

COURSE OVERVIEW PE0085

Oil & Gas Field Operations, Start-up & Shutdown

Gas Processing, Hydrates, Dehydration, Sweetening, NGL Recovery & Fractionation, Oil Production, Desalting, Stabilization, Storage Tanks, Mixers, Meter Proving, Cargo Calculations, Flow Measurement, Start-up & Shutdown

Course Title

Oil & Gas Field Operations, Start-up & Shutdown: Gas Processing, Hydrates, Dehydration, Sweetening, NGL Recovery & Fractionation, Oil Production, Desalting, Stabilization, Storage Tanks, Mixers, Meter Proving, Cargo Calculations, Flow Measurement, Start-up & Shutdown



Course Reference

PE0085

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



Course Date/Venue

Session(s)	Date	Venue
1	September 29-October 03, 2024	Horus Meeting Room, Holiday Inn & Suites Maadi, Cairo, Egypt
2	January 05-09, 2025	

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



Oil or gas wells produce a mixture of hydrocarbon gas, condensate, or oil; water with dissolved minerals, usually including a large amount of salt; other gases, including nitrogen, carbon dioxide (CO₂), and possibly hydrogen sulphide (H₂S); and solids, including sand from the reservoir, dirt, scale and corrosion products from the tubing.



For the hydrocarbons (gas or liquid) to be sold, they must be separated from the water and solids, measured, sold and transported by pipeline, truck, rail, or ocean tanker to the user. Gas is usually restricted to pipeline transportation but can also be shipped in pressure vessels on ships, trucks, or railroad cars as compressed natural gas or converted to a liquid and sent as a liquefied natural gas (LNG). This course discusses the field processing required before oil and gas can be sold.

This course is designed to provide participants with a detailed and up-to-date overview of oil and gas field operations, start-up and shutdown. It covers the properties of crude oil; crude assay; types and accessories of tanks; operation and inspection guidelines; corrosion and cathodic protection; tank gauging; tank mixers; meter proving and calculations; meter proving; meter factor and calculations; crude tank cleaning; and gas freeing and line pigging.

The course will also discuss the physical properties of gases; gas liquid separation; hydrates and water content of gas; hydrate inhibition and dehydration of gas; NGL recovery; short cycle units; low temperature separation; mechanical refrigeration; and turbo expander; gas sweetening; amine gas sweetening; MEA loading and corrosion; and amine reclaimer.

Course Objectives

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

- Apply and gain an in-depth knowledge on oil and gas field operations, start-up and shutdown including gas processing, hydrates, dehydration, sweetening, NGL recovery & fractionation, oil production, desalting, stabilization, storage tanks, mixers, meter proving, cargo calculations, flow measurement and same safety aspects
- Discuss properties of crude oil, crude assay, types and accessories of tanks, operation and inspection guidelines, corrosion and cathodic protection and tank gauging
- Recognize tank mixers, meter proving and calculations, meter proving, meter factor and calculations
- Apply crude tank cleaning, gas freeing and line pigging
- Describe physical properties of gases, gas liquid separation, hydrates and water content of gas, hydrate inhibition and dehydration of gas
- Discuss NGL recovery, short cycle units, low temperature separation, mechanical refrigeration and turbo expander
- Differentiate between gas sweetening and amine gas sweetening and identify MEA loading and corrosion and amine reclaimer

Who Should Attend


This course is intended for those seeking a complete and detailed overview of the various operations that take place in the oil and gas fields. This includes managers, engineers, supervisors and other technical staff. Further, the course is very useful for new recruits and for those who just started to handle responsibilities related to oil and gas operations.

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: -


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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.

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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.

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:



Dr. Hesham Abdou, PhD, MSc, PgDip, BSc, is a **Senior Process & Petroleum Engineer** with **40 years** of integrated experience within the **Oil & Gas** industries. His specialization widely covers in the areas of **Artificial Lift System, Artificial Lift Methods, Petroleum Economics, Petroleum Refinery Processing, Refinery Material Balance Calculation, Refinery Gas Treating, Asset Operational Integrity, Drilling Operations, Drilling Rig, Bits & BHA, Mud Pumps, Mud logging Services, Wireline & LWD Sensors, Casing & Cementing Operation, Completion & Workover Operations, Petroleum Engineering, Production Optimization, Well Completion, Rig & Rigless Workover, Advanced PVT & EOS Characterization, PVT/Fluid Characterization/EOS, Advanced Phase Behaviour & EOS Fluid Characterization, PVT Properties of Reservoir Fluids, Directional Drilling Fundamentals, Application & Limitation, Horizontal & Multilateral Wells (Analysis & Design), Directional, Horizontal & Multilateral Drilling, Root Cause Analysis (RCA), Root Cause Failure Analysis (RCFA), Root Cause Analysis Study, Root Cause Analysis Techniques & Methodologies, Process Hazard Analysis (PHA), Crude Oil Testing & Water Analysis, Crude Oil & Water Sampling Procedures, Equipment Handling Procedures, Crude & Vacuum Process Technology, Gas Conditioning & Processing, Cooling Towers Operation & Troubleshooting, Sucker Rod Pumping, ESP & Gas Lift, PCP & Jet Pump, Pigging Operations, Electric Submersible Pumps (ESP), Progressive Cavity Pumps (PCP), Natural & Artificial Flow Well Completion, Well Testing Procedures & Evaluation, Well Performance, Coiled Tubing Technology, Oil Recovery Methods Enhancement, Well Integrity Management, Well Casing & Cementing, Acid Gas Removal, Heavy Oil Production & Treatment Techniques, Water Flooding, Water Lift Pumps Troubleshooting, Water System Design & Installation, Water Networks Design Procedures, Water Pumping Process, Pipelines, Pumps, Turbines, Heat Exchangers, Separators, Heaters, Compressors, Storage Tanks, Valves Selection, Compressors, Tank & Tank Farms Operations & Performance, Oil & Gas Transportation, Oil & Gas Production Strategies, Artificial Lift Methods, Piping & Pumping Operations, Oil & Water Source Wells Restoration, Pump Performance Monitoring, Rotor Bearing Modelling, Hydraulic Repairs & Cylinders, Root Cause Analysis, Vibration & Condition Monitoring, Piping Stress Analysis, Amine Gas Sweetening & Sulfur Recovery, Heat & Mass Transfer and Fluid Mechanics.**

During his career life, Dr. Hesham held significant positions and dedication as the **General Manager, Petroleum Engineering Assistant General Manager, Workover Assistant General Manager, Workover Department Manager, Artificial Section Head, Oil & Gas Production Engineer** from Agiba Petroleum Company and **Engineering Consultant/Instructor** for various Oil & Gas companies as well as a **Senior Instructor/Lecturer** for **PhD, Master & BSc degree students** from various universities such as the Cairo University, Helwan University, British University in Egypt, Banha University.

Dr. Hesham has **PhD** and **Master** degrees as well as **Post Graduate Diploma in Mechanical Power Engineering** and a **Bachelor** degree in **Petroleum Engineering**. Further, he is a **Certified Instructor/Trainer** and a **Peer Reviewer**. Dr. Hesham is an active member of Egyptian Engineering Syndicate and the Society of Petroleum Engineering. Moreover, he has published technical papers and journals and has delivered numerous trainings, workshops, courses, seminars and conferences 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

US\$ 5,500 per Delegate + **VAT**. The rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), 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 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 – 0900	Oil Production, Recovery, Dehydration & Desalting
0900 – 0930	Properties of Crude Oil
0930 – 0945	Break
0945 – 1030	Crude Assay
1030 – 1130	Types of Tanks
1130 – 1230	Accessories of Tanks
1230 – 1245	Break
1245 – 1315	Operation & Inspection Guidelines
1315 – 1345	Corrosion & Cathodic Protection
1345 – 1420	Tank Gauging
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2

0730 – 0810	Tank Mixers
0810 – 0850	Meter Proving & Calculations
0850 – 0930	Meter Proving
0930 – 0945	Break
0945 – 1130	Meter Factor & Calculations
1130 – 1230	Crude Tank Cleaning





1230 – 1245	Break
1245 – 1315	Gas Freeing & Line Pigging
1315 – 1345	Gas Freeing & Pigging
1345 – 1400	Case Study
1400 – 1420	DVD, Question & Answer
1420 – 1430	Recap
1430	Lunch & End of Day Two

Day 3

0730 – 0810	Physical Properties of Gases
0810 – 0930	Gas Liquid Separation
0930 – 0945	Break
0945 – 1030	Exercise
1030 – 1130	Hydrates & Water Content of Gas
1130 – 1230	Hydrate Inhibition
1230 – 1245	Break
1245 – 1315	Dehydration of Gas
1315 – 1330	Exercise
1330 – 1420	Question & Answer, DVD
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4

0730 – 0830	NGL Recovery
0830 – 0900	Short Cycle Units
0900 – 0930	Low Temperature Separation
0930 – 0945	Break
0945 – 1100	Low Temperature Separation (cont'd)
1100 – 1230	Mechanical Refrigeration
1230 – 1245	Break
1245 – 1330	Turbo Expander
1330 – 1420	Question & Answer, DVD
1420 – 1430	Recap
1430	Lunch & End of Day Four

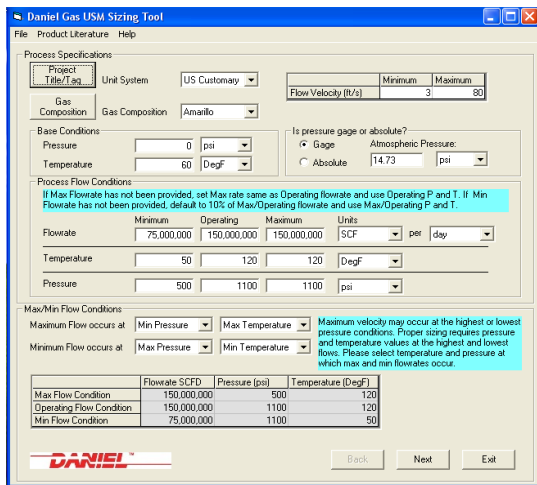
Day 5

0730 – 0830	Gas Sweetening
0830 – 0930	Amine Gas Sweetening
0930 – 0945	Break
0945 – 1145	MEA Loading & Corrosion
1145 – 1230	Amine Reclaimer
1230 – 1245	Break
1245 – 1300	Question & Answer
1300 – 1345	DVD
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 simulators “Gas Ultrasonic Meter Sizing Tool”, “Liquid Turbine Meter and Control Valve Sizing Tool”, “Liquid Ultrasonic Meter Sizing Tool” and “Orifice Flow Calculator” simulator “Centrifugal Pumps and Troubleshooting Guide 3.0”, “SIM 3300 Centrifugal Compressor”, “CBT on Compressors” and “ASPEN HYSYS” simulator.



Daniel Gas USM Sizing Tool

Process Specifications

Project Title / Tag: [] Unit System: US Customary

Gas Composition: Amairlo

Flow Velocity (ft/s): Minimum 3, Maximum 80

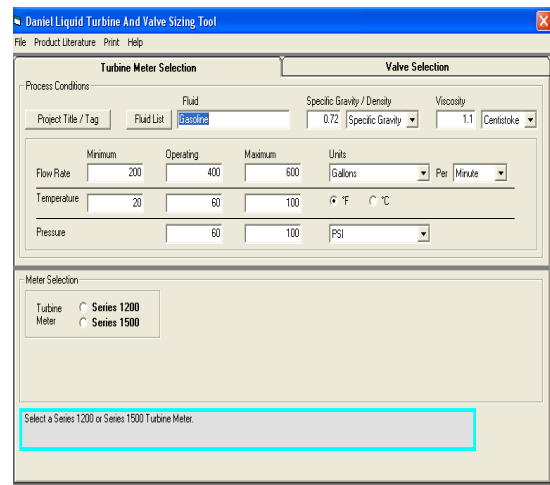
Base Conditions: Pressure 0 psi, Temperature 60 DegF

Process Flow Conditions: Flowrate 150,000,000 SCF per day, Temperature 50-120 DegF, Pressure 500-1100 psi

Max/Min Flow Conditions: Maximum flow occurs at Min Pressure, Minimum flow occurs at Max Pressure

	Flowrate (SCFD)	Pressure (psi)	Temperature (DegF)
Max Flow Condition	150,000,000	500	120
Operating Flow Condition	150,000,000	1100	120
Min Flow Condition	75,000,000	1100	50

Gas Ultrasonic Meter (USM) Sizing Tool Simulator



Daniel Liquid Turbine And Valve Sizing Tool

Turbine Meter Selection

Fluid: Gasoline, Specific Gravity / Density: 0.72, Viscosity: 1.1 Centistoke

Flow Rate: Minimum 200, Operating 400, Maximum 600 Gallons Per Minute

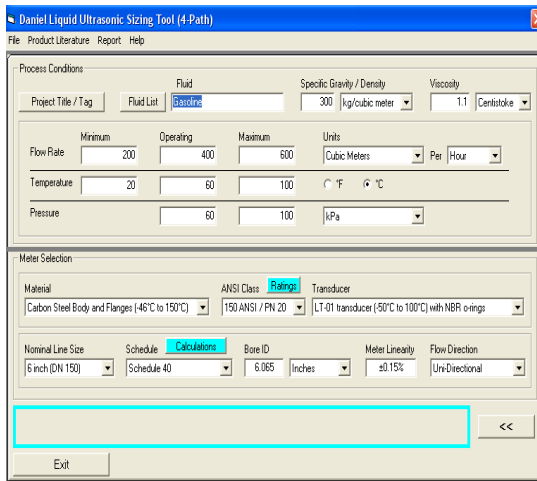
Temperature: 20, 60, 100 °F / °C

Pressure: 60, 100 PSI

Meter Selection: Tubine Meter Series 1200, Series 1500

Select a Series 1200 or Series 1500 Turbine Meter.

Liquid Turbine Meter and Control Valve Sizing Tool Simulator



Daniel Liquid Ultrasonic Sizing Tool (4-Path)

Process Conditions: Fluid Gasoline, Specific Gravity / Density 300 kg/cubic meter, Viscosity 1.1 Centistoke

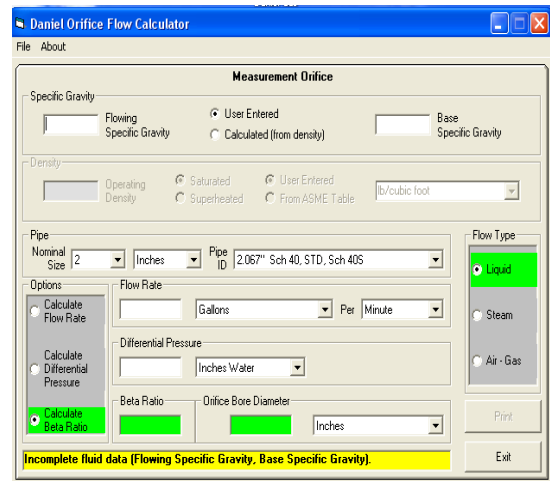
Flow Rate: Minimum 200, Operating 400, Maximum 600 Cubic Meters Per Hour

Temperature: 20, 60, 100 °F / °C

Pressure: 60, 100 kPa

Meter Selection: Material Carbon Steel Body and Flanges (48°C to 150°C), ANSI Class Ratings Transducer, Nominal Line Size 6 inch (DN 150), Schedule 40, Bore ID 6.065 Inches, Meter Linearity ±0.15%, Flow Direction Uni-Directional

Liquid Ultrasonic Meter Sizing Tool Simulator



Daniel Orifice Flow Calculator

Measurement Orifice

Specific Gravity: Flowing Specific Gravity, User Entered, Base Specific Gravity

Density: Operating Density, Saturated, Superheated, User Entered, From ASME Table, lb/cubic foot

Pipe: Nominal Size 2 Inches, Pipe ID 2.067" Sch 40, STD, Sch 40S

Flow Type: Liquid, Steam, Air - Gas

Options: Calculate Flow Rate, Calculate Differential Pressure, Calculate Beta Ratio

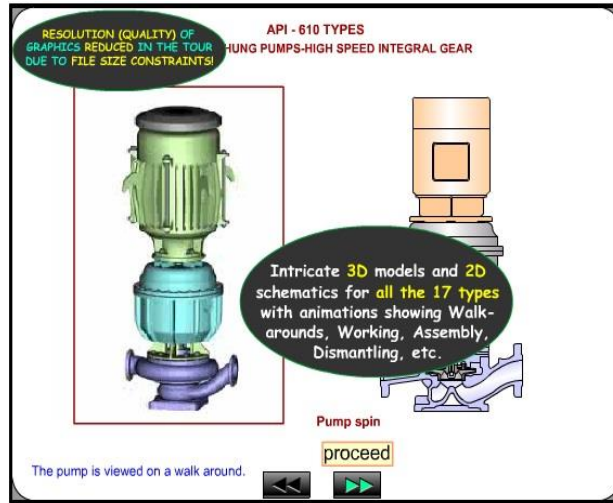
Flow Rate: Gallons Per Minute

Differential Pressure: Inches Water

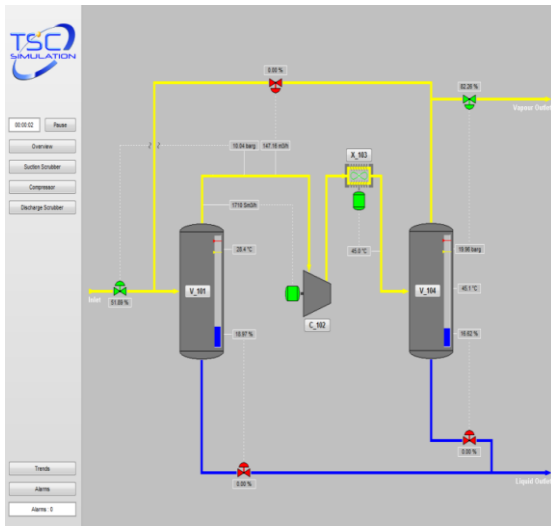
Beta Ratio: [] Orifice Bore Diameter: [] Inches

Incomplete fluid data (Flowing Specific Gravity, Base Specific Gravity).

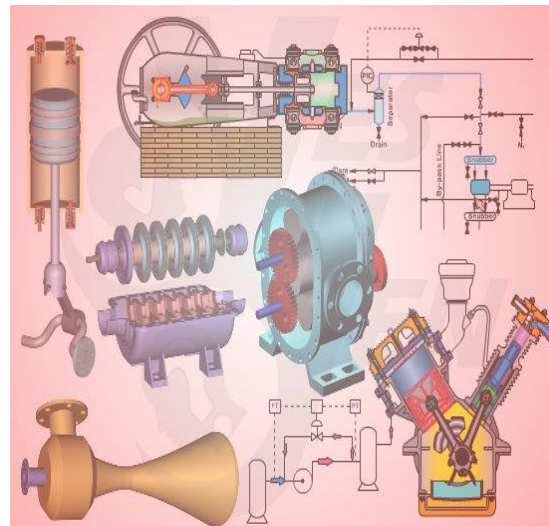
Orifice Flow Calculator Simulator



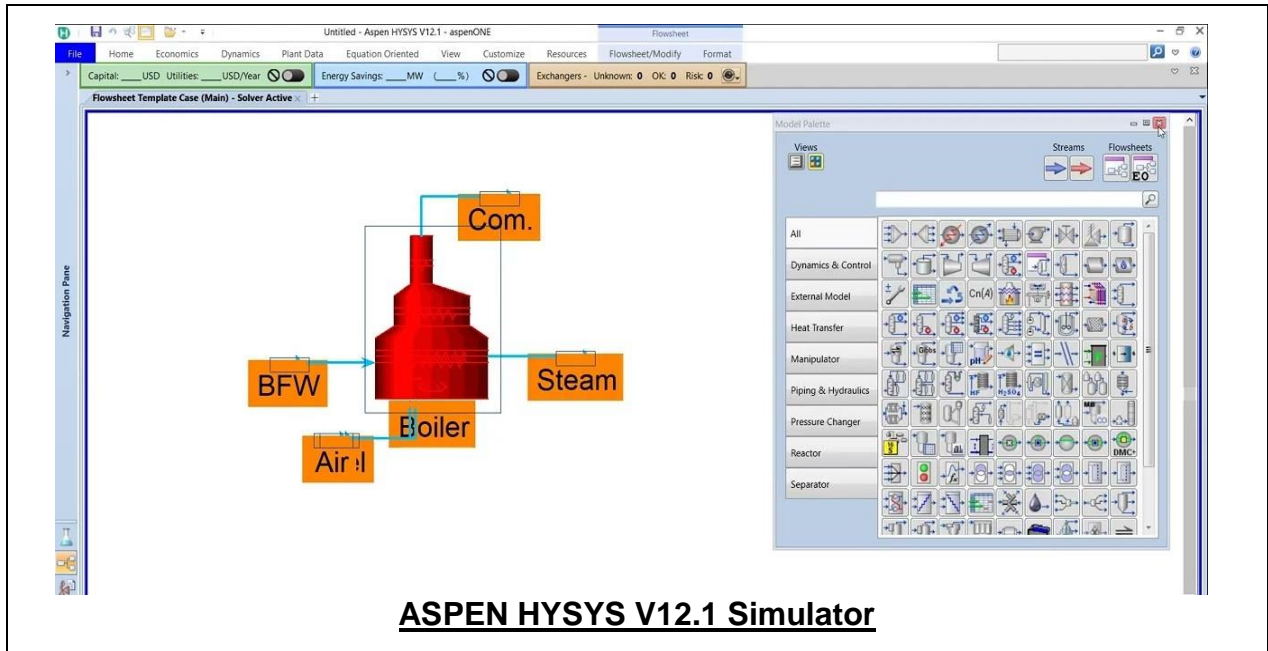
Centrifugal Pumps and Troubleshooting Guide 3.0



SIM 3300 Centrifugal Compressor Simulator



CBT on Compressors



Course Coordinator

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