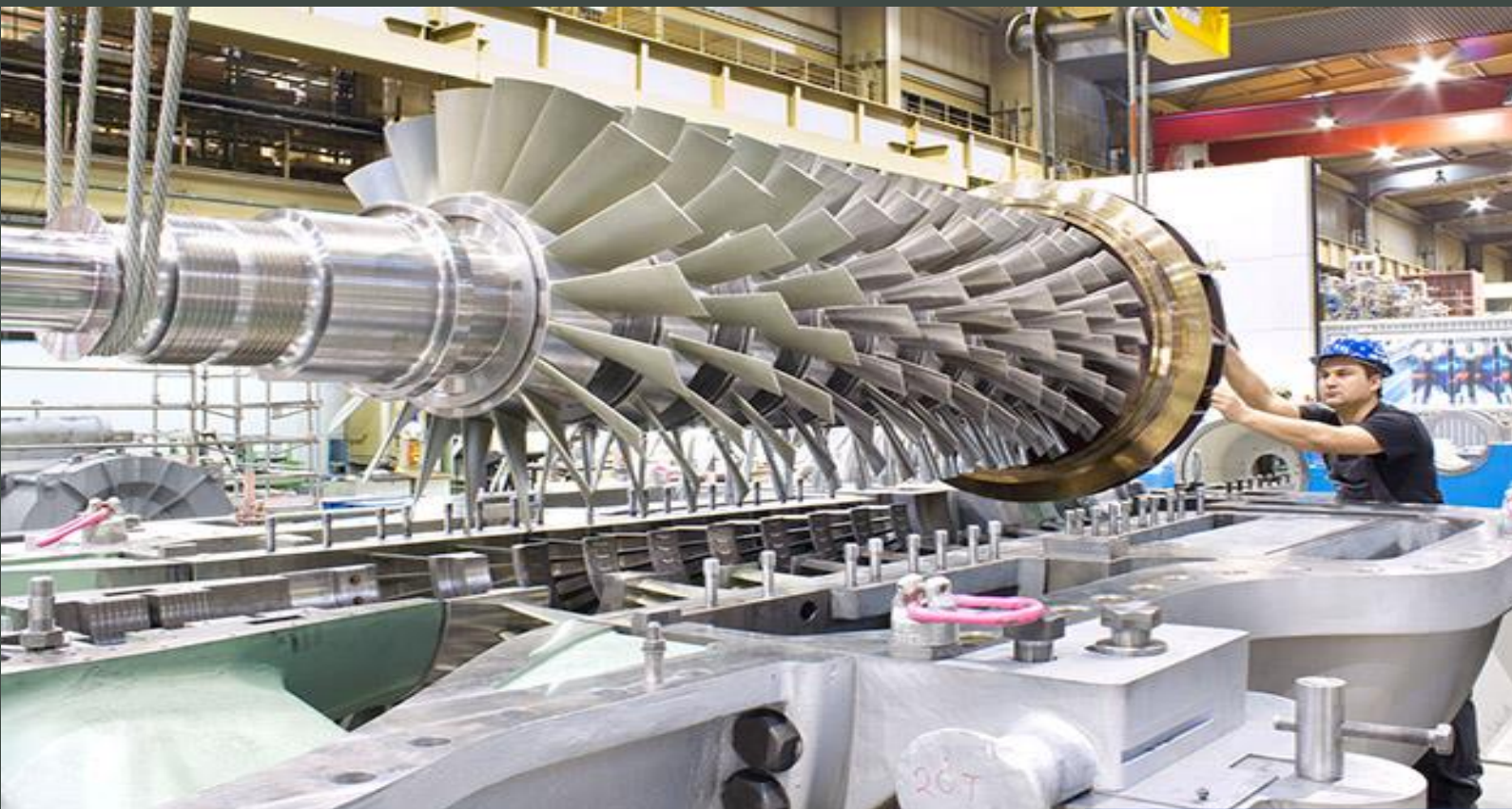


Compressors: Operations and Maintenance



YOUR PRINCIPAL COURSE LEADER: Mr. Fred Geitner,P.Eng



- More Than 50 Years of Experience in Oil, Gas and Petrochemical Industry
- Former Senior Machinery Advisor in Exxon Mobile
- Co-Author of Several Machinery Books
- International Training Instructor for Rotating Equipment
- Member of International Society of Tribologists and Lubrication Engineers

Kish Island-Iran

11-13 June, 2019

**Early Birth
Registration:**

10th May, 2019

Compressors: Operation and Maintenance

MAT Group Ltd. is proud to present “**Compressors: Operation and Maintenance Course**” for improving knowledge, scientific and professional level of engineers. This course will be held in 3 days starting on Tuesday, 11th June, 2019 from 8:30 to 17:15 in Kish Island/Iran.

COURSE DESCRIPTION:

Centrifugal and Reciprocating Compressors of several types, which have widely varying configurations and applications, are used extensively in the process industries. These compressors represent a significant part of the capital and operating costs of most plants, so that optimizing their selection is of major economic importance. An old adage is “If your rotating equipment works well, your plant works well”.

The course is devoted to efficiencies, operating characteristics, reliability and maintenance implications of centrifugal and reciprocating compressors. This course will cover the principles of centrifugal and reciprocating compressors, their design features, effects of efficiency on operating costs, energy usage, effect on plant costs, special materials of construction, operations, troubleshooting and maintenance.

The course will also cover plant run-length extension surveys, organizing for successful turnarounds and ongoing reliability improvement, and preventive vs. predictive maintenance strategy decisions. The course will provide the Participant with a basic, as well as advanced, compressor technology inventory required to successfully operate, troubleshoot and maintain this type of plant asset.

WHO SHOULD ATTEND

This course is intended to be of direct use to persons in staff (Senior Technicians, Operators, Supervisors, Superintendents) and corporate engineering, managerial and supervisory individuals responsible for operations and maintenance functions. The industries most directly involved with the subject matter are those producing chemicals, petrochemicals, petroleum products, natural gases, manufacturing gases, steel and other metals, and plants requiring process refrigeration. Throughout the course, Participants will have ample opportunity to have equipment-related questions addressed and answered by the Course Director.

COURSE OUTLINES:

DAY 1:

Session 1:

Introduction to Compressor Types:

Centrifugal, Axial, Configurations of Reciprocating Compressors, Helical Screw, Ranges of Application and Limitations, Some Selection Considerations.

Session 2:

Mechanical Design of Centrifugal Compressors:

Compressor Side Streams, Rotors, Balancing, Rotor Dynamics, Impellers, Casings, Bearings, Seals, Couplings.

Session 3:

Design and Materials of Reciprocating Compressor Components:

Design and Materials, Design of Non-Lubricated Compressors, Vulnerabilities.

Session 4:

Design and Materials of Reciprocating Compressor Components (Cont.):

Piston Rod Configurations, Piston Rod and Frame Loading, Disturbing Forces and Balancing.

Day 2 :

Session 1:

Turbo-Compressor Train Operation:

Operating Manuals, Housekeeping, Operating Principles, Performance Characteristics, Critical Speed, Effect of Speed Changes, Effect of Temperature Changes, Effect of Temperature Changes, Surge and Surge Protection, Control, Vibration Analysis.

Session 2:

Turbo-Compressor Inspection, Maintenance, Overhaul and Repair (IMO&R):

Planning, Execution, Documentation, Troubleshooting

Session 3:

Operation and Maintenance of Reciprocating Compressors:

Lubrication and Lubrication Systems, Valves, Valve Problems and Rebuilding, Packing and Packing Problems, Non-Lubricated Compressors, Controls and Cooling Systems.

Compressors: Operation and Maintenance

COURSE OUTLINES (Cont.):

Day 2 (Cont.):

Session 4:

Safety in Compressor Operation and Maintenance:

Basic Safety Rules, Safety Devices and Shutdowns, Safety Maintenance Procedures, Troubleshooting.

Day 3:

Session 1:

Overhaul and Repair of Reciprocating Compressors:

Methods of Repair and Overhaul, Alignment and Piston Rod Run-out, Foundation Problems and Repair, Component Repair and Rebuild.

Session 2:

Predictive vs. Preventive Maintenance (PdM vs. PM):

Types of Maintenance Programs, Purpose of PM, Health Monitoring by Performance Tracking, Vendor and Contractor Requirements, Planning and Implementation.

Session 3:

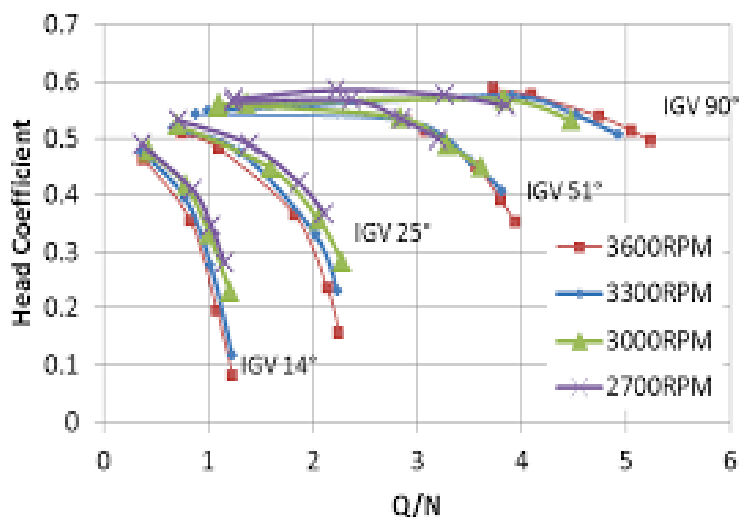
Predictive vs. Preventive Maintenance (PdM vs. PM) – Reciprocating Compressors:

Health Monitoring by Performance Tracking, Inspection and Inspection Forms.

Session 4:

Basic Approaches to Machinery Troubleshooting:

Troubleshooting Compressor Problems (Matrix Approach), Typical Problems and Solutions, Diagnostic Tests, Compressed Air System Evaluation.



About Your Course Leader:



Mr. Fred K. Geitner P.Eng. M.S.M.E. is the Principal Engineer of PMES (Process Machinery Engineering Services). He has **over 50 years experience** in rotating/process machinery engineering for the petrochemical and related process industries. He is presently working as an

expert witness for rotating machinery and is advising on subjects related to process machinery (e.g. air compressors, steam turbines, etc.), reliability improvement and maintenance such as machinery failure analysis, specifications, technical bid analysis and machinery design audits. From 1993 to 2000, Mr. Fred K. Geitner worked for a major natural gas transmission company in Germany where he was in charge of machinery technology liaison between the German firm and pipeline companies in the newly independent states of the former Soviet Union. Before retiring from Exxon in 1992, after twenty years of service, Mr. Geitner's professional career included positions as Engineering Associate with Esso Chemical Canada and a three-year assignment as a lead machinery specialist with Exxon Chemical France. Prior to joining Exxon, Mr. Geitner worked for ten years for Cooper Industries, a major manufacturer of process machinery. There he held positions in field service engineering, design and manufacturing at various locations in Canada and the U.S. Mr. Geitner graduated from the Technical University of Berlin/Germany with an M.S. (Dipl. Eng.) degree in Engineering and did post-graduate studies at the University of Cincinnati, USA. Mr. Geitner has presented courses and seminars on design, operation and maintenance of process machinery and related equipment in Canada, the US, Europe, South America and the Middle East.

He is also a present member of the Society of Tribologists and Lubrication Engineers and has, together with Heinz Bloch co-authored a series of books on process machinery management and reliability engineering. The current list of his books includes:

- (1) Machinery Failure Analysis and Troubleshooting (Third Edition), by Heinz P. Bloch and Fred K. Geitner (Houston, Texas: Gulf Publishing Company).
- (2) Practical Machinery Management for Process Plants, Volume 1, 3rd Edition.
- (3) Practical Machinery Management for Process Plants, Volume 2, 3rd Edition
- (4) Practical Machinery Management for Process Plants, Volume 3, 2nd Edition:
- (5) Practical Machinery Management for Process Plants, Volume 4, 2nd Edition.
- (6) Machinery Component Maintenance and Repair
- (7) Process Equipment Maintenance and Repair
- (8) Process Plant Machinery
- (9) Process Plant Reliability

REGISTRATION:

TERMS FOR ATTENDING THE COURSE:

- University Engineering Degree (e.g. Mechanical, Chemical &...) is highly recommended.
- Sending the completed "Course Registration Form" by **10th May, 2019**
- Knowledge or background in the field of "**Process Machinery**" is highly recommended.
- Formal language of the course is English.

COURSE FEE:

- Payment of Rials **50,000,000.00** to MAT Persian Group, **Account Number 810-652-6, Code 1080, Parsian Bank**, Iran, Tehran by **10th May, 2019**.
- The above price does not include 9%VAT.

IMPORTANT NOTICE:

- Payments are required with registration and must be received prior to the course to guarantee your place.
- The regular registration period ends on **10th May, 2019**. Afterward, late "Registration Fee" of **Rials 3,000,000.00** will be charged.
- A certificate of successful completion of the course will be awarded to participants who attend and complete all course sessions and successfully pass the final exam of the course.
- The registration payment includes: **Course Materials, Pre and Post Exam, Videos and Supplementary Documents..**

PAYMENT, CANCELATION & REFUND POLICIES:

All payments must be received prior to course commencement. Payments are accepted in the form of bank cheque or bank transfer. Cancellation requests by applicants should be in writing and received 30 days before the commencement of course, for the course fee to be refunded minus registration/administration cost of **Rials 3,000,000**.

Cancellations must be made in writing. No refunds will be made for cancellations received less than 30 days before the start of the course. Enrollment is not automatically cancelled if participant does not show up. A substitute participant may be nominated upon approval of MAT Group.

MAT Group reserves the right to withdraw or postpone a course if the number of participants is not sufficient, up to three weeks prior to the course starting date. If a course is cancelled by MAT Group, you will receive notice by email or fax. A full refund of paid registration fees will be given or can be transferred to another MAT Group public course within 12 months (date of registration) of equal cost. Please keep our registration and cancellation policies in mind when arranging your travel as MAT Group does not accept liability for any costs incurred for cancellation or change of travel or hotel reservations.



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