COURSE OVERVIEW PE1059
Field Equipment & Process Monitoring

Course Title
Field Equipment & Process Monitoring

Course Date/Venue
Please see page 2

Course Reference
PE1059

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 Field Equipment & Process Monitoring. It covers the field operations in oil and gas, process flow diagrams (PFDs), pumps, compressors, valves, heat exchangers and pressure vessels; the basic process monitoring principles covering equipment performance monitoring, key operating parameters to track and reporting and logging of equipment status; the static equipment, rotating equipment and mechanical seals and bearings; the routine equipment checks and monitoring techniques; and the common equipment failures and symptoms including the basics of instrumentation.

During this interactive course, participants will learn the analog gauge reading and transmitter interfaces and local displays and error identification from readings; the best practices for consistent readings and signal types; the data logging and daily field logs, calibration basics and fault identification; the daily routine surveillance techniques, abnormal conditions and troubleshooting field equipment issues; the information required by control room and radio communication protocols; the alarm response collaboration, incident logging and shift handovers; the emergency equipment identification and procedures; and the basic emergency response for leaks and failures.

Course Objectives

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

- Apply and gain an in-depth knowledge on field equipment and process monitoring
- Discuss field operations in oil and gas, process flow diagrams (PFDs), pumps, compressors, valves, heat exchangers and pressure vessels
- Explain the basic process monitoring principles covering equipment performance monitoring, key operating parameters to track and reporting and logging of equipment status
- Identify the static equipment, rotating equipment, mechanical seals and bearings and apply routine equipment checks and monitoring techniques
- Recognize common equipment failures and symptoms including the basics of instrumentation
- Carryout analog gauge reading, transmitter interfaces and local displays, error identification from readings and best practices for consistent readings
- Identify signal types and apply data logging and daily field logs, calibration basics and fault identification
- Employ daily routine surveillance techniques, recognize abnormal conditions and troubleshoot field equipment issues
- Recognize information required by control room and radio communication protocols as well as apply alarm response collaboration and incident logging and shift handovers
- Implement emergency equipment identification and procedures as well as basic emergency response for leaks and failures

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 field equipment and process monitoring for process engineers, plant or operations managers, maintenance managers, instrumentation engineers, control engineers, environmental engineers, mechanical engineers, field technicians, operators and other technical staff.

Course Date/Venue

Session(s)	Course Date	Venue
1	June 22-26, 2025	Olivine Meeting Room, Fairmont Nile City, Cairo, Egypt
2	August 03-07, 2025	Safir Meeting Room, Divan Istanbul, Taksim, Turkey
3	November 09-13, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE

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. Mervyn Frampton is a **Senior Process Engineer** with over **30 years** of industrial experience within the **Oil & Gas**, **Refinery**, **Petrochemical** and **Utilities** industries. His expertise lies extensively in the areas of **Process Troubleshooting**, **Distillation Towers**, **Fundamentals of Distillation** for Engineers, **Distillation** Operation and Troubleshooting, **Advanced Distillation** Troubleshooting, **Distillation** Technology, Vacuum **Distillation**, **Distillation Column** Operation & Control, **Oil Movement** Storage & Troubleshooting, **Process Equipment** Design, Applied **Process Engineering** Elements, **Process Plant** Optimization, **Revamping & Debottlenecking**, **Process Plant** Troubleshooting & Engineering Problem Solving, **Process Plant** Monitoring, **Catalyst** Selection & Production Optimization, Operations Abnormalities & Plant Upset, **Process Plant** Start-up & Commissioning, **Clean Fuel** Technology & Standards, Flare, Blowdown & Pressure Relief Systems, **Oil & Gas Field Commissioning** Techniques, **Pressure Vessel** Operation, **Gas Processing**, **Chemical** Engineering, **Process Reactors** Start-Up & Shutdown, **Gasoline Blending** for Refineries, **Urea Manufacturing** Process Technology, Continuous Catalytic Reformer (**CCR**), **De-Sulfurization** Technology, Advanced Operational & Troubleshooting Skills, Principles of Operations Planning, **Rotating Equipment** Maintenance & Troubleshooting, **Hazardous Waste Management & Pollution Prevention**, **Heat Exchangers & Fired Heaters** Operation & Troubleshooting, **Energy Conservation** Skills, **Catalyst Technology**, **Refinery & Process Industry**, **Chemical Analysis**, **Process Plant**, **Commissioning & Start-Up**, **Alkylation**, **Hydrogenation**, **Dehydrogenation**, **Isomerization**, **Hydrocracking & De-Alkylation**, **Fluidized Catalytic Cracking**, **Catalytic Hydrodesulphuriser**, **Kerosene Hydrotreater**, **Thermal Cracker**, **Catalytic Reforming**, **Polymerization**, **Polyethylene**, **Polypropylene**, Pilot Water Treatment Plant, **Gas Cooling**, **Cooling Water Systems**, Effluent Systems, Material Handling Systems, **Gasifier**, **Gasification**, Coal Feeder System, **Sulphur Extraction Plant**, **Crude Distillation Unit**, **Acid Plant Revamp** and **Crude Pumping**. Further, he is also well-versed in HSE Leadership, Project and Programme Management, Project Coordination, Project Cost & Schedule Monitoring, Control & Analysis, Team Building, Relationship Management, Quality Management, Performance Reporting, Project Change Control, Commercial Awareness and Risk Management.

During his career life, Mr. Frampton held significant positions as the **Site Engineering Manager**, **Senior Project Manager**, **Process Engineering Manager**, **Project Engineering Manager**, **Construction Manager**, **Site Manager**, **Area Manager**, **Procurement Manager**, **Factory Manager**, **Technical Services Manager**, **Senior Project Engineer**, **Process Engineer**, **Project Engineer**, **Assistant Project Manager**, **Handover Coordinator** and **Engineering Coordinator** from various international companies such as the **Fluor Daniel**, **KBR** South Africa, **ESKOM**, MEGAWATT PARK, CHEMEPIC, PDPS, CAKASA, **Worley Parsons**, Lurgi South Africa, **Sasol**, **Foster Wheeler**, **Bosch** & **Associates**, **BCG** Engineering Contractors, Fina Refinery, Sapref Refinery, Secunda Engine Refinery just to name a few.

Mr. Frampton has a **Bachelor's degree** in **Industrial Chemistry** from **The City University** in **London**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management** (**ILM**) and has delivered numerous trainings, courses, workshops, conferences and seminars 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 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.
Cairo	**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.
Istanbul	**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.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the workshop 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	***Overview of Field Operations in Oil & Gas*** *Role of Field Operations in Upstream/Midstream • Interfaces with Control Rooms & Production Units • Key Operational Challenges in Field Environments • Overview of Safety Protocols & Reporting Systems*
0930 – 0945	*Break*
0945 – 1030	***Introduction to Process Flow Diagrams (PFDs)*** *Difference Between PFDs & P&IDs • Identifying Key Symbols for Equipment & Flow Paths • Reading & Interpreting a Simple PFD • Common Flow Arrangements & Process Blocks*
1030 – 1130	***Types of Field Equipment: Pumps, Compressors, Valves*** *Functions & Classifications of Pumps • Compressor Basics: Reciprocating versus Centrifugal • Valve Types: Gate, Globe, Check, Control • Startup/Shutdown Considerations for Each Equipment*

1130 – 1215	***Heat Exchangers & Pressure Vessels*** *Shell & Tube versus Plate Type Exchangers • Pressure Vessel Function & Design Basics • Temperature/Pressure Monitoring Points • Safety Devices: Relief Valves, Rupture Discs*
1215 – 1230	*Break*
1230 – 1330	***Basic Process Monitoring Principles*** *Importance of Equipment Performance Monitoring • Key Operating Parameters to Track • Trends & Deviations: What to Look For • Reporting & Logging of Equipment Status*
1330 – 1420	***Workshop: PFD Interpretation & Equipment Mapping*** *Hands-on Practice with Simplified PFDs • Identify Equipment & Flow Sequence • Label Monitoring Points • Discuss Typical Data to Be Recorded*
1420 – 1430	***Recap*** *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

0730 – 0830	***Static Equipment: Vessels, Tanks, Heat Exchangers*** *Construction & Operation of Process Vessels • Level, Pressure & Temperature Monitoring Points • Inspections: Visual, Ultrasonic, Thickness Checks • Preventive Maintenance & Corrosion Monitoring*
0830 – 0930	***Rotating Equipment: Pumps & Compressors*** *Classification & Function • Operation Monitoring: Discharge Pressure, Flowrate • Motor Alignment & Coupling Checks • Troubleshooting Start-up Problems*
0930 – 0945	*Break*
0945 – 1100	***Mechanical Seals & Bearings*** *Types of Seals & Bearing Systems • Signs of Seal Failure: Leakage, Vibration • Lubrication Systems & Checks • Predictive Maintenance Strategies*
1100 – 1215	***Routine Equipment Checks & Monitoring Techniques*** *Daily, Weekly & Monthly Checklists • Visual, Auditory & Instrument-Based Inspections • Digital Tools versus Manual Data Collection • Reporting Abnormalities Effectively*
1215 – 1230	*Break*
1230 – 1330	***Common Equipment Failures & Symptoms*** *Cavitation, Seal Leaks, Bearing Wear • Overheating, Vibration, Abnormal Noise • Causes of Repeated Equipment Failure • Equipment Failure Case Studies*
1330 – 1420	***Workshop: Equipment Walkdown & Fault Tagging*** *Simulated Walkdown with Fault Identification • Recording Condition Observations • Use of Inspection Forms/Checklists • Discussion on Reporting Protocols*
1420 – 1430	***Recap*** *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

0730 – 0830	***Basics of Instrumentation*** *Pressure, Temperature, Level & Flow Basics • Types of Field Instruments (Analog, Digital) • Instrument Tags & Calibration Requirements • Introduction to Control Loops*
0830 – 0930	***Reading Gauges & Transmitters*** *Analog Gauge Reading (Psi, °C, Lpm, etc.) • Transmitter Interfaces & Local Displays • Error Identification from Readings • Best Practices for Consistent Readings*
0930 – 0945	*Break*
0945 – 1100	***Signal Types: 4-20 Ma, Hart, Wireless*** *Basics of 4-20 Ma Loop & Device Communication • Hart Protocol & Smart Instrument Diagnostics • Wireless Monitoring Systems • Signal Loss & Troubleshooting*
1100 – 1215	***Data Logging & Daily Field Logs*** *Structure & Importance of Field Logbooks • Digital versus Manual Data Entry • How to Trend Field Parameters • Reporting Out-of-Range Conditions*
1215 – 1230	*Break*
1230 – 1330	***Calibration Basics & Fault Identification*** *What is Calibration & Why it Matters • Simple Field Calibration Procedures • Zero/Span Errors & Drift Detection • Handling Out-of-Calibration Instruments*
1330 – 1420	***Workshop: Instrument Panel Readings & Fault Logs*** *Practice Reading Real/Simulated Gauges • Identify Incorrect Readings & Suggest Action • Fill Sample Daily Logbooks • Instrument Status Tagging (Working/Faulty)*
1420 – 1430	***Recap*** *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 Three*

Day 4

0730 – 0830	***Daily Routine Surveillance Techniques*** *Best Practice Patrol Routes & Frequency • Standard Observation Checklists • Thermal, Auditory & Vibration Monitoring • Feedback to Control Room on Observations*
0830 – 0930	***Recognizing Abnormal Conditions*** *Early Signs of Leaks, Corrosion, or Wear • Vibration & Sound Changes • Smell/Sight Indicators (Burnt Odor, Steam, Discoloration) • Gas & Chemical Leak Indicators*
0930 – 0945	*Break*
0945 – 1100	***Troubleshooting Field Equipment Issues*** *Systematic Approach to Troubleshooting • Common Problems & First-Response Actions • Isolation Procedures for Faulty Equipment • Escalation Protocols & Notifications*
1100 – 1215	***Communication with Control Room*** *Information Required by Control Room • Radio Communication Protocols • Alarm Response Collaboration • Incident Logging & Shift Handovers*

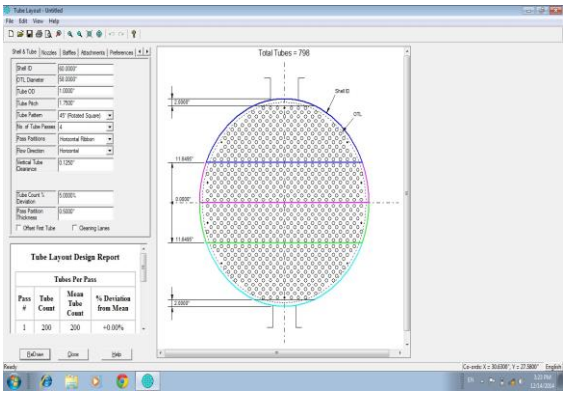
1215 – 1230	*Break*
1230 – 1420	***Mock Equipment Fault Diagnosis Exercise*** *Simulated Multi-Fault Field Condition • Step-by-Step Diagnostic Walkthrough • Cause Identification & Action Planning • Discussion of Lessons Learned*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will 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

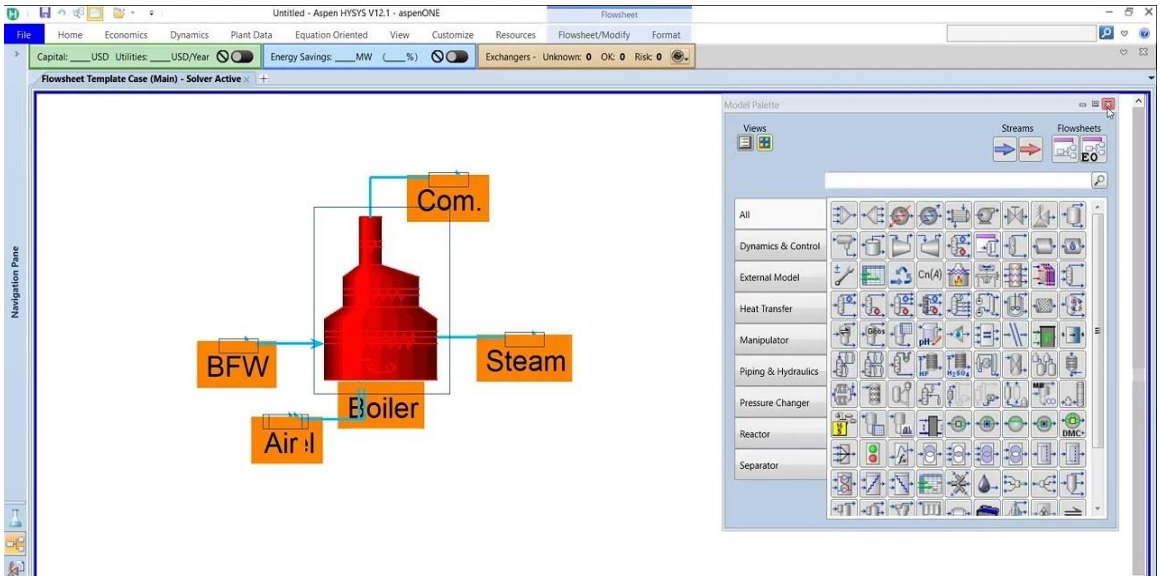
0730 – 0930	***Workshop: Team-Based Troubleshooting Simulation*** *Team Exercise with Role Distribution • Use of Tools, Manuals & Field Instruments • Structured Fault-Finding Process • Field Report Presentation*
0930 – 0945	*Break*
0945 – 1100	***Hands-on Field Inspection & Checklist Use*** *Practical Inspection of Equipment Models or Mockups • Checklist Completion & Report Writing • Use of Handheld Meters & Readers • Identify Faults & Maintenance Needs*
1100 – 1230	***Emergency Equipment Identification & Procedures*** *Fire Extinguishers, Gas Detectors, Emergency Stops • Muster Points & Evacuation Paths • Use of Breathing Apparatus in Emergencies • Emergency Shutdown System Locations*
1230 – 1245	*Break*
1245 – 1345	***Basic Emergency Response for Leaks & Failures*** *First Response to Gas or Fluid Leak • Isolation & Evacuation Steps • Notifying Supervisors & HSE • Personal Safety & Containment Actions*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

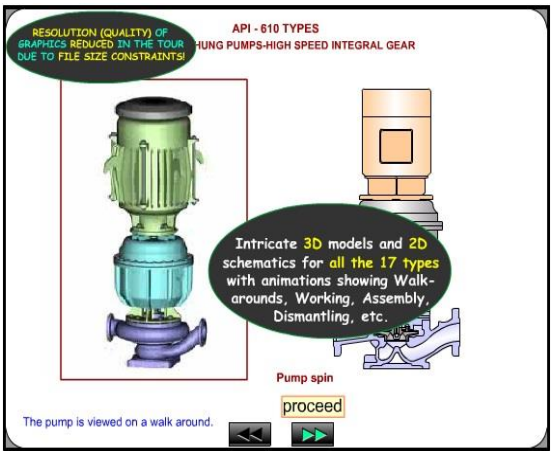
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art simulators “Heat Exchanger Tube Layout”, “ASPEN HYSYS V12.1”, “Centrifugal Pumps and Troubleshooting Guide 3.0”, “SIM 3300 Centrifugal Compressor”, “CBT on Compressors”, “COMPRESS Simulator”, “Valve Sizing Simulator”, “Valve Simulator 3.0”, “Valvestar 7.2 Simulator”, “PRV^{2}SIZE Simulator”, ’Hexagon PPM COADE TANK 2017 SP1 v9.00.01 (Integraph Tank)”, “ AME Tank v7.7” and “SafeRoof v2.1”.



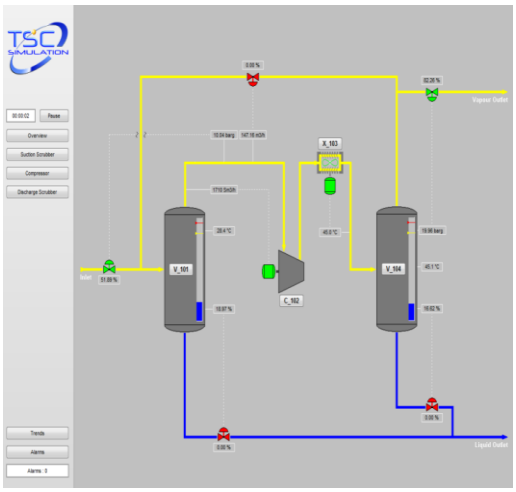
Heat Exchanger Tube Layout Simulator



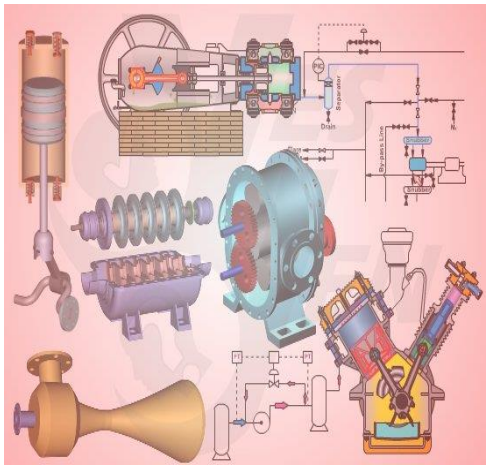
ASPEN HYSYS V12.1 Simulator



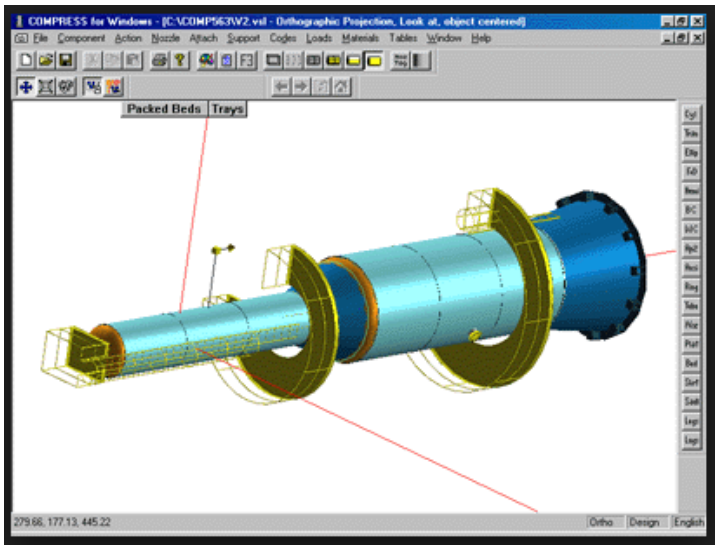
Centrifugal Pumps and Troubleshooting Guide 3.0



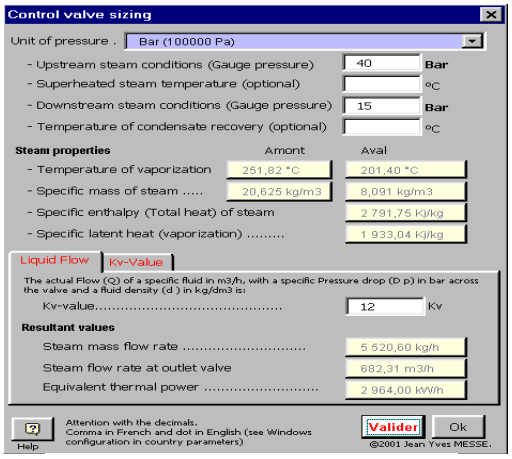
SIM 3300 Centrifugal Compressor Simulator



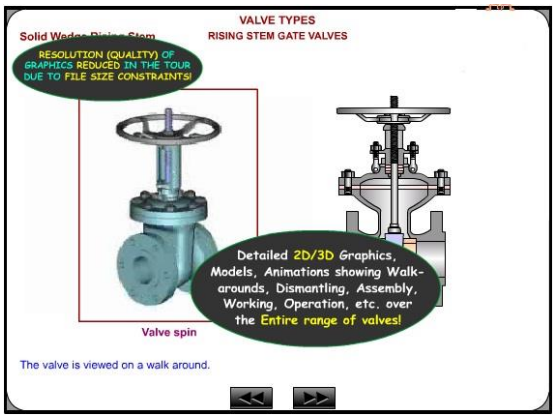
CBT on Compressors



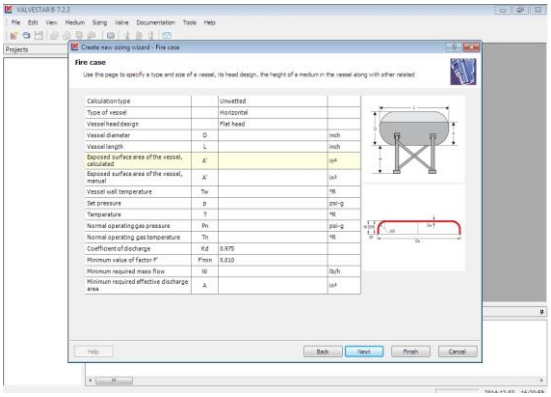
COMPRESS Simulator



Valve Sizing Simulator

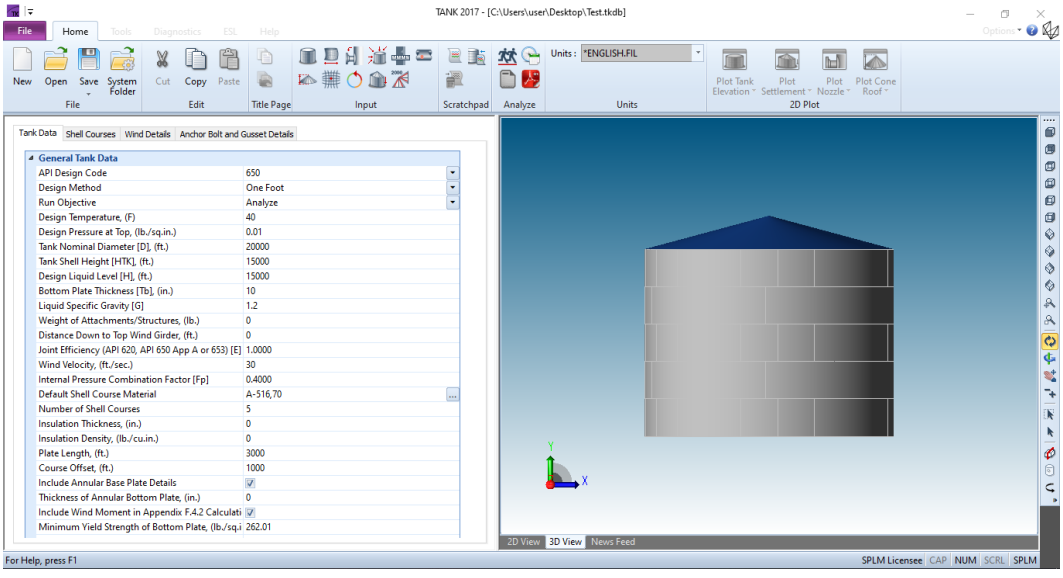


Valve Simulator 3.0

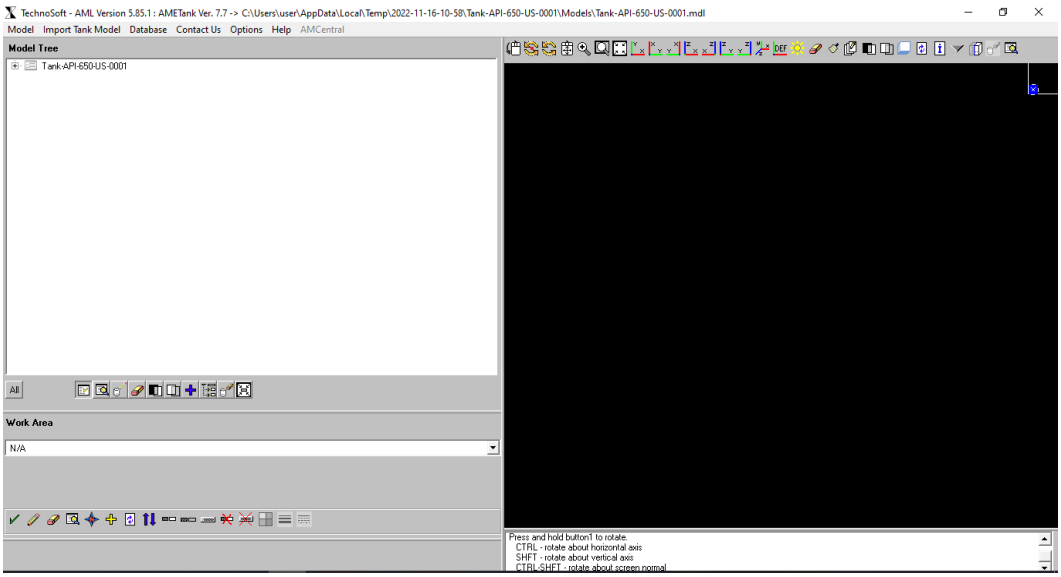


Valvestar 7.2 Simulator

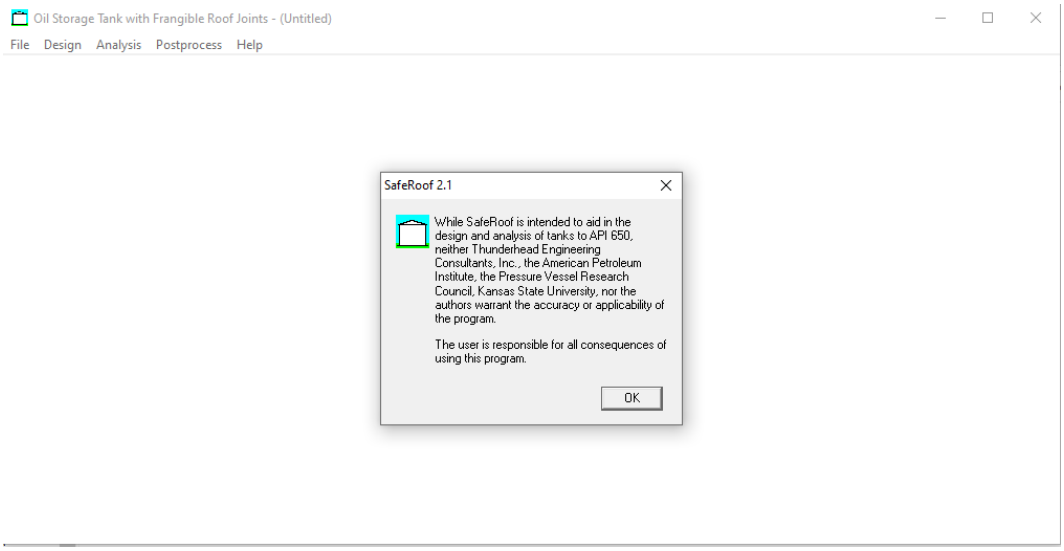
PRV²SIZE Simulator



Hexagon PPM COADE TANK 2017 SP1 v9.00.01 (Integraph Tank)



AME Tank v7.7



SafeRoof v2.1

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org