COURSE OVERVIEW SE0042
Preventive & Predictive Maintenance

Course Title
Preventive & Predictive Maintenance

Course Date/Venue
November 10-14, 2024/Executive Boardroom Meeting Room, Al Bandar Rotana - Creek, Dubai, UAE

Course Reference
SE0042

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive course includes real-life case studies where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of Preventive and Predictive Maintenance. It covers the various types and importance of maintenance; the fundamentals of preventive maintenance and its application in civil engineering; the predictive maintenance techniques and reliability-centered maintenance (RCM); the specific roles of civil engineers in maintaining infrastructure in the petroleum industry; the maintenance management systems (MMS) as the digital systems used to manage and track maintenance activities; and the maintenance schedules for civil infrastructure.

Further, the course will also discuss the monitoring and inspection of critical civil assets like buildings, foundations and pipelines; the routine maintenance tasks and the importance of proper documentation and record-keeping in preventive maintenance programs; managing maintenance budgets and resources; prioritizing maintenance tasks based on risk assessments for petroleum infrastructure; the condition-based maintenance (CBM), non-destructive testing (NDT) methods, vibration analysis and thermographic inspections; and monitoring the condition of structures by analyzing wear debris and surface degradation.

During this interactive course, participants will learn the collection and analysis of data from infrastructure to predict maintenance needs; optimizing preventive maintenance schedules using data to refine and improve preventive maintenance schedules for civil assets; integrating predictive and preventive maintenance strategies for optimal results; implementing condition monitoring systems (CMS), using failure modes, effects, and criticality analysis (FMECA) and improving maintenance planning for civil engineers; the lifecycle cost analysis and safety in maintenance operations; incorporating sustainability into maintenance practices to reduce environmental impact and resource usage; the Lean and Six Sigma principles; and conducting maintenance audits and assessing performance using key metrics.

Course Objectives

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

- Apply and gain an in-depth knowledge on preventive and predictive maintenance
- Identify the various types and importance of maintenance covering corrective, preventive and predictive)
- Discuss the fundamentals of preventive maintenance and its application in civil engineering
- Carryout predictive maintenance techniques and reliability-centered maintenance (RCM) to ensure safety, environmental compliance, and cost-effectiveness
- Define specific roles of civil engineers in maintaining infrastructure in the petroleum industry
- Recognize the maintenance management systems (MMS) as the digital systems used to manage and track maintenance activities
- Develop and implement maintenance schedules for civil infrastructure
- Monitor and inspect critical civil assets like buildings, foundations and pipelines
- Perform routine maintenance tasks specific to civil engineering structures within petroleum plants
- Discuss the importance of proper documentation and record-keeping in preventive maintenance programs
- Manage maintenance budgets and resources and prioritize maintenance tasks based on risk assessments for petroleum infrastructure
- Employ condition-based maintenance (CBM), non-destructive testing (NDT) methods, vibration analysis and thermographic inspections
- Monitor the condition of structures by analyzing wear debris and surface degradation
- Collect and analyze data from infrastructure to predict maintenance needs
- Optimize preventive maintenance schedules using data to refine and improve preventive maintenance schedules for civil assets
- Integrate predictive and preventive maintenance strategies for optimal results
- Implement condition monitoring systems (CMS) to continuously monitor the health of civil structures in petroleum facilities

- Use failure modes, effects, and criticality analysis (FMECA) to assess failure modes and improve maintenance planning for civil engineers
- Perform lifecycle cost analysis to justify maintenance investments in petroleum infrastructure
- Ensure safety in maintenance operations and incorporate sustainability into maintenance practices to reduce environmental impact and resource usage
- Apply Lean and Six Sigma principles to continuously improve maintenance processes
- Conduct maintenance audits and assess performance using key metrics

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 preventive and predictive maintenance for those who are involved in assessment, repair and risk-based inspection of concrete structures. This includes design engineers, construction engineers, civil engineers, inspection engineers, project engineers, site engineers, material engineers and other technical staff who are responsible for the integrity of reinforced concrete structures (buildings, bridges, pipelines, tanks, foundations, etc.).

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.

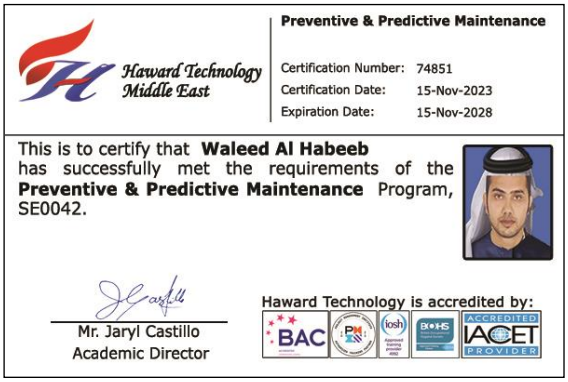
Course Certificate(s)

(1) Internationally recognized Competency Certificates and Plastic Wallet Cards will be issued to participants who completed a minimum of 80% of the total tuition hours and successfully passed the exam at the end of the course. Certificates are valid for 5 years.

Recertification is FOC for a Lifetime.

Sample of Certificates

The following are samples of the certificates that will be awarded to course participants:-



(2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course

Haward Technology Middle East

Continuing Professional Development (HTME-CPD)

CEU Official Transcript of Records

TOR Issuance Date: 15-Nov-23

HTME No. 74851

Participant Name: Waleed Al Habeeb

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
SE0042	Preventive & Predictive Maintenance	November 11-15, 2023	30	3.0

Total No. of CEU's Earned as of TOR Issuance Date **3.0**

TRUE COPY

Jaryl Castillo
Academic Director

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

P.O. Box 26070, Abu Dhabi, United Arab Emirates | Tel.: +971 2 3091 714 | E-mail: info@haward.org | Website: www.haward.org

Certificate Accreditations

Certificates are accredited 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.

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. Bilal Nabahani is a **Senior Civil Engineer** with almost **25 years** of practical experience in **construction** of **major civil engineering projects** including building, roads, bridges, airports, theatres, stadium, ports, etc. and other **energy** sectors. His expertise widely covers in the areas of **Civil** Engineering, **Project Relocation** & Development, **Site Inspection & Quality Control**, **Site** Supervision & Management, **Construction** Management, **Structural & Electrical Site Inspection & Quality Control**, **Construction** Management, **Earth Measurements**, **Earthwork** & **Structural Maintenance**, System Safety Program Plan (**SSPP**) Inspection, **Concrete** Structure Inspection & Repair, **Concrete** Inspection & Maintenance, **Concrete Maintenance & Reliability Analysis**, **Civil Engineering** Design, Design and Behaviour of **Steel Structures**, **Advanced Steel Design & Stability of Structures Concrete Structural Design**, **Dynamic Analysis of Rotating Equipment** Foundations & **Structural Steel Piperacks**, **Concrete** Technology, **Construction** Planning, **Construction & Concrete Works** Maintenance, **Seismic Design** for Buildings, Advanced **Building Construction Technology**, Advanced **Seismic & Wind Design of Reinforced Concrete**, **Road** Pavement Design, **Road** Maintenance, **Drainage** System Operations & Maintenance, **Land Surveying**, **AutoCAD Civil 3D**, **GIS & Mapping**, **Structural Analysis & Design** (**STAAD PRO**), **Construction** Planning, Methods & Management, **Sloping**, **Benching**, **Embankments**, **Construction** Planning, **Construction Quality** Management, **Project Risk** Assessment, **Project Quality** Plans, **Excavation**, **Backfill & Compaction**, **Excavation & Reinstatement**, **Excavation Safety** for Construction, **Groundworks Supervision**, Electrical **Project Utility Underground**, **Construction Quality** Remote Sensing, Construction Materials, Construction Surveying and **Detailed Engineering** Drawings, Codes & Standards.

Throughout Mr. Bilal's professional career, he has handled key positions as the **Site Manager**, **Project Manager**, **Project Supervisor**, **Resident Engineer**, **Consultant** and **Trainer/Instructor** for various international companies such as the Saudi Consulting, Tibah University, CKG Construction & Engineering, Almanarah Consulting, Tibah Consulting, Royal Scientific Association, MWH&CC Engineering & Consulting, Jordan Valley Authority, Graybeh Contracting, Alpha Consultant and Al Rakhaies Contracting, just to name a few.

Mr. Bilal has a **Bachelor's** degree in **Civil Engineering** from the **East University** of **North Cyprus**, **Turkey**. Further, he is a **Certified Trainer/Instructor** and has delivered various trainings, seminars, conferences, workshops and courses globally.

Course Program

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

Day 1: ***Sunday, 10th of November 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Overview of Maintenance Strategies:*** *Introduction to the Types of Maintenance (Corrective, Preventive & Predictive) & their Importance in Petroleum Industry Infrastructure*
0930 – 0945	*Break*
0945 – 1030	***Principles of Preventive Maintenance:*** *Understanding the Fundamentals of Preventive Maintenance & its Application in Civil Engineering*
1030 – 1130	***Predictive Maintenance Concepts:*** *Introduction to Predictive Maintenance Techniques & the Role of Data-Driven Approaches in Infrastructure Management*
1130 – 1215	***Reliability-Centered Maintenance (RCM):*** *Implementing RCM in Civil Projects to Ensure Safety, Environmental Compliance & Cost-Effectiveness*
1215 – 1230	*Break*
1230 – 1330	***The Role of Civil Engineers in Maintenance of Petroleum Infrastructure:*** *Exploring Specific Roles of Civil Engineers in Maintaining Infrastructure in the Petroleum Industry*
1330 – 1420	***Maintenance Management Systems (MMS):*** *Overview of Digital Systems Used to Manage & Track Maintenance Activities*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: ***Monday, 11th of November 2024***

0730 – 0830	***Development of Preventive Maintenance Schedules:*** *How to Develop & Implement Maintenance Schedules for Civil Infrastructure in Petroleum Facilities*
0830 – 0930	***Inspection & Monitoring Techniques:*** *Methods for Monitoring & Inspecting Critical Civil Assets like Buildings, Foundations & Pipelines*
0930 – 0945	*Break*
0945 – 1100	***Common Preventive Maintenance Activities:*** *Routine Maintenance Tasks Specific to Civil Engineering Structures within Petroleum Plants*
1100 – 1215	***Civil Asset Management & Documentation:*** *Importance of Proper Documentation & Record-Keeping in Preventive Maintenance Programs*
1215 – 1230	*Break*
1230 – 1330	***Managing Maintenance Budgets & Resources:*** *Cost Management in Preventive Maintenance including Budgeting for Labor, Materials & Downtime*
1330 – 1420	***Risk-Based Maintenance Approaches****: How to Prioritize Maintenance Tasks Based on Risk Assessments for Petroleum Infrastructure*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: Tuesday, 12th of November 2024

0730 – 0830	***Condition-Based Maintenance (CBM):*** *Introduction to CBM & how it is Used to Perform Maintenance when Asset Conditions Warrant Intervention*
0830 – 0930	***Non-Destructive Testing (NDT) Methods:*** *Overview of NDT Techniques (Ultrasonic Testing, Radiographic Testing, etc.) & their Application in Predictive Maintenance*
0930 – 0945	*Break*
0945 – 1100	***Vibration Analysis for Civil Structures:*** *Understanding Vibration Analysis & its Use in Predicting Structural Failures in Petroleum Facilities*
1100 – 1215	***Thermographic Inspections****: Using Thermal Imaging Technology to Detect Issues in Civil Structures such as Insulation Failures or Leaks*
1215 – 1230	*Break*
1230 – 1330	***Wear Debris Analysis for Infrastructure Components:*** *Monitoring the Condition of Structures by Analyzing Wear Debris & Surface Degradation*
1330 – 1420	***Data Collection & Analysis in Predictive Maintenance:*** *How to Collect & Analyze Data from Infrastructure to Predict Maintenance Needs*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4: Wednesday, 13th of November 2024

0730 – 0830	***Optimizing Preventive Maintenance Schedules****: Using Data to Refine & Improve Preventive Maintenance Schedules for Civil Assets*
0830 – 0930	***Integrating Predictive & Preventive Maintenance:*** *Best Practices for Combining Preventive & Predictive Maintenance Strategies for Optimal Results*
0930 – 0945	*Break*
0945 – 1100	***Condition Monitoring Systems (CMS):*** *Implementing CMS to Continuously Monitor the Health of Civil Structures in Petroleum Facilities*
1100 – 1215	***Maintenance Optimization Through Software Tools:*** *Leveraging Digital Tools such as CMMS (Computerized Maintenance Management Systems) to Enhance Planning & Execution*
1215 – 1230	*Break*
1230 – 1330	***Failure Modes, Effects & Criticality Analysis (FMECA):*** *Using FMECA to Assess Failure Modes & Improve Maintenance Planning for Civil Engineers*
1330 – 1420	***Infrastructure Lifecycle Cost Analysis:*** *How to Perform Lifecycle Cost Analysis to Justify Maintenance Investments in Petroleum Infrastructure*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5: Thursday, 14th of November 2024

0730 – 0830	***Safety in Maintenance Operations****: Ensuring Safety During Preventive & Predictive Maintenance Activities in Petroleum Facilities*
0830 – 0930	***Sustainability in Maintenance:*** *Incorporating Sustainability into Maintenance Practices to Reduce Environmental Impact & Resource Usage*
0930 – 0945	*Break*
0945 – 1045	***Continuous Improvement in Maintenance Processes:*** *Applying Lean & Six Sigma Principles to Continuously Improve Maintenance Processes*
1045 – 1145	***Maintenance Audits & Performance Metrics:*** *How to Conduct Maintenance Audits & Assess Performance Using Key Metrics*

1145 - 1230	***Training & Development for Maintenance Teams:*** *Importance of Ongoing Training for Maintenance Teams & Civil Engineers to Keep Up with New Technologies*
1230 – 1245	*Break*
1245 – 1300	***Case Studies & Best Practices in PPM:*** *Reviewing Real-World Examples of Successful Preventive & Predictive Maintenance Programs in the Petroleum Industry*
1300 – 1315	***Course Conclusion***
1315 – 1415	***COMPETENCY EXAM***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

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