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COURSE BROCHURE

# Pipe Stress Model Input Data and Load Case Definition Training Course

11 – 15 January 2027
Barcelona

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Pipe Stress Model Input Data and Load Case Definition is a 1-week training course for piping stress and design engineers who assemble the numbers behind a flexibility model, and it ends with a stress analysis input checklist each participant takes home. Errors in temperatures, allowables or restraint stiffness now travel quickly through shorter engineering schedules into fabricated spools and loaded nozzles. Jupiter Prime Training delivers this course on pipe stress model input data.

## Why Pipe Stress Model Input Data Matters Now

Three pressures shape how stress inputs are gathered today: compressed project schedules that push modelling ahead of final vendor data, plant life extension that asks old lines to carry new operating envelopes, and equipment vendors who hold piping to tighter nozzle limits. A model built on loose design conditions can pass on paper and still crack a weld, unseat a valve or overload a pump casing. The course rests on the recognised process piping and power piping design codes, described in general terms, and on vendor nozzle load tables.

## Who Gains Most from Pipe Stress Model Input Data

- Engineers who build and run flexibility models for process and utility lines
- Layout designers who route piping and place supports before stress checking
- Engineers who collect line list data, design temperatures and pressures from process
- Rotating and static equipment engineers who agree allowable nozzle loads with vendors
- Checkers who verify stress packages before issue for construction

A piping department sending stress engineers and layout designers together gains most.

## Pipe Stress Model Input Data Capabilities

Participants practise turning line lists, material specifications and vendor drawings into model values that a checker can trace back to a source document.

- Specify design, operating and upset temperatures for each line — thermal expansion cases
- Apply material allowable stresses at temperature from code tables — sustained and displacement checks
- Calculate restraint and soil stiffness values for anchors, guides and buried runs — support engineers
- Build sustained, expansion, occasional and hydrotest load cases — code compliance reviews
- Compare computed nozzle loads with vendor allowables — rotating equipment engineers
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Communicate assumptions and open data gaps in a traceable record — project checkers

## Key Pipe Stress Model Input Data Terms

- Design condition — the most severe coincident pressure and temperature a line is expected to see, used to size and check it.
- Basic allowable stress — the code limit for a material at a given temperature, set from its tensile and yield strength.
- Displacement stress range — the stress cycle caused by thermal growth and imposed movements, checked against a separate code allowable.
- Restraint stiffness — the force needed to move a support by a unit distance, controlling how loads share between supports.
- Nozzle load — the forces and moments piping transfers to an equipment connection, limited by vendor tables.
- Load case — a defined combination of weight, pressure, temperature and occasional loads analysed together for one code check.

## Pipe Stress Model Input Data Day by Day

## Day 1: Source Documents and Design Conditions

- Line List Review — Selecting Lines That Need Formal Stress Study
- Design and Operating Pressure Records — Choosing Values for Each Case
- Upset, Steam-Out and Start-Up Temperatures — Defining Thermal Envelopes
- Ambient and Installation Temperature Data — Setting Expansion Reference Points
- Critical Line Matrix — Ranking Effort Across a Piping System

## Day 2: Materials, Geometry and Allowables

- Material Specification Tables — Assigning Allowables at Design Temperature
- Pipe Wall, Corrosion Allowance and Mill Tolerance — Section Properties Input
- Insulation, Lining and Fluid Density — Weight Input for Sustained Cases
- Stress Intensification and Flexibility Factors — Modelling Bends and Branches
- Thermal Expansion Coefficient Selection — Accuracy of Displacement Results

## Day 3: Restraints, Stiffness and Equipment Interfaces

- Anchor, Guide and Line Stop Modelling — Representing Real Support Behaviour
- Friction Coefficients at Sliding Supports — Axial Load Prediction
- Soil Spring Values for Buried Piping — Restraint of Underground Runs
- Vessel and Tank Nozzle Flexibility — Realistic Connection Stiffness
- Vendor Nozzle Load Tables for Pumps and Compressors — Acceptance Limits

## Day 4: Load Case Definition and Occasional Loads

- Sustained, Expansion and Operating Case Sets — Matching Code Checks
- Wind and Seismic Load Input — Occasional Stress Evaluation
- Relief Valve Thrust and Slug Forces — Dynamic Load Allowances
- Hydrotest and Empty Weight Cases — Temporary Support Needs
- Settlement and Imposed Displacements — Tank and Equipment Movement Effects

## Day 5: Practising the Stress Analysis Input Checklist

- Design Condition Cross-Check With Process Data — Applying Day 1 Records
- Allowable and Section Property Verification — Applying Day 2 Tables
- Restraint and Nozzle Input Audit — Applying Day 3 Interface Values
- Load Case Matrix Review — Applying Day 4 Combinations
- Stress Analysis Input Checklist — Completing a Signed Data Record

## Applying Pipe Stress Model Input Data After the Course

- Audit one live flexibility model against its line list, material tables and vendor nozzle limits.
- Agree a standard load case matrix for the department.

## Pipe Stress Model Input Data Questions FAQ

### What is pipe stress model input data and why does it matter now?

Pipe stress model input data is the set of temperatures, pressures, allowables, stiffness values and load cases a flexibility model needs. Tighter schedules mean a wrong input can reach fabrication unnoticed.

### Which roles gain most from pipe stress model input data training?

Stress engineers and layout designers gain most. Equipment engineers and checkers also benefit.

### How does pipe stress model input data training differ from a stress analysis and support design course?

It concentrates on preparing and verifying what goes into the model. A stress analysis course focuses on interpreting results and selecting supports, while this course makes sure those results start from defensible design conditions and load cases.

### What do you bring back from pipe stress model input data training?

You bring back a stress analysis input checklist you can apply to your next line. It links every input to its source document.

## Pipe Stress Model Input Data: The Way Forward

The stress analysis input checklist first informs whether a model is ready to run or still waits on process or vendor data. Stress engineers, checkers and equipment engineers use it as a shared record. After its first use, revisit how occasional loads and soil stiffness were estimated, since these values often change as site data and vendor drawings mature.