

TECHNICAL TRAINING

Piping Vibration Analysis (Basic)

Explore new insights about piping vibration with hands-on practices to understand and evaluate Vibration induced fatigue failures of pipework.



Scope

- Piping systems
- Static structures
- Machinery operation



Course Duration

5 days
(40 hours)



Availability

- Customer site
- Classroom
- Online (Virtual)



Audience

- Piping engineers
- Design engineers
- Reliability engineers
- Vibration analysts
- Construction & commissioning engineers
- Asset integrity engineers



Prerequisites

- Field work awareness
- Mechanical engineering basics
- Vibration analysis knowledge

Learning outcome

- Identify piping system components and engineering specifications.
- Understand piping vibration dynamics and forcing frequencies.
- Identify proper piping vibration measurement technique.
- Differentiate between tonal (narrow band) or broadband excitation.
- Understand and identify piping vibration problems.
- Diagnose and evaluate piping vibration problem severity.

What will you learn

- **PFD / P&ID** – understand basic piping system representation through process flow and piping and instrumentation diagrams.
- **Piping materials** – provide insights of metallurgy & manufacturing of piping system including system assembly.
- **Stress analysis** – determine how piping system is affected by external & internal forces in different directions including fatigue stress.
- **Vibration analysis** – review vibration analysis fundamentals – explore dynamic system parameters effect on vibration – identify relationship between forcing frequencies & piping vibration
- **Signal processing** – understand the importance of sampling – review digital signal processing fundamentals – vibration signal configuration for proper piping vibration measurements
- **Vibration measurements** – learn about vibration measurement techniques including data acquisition tools and mounting
- **Resonance** – understand natural frequencies of pipework – how to identify resonant condition with excessive vibration consequences
- **Piping vibration** – understand the piping vibration behavior – differentiate between tonal (narrow band) or broadband excitation
- **Piping vibration measurements** – learn about vibration measurement techniques including allocation of piping measuring points
- **Piping vibration evaluation** – qualitative evaluation of piping vibration condition

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