COURSE OVERVIEW RE0086
Preventive Maintenance Techniques

Course Title
Preventive Maintenance Techniques

Course Date/Venue
August 03-07, 2025/TBA, Sheraton Riyadh Hotel & Towers, Riyadh, KSA

Course Reference
RE0086

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 detailed and up-to-date overview of Preventive Maintenance and Troubleshooting. It covers the reactive, preventive, predictive and proactive maintenance; the systematic approaches to identifying and solving problems; identifying hazards, implementing safety measures and proper documentation; the bearings, lubrication, electrical system and mechanical drives; the basic concepts and functions of hydraulic and pneumatic systems; the radiators, coolants and temperature regulation of cooling systems; and the AC/DC motors, speed control and protection systems of motor systems.

During this interactive course, participants will learn the maintenance scheduling and routine inspections; the checklists and items for daily, weekly and monthly checks; the cleaning schedules and calibration procedures; the parts replacement and cost-benefit analysis; evaluating the financial implications of maintenance strategies; the root cause analysis and visual inspection; the data monitoring, noise and vibration analysis, electrical testing and proper troubleshooting; the change management and key performance indicators (KPIs); the metrics for measuring maintenance effectiveness; and the emerging technologies, sustainability and environmental concerns.

Course Objectives

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

- Apply and gain an in-depth knowledge on preventive maintenance and troubleshooting
- Identify the types of maintenance covering reactive, preventive, predictive and proactive maintenance
- Carryout systematic approaches to identifying and solving problems, identify hazards and implement safety measures
- Apply proper documentation and discuss bearings, lubrication, electrical system and mechanical drives
- Recognize the basic concepts and functions of hydraulic and pneumatic systems including the radiators, coolants and temperature regulation of cooling systems
- Identify AC/DC motors, speed control and protection systems of motor systems
- Develop and manage maintenance scheduling and routine inspections including the checklists and items for daily, weekly and monthly checks
- Apply cleaning schedules and calibration procedures, parts replacement, cost-benefit analysis and evaluating the financial implications of maintenance strategies
- Carryout root cause analysis covering 5 whys, fishbone diagram and FMEA as well as a visual inspection using sight to identify issues early
- Employ sensor and data monitoring, noise and vibration analysis, electrical testing and proper troubleshooting
- Implement change management in maintenance including key performance indicators (KPIs) and metrics for measuring maintenance effectiveness
- Discuss the emerging technologies as well as the sustainability and environmental concerns

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**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of preventive maintenance and troubleshooting for facilities managers, maintenance engineers, plant operators, maintenance supervisors, technicians and maintenance staff.

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:

- 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 center, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- 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:

Dr. Maged Elhefnawey, PhD, MSc, BSc, ASNT (RT-PT-MT & UT), SMRP-CMRP, is a **Senior Mechanical & Maintenance Engineer** with **extensive years** of experience within **the Power & Water Utilities** and other **Energy Sectors**. His expertise widely covers in the areas of **Maintenance Management** Best Practices, **Rotating Equipment** Reliability Optimization, **Maintenance Planning & Scheduling**, Practical **Machinery Vibration**, **Vibration** Techniques, Effective **Reliability Maintenance**, Excellence in **Maintenance & Reliability** Management, **Preventive & Predictive Maintenance**, Machinery Failure Analysis (**RCFA**), **Reliability** Optimization & Continuous Improvement, **Maintenance** Planning, Scheduling & Work Control, **Maintenance Management** Strategy, **Mechanical & Rotating Equipment** Troubleshooting, Preventive Maintenance, Predictive Maintenance, Reliability Centered Maintenance (**RCM**), Condition Based Monitoring (**CBM**), **FMEA**, **Rotating Equipment** Selection, Operation, Maintenance, Inspection & Troubleshooting, **Maintenance** Management & Planning, **Tank Farm** Operations & Performance, **Pumps**, **Motors**, **Turbo-expanders**, **Gears**, **Compressors & Turbines**, **Heat Exchanger**, **Variable Speed Drives**, **Seals**, **Valves**, **Dry Seal**, **Fired Heaters**, **Air Coolers**, **Crude Desalter**, **Process Vessels**, Gas Transmission & Piping Distribution System (**ASME B31.8**), **Cathodic Protection**, **Welding** Technology, **Material Selection** Codes & Standards, **Pipe Stress** Analysis, **Boiler Plant** Operation, **Mechanical** Engineering, **Piping**, **Pipelines**, **Lubrication** Technology, **Vibration** Analysis, **Power System Hydraulics**, **Security Detection** Systems & Operation, **Process Plant** Equipment and Troubleshooting **Process Operations**.

During his career life, Dr. Maged has gained his expertise and thorough practical experience through several positions and dedication as the Acting **Department Head**, **Section Head Projects Engineer**, **Mechanical Engineer, Reliability Maintenance Engineer** and **Mechanical Supervisor** for various international companies and institutions such as the Gulf of Suez Petroleum Co. (GUPCO), British Petroleum (BP), BETROBEL, **KNPC**, SAIPEM Engineering, Natural Gas Pipeline, TRACTEBEL Engineering, Suez and TransGas Company to name a few. He also worked as **Mechanical/NDT Supervisor** wherein he was responsible for executing the scheduled inspections for welding, coating, pipeline, painting, hydrotest of pipeline & piping and fabrication and assembly.

Dr. Maged has **PhD** and **Master's** degree in **Mechanical Production Engineering** and a **Bachelor's** degree in **Mechanical Power Engineering**. Further, he is a **Certified Instructor/Trainer**, a **Certified ASNT Level II Inspector** in Radiography Testing (**RT**), Liquid Penetrant Testing (**PT**), Magnetic Particle Testing (**MT**) and Ultrasonic Testing (**UT**), a **Certified Maintenance and Reliability Professional** (**CMRP**) from the Society of Maintenance & Reliability Professionals (**SMRP**), **published numerous academic papers** and delivered various trainings, courses, workshops, seminars and conferences worldwide.

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.

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, 03rd of August 2025***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***What is Preventive Maintenance?*** *Definition, Scope & Objectives*
0930 – 0945	*Break*
0945 – 1045	***Types of Maintenance*** *Reactive, Preventive, Predictive & Proactive Maintenance*
1045 – 1145	***Introduction to Troubleshooting*** *Systematic Approaches to Identifying & Solving Problems*
1145 – 1200	*Break*
1200 – 1300	***Risk Assessment & Safety Protocols*** *Identifying Hazards & Implementing Safety Measures*
1300 - 1420	***Importance of Documentation*** *Records, Logs & the Role of Proper Documentation*
1420 - 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2:	Monday, 04th of August 2025
0730 – 0930	***Bearings & Lubrication*** *Types of Bearings & Lubrication Methods*
0930 – 0945	*Break*
0945 – 1100	***Electrical Systems*** *Basics of Electrical Circuits, Switches & Relays*
1100 – 1130	***Mechanical Drives*** *Belts, Chains & Gear Systems*
1130 – 1230	***Hydraulic & Pneumatic Systems*** *Basic Components & Functions*
1230 – 1245	*Break*
1245 – 1330	***Cooling Systems*** *Radiators, Coolants & Temperature Regulation*
1330 – 1420	***Motor Systems*** *AC/DC Motors, Speed Control &Protection Systems*
1420 - 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3:	Tuesday, 05th of August 2025
0730 – 0800	***Maintenance Scheduling*** *Developing & Managing a Maintenance Calendar*
0800 - 0930	***Routine Inspections*** *Checklists & Items for Daily, Weekly & Monthly Checks*
0930 – 0945	*Break*
0945 – 1100	***Cleaning & Adjustments*** *Cleaning Schedules & Calibration Procedures*
1100 – 1230	***Parts Replacement & Upkeep*** *Identifying Wear & Tear & Managing Spare Parts Inventory*
1230 – 1245	*Break*
1245 - 1345	***Cost-Benefit Analysis*** *Evaluating the Financial Implications of Maintenance Strategies*
1345 – 1420	***Case Studies: Implementing Preventive Maintenance*** *Real-World Examples & Exercises*
1420 - 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4:	Wednesday, 06th of August 2025
0730 – 0830	***Root Cause Analysis*** *Methods such as 5 Whys, Fishbone Diagram & FMEA*
0830 – 0930	***Visual Inspection*** *Using Sight to Identify Issues Early*
0930 – 0945	*Break*
0945 – 1100	***Sensor & Data Monitoring*** *Utilizing Sensors for Real-Time Health Checks*
1100 – 1230	***Noise & Vibration Analysis*** *Identifying Issues Through Sound & Oscillations*
1230 – 1245	*Break*
1245 – 1345	***Electrical Testing*** *Multimeters, Oscilloscopes & Other Testing Tools*

1345 - 1420	***Troubleshooting Scenarios*** *Role-Playing Exercises for Hands-on Problem-Solving*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5: ***Thursday, 07th of August 2025***

0730 - 0830	***Implementing Changes*** *Change Management in Maintenance*
0830 - 0930	***Key Performance Indicators (KPIs)*** *Metrics for Measuring Maintenance Effectiveness*
0930 – 0945	*Break*
0945 – 1045	***Emerging Technologies*** *IoT, Predictive Analytics & AI In Preventive Maintenance*
1045 – 1145	***Sustainability & Environmental Concerns*** *How to Make your Maintenance Practices more Eco-Friendly*
1145 – 1200	*Break*
1200 - 1345	***Feedback & Communication*** *Inter-departmental Coordination & Communication for Effective Maintenance*
1345 – 1400	***Course Conclusion***
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 the "iLearnVibration" simulator.

iLearnVibration Simulator

Course Coordinator

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