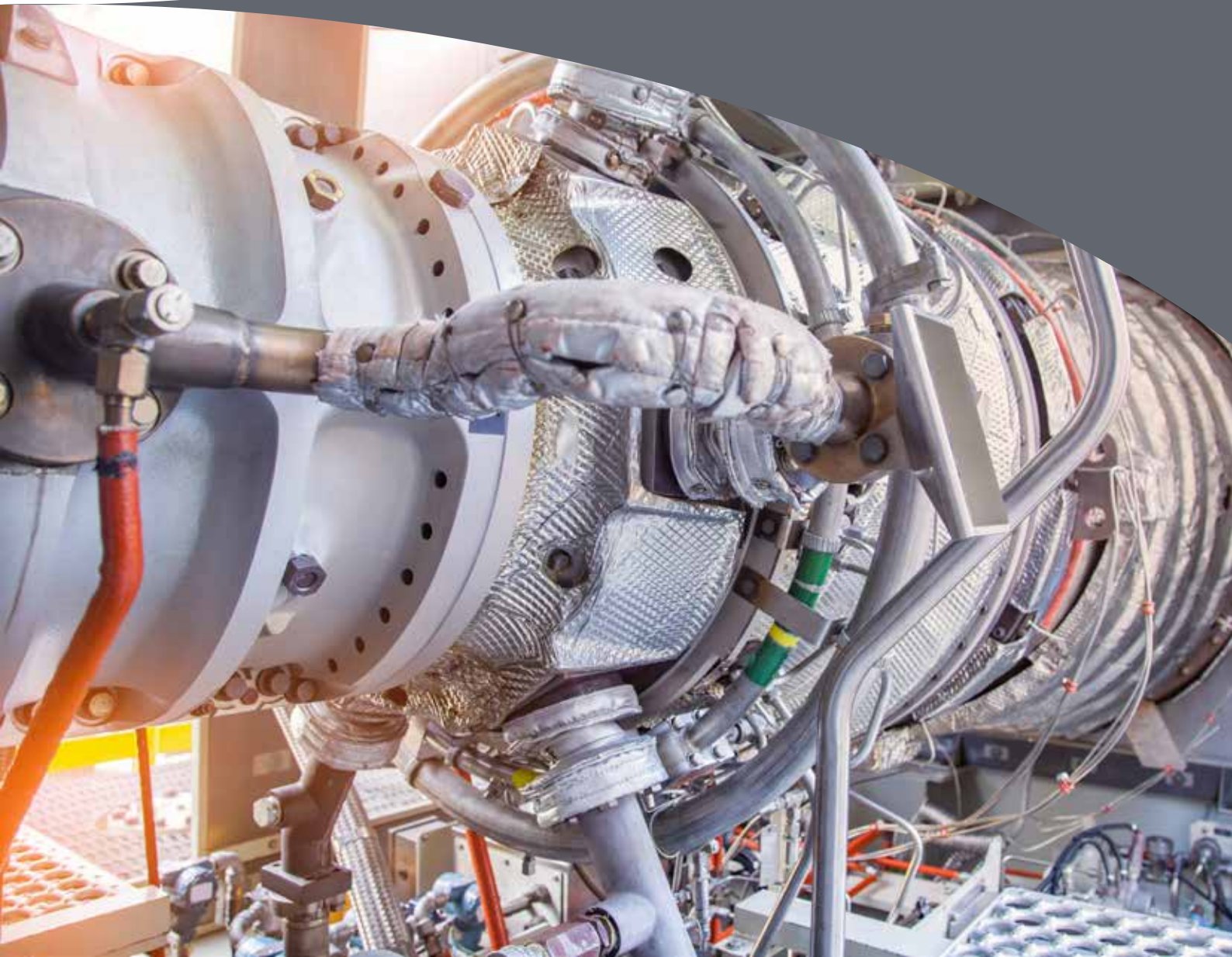


# Refinery Critical Equipment Operation

for Compressors, Turbines and Pumps

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25 - 29 Mar 2019, Istanbul



# Refinery Critical Equipment Operation

## for Compressors, Turbines and Pumps

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## Introduction

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Rotating equipment, such as compressors, turbines, pumps and others, are the most critical for processes in oil refineries and large petrochemical plants. These components with complex controls are subject to wear, deterioration and aging, which results in equipment failures, breakdowns and outages. Each type of equipment has a special role in the overall refinery operation and has a different criticality index associated with a failure's consequence that bring risks related to safety, environment, production loss and maintenance costs.

This highly interactive and intensive GLOMACS training course will consider the operation and maintenance of compressors, turbines and pumps from the aspect of quantitative critical analysis of their faults and defects and rank them according to the seriousness of consequences on safety, environment and production loss. This GLOMACS training course will explain the most efficient maintenance management strategy focused on high-priority maintenance tasks that minimize unplanned breakdowns and repeated failures, with the ultimate goal of maximizing the life of the components and the system

**This GLOMACS training seminar will highlight:**

- Technical characteristics of compressors, turbines and pumps for the given application
- Criticality index and criticality list of components
- Practical issues related to trouble-free operation of rotating equipment
- Root cause analysis of problems related to vibration and dynamic balancing
- Guidelines for monitoring, maintenance and troubleshooting

## Objectives

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**At the end of this GLOMACS training seminar, you will learn to:**

- Deal with technical characteristics of compressors, turbines and pumps
- Apply the guidelines for efficient operation with decreased maintenance costs
- Interpret results of testing and inspection of critical components
- Analyze failure modes of critical components
- Apply diagnostic and monitoring technologies to achieve the best results

## Training Methodology

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This training course will be conducted along the workshop principles with formal lectures, case studies and interactive work examples. Relevant and real-life case studies will be provided to illustrate the application of each tool in an operation and troubleshooting situation. Learning topics will be re-enforced with practical exercises. There will be plenty of opportunities for discussions and sharing experiences during class workshops.

## Organisational Impact

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On completion of this GLOMACS training course, the participants will be able to adequately analyze operation and maintenance methodologies employed within their organization. They will be able to initiate potential improvements where required. This training will give the participant the required level of technical knowledge and skill that will prove useful in their professional activities.

## Personal Impact

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The knowledge gained in this GLOMACS training course will provide a better understanding of compressors, turbines and pumps in complex operating conditions. The participants will be able to develop a proactive maintenance system which will allow better inspection, control and monitoring with the goal of avoiding unplanned equipment failures and maximizing rotating equipment availability and reliability.

## Who Should Attend?

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**This GLOMACS training course is suitable to a wide range of professionals but will greatly benefit:**

- Mechanical and Process Engineers
- Plant Engineers responsible for operations, maintenance and troubleshooting
- Project Leaders
- Maintenance and Instrumentation Professionals
- Technologists and Facility Operators

## DAY 1

### Equipment Criticality Analysis

- Rotating Equipment in Refineries: Criticality Aspect
- Quantitative Analysis of Equipment Faults
- Input Data Preparation
- Tools and Techniques
- Risk Assessment and Determination of Equipment Criticality
- Equipment Criticality Index
- Reliability of Critical Equipment and Mean Time Between Failures (MTBF)
- Application of Criticality Analysis on Maintenance Program

## DAY 2

### Compressors

- Overview of Positive Displacement Compressors
- Reciprocating Compressor Design Elements: Valves, Pistons, Bearings, Seals
- Effect of Gas Composition and Suction Conditions on Performance
- Wet Gas Compressors in FCC Operations
- Centrifugal Compressors Design and Configuration
- Performance Curves: Choke Conditions, Surge and Anti-Surge Protection
- Flow Control Techniques and Start-Up Procedures: Low- and High-speed Limits
- Auxiliary Systems: Lubrication and Cooling

## DAY 3

### Turbines

- Steam Turbine Construction Elements
- Technical Characteristics of Blades and Nozzles
- Control Systems and Safety Devices
- Technical Characteristics of Gas Turbines
- Combustion Monitoring, Ignition and Flaming System, Fuel Control
- Start-Up System, Over-speed Control Protection and Calibration
- Rotor Dynamics and Balancing
- Associated Equipment and Systems: Lubrication, Bearings and Seals

## DAY 4

### Pumps

- Centrifugal Pumps Design Overview
- Impellers, Shafts and Bearings
- Importance of Mechanical Seals
- Characteristic Curves
- NPSH and Cavitation Prevention
- Design of Suction Configuration and Flow Control
- Positive Displacement Pumps: Reciprocating and Rotary
- Problems with Pumping Difficult Liquids

## DAY 5

### Maintenance and Overhaul Management

- Maintenance and Overhaul of Rotating Equipment
- Preventive Maintenance for Critical Machines
- Predictive Maintenance Based on Inspection and NDT
- FMEA and Root Cause Analysis (RCA)
- On-Line and Off-Line Condition Monitoring
- Reliability-Centered Maintenance
- Computerized Maintenance Management System (CMMS)
- Best Practices Adopted in Maintenance



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# Refinery Critical Equipment Operation

for Compressors, Turbines and Pumps

**GLOMACS**  
Training & Consultancy

Code	Date	Venue	Fees
ME073	25 - 29 Mar 2019	Istanbul	\$5,950

## 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](mailto:info@glomacs.com)  
Website: [www.glomacs.com](http://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.

**GLOMACS**

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