



## **COURSE OVERVIEW RE0010** **Certified Maintenance Auditor (CMA)**

### **Course Title**

Certified Maintenance Auditor (CMA)

### **Course Date/Venue**

October 26-30, 2025/Tamra Meeting Room, Al  
Bandar Rotana Creek, Dubai, UAE

### **Course Reference**

RE0010

### **Course Duration/Credits**

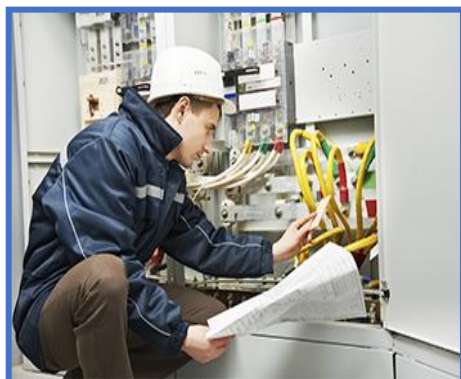
Five days/3.0 CEUs/30 PDHs

### **Course Description**



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

Recent competitive trends have been pushing companies to reconsider the impact and importance of increasing equipment availability, utilization and resource utilization, and increasing quality and responsiveness of maintenance services in achieving World Class Status to meet world competition.



It has been estimated that of the over 600 billion dollars per year spent on maintenance, more than one third 200 billion dollars is wasted! Wasted due to poor management of resources, poor measurement and control of labor, material, capital! Not only that: Maintenance costs are higher than managers realize, because although they think the costs of doing maintenance are high, they don't often realize the costs of not doing maintenance right are even higher.



Perhaps as much as 15 to 40 percent of total product cost (due to the 'hidden, costs such as breakdowns, lost production, lost time, late delivery, disorder, poor quality, high rework)! Think about it, most managers think of maintenance as a cost, a necessary evil.

Costs are something to be minimized, even eliminated, if possible. But everyone knows you can't eliminate maintenance. The plant would come to a screeching halt. No, you must optimize the maintenance function, not minimize it. But to optimize maintenance means you must develop more meaningful, contribution-based measurements.





This comprehensive course will show you how to initiate and sustain a process of maintenance performance improvement; a process in which maintenance is recognized as critical to the overall production strategy by which your plant provides the product to the customer at a quality he wants and a price they are willing to pay.

This course is devoted to helping you understand how to improve performance through more effective measurement systems such as Auditing and Benchmarking. Here's a road map to get you from where you are to where you need to be! Here are some practical guidelines, tools, and techniques that will enable maintenance and production managers to develop consistent, useful, and relevant measures of performance as they strive for 'world class' status.

The course includes an e-book entitled "*Maintenance Benchmarking and Best Practices*", published by McGraw-Hill Professional, which will be given to the participants to help them appreciate the principles presented in the course.

### **Course Objectives**

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

- Get certified as a "*Certified Maintenance Auditor*"
- Apply and gain an in-depth knowledge and skills in maintenance auditing, benchmarking, and performance improvement towards world-class status
- Carryout maintenance benchmarking and best practices by developing the scoreboard for maintenance excellence
- Measure overall equipment effectiveness, improve craft labor productivity and provide significant gained value
- Use performance measures as feedback to enhance planning, estimating and scheduling
- Develop maintenance excellence index and apply maintenance planning, estimating, scheduling and materials management
- Employ inventory management best practices and illustrate cycle counting
- Implement maintenance planning, estimating and scheduling and identify the role of maintenance and operations in world-class organizations
- Define the terms mentioned in ISO 9001:2008 including the maintenance key performance indicators in accordance with BS EN 15341 standard
- Recognize the evaluation criteria for reliability-centered maintenance processes as per SAE JA 1011

### **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 maintenance auditing, benchmarking and performance improvement towards world class for maintenance managers, superintendents, engineers and supervisors who realize the power of performance measurement to motivate, coordinate, and achieve the overall goals and objectives of their company, plant, or department. Line or staff maintenance or production, mid-level or executive, every attendee will benefit from this imminently practical workshop approach to establishing meaningful measures of maintenance performance.





### 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. Successful candidate will be certified as a "Certified Maintenance Auditor". 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 \* CEUs \* Haward Technology \* CEUs \* Haward Technology \* CEUs \* Haward Technology \*

**Haward Technology Middle East**  
 Continuing Professional Development (HTME-CPD)

CEUs

**CEU Official Transcript of Records**

**TOR Issuance Date:**  
**HTME No.**  
**Participant Name:**

**14-Nov-22**  
**74851**  
**Waleed Al Habeeb**

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
RE0010	Certified Maintenance Auditor (CMA)	November 10-14, 2022	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

Haward's certificates are accredited 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**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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.

-  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.

### Accommodation

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

### 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. In addition to the Course Manual, participants will receive an e-book "*Operator's Guide to Rotating Equipment: An Introduction to Rotating Equipment Construction, Operating Principles, Troubleshooting and Best Practices*", published by AuthorHouse.







### 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. Andrew Ladwig** is a **Senior Process & Mechanical Maintenance Engineer** with over **25 years** of extensive experience within the **Oil & Gas, Refinery, Petrochemical & Power** industries. His expertise widely covers in the areas of **Maintenance Planning, Maintenance & Reliability Management, Material Cataloguing, Equipment Maintenance, Root Cause Failure Analysis (RCFA), Rotating Machinery Troubleshooting, Maintenance Auditing & Benchmarking, Condition Monitoring Techniques, Machinery Lubrication Technology, Lubricant Oil & Grease Testing & Analysis, Crude Oil Storage & Management, Ammonia Manufacturing & Process Troubleshooting, Crude Oil Distillation, Distillation Operation and Troubleshooting, Ammonia Storage & Loading Systems, Fertilizer Storage Management (Ammonia & Urea), Sulphur Recovery, Nitrogen Fertilizer Production, Refining Process & Petroleum Products, Safe Refinery Operations, Hydrotreating & Hydro-processing, Fractionation, Process Plant Operations, Storage Tanks Operations & Measurements, Process Plant Troubleshooting & Engineering Problem Solving, Process Plant Performance, Process Troubleshooting Techniques, Pressure Vessel Operation, Process Equipment Performance & Troubleshooting, Plant Startup & Shutdown and Flare & Relief System.** Further, he is also well-versed in **Compressors & Turbines Maintenance, Heat Exchanger Overhaul & Testing Techniques, Balancing of Rotating Machinery (BRM), Pipe Stress Analysis, Valves & Actuators Technology, Control Valve Engineering, Tank Design, Material Cataloguing, Specifications, Handling & Storage, Steam Trap Design, Operation, Maintenance & Troubleshooting, Steam Trapping & Control, Column, Pump & Exchangers, Troubleshooting & Design, Detailed Engineering Drawings, Codes & Standards, Production Optimization, Permit to Work (PTW), Project Engineering, Data Analysis, Process Hazard Analysis (PHA), HAZOP Study, Sampling & Analysis, Training Analysis, Job Analysis Techniques, Storage & Handling of Toxic Chemicals & Hazardous Materials, Hazardous Material Classification & Storage/Disposal, Dangerous Goods, Environmental Management System (EMS), Supply Chain, Purchasing, Procurement, Logistics Management & Transport & Warehousing & Inventory, Risk Monitoring Authorized Gas Tester (AGT), Confined Space Entry (CSE), Personal Protective Equipment (PPE), Fire & Gas, First Aid and Occupational Health & Safety.**

During his career life, Mr. Ladwig has gained his practical experience through his various significant positions and dedication as the **Mechanical Engineer, Project Engineer, Reliability & Maintenance Engineer, Maintenance Support Engineer, Process Engineer, HSE Supervisor, Warehouse Manager, Quality Manager, Business Analyst, Senior Process Controller, Process Controller, Safety Officer, Mechanical Technician, Senior Lecturer and Senior Consultant/Trainer** for various companies such as the Sasol Ltd., Sasol Wax, Sasol Synfuels, just to name a few.

Mr. Ladwig has a **Bachelor's degree in Chemical Engineering** and a **Diploma in Mechanical Engineering**. Further, he is a **Certified Instructor/Trainer, a Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)** and has delivered various trainings, workshops, seminars, courses and conferences internationally.



### 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 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, 26<sup>th</sup> of October 2025**

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	<b>PRE-TEST</b>
0830 – 0930	<b>Maintenance Benchmarking &amp; Best Practices: Developing Your Scoreboard for Maintenance Excellence</b> World Class Organizations • Framework for Maintenance Excellence • The Continuous Improvement Process • People Really Interested in Developing Excellence in Maintenance • Today's Maintenance Challenges • Facing Today's Maintenance Challenges • Continuous Reliability Improvement • The Reliability Pyramid • Profit & Customer Centered Maintenance
0930 – 0945	Break
0945 - 1115	<b>Maintenance Benchmarking &amp; Best Practices: Developing Your Scoreboard for Maintenance Excellence (cont'd)</b> What is an Internal Audit? • The Auditing Process • Audit Approaches • The Main Steps of the Generic Auditing Process • Red, Amber, Green Status (RAG Status) • Spider/Radar Charts • Improving Productivity of People Resources • Productivity
1115 – 1145	<b>Measuring Overall Equipment Effectiveness (OEE)</b> Overall Equipment Effectiveness Concepts • The Eight Major Losses • The Eight Major Losses: Measuring of Results • Overall Equipment Effectiveness (OEE)
1145 – 1230	<b>Measuring &amp; Improving Craft Labor Productivity</b> OCE Measures Craft Productivity • Baseline Cost for Examples of Gained Value from Craft Productivity Improvement • Calculating Craft Utilization • What is Your Wrench Time? • Improving Craft Utilization
1230 – 1245	Break
1245 – 1305	<b>Measuring &amp; Improving Craft Labor Productivity (cont'd)</b> Measuring Your Craft Utilization • Work Sampling • Track Non-Productive Work By Type • Calculating Craft Performance • Craft Service Quality



1305 – 1420	<b>Bottom Line: Improving Craft Labour Productivity can Provide Significant Gained Value</b> Planning for Maintenance Excellence • Measuring Maintenance Excellence • Maintenance Benchmarking and Best Practices • The Scoreboard for Maintenance Excellence • The Scoreboard for Maintenance Excellence: Key Steps to Continuous Reliability Improvement • The Scoreboard for Facilities Management Excellence
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 One

**Day 2: Monday, 27<sup>th</sup> of October 2025**

0730 – 0930	<b>Bottom Line: Improving Craft Labour Productivity Can Provide Significant Gained Value (cont'd)</b> Approach for Assessment of the Total Maintenance Operation • Selecting the Right Metrics and Key Performance Indicators for Your Maintenance Operation • Performance Indicators • What are Key Performance Indicators • Performance Indicator Characteristics and Requirements • Key Performance Indicators
0930 – 0945	Break
0945 – 1230	<b>Bottom Line: Improving Craft Labour Productivity Can Provide Significant Gained Value (cont'd)</b> What is Benchmarking? • Benchmarking vs KPI's • Performance Parameter Hierarchy • Work Management KPI's • Types of Measurements • Maintenance Effectiveness KPI's
1230 – 1245	Break
1245 – 1310	<b>Using Performance Measures as Feedback to Enhance Planning, Estimating &amp; Scheduling</b> Maintenance Performance Metrics
1310 – 1420	<b>Developing Your Maintenance Excellence Index</b> The Maintenance Excellence Index • CMMS System Outputs • Key Benefits of CMMS • CMMS Packages
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, 28<sup>th</sup> of October 2025**

0730 – 0925	<b>Developing Your Maintenance Excellence Index (cont'd)</b> The CMMS Benchmarking System • Automatic Identification • The Maintenance Excellence Institute (TMEI) • The ACE Team Benchmarking Process
0925 – 0940	Break
0940 – 1010	<b>Maintenance Planning, Estimating &amp; Scheduling &amp; Materials Management</b> Improving Productivity of People Resources • Maintenance Planning, Estimating & Scheduling Provides Gained Value • The Planner/Scheduler's Role • Ensuring Your Maintenance Storeroom Supports the Planning Process • What is Inventory Management? • Primary Responsibility for Customer Satisfaction • Materials Management





1010 – 1135	<b>Inventory Management Best Practices</b> <i>Where are you Now? • Where you Need to be • ABC Inventory Analysis • Security And Warehouse Access • Establish an Approved Stock List • Assign And Use Bin Locations • Record All Stock Withdrawals • Process All Transactions Quickly • Have Objectives For Purchasing • Know Cost Of Bad Inventory Management • Maintain Accurate Stock Balances • Establish Best Replenishment Path • Establish Reorder Guidelines • Define Replenishment Procedures • Establish Performance Goals • Attack Slow Moving/Dead Inventory • Effective Strategic Planning</i>
1135 – 1220	<b>Cycle Counting: How It Can Work for You</b> <i>Cycle Counting • Key Problems With Cycle Counting • Key Steps For Cycle Counting • Guidelines for Cycle Counting • Geographic Method • Ranking Method Of Cycle Counting • Pareto (ABC) Analysis • Cycle Counting Guidelines</i>
1220 – 1235	Break
1235 – 1345	<b>Inventories: How Much Do We Really Need?</b> <i>Performance Measures • Inventory Turnover • Inventory Turnover Example • Inventory Turnover Formula • Customer Service • Vendor Performance • Excess Inventory Reduction • Inventory Accuracy • Get Maximum Value from Your Maintenance Storeroom • Planning for your Maintenance Storeroom • Planning &amp; Scheduling Will Improve Craft Labor Productivity • Planning &amp; Scheduling Will Improve Craft Labor Productivity • The Planning/Scheduling Process (5 phases) • Organizing and Managing a Maintenance Planning and Scheduling Process • Roles and Responsibilities</i>
1345 – 1420	<b>Maintenance Planning, Estimating &amp; Scheduling</b> <i>Maintenance Supervisor • Maintenance Engineering • Maintenance Planner/Scheduler • Requirements for an Effective Maintenance Planning and Scheduling Process • Planner/Scheduler Selection &amp; Key Roles Responsibilities • Good Planning Starts With A Good Planner • Factors Influencing Number of Planners (Planner to Craft Ratio) • Duties of a Maintenance Planner • Some Things a Planner Should Not Do</i>
1420 – 1430	<b>Recap</b> <i>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</i>
1430	Lunch & End of Day Three

**Day 4: Wednesday, 29<sup>th</sup> of October 2025**

0730 – 0930	<b>Maintenance Planning, Estimating &amp; Scheduling (cont'd)</b> <i>Backlog Management • Valid Priority System • Steps for an Effective Planning Process • Criteria of a Planned Job • What Work Orders to Be Planned and How Much Planning is Enough • Informational Support-The Maintenance Technical Library • Screening Work Requests • Evaluating the Job for Scope of Work • Job Assessment and Scoping Checklist • Total Planned Time for Scheduling Purposes</i>
0930 – 0945	Break



0945 – 1100	<b>Maintenance Planning, Estimating &amp; Scheduling (cont'd)</b> Detailed Planning and Breakdown of Job Steps • Job Preparation & the Planned Job Package • Getting Feedback on the Job Plan • Coordinating Equipment Access, Permitting, Safety and Compliance Issues • An Important Partnership for Effective Planned Maintenance • Responsibilities of the Planner/Scheduler to the Materials Management Process • Maintenance Storeroom • Materials Management's Support to Proactive, Planned Maintenance • Key Procedures for Effective Scheduling • Job Loading
1100 – 1245	<b>Maintenance Planning, Estimating &amp; Scheduling (cont'd)</b> Job Scheduling • Labor Deployment Plan • Key Guidelines for Completing the Scheduling Process • Do not Schedule a Job Until All of these Things are in Place • Supervisor Responsibility for Job Execution • Handling Schedule Adjustments • The Morning Meeting • Job Close Out and Follow Up • Schedule Compliance • Reasons for Schedule Non-Compliance
1245 – 1300	Break
1300 – 1420	<b>The Role of Maintenance &amp; Operations in World-Class Organizations</b> What is Maintenance? • The Evolution of Maintenance • Downtime versus Repair Time • The Four Stages of Maintenance • Types of Maintenance • Predictive Maintenance (PdM) • Statistical Analysis of Equipment Failure Data • Data Analysis • Reliability Availability and Maintainability (RAM) • What is Total Productive Maintenance (TPM)? • A Total Productive Maintenance (TPM) Definition • Another TPM Definition • TPM Principles • The Eight Major Pillars of TPM • Operator Autonomous Maintenance • Key Operation Success Factors • QESH or QUENSH: Quality, Environment, Safety & Health
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 Four

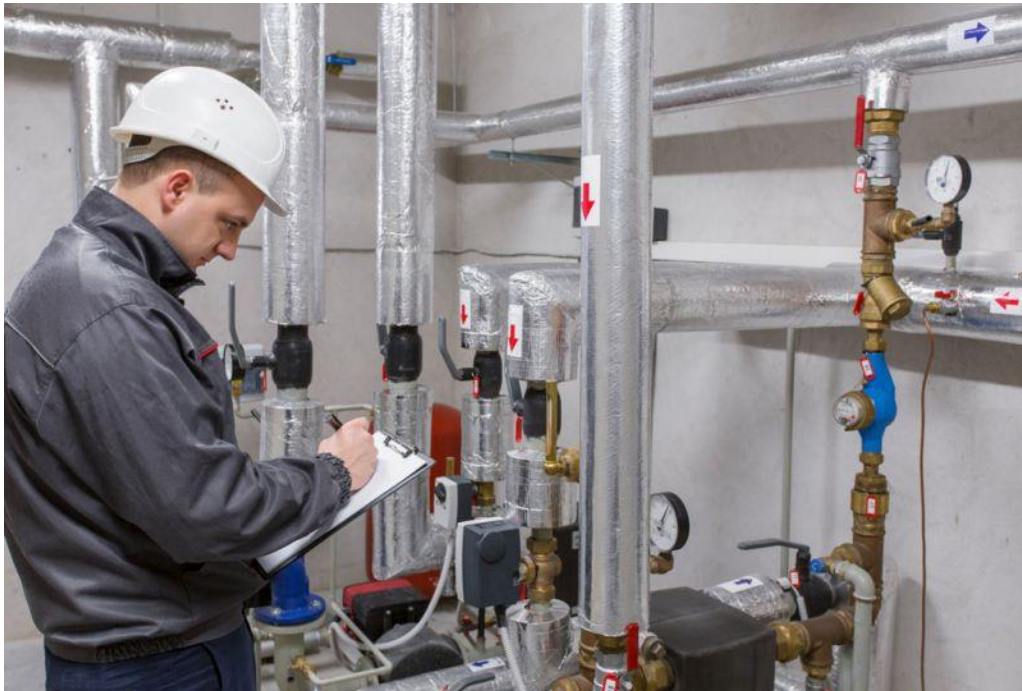
**Day 5: Thursday, 30<sup>th</sup> of October 2025**

0730 – 0930	<b>ISO 9001: 2008 in Simple Terms</b> ISO 9001:2008 Made Simple • ISO 9001:2008 and Other Elements of the IMS are Based on the Methodology Known as PDCA (Plan-Do-Check-Act) • Process Basics • Reliability Centered Maintenance (RCM) • Functional Failure • Categories of Functional Failures • Failure Mode Types
0930 – 0945	Break
0945 – 1030	<b>ISO 9001: 2008 in Simple Terms (cont'd)</b> The Failure Process • RCM – The Analytical Decision Logic • RCM – The Functional Block Diagram • Maintenance Tasks • MSG3 Decision Logic
1030 – 1130	<b>Maintenance Key Performance Indicators BS EN 15341 Standard</b> Why Measure? • Introduction • What are KPIs? • Scope • Terms & Definitions • Maintenance Performance • System of Indicators • Objectives • Architecture of Key Indicators • Economic Key Indicators • Technical Key Indicators • Organizational Indicators
1130 – 1145	Break

1145 – 1230	<b>Maintenance Key Performance Indicators BS EN 15341 Standard (cont'd)</b> <i>Methodology for the Selection &amp; Use of Key Performance Indicators • Desirable Characteristics of KPIs • Defining the Objectives • Selecting the Relevant Indicators • Selecting Indicators • Defining, Collecting the Basic Data • Calculating the Indicators • Type of Presentation • Test and Validation • Analysis of the Results • Assessing KPI Usefulness</i>
1230 – 1300	<b>Evaluation Criteria for Reliability-Centered Maintenance Processes SAE JA 1011</b> <i>Definition • Reliability-Centered Maintenance • Information to be gathered</i>
1300 – 1315	<b>Course Conclusion</b> <i>Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course</i>
1315 – 1415	<b>COMPETENCY EXAM</b>
1415 – 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch &amp; End of Course</i>

### **Practical Sessions**

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

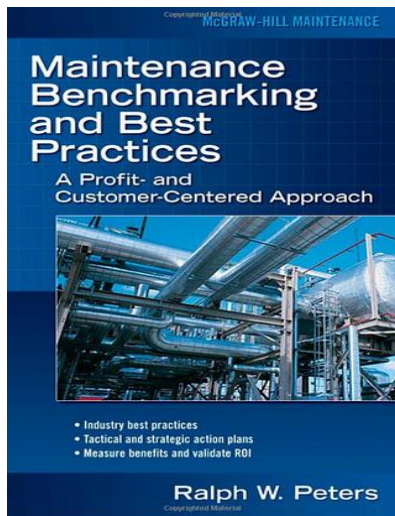






### **Book(s)**

As part of the course kit, the following e-book will be given to all participants:



**Title** : Maintenance Benchmarking and Best Practices  
**ISBN** : 978-0071463393  
**Author** : Ralph Peters  
**Publisher** : McGraw-Hill Professional

### **Course Coordinator**

Mari Nakintu, Tel: +971 2 30 91 714, Email: [mari1@haward.org](mailto:mari1@haward.org)