Load Calculation

- Scenario Selection Worksheet — Finding the Governing Case
- Fire Case Load Calculation — Wetted Area and Heat Input
- Blocked Outlet and Control Valve Failure — Gas and Liquid Loads
- Thermal Relief for Trapped Liquids — Small Valves, Real Risks
- Two-Phase Flow Considerations — When Simple Methods Fall Short

Day 3: Sizing and Selection

- Orifice Area Sizing for Gas and Steam — Effective Area and Coefficients
- Liquid Relief Sizing — Viscosity and Capacity Corrections
- Inlet Pressure Loss and Outlet Back Pressure Checks — Valve Stability
- Material and Trim Selection — Corrosive, Cryogenic and Sour Service
- Discharge Routing — Atmosphere, Vent Mast or Closed System

Day 4: Testing, Maintenance and Records

- Bench Testing Procedure — Set Pressure, Blowdown and Seat Leakage
- In-Situ Testing Options — Lift Assist Devices and Their Limits
- Overhaul and Lapping Practice — Restoring Seat Tightness
- Test Interval Setting — Service History and Failure Findings
- Change Control for Relief Devices — Re-Rating and Process Changes

Day 5: Practising the Relief Device Register and Sizing File

- Ship Boiler Safety Valve Case — Applying Day 2 Load Methods
- Terminal Separator Relief Sizing — Applying Day 3 Calculations
- Bench Test Results Review — Applying Day 4 Criteria
- Gap List of Undersized or Overdue Valves — Ranking Corrective Actions
- Relief Device Register and Sizing File — Basis, Settings and Test Dates

Applying Pressure Relief Valve Selection and Sizing After the Course

- Check the sizing basis of the ten most critical relief valves and flag any without a documented governing scenario.
- Compare bench test results over the last three overhauls and adjust test intervals where valves failed to lift or reseat.

Pressure Relief Valve Selection and Sizing Questions FAQ

What is pressure relief valve selection and sizing and why does it matter now?

It is the work of choosing, sizing and proving the valves that stop pressure equipment from exceeding safe limits. Changing processes and longer test intervals mean many valves need their basis checked.

Which roles gain most from pressure relief valve selection and sizing training?

Marine engineers, terminal and plant engineers, valve overhaul technicians and maintenance planners gain most.

How does pressure relief valve selection and sizing differ from a pressure vessel inspection course?

It concentrates on the protective device: relieving loads, orifice sizing, valve stability and bench testing. A pressure vessel inspection course concentrates on wall thickness, damage mechanisms and fitness for service of the vessel itself.

What do you bring back from pressure relief valve selection and sizing training?

You bring back a relief device register with sizing basis, worked calculations and a ranked list of valves needing action.

Pressure Relief Valve Selection and Sizing: The Way Forward

The relief device register and sizing file links every valve to its governing scenario, orifice, set pressure and last test. Its first use is deciding which valves to replace or re-test at the next dry-dock or shutdown, and it serves engineers, overhaul staff and surveyors. After the first overhaul cycle, revisit whether test intervals matched the failures found.