

COURSE OVERVIEW ME0780

Dynamic Analysis for a Reciprocating Compressor System

Course Title

Dynamic Analysis for a Reciprocating Compressor System

Course Date/ Venue

Session 1: April 14-18, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Session 2: October 05-09, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE



Course Reference

ME0780

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.

The aim of this course is to provide delegates with a detailed and up-to-date overview of fundamentals and practice of reciprocating compressors. Many present-day compressors are likely to have been designed with the emphasis on reduced weight, less floor space and less initial cost. Today, it is also necessary to consider aspects of maintainability and life cycle cost. So the course looks at issues of design, operation, preventative maintenance, overhaul and repair, troubleshooting and safety in operation.



At the completion of the course, participant will be able to identify the various applications of reciprocating compressor; recognize the design and materials for compressor components; review and improve the operation and maintenance of reciprocating compressors; carryout overhauling and repairing techniques of reciprocating compressors; apply troubleshooting to various compressor problems; identify the importance of preventive maintenance of reciprocating compressors; and emphasize the safety in the operation and maintenance and reciprocating compressors.



Course Objectives

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

- Apply and gain an in-depth knowledge on reciprocating compressors and their various applications
- Recognize the design and materials for compressor components
- Review and improve the operation and maintenance of reciprocating compressors
- Carryout overhauling and repairing techniques of reciprocating compressors
- Employ troubleshooting to various compressor problems
- Identify the importance of preventive maintenance for reciprocating compressors
- Emphasize the safety in the operation and maintenance of reciprocating compressors

Who Should Attend

This course provides an overview of all significant aspects and considerations of reciprocating compressors for engineers, managers and other technical staff in all industries using reciprocating compressors.

Exclusive Smart Training Kit - H-STK®



Participants of this course will receive the exclusive “Haward Smart Training Kit” (H-STK®). The H-STK® consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.

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 accredited by the following international accreditation organizations:

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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.

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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.

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. Dimitry Rovas, CEng, MSc, PMI-PMP, is a Senior Engineer & Analytical & Laboratory Consultant with extensive industrial experience in Oil, Gas, Power and Utilities industries. His expertise includes Chemical Sampling & Dosing & Lab Tests, Practical Problem Solving in Chemical Analysis, Advanced Chemical Sampling Techniques, Chemical Laboratory Operations, Process Analyzers & Analytical Chemistry, Planning/Budget of Lab Consumables, Modern Analytical Laboratory, Laboratory Quality Management, Laboratory Internal Audit, Laboratory Waste Disposal, Glass Reinforced Epoxy (GRE), Glass Reinforced Pipes (GRP), Glass Reinforced Vent (GRV), Diagnostics & Prognostics

Algorithms, Aeroderivative Gas Turbine Operation, Aero Engine Design & Performance, Mechanical Pipe Fittings, Flange Joint Assembly, Adhesive Bond Lamination, Butt Jointing, Joint & Spool Production, Isometric Drawings, Flange Assembly Method, Fabrication & Jointing, Jointing & Spool Fabrication, Pipe Cuttings, Flange Bolt Tightening Sequence, Hydro Testing, Pump Technology, Pump Selection & Installation, Centrifugal Pumps & Troubleshooting, Reciprocating & Centrifugal Compressors, Compressor Control & Protection, Gas & Steam Turbines, Turbine Operations, Gas Turbine Technology, Valves, Bearings & Lubrication, Advanced Machinery Dynamics, Rubber Compounding, Elastomers, Thermoplastic, Industrial Rubber Products, Rubber Manufacturing Systems, Heat Transfer, Vulcanization Methods, Process Plant Shutdown & Turnaround, Maintenance Optimization & Best Practices, Maintenance Auditing & Benchmarking, Reliability Management, Rotating Equipment, Energy Conservation, Energy Loss Management in Electricity Distribution Systems, Energy Saving, Thermal Power Plant Management, Thermal Power Plant Operation & Maintenance, Heat Transfer, Machine Design, Fluid Mechanics, Heating & Cooling Systems, Heat Insulation Systems, Heat Exchanger & Cooling Towers, Mechanical Erection, Heavy Rotating Equipment, Material Unloading & Storage, Commissioning & Start-Up. Further, he is also well-versed in MS project & AutoCAD, EPC Power Plant, Power Generation, Combined Cycle Powerplant, Leadership & Mentoring, Project Management, Strategic Planning/Analysis, Construction Management, Team Formation, Relationship Building, Communication, Reporting and Six Sigma. He is currently the **Project Manager wherein he is managing, directing and controlling all activities and functions associated with the domestic heating/cooling facilities projects.**

During his life career, Mr. Rovas has gained his practical and field experience through his various significant positions and dedication as the **EPC Project Manager, Maintenance Manager, Mechanical Engineer, Field Engineer, Preventive Maintenance Engineer, Lead Rotating Equipment Commissioning Engineer, Mechanical Engineer, Construction Commissioning Engineer, Offshore Lead Maintenance Engineer, Researcher, Instructor/Trainer, Telecom Consultant and Consultant** from various companies such as the Mytilineos Aluminium Group, Podaras Engineering Studies, Metka and Diadikasias, S.A., Hellenic Petroleum Oil Refinery and COSMOTE.

Mr. Rovas is a **Chartered Engineer** of the **Technical Chamber of Greece**. Further, he has a **Master's degree in Mechanical Engineering and Energy Production & Management** from the **National Technical University of Athens**. Moreover, he is a **Certified Instructor/Trainer**, a **Certified Maintenance and Reliability Professional (CMRP)** from the Society of Maintenance & Reliability Professionals (**SMRP**), a **Certified Project Management Professional (PMP)**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)** and a **Certified Six Sigma Black Belt**. He is an active member of Project Management Institute (**PMI**), Technical Chamber of Greece and Body of Certified Energy Auditors and has further delivered numerous trainings, seminars, courses, workshops and conferences internationally.

Course Fee

US\$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Howard Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

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

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Reciprocating Compressors & their Applications Introduction • What is a Compressor? • How Compressors Work • Methods of Compression • Types of Compressors • Compressor Definitions
0930 – 0945	Break
0945 – 1100	Reciprocating Compressors & their Applications (cont'd) Pressure • Pressure Definitions Associated with Compressors • Theory of Reciprocating Compressors • Characteristics of Reciprocating Compressors • Compressor Type Selection • Reciprocating Compressor Cylinder Arrangements
1100 – 1230	Design & Materials for Compressor Components Materials of Construction • Non-Lubricated or Oil-Free Cylinder Construction • Piston Rod Column or Frame Loading • Disturbing or Shaki Forces
1230 – 1245	Break
1245 – 1420	Design & Materials for Compressor Components (cont'd) Foundations for Reciprocating Compressors • Compressor Piping and Pulsation • Design Overview of Labyrinth • Piston Compressors
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	End of Day One

Day 2

0730 – 0930	Operation & Maintenance of Reciprocating Compressors Lubrication of Reciprocating Compressors
0930 – 0945	Break
0945 – 1100	Operation & Maintenance of Reciprocating Compressors (cont'd) Operational Problems and Maintenance of Compressor Valves
1100 – 1230	Operation & Maintenance of Reciprocating Compressors (cont'd) Compressor Piston Rod Packing • Compressor Control Systems • Compressor Cylinder Cooling

1230 – 1245	Break
1245 – 1420	Operation & Maintenance of Reciprocating Compressors (cont'd) Non-Lubricated Compressor Maintenance • Labyrinth-Piston Compressors
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	End of Day Two

Day 3

0730 – 0930	Overhaul & Repair of Reciprocating Compressors Rule of Thumb for General Running Clearances • Compressor Alignment • Web Deflection Measurements
0930 – 0945	Break
0945 – 1100	Overhaul & Repair of Reciprocating Compressors (cont'd) Compressor Cylinder Alignment • Foundation Problems and Repairs • Compressor Bearing Maintenance and Replacement
1100 – 1230	Overhaul & Repair of Reciprocating Compressors (cont'd) Cylinder Repair and Maintenance • Compressor Piston Maintenance • Rebuilding Compressor Pistons
1230 – 1245	Break
1245 – 1420	Overhaul & Repair of Reciprocating Compressors (cont'd) Installing Pistons on Piston Rods • Other Compressor Component Repairs • Compressor Part Replication
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	End of Day Three

Day 4

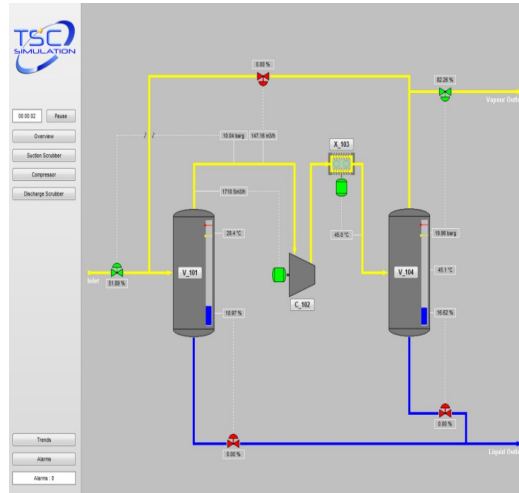
0730 – 0930	Troubleshooting Compressor Problems Compressor Problems • Typical Compressor Problems • Troubleshooting Lubrication Systems • Significance of Inter-Cooler Pressures • Inter-Stage Pressures
0930 – 0945	Break
0945 – 1100	Troubleshooting Compressor Problems (cont'd) Belt Drives • Motor Controls • Diagnostic Tests • Evaluating Reciprocating Compressor Condition Using Ultrasound and Vibration Patterns • Compressor Service Technician Reports • Basic Air Compressor System Evaluation
1100 – 1230	Preventive Maintenance for Reciprocating Compressors Compressor Maintenance • Emergency Repairs should be Minimized
1230 – 1245	Break
1245 – 1420	Preventive Maintenance for Reciprocating Compressors (cont'd) Effectiveness of Preventive Maintenance • Compressor Preventive Maintenance Program
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	End of Day Four

Day 5

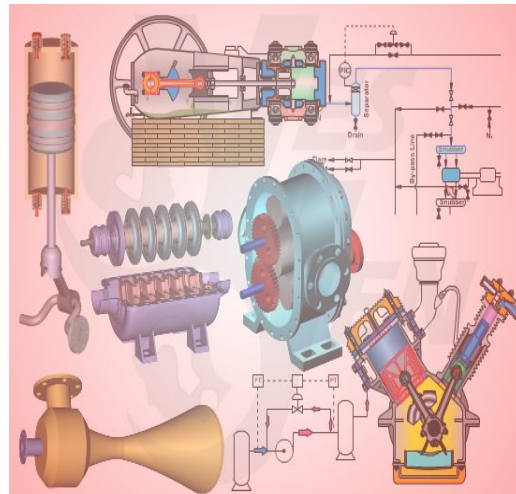
0730 – 0930	Preventive Maintenance for Reciprocating Compressors (cont'd) Spare Parts Vendor Selection • Personnel Training • Maintenance Contractors
0930 – 0945	Break
0945 – 1100	Preventive Maintenance for Reciprocating Compressors (cont'd) Predictive Maintenance • Integrated Condition Monitoring Systems
1100 – 1230	Safety in Operation & Maintenance Basic Safety Rules • Lock-Out/Tag-Out Program • Safe Maintenance Procedures Restated
1230 - 1245	Break
1245 - 1345	Safety in Operation & Maintenance (cont'd) Valve Installation • Fires and Explosions • Summary • Air Piping
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	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

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