COURSE OVERVIEW RE0096
Advanced Inspection & Performance Evaluation of Rotating Equipment including Turbine Maintenance

Course Title
Advanced Inspection & Performance Evaluation of Rotating Equipment including Turbine Maintenance

Course Date/Venue
June 15-19, 2025/Safir Meeting Room, Divan Istanbul, Turkey

Course Reference
RE0096

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 Advanced Inspection & Performance Evaluation of Rotating Equipment including Turbine Maintenance. It covers the types, applications and significance of rotating equipment in industrial settings; the basic mechanical principles behind turbines; the importance of safety in maintenance practices; the inspection techniques for rotating equipment and the role of lubricants in equipment performance; the techniques and tools for vibration analysis and thermal imaging for fault detection to identify potential issues; the ultrasonic testing methods for detecting internal flaws; the tools used for precise measurement in maintenance; and the patterns of wear and how to address them.

During this interactive course, participants will learn the key performance metrics and indicators for rotating equipment and data-driven maintenance strategies; the equipment efficiency and the principles and implementation of RCM; the root cause analysis of failures including turbine components and functions; the routine maintenance procedures for turbine and troubleshooting common turbine issues; the techniques for complex repairs, component replacements and condition monitoring systems (CMS) for turbine maintenance; the renewable energy turbines, regulatory compliance and standards and future trends in equipment maintenance; and the skills in leading maintenance teams effectively.

Course Objectives

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

- Apply and gain an advanced knowledge on the inspection and performance evaluation of rotating equipment including turbine maintenance
- Discuss the types, applications and significance of rotating equipment in industrial settings
- Identify the basic mechanical principles behind turbines and emphasize the importance of safety in maintenance practices
- Carryout inspection techniques for rotating equipment and explain the role of lubricants in equipment performance
- Apply the techniques and tools for vibration analysis and thermal imaging for fault detection to identify potential issues
- Employ ultrasonic testing methods for detecting internal flaws
- Determine the tools used for precise measurement in maintenance and describe the patterns of wear and how to address them
- Identify the key performance metrics for rotating equipment and apply data-driven maintenance strategies
- Evaluate and enhance equipment efficiency and discuss the principles and implementation of RCM
- Recognize root cause analysis of failures including turbine components and functions
- Apply routine maintenance procedures for turbine and troubleshoot common turbine issues
- Demonstrate techniques for complex repairs and component replacements as well as apply condition monitoring systems (CMS) for turbine maintenance
- Discuss renewable energy turbines, regulatory compliance and standards and the future trends in equipment maintenance
- Implement skills in leading maintenance teams effectively

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 advanced inspection and performance evaluation of rotating equipment including turbine maintenance for mechanical engineers, maintenance engineers, plant managers and supervisors, reliability engineers, process engineers, maintenance planners, maintenance and reliability managers, field service engineers, energy industry professionals, pump and compressor specialists and those who are involved in the operation, maintenance, and inspection of rotating machinery, especially turbines.

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:

- 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.

- 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:

Mr. Karl Thanasis, PEng, MSc, MBA, BSc, is **Senior Mechanical & Maintenance Engineer** with over **45 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's** and **Bachelor's** degree 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

US$ 6,000 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.

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, 15th of June 2025***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Overview of Rotating Equipment**: Types, Applications & Significance in Industrial Settings*
0930 – 0945	*Break*
0945 – 1030	***Fundamentals of Turbine Mechanics**: Understanding the Basic Mechanical Principles Behind Turbines*
1030 – 1130	***Safety Protocols in Equipment Inspection**: Emphasizing the Importance of Safety in Maintenance Practices*
1130 - 1230	***Inspection Techniques for Rotating Equipment**: Introduction to Various Inspection Methods & Tools*
1230 – 1245	*Break*
1245 – 1320	***Lubrication & Maintenance Basics**: Understanding the Role of Lubricants in Equipment Performance*
1350 - 1420	***Case Studies**: Review of Real-life Incidents to Understand Common Failures & Solutions*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: Monday, 16th of June 2025

0730 – 0830	***Vibration Analysis in Equipment Inspection***: *Techniques & Tools for Vibration Analysis*
0830 – 0930	***Thermal Imaging for Fault Detection***: *Utilizing Thermal Imaging to Identify Potential Issues*
0930 – 0945	*Break*
0945 – 1130	***Ultrasonic Testing Methods***: *Advanced Ultrasonic Methods for Detecting Internal Flaws*
1130 – 1230	***Precision Measurement Tools***: *Introduction to Tools Used for Precise Measurement in Maintenance*
1230 – 1245	*Break*
1245 – 1345	***Wear & Tear Analysis***: *Understanding Patterns of Wear and How to Address them*
1345 - 1420	***Interactive Workshop***: *Hands-on Session with Equipment to Practice Inspection Techniques*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: Tuesday, 17th of June 2025

0730 – 0830	***Performance Metrics for Rotating Equipment***: *Identifying Key Performance Indicators*
0830 – 0930	***Data-Driven Maintenance Strategies***: *Utilizing Data for Predictive Maintenance*
0930 – 0945	*Break*
0945 – 1130	***Efficiency Analysis Techniques***: *Methods to Evaluate & Enhance Equipment Efficiency*
1130 – 1230	***Reliability-Centered Maintenance***: *Principles & Implementation of RCM*
1230 – 1245	*Break*
1245 – 1345	***Root Cause Analysis of Failures***: *Techniques to Determine the Underlying Causes of Failures*
1345 - 1420	***Group Discussion***: *Analyzing Different Scenarios & Decision-Making Processes*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4: Wednesday, 18th of June 2025

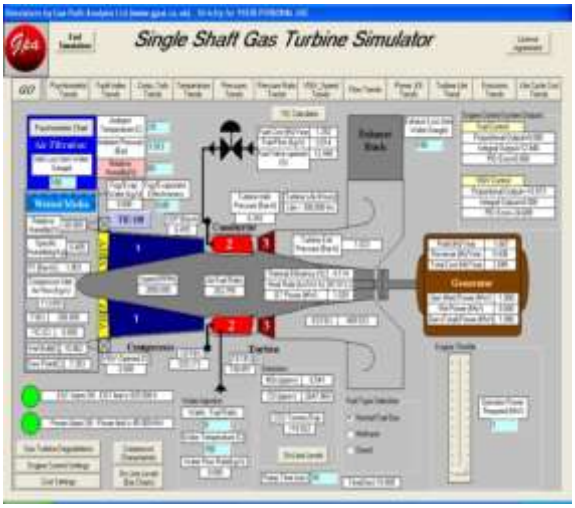
0730 – 0830	***Turbine Components & Functions***: *Detailed Overview of Turbine Parts & their Roles*
0830 – 0930	***Routine Maintenance Procedures for Turbines***: *Standard Practices for Maintaining Turbines*
0930 – 0945	*Break*
0945 – 1130	***Troubleshooting Common Turbine Issues***: *Identifying & Resolving Frequent Problems*
1130 – 1230	***Advanced Repair Techniques***: *Techniques for Complex Repairs & Component Replacements*
1230 – 1245	*Break*
1245 – 1345	***Condition Monitoring Systems***: *Understanding & Using CMS for Turbine Maintenance*
1345 - 1420	***Simulation Exercise***: *Simulated Troubleshooting Scenarios*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5: Thursday, 19th of June 2025

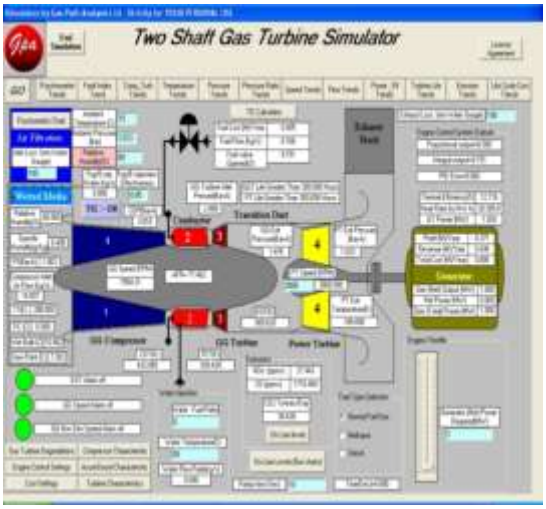
0730 – 0930	***Renewable Energy Turbines***: *Maintenance Challenges & Solutions for Wind and Hydro Turbines*
0930 – 0945	*Break*
0945 – 1030	***Regulatory Compliance & Standards***: *Understanding Relevant Industry Regulations*
1030 – 1230	***Future Trends in Equipment Maintenance***: *Emerging Technologies & Methodologies*
1230 – 1245	*Break*
1245 - 1345	***Leadership & Management in Maintenance***: *Skills for Leading Maintenance Teams Effectively*
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 our state-of-the-art "Single Shaft Gas Turbine Simulator" and "Two Shaft Gas Turbine Simulator", "Steam Turbine & Governing System", "Centrifugal Pumps and Troubleshooting Guide 3.0", "SIM 3300 Centrifugal Compressor Simulator" & "CBT on Compressors" Simulators.

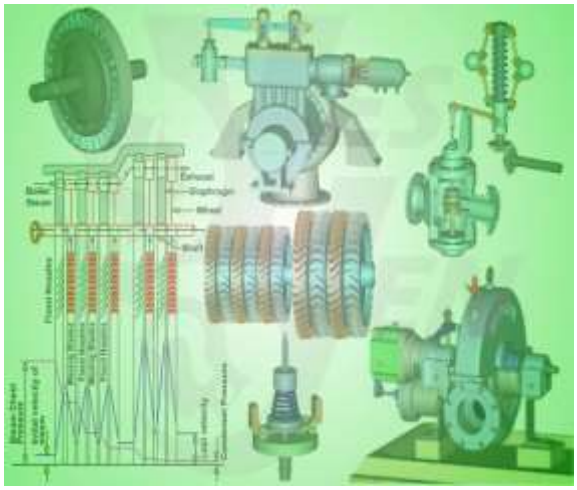


Single Shaft Gas Turbine Simulator

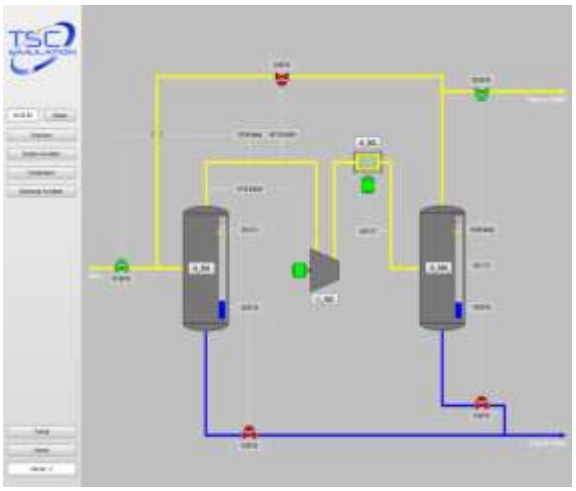


Two Shaft Gas Turbine Simulator

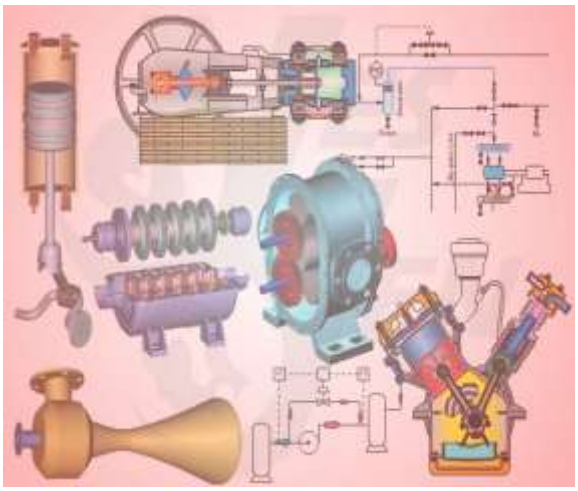
Steam Turbine & Governing System



Centrifugal Pumps and Troubleshooting Guide 3.0



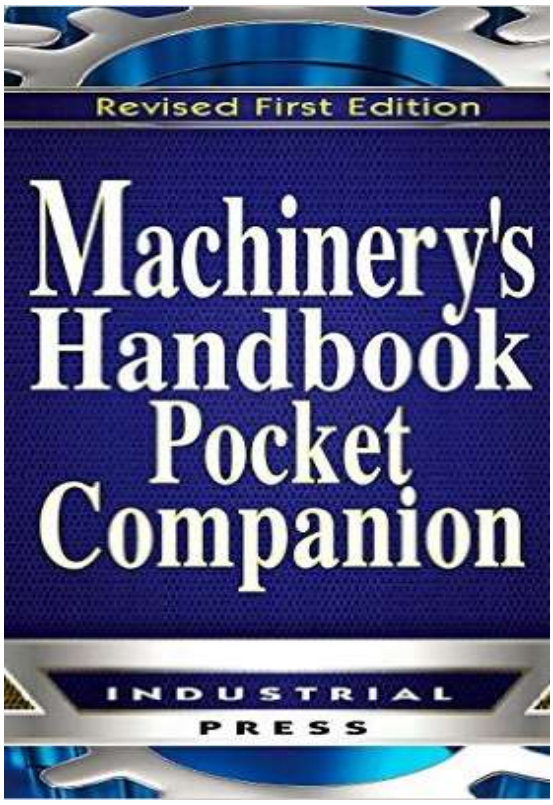
SIM 3300 Centrifugal Compressor Simulator



CBT on Compressors

Book(s)

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



Title : Machinery's Handbook Pocket Companion
ISBN : 9780831130954
Author : Christopher McCauley
Publisher : Industrial Press

Course Coordinator

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