

COURSE OVERVIEW ME0616
Compressor Operation, Maintenance & Troubleshooting

Course Title

Compressor Operation, Maintenance & Troubleshooting

Course Date/Venue

October 13-17, 2024/Big Ben Meeting Room, Radisson Blu Hotel Istanbul, Sisli, Istanbul, Turkey

Course Reference

ME0616

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.



This course is designed to provide participants with a good working knowledge on the operation, maintenance and troubleshooting of compressors. It covers the common types, ranges of application, limitation and functions of compressors; the principles of equipment failure patterns; the common factors of why equipment fails; the different aspects of machinery corrosion; and the correct selection of materials for a given application.



At the completion of the course, participants will be able to apply basic approaches to machinery troubleshooting; troubleshoot most possible faults and failures of pumps and compressor; carryout various approaches to be considered in applying corrective action; and employ the principles of dry gas, packing and mechanical seals.

The course will also cover the components and functions of compressors; the features of dry gas seal for centrifugal gas compressor; the troubleshooting of mechanical seal failure; the various maintenance and repair methods used; and the basic concept of bearing care, maintenance, bearing classification and lubrication management.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply systematic techniques in the operation, maintenance and troubleshooting of compressors
- Identify the common types of compressors and the ranges of application and limitation and have an overview of centrifugal compressors including its type and function
- Recognize the principles of equipment failure patterns including its type and review the common factors of why equipment fails
- Differentiate between the different aspects of machinery corrosion and to make the correct selection of material for a given application
- Determine the basic approaches to machinery troubleshooting and troubleshoot most possible faults and failures of pumps and compressors and discover the various approaches to be considered in applying corrective actions
- Employ the principles of dry gas, packing and mechanical seals and recognize their components and functions
- Explain the features of dry gas seal for centrifugal gas compressor
- Analyze and troubleshoot mechanical seal failure and identify the various maintenance and repair methods used
- Discuss the basic concept of bearing care and maintenance, bearing classification and lubrication management

Who Should Attend

This course covers systematic techniques and methodologies on the operation, maintenance and troubleshooting of compressors for those who work with mechanical and rotating equipment at industrial plants, petrochemical plants, process plants, utilities, production oil/gas field, or manufacturing facilities. General maintenance personnel, first line supervisors and engineers will find this course extremely useful. Attendees come from a wide variety of industries, skill-levels, company sizes, and job titles.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Practical Workshops & Work Presentations
- 30% Hands-on Practical Exercises & Case Studies
- 20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accreditation by the following international accreditation organizations:-


- 

The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology’s courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units (CEUs)** in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant’s involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant’s CEU and PDH Transcript of Records upon request.

- 

British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

Course Fee

US\$ 6,000 per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



Mr. Yasser Almasood is a **Senior Mechanical and Maintenance Engineer** with almost over **20 years** of extensive experience within the Oil & Gas industries. His wide expertise covers in the areas of **Compressor Operation, Maintenance & Troubleshooting, Boiler Operation & Maintenance, Water Treatment Technology, Boiler Instrumentation & Control, Valves, Piping System, Tank, Vessel, Boiler and Turbine Installation, Boiler Operations & Performance, Gas Processing Calculation, Process Reactor Operation & Troubleshooting, Catalytic Reactors, Heat Exchanger, Distillation Columns, Pumps, Distributed Control System (DCS), Catalytic Reformer Unit, Polymerization, Dehydrogenation, Gas Processing Plant Operations & Control, Gas Processing Monitoring & Troubleshooting, Process Plant Start-up Commissioning & Troubleshooting, Process Plant Optimization & Energy Conservation, Process Equipment Design & Troubleshooting, Advanced Operation Skills, Refinery Process Yield Optimization, Oil & Gas Processing, Troubleshooting Oil & Gas Processing Facilities, Polymers & Polymerization, Applied Process Engineering, Process Plant Troubleshooting & Engineering Problem Solving, Process Plant Performance & Efficiency, Process Design & Optimization, Desalination Processes, Reverse Osmosis and Molecular Sieves. Further, he is also well-versed in **Process Analyzers & Analytical Instrumentation, Process Control, Instrumentation & Safeguarding, Process Controller, Control Loop & Valve Tuning, Industrial Distribution Systems, Industrial Control & Control Systems, Distributed Control System, Control Valves & Actuators, Advanced Process Control (APC) Technology, Process Control & Loop Tuning, Process Control & Automation, AspenTech, Aspen HYSYS, Pro II, exSILentia, OLGA, Flare System Analyzer, Aspen PIMS, DYN SIM, RiskWISE, MS Office and IBM Maximo.****

During his career life, Mr. Yasser has gained his practical and field experience through his various significant positions and dedication as the **Senior Process Engineer, Process Engineer, Oil & Gas Process & Safety Instructor, On-Job Instructor, Process Senior Operator, Acting DCS Operator and Shift Controller** for various multi-national companies such as the ADNOC Gas Processing (**GASCO**), Conoco Phillips Gas Plant and Syrian Gas Company (SGC).

Mr. Yasser has a **Bachelor's** degree in **Petroleum Engineering**. Further, he is a **Certified Instructor/Trainer** and has further delivered numerous training, courses, workshops, seminars and conferences worldwide.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: Sunday, 13th of October 2024

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Introduction Overview of Rotating Equipment • Understanding How Equipment Works
0930 – 0945	Break
0945 – 1100	Compressor Types & Terminology Centrifugal • Axial • Reciprocating • Helical Screw • Ranges of Application & Limitations
1100 – 1215	Centrifugal Compressors Overview Rotors • Balancing Rotor Dynamics • Impellers • Casings
1215 – 1230	Break
1230 – 1420	Centrifugal Compressors Overview (cont'd) Troubleshooting & Preventive Maintenance for Compressors • Bearings • Seals: Labyrinths, Oil Seals & Self-Acting Gas Seals • Couplings • Controls
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today & Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day One

Day 2: Monday, 14th of October 2024

0730 – 0930	Equipment Failure Patterns Materials • Types of Corrosion • Bath-Tub Curve • Actual Equipment Failure Patterns • Actions to Minimize Failure Effect
0930 – 0945	Break
0945 – 1100	Basic Approaches to Machinery Troubleshooting Examples from Recent Failure Incidents Attributed to Design Processing & Manufacturing Deficiencies
1100 – 1215	Troubleshooting Faults & Applying Corrective Action Equipment Performance Monitoring • Vibration Analysis • Fast Fault Finding • Acoustical Troubleshooting • Infra-red Inspection • Oil Analysis
1215 – 1230	Break
1230 – 1300	Vibration Analysis DVDs
1300 – 1420	Case Studies
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today & Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day Two



Day 3: Tuesday, 15th of October 2024

0730 – 0830	Introduction to Dry Gas Seals Principle of Operation • Materials of Construction • Manufacturing & Verification Testing
0830 – 0930	Packing & Mechanical Seals Compression Packing • Molded (Automatic) Packing • Basic Principles of Mechanical Seals • Face Materials • Secondary Seal Materials • Single Mechanical Seals • Single Mechanical Seal • Flushing Plans
0930 – 0945	Break
0945 – 1045	Flowserve DVD
1045 – 1215	Case Studies
1215 – 1230	Break
1230 – 1330	Seal Support Systems Dual Sealing Systems & Flushing Plans • API 682 Reference Guide • Gas Barrier Seal Technology for Pumps • Support Systems for Dry Gas (Self Acting) Compressor Seals • Mechanical Seal Selection Strategies
1330 – 1420	Dry Gas Seal for Centrifugal Gas Compressors
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today & Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day Three

Day 4: Wednesday, 16th of October 2024

0730 – 0930	Mechanical Seal Failure Analysis & Troubleshooting Failure Analysis • Mechanical Seal Troubleshooting • Determining Leakage Rates • Ascertaining Seal Stability
0930 – 0945	Break
0945 – 1100	Mechanical Seal Maintenance & Repair Bellows Seal Repair • Cartridge Seal Installation & Management • Seal Face Care
1100 – 1215	Bearing Care & Maintenance Basic Bearing Concepts • Bearing Classifications • Bearing Care & Maintenance • Lubrication Management Break
1215 – 1230	Break
1230 – 1315	Flowserve DVD
1315 – 1420	Case Studies
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today & Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day Four

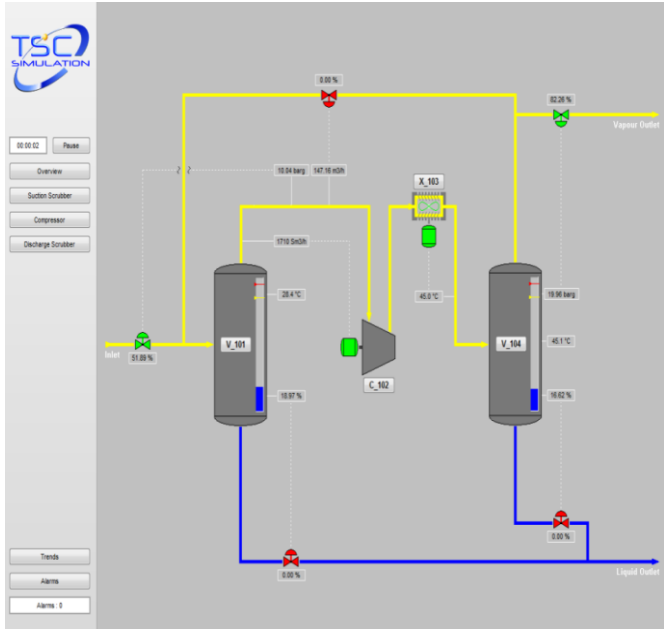


Day 5: Thursday, 17th of October 2024

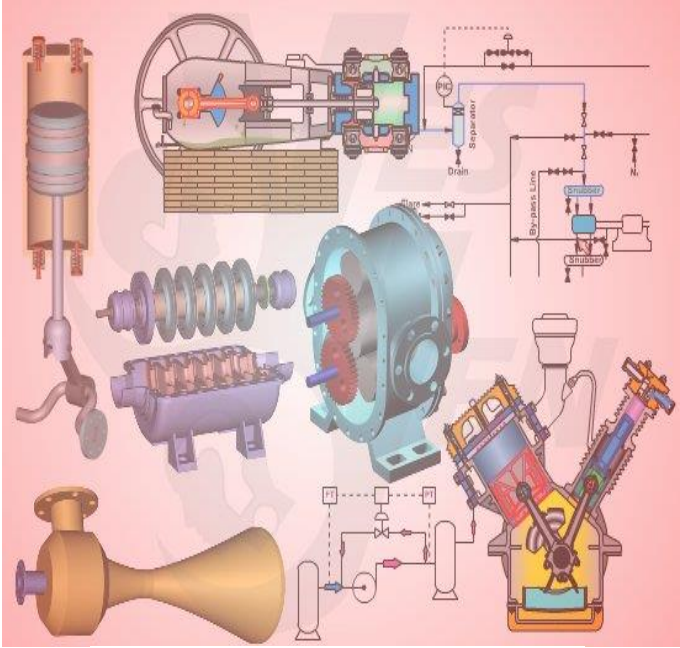
0730 – 0900	Preventive Maintenance-Lubrication Cost of Poor Lubrication • Fundamentals-Oil & Grease • Storage & Handling Methods
0900 – 0930	Flowserve DVD
0930 – 0945	Break
0945 – 1100	Preventive Maintenance-Lubrication (cont'd) Comparative Viscosity • Classifications
1100 – 1215	Lubrication DVD
1215 – 1230	Break
1230 – 1345	Preventive Maintenance General Philosophy • Equipment Sparing Factor & Maintenance Approach
1345 – 1400	Course Conclusion Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course
1400 – 1415	POST-TEST
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art simulators “SIM 3300 Centrifugal Compressor” and “CBT on Compressors”.



SIM 3300 Centrifugal Compressor Simulator



CBT on Compressors

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org