



**COURSE OVERVIEW ME0468**

**Inspect and Evaluate Performance of Rotating Equipment**

**Course Title**

Inspect and Evaluate Performance of Rotating Equipment

**Course Date/Venue**

February 18-22, 2024/The Mouna Meeting Room, The H Dubai Hotel, Sheikh Zayed Rd - Trade Centre, Dubai, UAE

**Course Reference**

ME0468

**Course Duration/Credits**

Five days/3.0CEUs/30 PDHs



**Course Description**



***This practical and highly-interactive course includes 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 detailed and up-to-date overview of Inspect and Evaluate Performance of Rotating Equipment - Fundamental. It covers the different types of rotating equipment in industries and the basic working principles and operational considerations; the role of condition monitoring in plant integrity maintenance; the impact of poor condition monitoring on equipment lifespan and plant safety; the function of key components of rotating equipment and the locations of these parts and their significance in performance monitoring; and the common tools used in the industry and the principle behind each tool and its application.



Further, the course will also discuss the difference between regular checks and detailed evaluations; the importance of routine checks for early detection; the monitoring instruments comprising of vibration analysis tools, thermographic cameras, ultrasonic detection instruments and oil analysis equipment; the key parameters to be captured during routine inspection and the critical indicators of equipment health; using instruments for specific equipment types; customizing monitoring based on equipment; and adjusting equipment size, operational load and other specifics.



During this interactive course, participants will learn to respond to abnormal conditions by identifying the abnormalities; apply immediate steps to be taken when abnormalities are observed; maintain inspection logs and use records for predictive maintenance and analysis; identify the global and industry-specific standards, interpret maintenance manuals and tailor monitoring processes based on manufacturer recommendations; apply advanced tools and methodologies and cost-benefit analysis for advanced monitoring; interpret the importance of periodic in-depth evaluations; and compare findings from routine checks and comprehensive evaluations.

### **Course Objectives**

At the end of this course, the Trainee will be able to:-

- Apply and gain a fundamental knowledge on the inspection and evaluation of rotating equipment performance
- Explain the importance of condition monitoring for rotating equipment as part of plant integrity maintenance
- Describe the parts of rotating equipment to be monitored or evaluated and their locations
- Demonstrate correct use of the tools/instruments used to perform condition monitoring
- Explain the use of the various types of instruments/tools in performing condition monitoring on rotating equipment
- Describe the key parameters to be captured when performing routine inspection
- Respond appropriately in accordance to relevant procedures if abnormal conditions are observed
- Perform condition monitoring by routine inspection and monitor performance of rotating equipment as per required standards and maintenance manual
- Explain the different types of rotating equipment in industries and the basic working principles and operational considerations
- Emphasize the role of condition monitoring in plant integrity maintenance
- Discuss the impact of poor condition monitoring on equipment lifespan and plant safety
- Identify the function of key components of rotating equipment and the locations of these parts and their significance in performance monitoring
- Recognize the common tools used in the industry and the principle behind each tool and its application
- Differentiate between regular checks and detailed evaluations and discuss the importance of routine checks for early detection
- Identify monitoring instruments covering vibration analysis tools, thermographic cameras, ultrasonic detection instruments and oil analysis equipment
- Discuss the key parameters to be captured during routine inspection and the critical indicators of equipment health

- Use instruments for specific equipment types, customize monitoring based on equipment and adjust equipment size, operational load and other specifics
- Respond to abnormal conditions by identifying the abnormalities and applying immediate steps to be taken when abnormalities are observed
- Maintain inspection logs and use records for predictive maintenance and analysis
- Explain the global and industry-specific standards, interpret maintenance manuals and tailor monitoring processes based on manufacturer recommendations
- Apply advanced tools and methodologies and cost-benefit analysis for advanced monitoring
- Discuss the importance of periodic in-depth evaluations and compare findings from routine checks and comprehensive evaluations

### **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, sample video clips of the instructor’s actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.

### **Who Should Attend**

This course provides an overview of all significant aspects and considerations of inspection and evaluation of rotating equipment performance for mechanical engineers, maintenance and reliability engineers, technicians, operators, plant managers, supervisors, maintenance planners, schedulers, asset management professionals, reliability professionals, energy and power generation professionals.

### **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 Fee**

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

**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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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.

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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.

**Accommodation**

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



### 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. Roshdi Alkam** is a **Senior Mechanical & Maintenance Engineer** with over **35 years** of extensive experience within the **Oil & Gas, Petrochemical and Refining Industries**. His specialization widely covers in the areas of **Facilities Management, Reliability Centred Maintenance (RCM), Reliability Management, Reliability Management and Rotating Equipment, Housing & Facilities Maintenance Management, Reliability-Availability-Maintainability (RAM), Machinery Root Cause Failure Analysis (RCFA), Condition Based Monitoring, Piping System, Process Equipment, Mechanical Integrity, Maintenance Management, Total Plant Maintenance (TPM), Engineering Drawings and P&ID Reading, Interpretation & Developing, Diesel Engine Maintenance, Centrifugal & Reciprocating Compressors, Pump Technology, Lubrication & Bearing Maintenance, Valve Troubleshooting, Mechanical & Dry Gas Seals, Gas & Steam Turbine, Boiler Operation, Mechanical Governors, Burners, Storage Tanks Maintenance, Pressure Vessel & Reactors, Heat Exchangers, Cooling Towers & Heaters, Steam Traps Operation, Flanges & Blinding, Piping System & Online Leak Sealing, Mechanical & Rotor Alignment & Balancing, Pump Technology, Pump Selection & Installation, Centrifugal Pumps & Troubleshooting, Compressor Control & Protection, Turbine Operations, Valves, Bearings & Lubrication, Advanced Machinery Dynamics, Heat Transfer, Process Plant Shutdown & Turnaround, Maintenance Optimization & Best Practices and Maintenance Auditing & Benchmarking.**

Throughout Mr. Roshdi's professional career, he has handled key positions as the **Technical Instructor** for **Mechanical Trade, Maintenance Manager** and **Mechanical Engineer** for international companies and organizations such as United Nations Relief and Works Agency (**UNRWA**), The United Nations Educational, Scientific and Cultural Organization (**UNESCO**) and Azmi Sabri Contracting Company just to name a few. Further he has been the **Certified Process Operator Program (CPO) (Accredited by City & Guilds) Instructor** contracted by **KNPC** for the year 2014-2015 in delivering **Certified Program for Kuwaiti Contractor Employee**.

Mr. Roshdi has a **Bachelor's** degree and **Diploma** in **Mechanical Engineering** from the **University of Annaba**. He is also an active member of the **Jordan Engineers Association, JICA Alumni Association, GIZ Forum (Germany)** and the **UNESCO-UNEVOC e-Forum**. Further, he is a **Certified Instructor/Trainer** and has delivered numerous training, courses, seminars, workshops and conferences in his field of expertise.



**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, 18<sup>th</sup> of February 2024**

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	<b>PRE-TEST</b>
0830 - 0930	<b>Introduction to Rotating Equipment</b> Different Types of Rotating Equipment in Industries • Basic Working Principles & Operational Considerations
0930 – 0945	Break
0945 – 1100	<b>Importance of Condition Monitoring</b> Emphasis on Its Role in Plant Integrity Maintenance • Impact of Poor Condition Monitoring on Equipment Lifespan & Plant Safety
1100 - 1230	<b>Overview of Parts to be Monitored</b> Identification & Function of Key Components of Rotating Equipment
1230 - 1245	Break
1245 - 1420	<b>Overview of Parts to be Monitored (cont'd)</b> Locations of these Parts & their Significance in Performance Monitoring
1420 – 1430	<b>Recap</b> 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: Monday, 19<sup>th</sup> of February 2024**

0730 – 0930	<b>Basic Tools &amp; Instruments for Condition Monitoring</b> Introduction to Common Tools Used in the Industry • Understanding the Principle Behind Each Tool & Its Application
0930 – 0945	Break
0945 – 1100	<b>Routine Inspection vs. Advanced Monitoring Techniques</b> Differentiating Between Regular Checks & Detailed Evaluations • Importance of Routine Checks for Early Detection
1100 – 1230	<b>Case Study: Real-world Analysis of Equipment Failure</b> Discussion on a Real-Life Incident Caused by Improper Condition Monitoring • Lessons Learned & How to Avoid Similar Incidents
1230 – 1245	Break
1245 – 120	<b>Detailed Study of Monitoring Instruments</b> Vibration Analysis Tools • Thermographic Cameras • Ultrasonic Detection Instruments • Oil Analysis Equipment
1420 – 1430	<b>Recap</b> 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	Lunch & End of Day Two





**Day 3: Tuesday, 20<sup>th</sup> of February 2024**

0730 – 0930	<b>Key Parameters to be Captured During Routine Inspection</b> Critical Indicators of Equipment Health • Interpreting the Data: What’s Normal & What’s Alarming?
0930 – 0945	Break
0945 – 1100	<b>Using Instruments for Specific Equipment Types</b> Customizing Monitoring Based on Equipment (e.g., Pumps vs. Compressors) • Adjustments for Equipment Size, Operational Load & Other Specifics
1100 – 1230	<b>Hands-on Workshop: Practical Use of Monitoring Tools</b> Real-Time Demonstration on Operating Equipment • Participants Practice using Tools under Supervision
1230 – 1245	Break
1245 – 120	<b>Responding to Abnormal Conditions</b> Identification of Abnormalities • Immediate Steps to be Taken when Abnormalities are Observed • Role of Emergency Procedures & Safety Protocols
1420 – 1430	<b>Recap</b> 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	Lunch & End of Day Two

**Day 4: Wednesday, 21<sup>st</sup> of February 2024**

0730 – 0930	<b>Documentation &amp; Record Keeping</b> Importance of Maintaining Inspection Logs • Using Records for Predictive Maintenance & Analysis
0930 – 0945	Break
0945 – 1100	<b>Standards in Condition Monitoring</b> Introduction to Global & Industry-Specific Standards • Importance of Adhering to these Standards
1100 – 1230	<b>Maintenance Manuals &amp; their Role in Condition Monitoring</b> Understanding & Interpreting Maintenance Manuals • Tailoring Monitoring Processes Based on Manufacturer Recommendations
1230 – 1245	Break
1245 – 120	<b>Advanced Techniques in Condition Monitoring</b> Introduction to Advanced Tools & Methodologies • Cost-Benefit Analysis for Advanced Monitoring
1420 – 1430	<b>Recap</b> 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	Lunch & End of Day Two

**Day 5: Thursday, 22<sup>nd</sup> of February 2024**

0730 – 0930	<b>Routine Inspection vs. Comprehensive Performance Evaluation</b> Importance of Periodic In-Depth Evaluations
0930 – 0945	Break
0945 – 1100	<b>Routine Inspection vs. Comprehensive Performance Evaluation (cont’d)</b> Comparing Findings from Routine Checks & Comprehensive Evaluations
1100 – 1230	<b>Case Study: Successful Condition Monitoring Implementation</b> Discussion on a Company that Averted Major Issues through Effective Monitoring • Importance of Training, Proper Tools & Proactive Measures



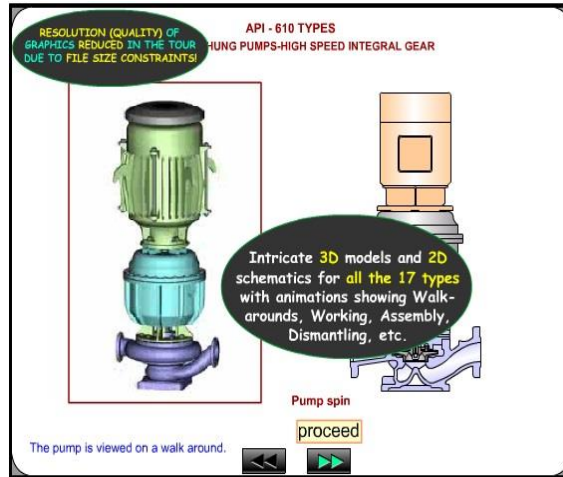


1230 - 1245	Break
1245 - 1345	<b>Wrap-up &amp; Q&amp;A Session</b> Recapping Key Topics Covered in the Course • Open Floor for Participants to Clarify Doubts & Discuss Experiences
1345 - 1400	<b>Course Conclusion</b> Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course
1400 - 1415	<b>POST-TEST</b>
1415 - 1430	Presentation of Course Certificate
1430	Lunch & End of Course

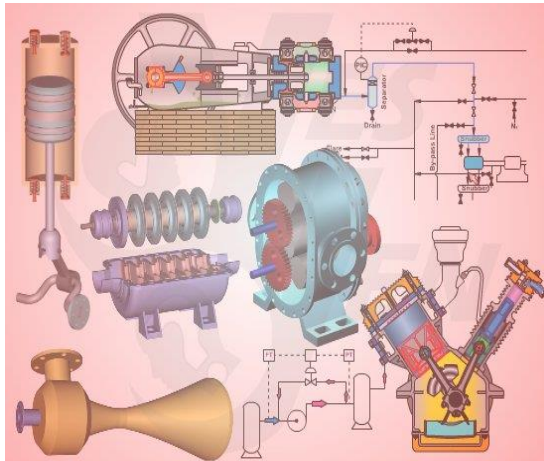


**Simulator (Hands-on Practical Sessions)**

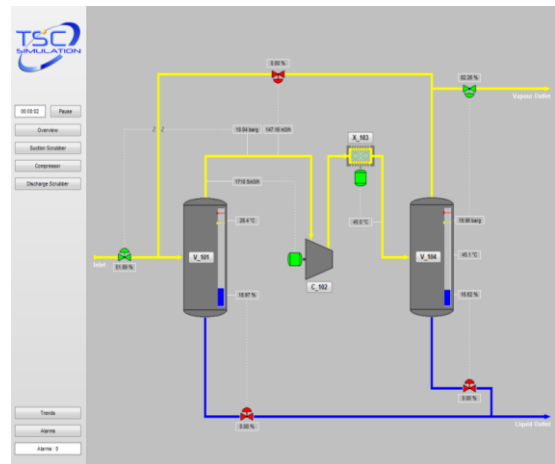
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art “Centrifugal Pumps and Troubleshooting Guide 3.0”, “SIM 3300 Centrifugal Compressor Simulator”, “CBT on Compressors” Simulators and “iLearnVibration”.



**Centrifugal Pumps and Troubleshooting Guide 3.0**



**SIM 3300 Centrifugal Compressor Simulator**



**CBT on Compressors**



**iLearnVibration Simulator**

**Course Coordinator**

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