



MUE116

Inspect and Evaluate Performance of Rotating Equipment

Course Overview:

This intensive training course will introduce delegates to elements of rotating equipment as encountered in oil and gas industry. Various types of gas compressors, pumps and turbines will be discussed and the importance of their vital design elements such as bearings, seals, filters, safety controls, and others, will be explained in detail. The focus of this training course will be on the start-up and operation of these machines and their optimal maintenance, diagnostics, inspection and troubleshooting techniques. The training will also highlight the guidelines for efficient and safe operation, by indicating the important elements of safety control systems

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- Upon completion of the course, participants will be able to:
- Explain how to operate rotating machinery (pumps, compressors, steam turbines),
- Explain the key points for fluid flow and gas compression/expansion theory and practical applications,
- List the key points for rotating machinery maintenance and inspection operations,
- Explain how to achieve these operations,
- List the main failure modes related to each here above listed rotating machinery,
- Participate in the machinery reliability improvement process.

Who Should Attend?

- This course provides key competencies related to rotating machinery operation and maintenance tasks.
- Technical Personnel in charge of production
- Maintenance and Operation Engineers
- Operators
- Supervisors
- Engineering Managers

Course Outline:

Day One: Technical Characteristics of Rotating Equipment

- Rotating Equipment and Safety Requirements for Start-Up and Operation
- Specifics of Gas Compressing and Cooling Methods
- Selection and Application of Gas Compressors
- Design Elements of Centrifugal and Axial Compressors
- Performance of Reciprocating and Rotary Compressors
- Workshop: Case Study, Examples and Solutions

Day Two: Pump Elements and Operating Characteristics

- Specifics of Process of Liquid Pumping Based on Liquid Types
- Selection and Application of Liquid Pumps
- Design Elements and Characteristics of Centrifugal Pumps
- Importance of Suction Pumping System for NPSH and Cavitation
- Performance of Reciprocating and Rotary Pumps
- Workshop: Case Study, Examples and Solutions

Day Three: Gas and Steam Turbines Operating Characteristics

- Industrial Application of Gas and Steam Turbines
- Design Elements and Operation of Gas Turbine
- Combustor Performance and Selection of Fuels
- Steam Turbine Operating Characteristics and Safety Control System
- Cogeneration Process with Gas and Steam Turbine working Together
- Workshop: Case Study, Examples and Solutions

Day Four: Installation, Start-Up and Performance Control of Rotating Equipment

- Installation, Commissioning, Start-Up and Performance Control of Compressors
- Installation, Commissioning and Start-Up of Pumps and Piping Systems
- Start-Up of Gas and Steam Turbines
- Summary of Operation Control and Performance Monitoring of Rotating Equipment
- Workshop: Case Study, Examples and Solutions

Day Five: Inspection, Maintenance and Troubleshooting of Rotating Equipment

- Inspection of Vital Elements of Rotating Equipment and Safety Control
- Common Failures in Operation of Rotating Equipment
- Condition Monitoring and Predictive Maintenance
- Bearing Degradation and Replacement
- Mechanical Seal Problems in Operation and Root Cause Analysis
- Summary and Conclusions

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

- Interactive lecture.
- Case studies based on industrial and actual feedback.
- Practical work in workshops on actual equipment.
- Use of dynamic simulators: pumps, compressors, steam turbines.

Course Fees:

To be advised as per the course location. This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee/Tea
08:20 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Coffee/Tea/Snacks)
13:30 - 15:00	Last Session