MU019:
Rotating Equipment Selection, Operation, Maintenance, Inspection & Troubleshooting
Training Description:

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.

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 12 principal types of machinery used in industry. They will understand the differences between electric motors, design peculiarities, advantages and disadvantages of different types of gears, operating principles of gas turbines and reciprocating gas engines.

The course will convey an understanding of impulse vs. reaction turbines, insights into application ranges, limitations, maintenance and operability constraints for different kinds of pumps, compressors and dynamic gas machinery such as turbo-machinery as opposed to displacement machinery.

Training Objectives:

By the end of the training, participants will be able to:

✓ Apply the latest skills and techniques on operating, maintenance, inspection and selection of the major types of rotating equipment
✓ Discuss electric motors, gears, transmission equipment, steam turbines and expanders
✓ Select and use centrifugal pumps, positive displacement and vacuum pumps, turbo-compressors, fans, blowers and displacement compressors
✓ Implement the shortcut calculation methods for fluid machinery
✓ Discuss machinery reliability and availability calculations
✓ Know the principles of pump, compressor and turbine start up and operation
✓ Have a best practice for maintenance and repair
✓ Learn the measurement and control of performance of these machines
✓ Learn the inspection and diagnosing the root cause of problems
✓ Know the troubleshooting techniques for operational problems of pumps, compressors and turbines
✓ Understand different types of pumps, compressors and turbines.
✓ Operate pumps, compressors and turbines close to the design efficiency.
✓ Monitor pump compressor and turbine reliability and availability and cost effectiveness
✓ Select the best operation and maintenance strategy
✓ Troubleshoot pump, compressor and turbine problems

Training Designed for:

This course is intended for all Mechanical Engineers, Rotating Equipment Engineers, Superintendents,
Supervisors, Foremen & Senior Technicians. Further, the course is suitable to all other engineering disciplines who are dealing with rotating equipment such as Process Engineers, Chemical Engineers, Electrical Engineers, Plant Engineers, Project Engineers and Instrumentation Engineers.

**Training Program:**

**DAY ONE:**
PRE-TEST

**COMPRESSION PRINCIPLES**
- Principles of Compression
- Ranges of Application
- Centrifugal Compressors
- Reciprocating Compressors
- Rotary Compressors
- Workshop: Examples and Solutions

**DAY TWO:**

**COMPRESSORS: ELEMENTS AND TECHNICAL CHARACTERISTICS**
- Centrifugal Compressors
- Axial Compressors
- Compressor Packages
- Reciprocating Compressors
- Rotary Compressors
- Workshop: Examples and Solutions

**DAY THREE:**

**PUMPS: ELEMENTS AND TECHNICAL CHARACTERISTICS**
- Types of Fluids and Range of Application
- Centrifugal pumps:
  - Axial Pumps
  - Reciprocating Pumps
  - Rotary Pumps
- Workshop: Examples and Solutions

**DAY FOUR:**

**START UP AND OPERATION OF COMPRESSORS AND PUMPS**
- Centrifugal and Axial Compressors
- Reciprocating and Rotary Compressors
- Centrifugal and Axial Pumps
- Reciprocating and Rotary Pumps
- Workshop: Examples and Solutions

**DAY FIVE:**

**MAINTENANCE AND TROUBLESHOOTING OF ROTATING EQUIPMENT**
- Centrifugal and Axial Compressors
- Reciprocating and Rotary Compressors
- Centrifugal and Axial Pumps
Reciprocating and Rotary Pumps
Course Summary and Review
POST-TEST and EVALUATION

Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request”.

Please note that the above topics can be amended as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-
- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

As per the course location - This rate includes participant’s manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:
- 07:45 - 08:00 Morning Coffee / Tea
- 08:00 - 10:00 First Session
- 10:00 - 10:20 Recess (Coffee/Tea/ Snacks)
- 10:20 - 12:20 Second Session
- 12:20 - 13:30 Recess (Prayer Break & Lunch)
- 13:30 - 15:00 Last Session

For training registrations or in-house enquiries, please contact:
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Training & Career Development Department