

## TECHNICAL TRAINING

# Piping Vibration Analysis (Advanced)

*Promote your field experience with hands-on practices that allows you to manage and control your piping system dynamics with proper measurements and corrections.*



### Scope

- Piping systems
- Static structures
- Machinery operation



### Course Duration

5 days  
(40 hours)



### Availability

- Customer site
- Classroom
- Online (Virtual)



### Audience

- Construction & commissioning engineers
- Vibration analysts
- Asset integrity engineers



### Prerequisites

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

## Learning outcome

- Identify piping system components dynamics and excitations.
- Understand how system properties affect the piping vibration.
- How to plan and perform proper piping vibration measurement.
- Analyze piping vibration problems (tonal or broadband).
- Verify piping vibration severity through system design aspects.
- Suggest & recommend proper corrective actions for piping vibration.

## What will you learn

- **Piping system overview** – review basic piping system components and their representation including metallurgy and stress analysis.
- **Piping vibration** – review piping vibration fundamentals including behavior of tonal (narrow band) or broadband excitation
- **Piping vibration evaluation** – perform and verify qualitative evaluation of piping vibration condition
- **ODS analysis** – perform operating deflection shape analysis including measurement plan & deliver value-added results
- **Modal analysis** – perform advanced modal analysis for piping system & identify different system properties to support your analysis
- **Piping vibration analysis** – recognize different approaches for piping vibration and perform vibration analysis for system components
- **Introduction to FEA** – learn about finite-element analysis technique & how to contribute analysis with advanced computation
- **Introduction to CFD** – learn about computational fluid dynamics (CFD) & how to verify piping system vibration with advanced simulation
- **Acceptance testing** – how to plan a piping system survey & perform acceptance testing including proper vibration assessment whether in-service or commissioning stages
- **Support & damping systems** – understand how to interpret & verify your analysis to be hands-on corrective actions using design changes, modifications, or proposing a control devices

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