COURSE OVERVIEW RE0020
Effective Reliability Maintenance & Superior Maintenance Strategies

Course Title
Effective Reliability Maintenance & Superior Maintenance Strategies

Course Date/Venue
Session 1: February 11-15, 2024/The Mouna Meeting Room, The H Dubai Hotel, Sheikh Zayed Rd - Trade Centre, Dubai, UAE
Session 2: March 03-07, 2024/Oryx Meeting Room, Doubletree By Hilton Doha-Al Sadd, Doha, Qatar

Course Reference
RE0020

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.

The chronic problem that many companies struggle with regarding reliability maintenance is transforming their mindset from being reactive to being predictive. The differences are extreme. Reactive maintenance doesn't address machine problems until production is impaired or machines fail. A next phase is preventive. This mindset involves repairing bearings, belts and machines based on a schedule or machine hours. What this doesn't insure is machine failure causing unplanned downtime and unexpected costs.

The predictive mindset is proactive. It involves collecting and analyzing machinery information on a periodic basis including vibration, ultrasonic and temperature readings. Predictive maintenance addresses and corrects the root causes of machine problems. It promotes reliability. The benefits of predictive maintenance are that it allows a company to plan down-time and repair machinery on a scheduled basis. Also, it identifies which machines and parts need to be repaired and replaced and which do not.

This course presents recent, but proven, developments in reliability maintenance in a practical way enabling delegates to transform maintenance from a cost item to a profit center. In addition to the effective reliability and maintainability, this course will also cover the Asset Management, a concept that emerged in recent years as the total organization of a physical asset's life cycle to achieve the lowest cost with maximum return. As such, it spans an entire organization, beyond maintenance or operations functions. Asset management demands continuous, prioritized improvement through design and procedural change. Success is measured by the contribution to a company's results and shareholder value. Asset management is adapted by a growing number of enterprises as an umbrella for bringing good existing operations, maintenance, procurement, quality, and engineering practices together. Various companies provide the maintenance part of asset management services and solutions by providing assessment and improvement programs. Each offers a different slant and bias, typically derived from the organization's background, culture, and strengths.

Course Objectives

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

- Extend the life of your equipment
- Apply life cycle cost and risk planning to your facility assets
- Lower your overall maintenance costs
- Utilize your manpower more efficiently
- Target maintainability and reliability in the development of your facility maintenance plans
- Save on capital equipment expenditures, learning curves and manpower
- Implement the cycle of continuous improvement
- Reduce machine down time
- Acquire a practical knowledge and understanding of AM (Asset Management), RCM (Reliability Centered Maintenance), TPM (Total Productive Maintenance) and Continuous Improvement (CI) processes

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 effective reliability maintenance and superior maintenance strategies for maintenance, reliability, machinery, rotating equipment and plant engineers, planners and other technical staff involved in plant maintenance and reliability.

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: -

- 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. Karl Thanasis, PEng, MSc, MBA, BSc, is **Senior Mechanical & Maintenance Engineer** with over **30 years** of extensive industrial experience. His wide expertise includes **Piping & Pipeline**, Maintenance, Repair, **Shutdown**, **Turnaround & Outages**, **Maintenance & Reliability** Management, **Mechanical Maintenance** Planning, Scheduling & Work Control, Advanced Techniques in **Maintenance** Management, **Predictive & Preventive** Maintenance, **Maintenance & Operation Cost Reduction** Techniques, Reliability Centered Maintenance (**RCM**), **Machinery Failure** Analysis, **Rotating Equipment Reliability** Optimization & Continuous Improvement, **Material Cataloguing**, **Mechanical & Rotating Equipment** Troubleshooting & Maintenance, **Root Cause Analysis & Reliability** Improvement, **Condition** Monitoring, **Root Cause Failure Analysis** (RCFA), **Steam Generation**, **Steam Turbines**, **Power Generator Plants**, **Gas Turbines**, **Combined Cycle Plants**, **Boilers**, **Process Fired Heaters**, Air Preheaters, Induced Draft Fans, All Heaters Piping Work, Refractory Casting, Heater Fabrication, Thermal & Fired Heater Design, **Heat Exchangers**, Heat Transfer, Coolers, **Power Plant** Performance, Efficiency & Optimization, **Storage Tank** Design & Fabrication, **Thermal Power Plant** Management, **Boiler & Steam** System Management, **Pump** Operation & Maintenance, **Chiller & Chiller Plant** Design & Installation, **Pressure Vessel**, **Safety Relief Valve** Sizing & Selection, **Valve** Disassembling & Repair, Pressure Relief Devices (**PSV**), **Hydraulic & Pneumatic** Maintenance, Advanced **Valve** Technology, **Pressure Vessel** Design & Fabrication, **Pumps**, Turbo-Generator, Turbine **Shaft Alignment**, **Lubrication**, Mechanical **Seals**, Packing, **Blowers**, **Bearing** Installation, **Couplings**, **Clutches** and **Gears**. Further, he is also versed in **Wastewater Treatment** Technology, **Networking** System, **Water Network Design**, Industrial **Water Treatment** in Refineries & Petrochemical Plants, **Piping** System, Water Movement, Water Filtering, Mud Pumping, **Sludge Treatment** and **Drying**, **Aerobic Process** of **Water Treatment** that includes **Aeration**, **Sedimentation** and **Chlorination Tanks**. His strong background also includes **Design** and **Sizing** of all **Waste Water Treatment Plant Associated Equipment** such as **Sludge Pumps**, **Filters**, **Metering Pumps**, **Aerators** and **Sludge Decanters**.

Mr. Thanasis has acquired his thorough and practical experience as the **Project Manager**, **Plant Manager**, **Area Manager - Equipment Construction**, **Construction Superintendent**, **Project Engineer** and **Design Engineer**. His duties covered **Plant Preliminary Design**, **Plant Operation**, **Write-up** of **Capital Proposal**, **Investment Approval**, **Bid Evaluation**, **Technical Contract Write-up**, **Construction** and **Sub-contractor Follow up**, **Lab Analysis**, **Sludge Drying** and **Management** of **Sludge Odor** and **Removal**. He has worked in various companies worldwide in the **USA**, **Germany**, **England** and **Greece**.

Mr. Thanasis is a **Registered Professional Engineer** in the **USA** and **Greece** and has a **Master** and **Bachelor** degrees in **Mechanical Engineering** with **Honours** from the **Purdue University** and **SIU** in **USA** respectively as well as an **MBA** from the **University of Phoenix** in **USA**. Further, he is a **Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management** (**ILM**) a **Certified Instructor/Trainer** and has delivered numerous trainings, courses, seminars, workshops and conferences worldwide.

Course Fee

Dubai	**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.
Doha	**US$ 6,000** per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

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

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Course Overview*** *Course Objectives ● Delegate Expectations ● Overview ● Discussions ● What Concerns Do You Have About Your Reliability?*
0930 – 0945	*Break*
0945 – 1100	***Organizing For World Class Operations–Pacesetter Characteristics*** *Steps Toward Pacesetter Performance ● Framework for Reliability Excellence ● Exercise ● Pacesetter Elements & Characteristics*
1100 – 1215	***Organizing For World Class Operations –Pacesetter Characteristics (cont'd)*** *Best Reliability Practices ● Discussions ● Are There Any Other Characteristics That Were Missed?*
1215 – 1230	*Break*
1230 – 1420	***Equipment Failure Patterns*** *Distinguishing Between Repairable & Non-Repairable Equipment ● Types of Equipment Failure ● Review Why Equipment Fails ● Areas of The Bath-Tub Curve ● Actual Equipment Failure Patterns ● Actins to Minimize Failure Effect ● Discussions ● How Does Most of Your Equipment Fail?*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***Maintenance Affect on Reliability*** *Today's Maintenance Issues ● Different Types of Maintenance ● How Maintenance Influences Equipment Performance*
0930 – 0945	*Break*
0945 – 1100	***Maintenance Affect on Reliability (cont'd)*** *Introduction to Condition Based Maintenance ● Factors Contributing to Excessive Maintenance ● Discussions*
1100 – 1215	***Monitoring Techniques*** *Types of Condition-Based Monitoring ● Vibration Monitoring ● Pump Monitoring Frequency ● Temperature Based Monitoring ● Infrared Monitoring ● Lube Oil Analysis ● Discussion ● Analytical- Base Tools ● Data Analysis ● Weibul Analysis ● Discussions ● What Kind of Analysis is Done?*
1215 – 1230	*Break*
1230 – 1420	***Total Productive Maintenance*** *TPM Concepts ● TPM Goals ● TPM Losses ● Activities to Achieve TPM ● Experience With Autonomous Maintenance ● Discussions ● Who Are The People Doing The Tasks?*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Life Cycle Cost*** *Introduction ● Example*
0930 – 0945	*Break*
0945 – 1100	***Reliability Centered Maintenance*** *What is RCM ● Approach ● Selecting the Equipment for RCM ● RCM Functional Categories ● The Key Questions for Implementing RCM ● Potential Maintenance Tasks ● Implementation Scheme ● Alternative Method to RCM ● Discussion ● Was it a Successful Program?*
1100 – 1215	***Reliability Mathematics*** *Understanding Equipment Failure Information ● Non-Repairable System Mathematics ● Repairable System Mathematics ● Series System With Examples ● Parallel System With Examples ● Combined System Example ● Reliability Modeling Problem*
1215 – 1230	*Break*
1230 – 1420	***Availability Modeling*** *What is Modeling & Its Benefits ● Two Simple Approaches to Modeling ● Example ● Simulation Modeling ● Simulation Example ● When to Use What Type of Modeling ● Discussion ● What Type of Modeling Has Been Used?*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Application of R&M Principles to Projects*** *Key Elements of Reliability ● Establish Reliability During Design ● Why Build Reliability Into a Project*
0930 – 0945	*Break*
0945 – 1100	***Application of R&M Principles to Projects (cont'd)*** *Work Process for Implementing ● Overall Reliability Goals ● Elements of an R&M Program ● Exercise ● Maintainability*

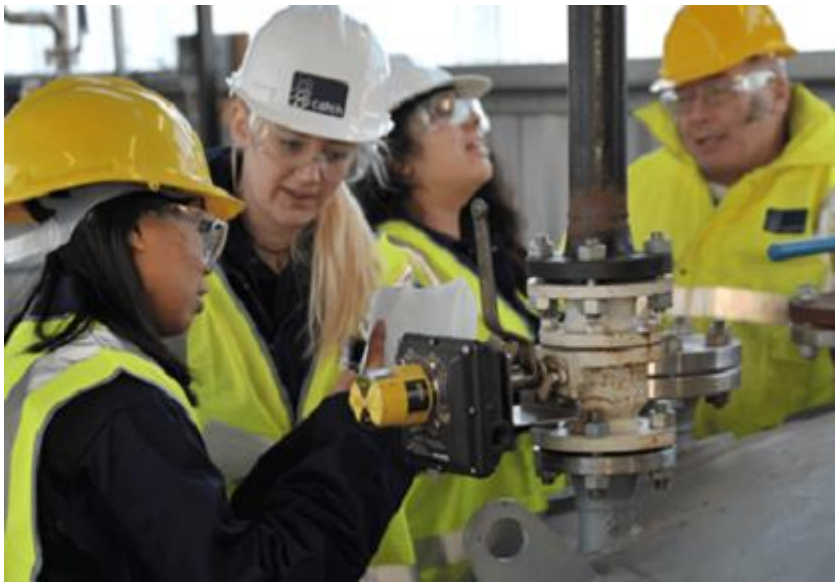
1100 – 1215	***Application of R&M Principles to Projects (cont'd)*** *Exercise ● Implementation ● Pros & Cons? ● Discussion ● Do Projects Consider R&M During Design & Engineering?*
1215 – 1230	*Break*
1230 – 1420	***Human Reliability*** *What Does It Cost a Plant ● Human Error Why & When ● Human Reliability ● What Causes Unreliability ● Experience ● Lesson Learned ● Design Considerations*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Performance Metrics*** *Performance Indicator Characteristics ● Business Results Indicators ● Balancing R&M ● System Performance Indicators ● Maintenance Effectiveness Metrics ● Equipment Specific Indicators*
0930 – 0945	*Break*
0945 – 1045	***Performance Metrics (cont'd)*** *Machinery Targets ● Heat Exchanger Indicators ● Instrument Indicators ● Discussion ● How Frequently are They Being Reported or Tracked?*
1045 – 1215	***Proven Turnaround Practices*** *Success Factors ● T/A Concern Areas ● Management Practices ● Milestone Plan ● Work Scope ● Projects*
1215 – 1230	*Break*
1230 – 1315	***Proven Turnaround Practices (cont'd)*** *Material Procurement ● Process Operations ● Pre-T/A Reviews ● Discussion ● Do You Pre-T/A Reviews?*
1315 – 1345	***Review & Wrap-Up***
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
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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