CENTRIFUGAL COMPRESSOR & STEAM TURBINE
Design, Operations & Maintenance

18 - 22 Nov 2018, Dubai
Introduction

This training seminar entails a study of gas compression and expansion laws applied to industrial processes followed by an illustration of the different types of rotating machines usually encountered in plants, and their related aspects. The aim is to provide a satisfactory approach to the problems posed by compressors and turbines and the means to solve them.

Key highlights of the training course are:

- Understanding of monitoring techniques as applied to compressors and turbines
- Ability to put in place measures to quantify equipment condition
- Interface with and control service providers
- Identify and specify new compressor and turbine plant

Objectives

At the end of this training seminar, participants will have:

- An understanding of the construction and operational constraints of centrifugal compressors and steam turbines
- Knowledge of how to optimally maintain the equipment for the benefit of the company
- Hints and Tips for practical application of monitoring technologies so as to achieve the best results

Training Methodology

The training seminar will be conducted along workshop principles with formal lectures, case studies and interactive worked examples. Relevant case studies will be provided to illustrate the application of each tool in an operations environment. Each learning point will be re-enforced with practical exercises. There will be ample opportunities for discussion and sharing experiences.

Organisational Impact

Predictive maintenance of rotating plant is vital to the budgetary success of the operations organisation. On completion of this training seminar, the delegate will be able to critically analyse the methodologies employed within the organisation and instigate improvements where required.

Personal Impact

Technical knowledge is key to effective control and peer respect within any maintenance organisation; when this is achieved personal satisfaction follows. This training seminar will give the delegate the required level of technical knowledge and skill to achieve that personal satisfaction.

Who Should Attend?

- Engineers, Operators, and Technicians in Maintenance, Engineering and Production
- Anyone who wishes to update themselves on Maintenance Engineering Technologies, judges the suitability of these technologies for their needs, and learns how to implement them for the benefit of their organisations

*REP logo, PMI & PMP are registered trademarks of Project Management Institute, Inc.*
DAY 1

Gas Laws & Compression Theory
Compression and Expansion Fundamentals
- Gas Equations
  - Ideal gas equation and practical application
  - Isentropic, polytropic compression
  - Mass and volume capacity
- Practical Compression Laws
  - Effect of process temperature
  - Power of compression
- Mollier Diagrams
  - For gas and steam

Compression and Expansion Mechanisms
- Compression Basics
  - Euler’s law, applications for compressors and turbines,
  - Characteristic curves
  - Velocities triangle
- Blade Types
  - Impulse profile and Reaction profile - where each type are used and why
- Dynamic Effects
  - Mach number effect on temperature, pressure and density
  - Subsonic and supersonic machines
- Simple Calculations
  - Dimensionless coefficients, specific speeds

DAY 2

Practical Applications
Compressor and Turbine Performance and Operation
- Affinity Laws for Centrifugal Impellers
  - Calculating effect of speed change
  - Calculating effect of impeller changes
- Characteristic Curves
  - Effect of change on operating and process parameters
- Operational Problems
  - Surge
  - Stonewall
  - Range of working efficiency
- Capacity Control Methods
  - Speed change
  - Inlet guide vanes
- Commissioning
  - Pre-start checks
  - Vibration survey
  - Run-up / Rundown analyses

DAY 3

Steam Plant & Turbines
Steam Turbines
- Turbine Characteristics
  - Speed
  - Specific consumption
  - Efficiency
- Steam Conditions
  - Influence of inlet steam state
  - Effects of exhaust steam
- Control Systems
  - Speed governor
  - Pressure & temperature control systems
- Safety Devices
  - Overspeed
  - Overpressure
- Associated Equipment
  - Condensers
  - Pumps
  - Boilers

DAY 4

Turbine Construction & Maintenance
Construction and Systems
- Construction
  - Casings
  - Diaphragms
  - Stator
  - Blades
- Bearings & Seals
  - Rotor, journal and thrust bearings
  - Internal and shaft seals
  - Coupling
- Rotor Dynamics
  - Balance
  - Critical speeds
- Associated Systems
  - Lubrication system
  - Seal systems
- Typical Mechanical Incidents

DAY 5

Engineering Aspects
Engineering
- API Specifications
- Information required for Bidding
- Factory Tests
REGISTRATION DETAILS

LAST NAME:________________________________________
FIRST NAME:_______________________________________
DESIGNATION:_____________________________________
COMPANY: ________________________________________
ADDRESS: ________________________________________
CITY:______________________________________________
COUNTRY: ________________________________________
TELEPHONE:______________________________________
MOBILE: __________________________________________
FAX:________________________________________________
EMAIL:_____________________________________________

AUTHORISATION DETAILS

AUTHORISED BY:___________________________________
DESIGNATION:_____________________________________
COMPANY: ________________________________________
ADDRESS: ________________________________________
CITY:______________________________________________
COUNTRY: ________________________________________
TELEPHONE:______________________________________
MOBILE: __________________________________________
FAX:________________________________________________
EMAIL:_____________________________________________

PAYMENT DETAILS

☐ Please invoice my company
☐ Cheque payable to GLOMACS
☐ Please invoice me

CERTIFICATION

Successful participants will receive GLOMACS’ Certificate of Completion

4 WAYS TO REGISTER

Tel: +971 (04) 425 0700
Fax: +971 (04) 425 0701
Email: info@glomacs.com
Website: www.glomacs.com

TERMS AND CONDITIONS

• Fees – Each fee is inclusive of Documentation, Lunch and refreshments served during the entire seminar.
• Mode of Payment – The delegate has the option to pay the course fee directly or request to send an invoice to his/her company/sponsor. Credit card and cheque payments are both acceptable.
• Cancellation / Substitution – Request for seminar cancellation must be made in writing & received three (3) weeks prior to the seminar date. A US$ 250.00 processing fee will be charged per delegate for each cancellation. Thereafter, we regret that we are unable to refund any fees due, although in such cases we would be happy to welcome a colleague who would substitute for you.
• Hotel Accommodation – is not included in the course fee. A reduced corporate rate and a limited number of rooms may be available for attendees wishing to stay at the hotel venue. Requests for hotel reservations should be made at least three (3) weeks prior to the commencement of the seminar. All hotel accommodation is strictly subject to availability and terms and conditions imposed by the hotel will apply.
• Attendance Certificate – a certificate of attendance will only be awarded to those delegates who successfully completed/attended the entire seminar including the awarding of applicable Continuing Professional Education Units/Hours.
• Force Majeure – any circumstances beyond the control of the Company may necessitate postponement, change of seminar venue or substitution of assigned Instructor. The Company reserves the right to exercise this clause and implement such amendments.
• Fair Access / Equal Opportunities – In the provision of its services as a world-class Training Provider, the Company is committed to provide fair access/equal opportunities throughout the delivery of its courses and assessment leading to the completion of training seminars, or 3rd party qualifications/certifications.

CENTRIFUGAL COMPRESSOR & STEAM TURBINE
Design, Operations & Maintenance