

F-ME011 Principles of Rotating Equipment

Course dates: TBA @ Dubai, UAE

This course is designed to cover the selection, operation, maintenance, inspection and troubleshooting of the various types of rotating equipment such as compressors, pumps, motors, turbines, turbo-expanders, gears and transmission equipment. The course will feature a unique blend of practical application experience and basic analysis methods. Its aim is to convey a thorough understanding of machinery operating principles, equipment and specific operations.

Why Attend

The course will cover the principal machines represented at a large number of plants. There will be a thorough examination of basic operating concepts, application ranges, selection criteria, maintenance, inspection and vulnerabilities of certain types of equipment. The course will also review the short-cut selection and sizing methods for fluid machinery. Upon the successful completion of this course, participants will have gained an understanding of the principal types of rotating machinery used in industry. They will understand the differences between electric motors, design , advantages and disadvantages of different types of gears, operating principles of gas turbines and reciprocating diesel engines.

Course Objectives

By the end of the course, among various achievements, participants will get specialist insight into:

- ◇ Recognize the concept of organizing for world class operations particularly the characteristics and steps used toward improved performance
- ◇ Explain equipment failure patterns by distinguishing repairable from non-repairable equipment, identifying the types of equipment failure, reviewing why equipment fails and employing actions to minimize failure effect
- ◇ Develop in depth understanding on the maintenance effect on reliability and recognize how maintenance influences equipment performance
- ◇ Heighten awareness and understanding on root cause failure analysis RCFA including the various types and approaches used in rotating equipment troubleshooting.
- ◇ Know the principle of predictive maintenance and be able to employ the various predictive maintenance techniques and strategies used in rotating equipment maintenance.

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Who should attend

This course provides an overview of all significant aspects and considerations of rotating equipment in accordance with the international standards for those who are involved in the sizing, selection, operation, inspection, maintenance and troubleshooting of pumps, compressors, fans, blowers, turbines and gear machinery. This includes process engineers, mechanical engineers, piping engineers, pipelines and pressure vessels engineers and supervisors.

Course Outline

Electric Motors

Design , Controls , Wiring Systems , Standard Motors , Special Designs , Major Components , The Motor as Part of a System , Adjustable Frequency Motors

Gears and Transmission Equipment

Types of Gears , Applications Constraints , Maintenance

Gas Turbines and Engines

Simple Cycle , Heat Recovery Cycles , Type Selection , Maintenance , Two and Four Cycle Gas Engines , Gas Engine Compressor Auxiliary Systems Steam Turbines and Expanders Impulse Turbines , Reaction Turbines , Application Ranges , Turbine Configurations , Applications Constraints , Maintenance Applications , Operation

Centrifugal Pumps

Configurations and Styles , Application Ranges and Constraints , Construction Features and Options , Pump Auxiliaries , Wear Components Canned Motor and Magnetic Drive Pumps , High Speed/Low Flow Pumps , Servicing and Condition Monitoring

Positive Displacement and Vacuum Pumps

Reciprocating Steam and Power Pumps , Diaphragm Pumps , Plunger Pumps , Gear Screw and Progressive Cavity Pumps , Peristaltic Pumps Positive Displacement and Vacuum Pumps (cont'd) Conventional and Special Vacuum Pumps , Liquid Jet and Liquid Ring Pumps , Combination and Staged Vacuum Pumps

Turbo-compressors

Types, Styles and Configurations of Centrifugal and Axial Compressors , Construction Features , Mode of Operation , Compressor Auxiliaries and Support Systems Condition Monitoring , Application Criteria , Performance Capabilities and Limitations , Maintenance

Fans and Blowers

Types and Configurations , Performance and System Effects Performance Correction , Capacity Control Options

Positive Displacement Compressors

Classification , Reciprocating Compressors vs. Rotary Screw Compressors , Application Ranges and Limitations , Compression Processes Construction Features and Components , Capacity Control



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Theory and Shortcut Calculation Methods for Fluid Machinery

Shortcut Calculation Methods for Centrifugal Pumps Calculation Methods for Steam Turbines

Shortcut Calculation Methods for Gas Compression Machinery

Machinery Reliability and Availability Calculations Reliability Indices

Machinery Systems Reliability Calculations

The workshop

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures
- 30% Workshops & Work Presentations
- 20% Case Studies & Practical Exercises
- 20% Videos, Software & General Discussions

The course instructor may modify the above training methodology before or during the course for technical reasons with no prior notice to participants

Falcon Consulting Professionals established in Greece for the last 15 years in the areas of technical consulting and professional training for the local industries. **Falcon** is expanding in GCC, aiming to provide the best consulting and training solutions to the industries of the region. **Falcon's instructors are accredited trainers and highly experienced in their fields, as well as adult training.** We aspire to build our business relationships on mutual trust. The achievement of results with an emphasis on innovation and sustainability, quality, cost analysis and time scheduling are non-negotiable from the conceptual phase of the training sessions to their successful closure.



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