COURSE OVERVIEW ME0114(AD4)
Bearing & Bearing Failure Analysis

Course Title
Bearing & Bearing Failure Analysis

Course Reference
ME0114(AD4)

Course Duration/Credits
Five days/3.25 CEUs/32.5 PDHs

Course Date/Venu

Session(s)	Date	Venue
1	January 26-30, 2025	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
2	April 13-17, 2025	Oryx Meeting Room, Double Tree by Hilton Al Saad, Doha, Qatar
3	August 03-07, 2025	Al Khobar Meeting Room, Hilton Garden Inn, Al Khobar, KSA
4	November 17-21, 2025	Ajman Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

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.

Equipment productivity and reliability depends on the skillful accomplishment of maintenance practices and there is a clear relationship between maintenance practices, equipment productivity and bottom-line profit.

It is an industry recognized fact that in excess of 90% of premature bearing failures can be attributed to lubrication, contamination or installation issues. Determining the true cause of bearing failure, subsequently correcting this problem and then adopting the correct fitting procedures can dramatically increase bearing life and resulting in an overwhelming increase in equipment reliability and a dramatic reduction in unplanned downtime.

This course introduces a maintenance employee to the basic types of bearings and common nomenclature used. Bearing design, installation and maintenance is discussed with a focus on preventing premature failure. The participant is also trained to analyze failed bearings so a similar occurrence will not happen again.

Upon the successful completion of this course, each participant will be able to identify common sources of premature machinery failure and define precision mechanical maintenance practices to improve performance and extend machinery life. This course is designed to get the most critical part of a Machinery Improvement program into action. Skills and awareness to both maintain and considerably improve your equipment are presented and practiced in an easy to understand format.

This course is designed in order to make participants familiar with how to remove, inspect, maintain, select, design, handle, install, and troubleshoot bearings according to manufacturers' instructions and best practices. Participants learn how to identify replacement bearings and install and maintain the bearings properly using the right tools.

Course Objectives

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

- Apply and gain a good working knowledge on bearing and bearing failure analysis
- Discuss the technology, loads and lubrication, components, quality and operating environment of bearing
- Carryout proper installation and maintenance practices of bearing
- Illustrate different techniques of bearing clearance measurement
- Perform mounting and dismounting procedures covering mounting process, precaution, bearing adjustment and test running
- Identify bearings trouble signs and employ condition monitoring, troubleshooting and solution of bearings
- Recognize bearing failure causes and analysis as well as troubleshoot and maintain bearing in a professional manner
- Determine bearing lubrication covering the fundamentals of lubricants and the selection parameters for oil or grease

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 bearing for all level of maintenance engineers, supervisors and other technical staff in medium and large industries.

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 **3.25 CEUs** (Continuing Education Units) or **32.5 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 center, Haward Technology meets all of the international higher education criteria and standards set by BAC.

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. Manuel Dalas MSc, BSc, is a **Senior Mechanical & Maintenance Engineer** with over **25 years** of industrial experience in **Oil**, **Gas**, **Refinery**, **Petrochemical**, **Power** and **Nuclear** industries. His wide expertise includes **Gas Turbines & Compressors** Troubleshooting, **Gas Turbines** Performance, Maintenance & Testing, **Gas Turbine Performance** and Optimization, **Gas Turbine Control** Systems, **Advanced Gas Turbine**, **Gas Turbine Design** and **Analysis**, **Air Compressor** & **Gas Turbines** Selection and Design, **Material Cataloguing**, **Maintenance Planning & Scheduling**, Reliability Centered Maintenance (**RCM**), **Reliability Maintenance**, **Condition Based Maintenance & Condition Monitoring**, **Asset & Risk** Management, **Vibration Condition Monitoring & Diagnostics** of Machines, **Vibration & Predictive** Maintenance, Reliability Improvement & Vibration Analysis for Rotating Machinery, Effective Maintenance **Shutdown & Turnaround** Management, **Engineering Codes & Standards**, **Rotating Equipment** Maintenance, **Mechanical** Troubleshooting, **Static Mechanical Equipment** Maintenance, **Machinery** Failure Analysis, **Machinery Diagnostics & Root Cause Failure** Analysis, **Plant Reliability & Maintenance** Strategies, **Boiler** Operation & Water Treatment, **Pumps** Maintenance & Troubleshooting, **Fans**, **Blowers & Compressors**, **Process Control Valves**, Piping Systems & Process Equipment, Advanced **Valve** Technology, **Pressure Vessel** Design & Analysis, **Steam & Gas Turbine**, **High Pressure Boiler** Operation, **FRP Pipe** Maintenance & Repair, **Centrifugal & Positive Displacement Pump** Technology Troubleshooting & Maintenance, **Rotating Machinery** Best Practices, **PD Compressor & Gas Engine** Operation & Troubleshooting, **Hydraulic Tools & Fitting**, **Mass & Material Balance**, **Water Distribution & Pump Station**, **Tank Farm & Tank Termina**l Safety & Integrity Management, **Process Piping** Design, Construction & **Mechanical Integrity**, **Stack & Noise** Monitoring, **HVAC & Refrigeration** Systems, BPV Code, Section VIII, Division 2, **Facility Planning & Energy** Management, Hoist - Remote & Basic **Rigging & Slinging**, **Mobile Equipment** Operation & Inspection, **Heat Exchanger**, **Safety Relief Valve**, **PRV & POPRV/PORV**, **Bearing & Lubrication**, **Voith Coupling** Overhaul, **Pump & Valve** Technology, **Lubrication** Inspection, **Process Plant** Optimization, Rehabilitation, Revamping & Debottlenecking, Engineering Problem Solving and **Process Plant** Performance & Efficiency. Currently, he is the **Technical Consultant** of the **Association of Local Authorities of Greater Thessaloniki** where he is in charge of the mechanical engineering services for piping, pressure vessels fabrications and ironwork.

During his career life, Mr. Dalas has gained his practical and field experience through his various significant positions and dedication as the **Technical Manager**, **Project Engineer**, **Safety Engineer**, **Deputy Officer**, **Instructor**, **Construction Manager**, **Construction Engineer**, **Consultant Engineer** and **Mechanical Engineer** for numerous multi-billion companies including the **Biological Recycling Unit** and the **Department of Supplies** of **Greece**, **Alpha Bank Group**, **EMKE S.A**, **ASTE LLC** and **Polytechnic College of Evosmos**.

Mr. Dalas has a **Master's** degree in **Energy System** from the **International Hellenic University, School of Science & Technology** and a **Bachelor's** degree in **Mechanical Engineering** from the **Mechanical Engineering Technical University of Greece** along with a **Diploma** in **Management & Production Engineering** from the **Technical University of Crete**. Further, he is a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership and Management** (**ILM**), a **Certified Project Manager Professional** (**PMI-PMP**), a **Certified Instructor/Trainer**, a **Certified Energy Auditor** for **Buildings**, **Heating & Climate Systems**, a **Member** of the **Hellenic Valuation Institute** and the **Association of Greek Valuers** and a **Licensed Expert Valuer Consultant** of the **Ministry of Development and Competitiveness**. He has further delivered numerous trainings, courses, seminars, conferences and workshops internationally.

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:

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.
Al Khobar	**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.
Abu Dhabi	**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.

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

Day 1:

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0900	***Bearing Basics***
0900 - 0930	***Fundamentals of Bearing Technology***
0930 - 0945	*Break*
0945 – 1100	***Bearing Components***
1100 – 1230	***Terminology***
1230 – 1245	*Break*
1245 - 1420	***Loads & Lubrication***
1420 - 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2:

0730 – 0830	***Bearing Quality***
0830 - 0930	***Operating Environment***

0930 - 0945	Break
0945 – 1030	**Installation**
1030 – 1130	**Maintenance Practices**
1130 - 1230	**Different Techniques of Bearing Clearance Measurement**
1230 - 1245	Break
1245 – 1420	**Mounting & Dismounting**
1420 – 1430	**Recap**
1430	Lunch & End of Day Two

Day 3:

0730 – 0830	**Preparation for Mounting**
0830 - 0930	**Mounting Process & Precaution**
0930 – 0945	Break
0945 – 1030	**Bearing Adjustment**
1030 – 1130	**Test Running**
1130 - 1230	**Hand & Hydraulic Tools**
1230 – 1245	Break
1245 – 1420	**Bearings Trouble Signs Identification**
1420 – 1430	**Recap**
1430	Lunch & End of Day Three

Day 4:

0730 – 0830	**Listen, Feel, Look & Lubricate**
0830 - 0930	**Bearings Condition Monitoring, Troubleshooting & Solution**
0930 – 0945	Break
0945 – 1030	**Vibration Analysis**
1030 – 1130	**Bearing Defect Frequency Analysis**
1130 - 1230	**Envelope Detection**
1230 – 1245	Break
1245 – 1420	**Overheated Bearing**
1420 – 1430	**Recap**
1430	Lunch & End of Day Four

Day 5:

0730 – 0830	**Noisy Bearing**
0830 - 0930	**Unsatisfactory Equipment Performance**
0930 – 0945	Break
0945 – 1100	**Bearing is Loose on the Shaft**
1100 – 1230	**Shaft is Difficult to Turn**
1230 – 1245	Break
1245 - 1345	**Peak View & Spike Energy**
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 state-of-the-art simulator "iLearnVibration".

iLearnVibration Simulator

Course Coordinator

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