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COURSE BROCHURE

Piping Stress Analysis and Pipe Support Design Training Course

17 – 21 October 2027
Muscat

Piping Stress Analysis and Pipe Support Design Training Course

Ref: 1714_62854 **Date:** 17 – 21 October 2027 **Location:** Muscat **Fees:** 6500 GBP

Piping Stress Analysis and Pipe Support Design is a 1-week training course for piping and mechanical engineers who set up load cases, check allowable stresses and select restraints, and who leave with a signed-off stress isometric and support schedule for one live line. Hot lines, rotating equipment and tighter turnaround windows make stress-driven rework costly, so early, defensible support decisions matter now. Jupiter Prime Training delivers this piping stress analysis course.

Why Piping Stress Analysis and Pipe Support Design Matters Now

Three pressures shape piping stress work today. Plants run hotter and cycle more often, so thermal growth and fatigue govern more lines than before. Equipment vendors publish tighter nozzle allowables for pumps, compressors and exchangers, which puts stress engineers in direct negotiation with rotating-equipment and vessel specialists. The course rests on the recognised process piping design code approach to sustained, displacement and occasional stress ranges, and on vendor nozzle load tables, both described in general terms.

Who Gains Most from Piping Stress Analysis and Pipe Support Design

- Engineers who build and run pipe stress models for new process units
- Layout designers who route hot, cold and two-phase lines around equipment
- Support engineers who specify shoes, guides, springs and anchors
- Rotating-equipment specialists who accept or reject nozzle load reports
- Plant engineers who check modifications and tie-ins on operating lines

A layout and stress group that sends its designers and stress checkers together gains most.

Piping Stress Analysis and Pipe Support Design Capabilities

Participants move from hand checks of span and thermal growth to a full software model.

- Calculate sustained, expansion and occasional stresses for a routed line — design review sign-off
- Specify pipe support types, spacing and friction assumptions — support engineer and fabricator
- Design expansion loops and offsets that absorb thermal growth — layout designer
- Assess nozzle loads against vendor allowables — rotating-equipment and vessel specialists
- Build and verify a stress software model with correct boundary conditions — lead stress engineer
- Communicate stress findings and rerouting options — project and operations stakeholders

Key Piping Stress Analysis and Pipe Support Design Terms

- Sustained load — weight and pressure acting on a line throughout operation, checked against the hot allowable stress.
- Displacement stress range — stress caused by thermal growth and anchor movement, limited by an allowable range that reflects fatigue.
- Occasional load — short-duration loading such as wind, seismic shaking, relief valve thrust or slug flow.
- Spring hanger — a support that carries pipe weight while allowing vertical travel, set as variable or constant load.
- Nozzle load — forces and moments that a line imposes on an equipment connection, compared against vendor limits.
- Stress intensification factor — a multiplier raising calculated stress at fittings such as elbows, tees and branch connections.

Piping Stress Analysis and Pipe Support Design Day by Day

Day 1: Loads Acting on Process Lines

- Design Code Stress Categories — Which Loads Govern Each Line
- Hot and Cold Allowable Stresses — Material Selection at Temperature
- Weight Span Hand Checks — Initial Support Spacing on Racks
- Thermal Growth Calculation — Identifying Lines That Need Formal Analysis
- Critical Line List Criteria — Scoping the Stress Workload

Day 2: Flexibility and Line Routing

- Expansion Loops and Offsets — Absorbing Growth Without Extra Fittings
- Stress Intensification Factors — Weak Points at Elbows and Tees
- Cold Spring and Cut Short — When Pre-Stressing Is Justified
- Expansion Joints and Bellows — Trade-Offs Against Loop Space
- Displacement Stress Range Checks — Fatigue Life in Cyclic Service

Day 3: Supports, Springs and Restraints

- Shoes, Guides and Line Stops — Restraint Choice on Pipe Racks
- Variable and Constant Spring Hangers — Sizing for Vertical Travel
- Friction and Slide Plates — Load Transfer to Steel Structures
- Occasional Load Cases — Wind, Seismic, Relief Thrust and Slug
- Support Load Summaries — Data Handed to Civil and Structural Teams

Day 4: Equipment Nozzles and Software Models

- Pump and Compressor Nozzle Allowables — Protecting Shaft Alignment
- Vessel and Exchanger Nozzle Checks — Local Shell Stress Review
- Stress Software Model Build — Nodes, Restraints and Boundary Conditions
- Load Case Combinations in Software — Operating, Sustained and Expansion
- Model Verification Checks — Catching Input Errors Before Issue

Day 5: Practising the Stress Isometric and Support Schedule

- Rerouting a Failing Pump Suction Line — Applying Loop Design
- Spring Selection for a Hot Exchanger Line — Applying Hanger Sizing
- Nozzle Load Reduction Options — Applying Equipment Interface Checks
- Stress Report Peer Review — Defending Results in Design Review
- Stress Isometric and Support Schedule — Issuing the Final Line Package

Applying Piping Stress Analysis and Pipe Support Design After the Course

- Rerun one critical hot line with the load case combinations and model checks taught, and record the support changes it produces.
- Review nozzle load reports for one pump or compressor against vendor allowables and propose restraint or routing fixes.

Piping Stress Analysis and Pipe Support Design Questions FAQ

What is piping stress analysis and pipe support design, and why does it matter now?

It is the method of checking that process lines carry weight, pressure and thermal growth safely through correctly placed supports. Hotter, cyclic operation and tighter equipment limits raise its importance.

Which roles gain most from piping stress analysis and pipe support design?

Stress engineers, layout designers and support engineers gain most. Rotating-equipment specialists and plant engineers also benefit.

How does piping stress analysis and pipe support design differ from a pipe wall thickness course?

It focuses on load cases, supports, springs and nozzle loads in a software model. A wall thickness course sizes pipe for pressure; here you assume the pipe is sized and decide how it is held.

What do you bring back from piping stress analysis and pipe support design?

You bring back a stress isometric and support schedule for one live line. It records load cases, restraints, spring settings and nozzle checks.

Piping Stress Analysis and Pipe Support Design: The Way Forward

The stress isometric and support schedule first informs whether a critical line can be issued for fabrication as routed. Layout designers, support engineers and rotating-equipment specialists use it to agree restraints and nozzle loads. After its first use on a refinery or gas processing line, revisit the friction and spring assumptions against measured hot settings during start-up.