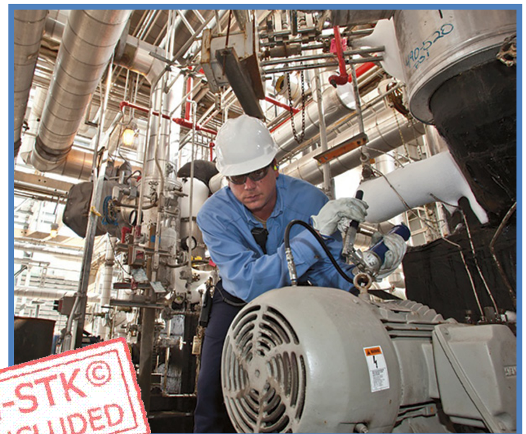
COURSE OVERVIEW ME0771

Workshop Machinery Management: Operation and Maintenance



H-STK© INCLUDED

Course Title
Workshop Machinery Management: Operation and Maintenance

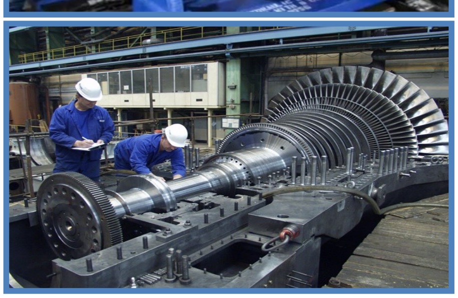
Course Date/Venue
Session 1: April 21-25, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
Session 2: August 10-14, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
ME0771

3.0 CEUs (30 PDHs) AWARD

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

Course Description



This hands-on, 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 cover the selection, operation, maintenance, inspection and troubleshooting of the various types of rotating equipment such as compressors, pumps, motors, turbines, turbo-expanders, gears and transmission equipment. The course will feature a unique blend of practical application experience and basic analysis methods. Its aim is to convey a thorough understanding of machinery operating principles, equipment and specific operations.

The course will cover the principal machines represented at a large number of plants. There will be a thorough examination of basic operating concepts, application ranges, selection criteria, maintenance, inspection and vulnerabilities of certain types of equipment. The course will also review the short-cut selection and sizing methods for fluid machinery.

Upon the successful completion of this course, participants will have gained an understanding of the 12 principal types of machinery used in industry. They will understand the differences between electric motors, design peculiarities, advantages and disadvantages of different types of gears, operating principles of gas turbines and reciprocating gas engines.

The course will convey an understanding of impulse vs. reaction turbines, insights into application ranges, limitations, maintenance and operability constraints for different kinds of pumps, compressors and dynamic gas machinery such as turbo-machinery as opposed to displacement machinery.

Course Objectives

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

- Apply and gain a comprehensive knowledge on machinery operations
- Discuss the basics of a wide spectrum of turbomachinery applications
- Identify the fundamentals of design and performance including the suitability of difference machine classes to various applications
- Carryout analytical methods used in turbomachinery design
- Employ modern techniques for performance modelling and optimization
- Identify the classes of turbomachinery and employ dimensional analysis including energy transfer in turbo machinery and axial and radial modelling approaches
- Describe centrifugal pumps covering its configurations and styles, application ranges and constraints, construction features and options, auxiliaries and wear components
- Recognize canned motor and magnetic drive pumps, high speed/low flow pumps and carryout servicing and condition monitoring
- Identify positive displacement pumps, vacuum pumps, fans, blowers, centrifugal compressors, axial compressors and radial turbines

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 covers systematic techniques and methodologies on machinery operations for mechanical engineers, rotating equipment engineers, supervisors and other technical staff. Further, the course is suitable to all other engineering disciplines who are dealing with rotating equipment such as process engineers, chemical engineers, electrical engineers, plant engineers, project engineers and instrumentation engineers.

Accommodation

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

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 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 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 within the **Power & Water Utilities** and other **Energy Sectors**. His wide expertise includes **District Cooling Plant**, **District Cooling Plant Operations**, **HVAC** Basics, **HVAC&R**, **KOTZA**, **Refrigeration**, **Modern HVAC & Refrigeration Systems Design, Utilization, Operation & Effective Maintenance, Control Valve & Actuators**, **Fire Safe Valves**, **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 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	***Classes of Turbomachinery***
0930 – 0945	*Break*
0945 – 1145	***Dimensional Analysis***
1145 – 1200	*Break*
1200 – 1300	***Energy Transfer in Turbo Machinery***
1300 – 1320	***Axial & Radial Modeling Approaches***
1320 – 1330	***Recap***
1330	*Lunch & End of Day One*

Day 2

0730 – 0930	***Centrifugal Pumps*** *Configurations and Styles • Application Ranges and Constraints • Construction Features and Options • Pump Auxiliaries • Wear Components*
0930 – 0945	*Break*
0945 – 1145	***Centrifugal Pumps (cont'd)*** *Canned Motor and Magnetic Drive Pumps • High Speed/Low Flow Pumps • Servicing and Condition Monitoring*
1145 – 1200	*Break*
1200 – 1300	***Positive Displacement and Vacuum Pumps*** *Reciprocating Steam and Power Pumps • Diaphragm Pumps • Plunger Pumps • Gear Screw and Progressive Cavity Pumps • Peristaltic Pumps*
1300 – 1320	***Positive Displacement and Vacuum Pumps (cont'd)*** *Conventional and Special Vacuum Pumps • Liquid Jet and Liquid Ring Pumps • Combination and Staged Vacuum Pumps*
1320 – 1330	***Recap***
1330	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Fans and Blowers*** *Types and Configurations • Performance and System Effects*
0930 – 0945	*Break*
0945 – 1145	***Fans and Blowers (cont'd)*** *Performance Correction • Capacity Control Options*
1145 – 1200	*Break*
1200 – 1300	***Centrifugal Compressors*** *Types, Styles and Configurations of Centrifugal and Axial Compressors • Construction Features • Mode of Operation • Compressor Auxiliaries and Support Systems*
1300 – 1320	***Centrifugal Compressors (cont'd)*** *Condition Monitoring • Application Criteria • Performance Capabilities and Limitations • Maintenance*
1320 – 1330	***Recap***
1330	*Lunch & End of Day Three*

Day 4

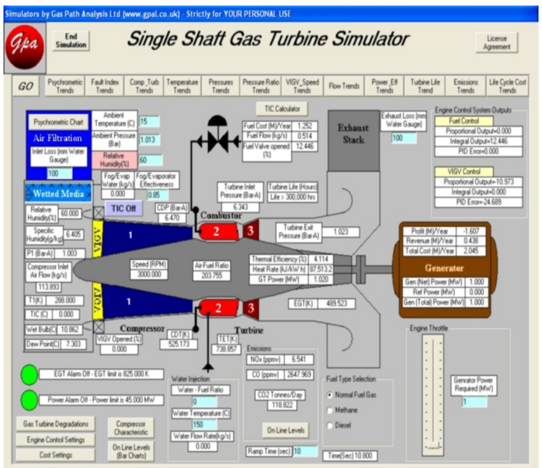
0730 – 0930	***Axial Compressors*** *Classification • Reciprocating Compressors vs. Rotary Screw Compressors*
0930 – 0945	*Break*
0945 – 1145	***Axial Compressors (cont'd)*** *Application Ranges and Limitations • Compression Processes*
1145 – 1200	*Break*
1200 – 1300	***Axial Compressors (cont'd)*** *Construction Features and Components • Capacity Control*
1300 – 1320	***Radial Turbines***
1320 – 1330	***Recap***
1330	*Lunch & End of Day Four*

Day 5

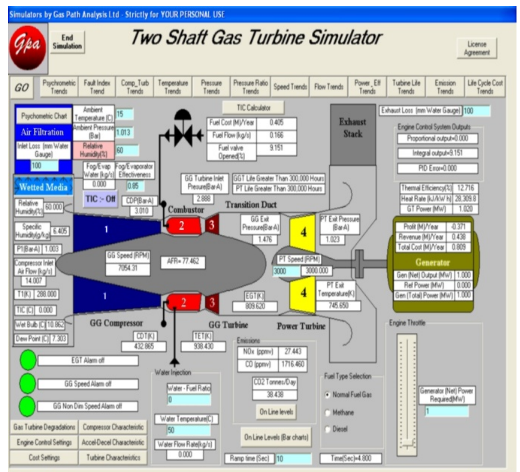
0730 – 0930	***Steam Turbines*** *Impulse Turbines • Reaction Turbines • Application Ranges • Turbine Configurations • Applications Constraints • Maintenance*
0930 – 0945	*Break*
0945 – 1045	***Steam Turbines (cont'd)*** *Turbo-expander Construction Features • Applications • Operation*
1045 – 1100	*Break*
1100 – 1200	***Gas Turbines and Engines*** *Simple Cycle • Heat Recovery Cycles • Type Selection • Maintenance • Two and Four Cycle Gas Engines • Gas Engine Compressor Auxiliary Systems*
1200 – 1245	***Case Studies & Exercises***
1245 – 1300	***Course Conclusion***
1300 – 1315	***POST-TEST***
1315 – 1330	*Presentation of Course Certificates*
1330	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

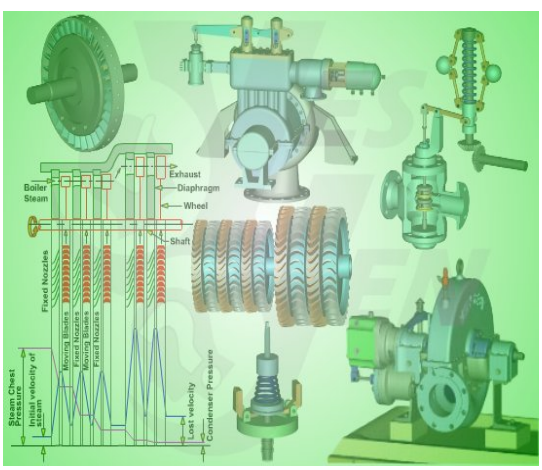
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art “Single Shaft Gas Turbine Simulator” and “Two Shaft Gas Turbine Simulator”, “Steam Turbine & Governing System”, “Centrifugal Pumps and Troubleshooting Guide 3.0”, “SIM 3300 Centrifugal Compressor Simulator”, “CBT on Compressors” and “Valve Sizing”, “Valve 3.0”, “Valvestar 7.2” and “PRV2SIZE” Simulators.



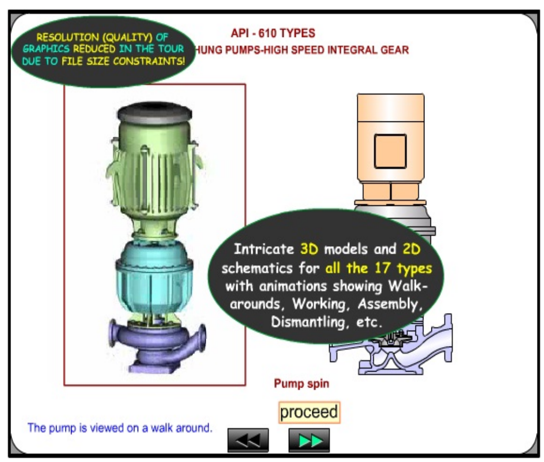
Single Shaft Gas Turbine Simulator



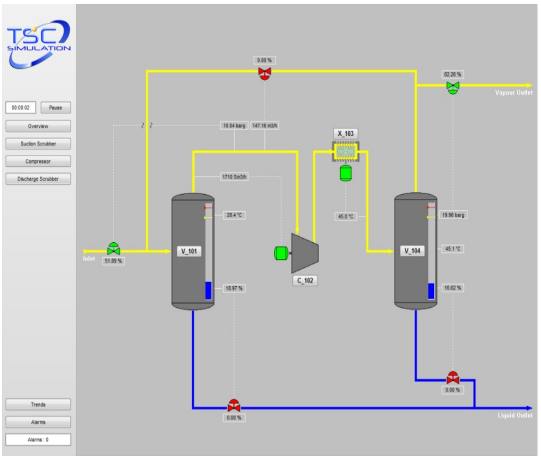
Two Shaft Gas Turbine Simulator



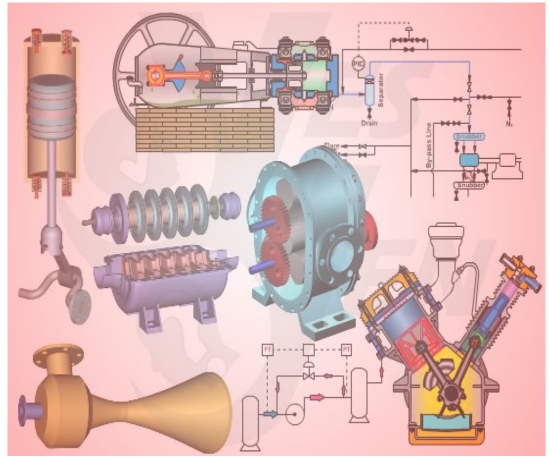
Steam Turbine & Governing System



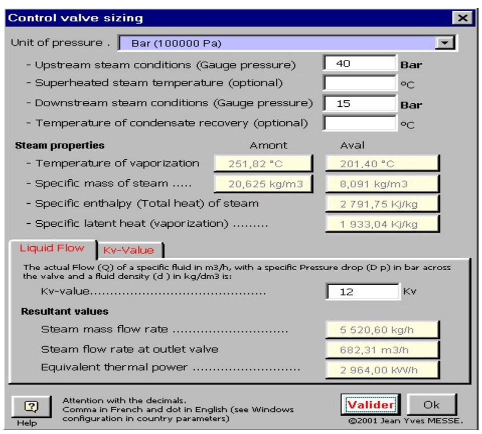
Centrifugal Pumps and Troubleshooting Guide 3.0



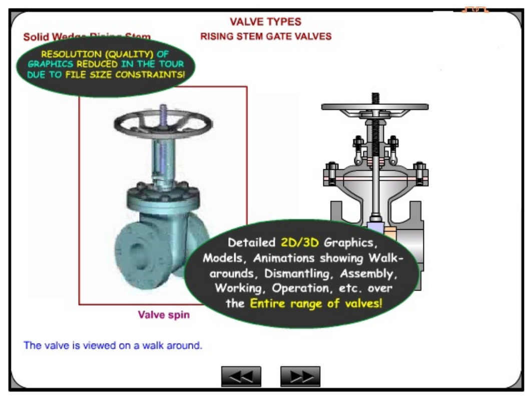
SIM 3300 Centrifugal Compressor Simulator



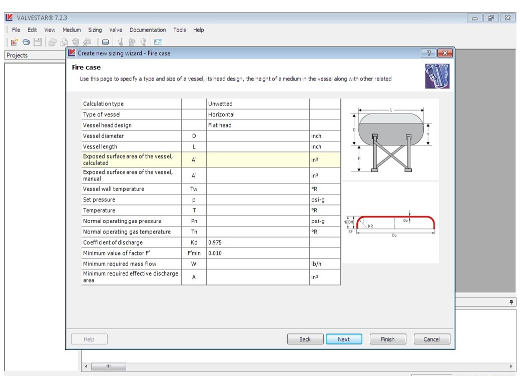
CBT on Compressors



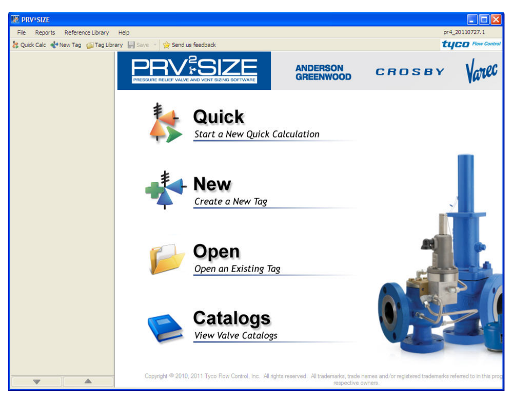
Valve Sizing Simulator



Valve Simulator 3.0



Valvestar 7.2 Simulator



PRV^{2}SIZE Simulator

Course Coordinator

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