

COURSE OVERVIEW PE0010
Oil Movement, Storage & Troubleshooting

Course Title

Oil Movement, Storage & Troubleshooting

Course Reference

PE0010

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



Course Date/Venue

Session(s)	Date	Venue
1	April 28–May 02, 2024	Kizkulesi, Crown Plaza Istanbul Asia Hotels & Convention Center, Istanbul, Turkey
2	June 10-14, 2024	Hampstead Meeting Room, London Marriott Hotel Regents Park, London, United Kingdom
3	September 22-26, 2024	Oryx Meeting Room, Doubletree By Hilton Doha-Al Sadd, Doha, Qatar
4	January 19-23, 2024	The Kooh Al Noor Meeting Room, The H Dubai Hotel, Sheikh Zayed Rd - Trade Centre, Dubai, UAE

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 complete and up-to-date overview of the oil movement, storage and troubleshooting in modern refineries, process plants, oil/gas fields and marine terminals. It covers oil and gas transportation from the production fields to the refinery, process plant or the exporting facilities through land or sea.



Participants of the course will be able to identify the different types of tank; review and improve the operation of a tank farm; illustrate the process of gas freeing of tanks and vessels; determine the various methods of gauging tanks; and employ crude oil processing in modern refineries, marine terminals and oil plants.



The course will also cover LPG refrigeration; handling and bulk storage; terminal custody transfer, tank calibration and strapping, tank gauging technique, pulse radar and continuous wave radar and temperature compensation; leak detection system, the correct system, reliability, sensitivity, leak localization, pipeline observer and leakage classifier; production losses and the types of leaks; fatigue crack, stress corrosion cracking, surged induced vibration and meter performance; marine terminal and SPM operations; various product specifications; blending; tank mixing; meters and meter proving; crude oil and leaded gasoline tanks cleaning; and static electricity including its importance in oil movement, storage and troubleshooting.

Finally, the course will identify the oil spill emergencies; review the operation and cathodic protection of gas transmission lines; explain the pigging of crude and gas pipelines; demonstrate the process of ship loading; recognize the role and the importance of quality assurance, control and work permit system; discuss the ship shore interface; and apply the supervision, control and communication as well as the discussion prior to cargo transfer, ship shore check list and firefighting.

Course Objectives

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

- Apply a comprehensive overview of the oil movement and storage operations in refineries, process plants, oil/gas fields and marine terminals
- Acquire knowledge on oil production, recovery, dehydration and desalting and understand the description and installation of a tank farm
- Identify the different types of tanks and review and improve the operation of a tank farm
- Illustrate the process of gas freeing of tanks and vessels and determine the various methods of gauging tanks
- Employ crude oil processing in modern refineries, marine terminals and oil plants and discuss LPG refrigeration, handling and bulk storage
- Implement terminal custody transfer and carryout tank calibration and strapping, tank gauging technique, pulse radar and continuous wave radar and temperature compensation
- Carryout leak detection system, find the correct system and recognize reliability, sensitivity, leak localization, pipeline observer and leakage classifier
- Monitor and control production losses and identify the types of leaks
- Define fatigue crack, stress corrosion cracking, surged induced vibration and meter performance
- Describe marine terminal and SPM operations and explain the various product specifications
- Perform blending, tank mixing, meters and meter proving and cleaning of crude oil and leaded gasoline tanks
- Discuss static electricity and recognize its importance in oil movement, storage and troubleshooting
- Identify oil spill emergencies and review the operation and cathodic protection of gas transmission lines
- Increase knowledge on pigging of crude and gas pipelines and demonstrate the process of ship loading
- Recognize the role and importance of quality assurance, control and work permit system
- Discuss ship shore interface and apply supervision, control and communication as well as discussion prior to cargo transfer, ship shore check list and firefighting

Who Should Attend

This course provides an overview of all significant aspects and considerations of oil movement, storage and troubleshooting for process, production, operation, oil movement and storage engineers, managers, supervisors and other technical staff dealing with oil movement and storage in refineries, process plants, oil/gas fields, marine terminals and other exporting facilities.

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

Istanbul	US\$ 6,000 per Delegate + VAT . This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
London	US\$ 8,800 per Delegate + VAT . This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), 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.
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.

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: -


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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:



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.

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	<i>Registration & Coffee</i>
0800 – 0815	<i>Welcome & Introduction</i>
0815 – 0830	PRE-TEST
0830 – 0930	<i>Oil Production, Recovery, Dehydration & Desalting</i>
0930 – 0945	<i>Break</i>
0945 – 1130	<i>General Description & Installation of a Tank Farm</i>
1130 – 1300	<i>Types of Tanks</i>
1300 – 1315	<i>Break</i>
1315 – 1420	<i>General Operation of a Tank Farm</i>
1420 – 1430	Recap
1430	<i>Lunch & End of Day One</i>

Day 2

0730 – 0930	<i>Gas Freeing of Tanks & Vessels</i>
0930 – 0945	<i>Break</i>
0945 – 1045	<i>Methods of Gauging Tanks</i>
1045 – 1300	<i>Crude Oil Processing</i>
1300 – 1315	<i>Break</i>
1315 – 1345	<i>LPG Refrigeration, Handling & Bulk Storage</i>
1345 – 1420	<i>Terminal Custody Transfer</i> <i>Tank Calibration & Strapping • Tank Gauging Technique • Pulse Radar & Continuous Wave Radar • Temperature Compensation</i>
1420 – 1430	Recap
1430	<i>Lunch & End of Day Two</i>

Day 3

0730 – 0900	<i>Leak Detection System</i> <i>Finding the Correct System • Reliability • Sensitivity • Leak Localization • Pipeline Observer • Leakage Classifier</i>
0900 – 0915	<i>Break</i>
0915 – 1100	<i>Monitoring & Controlling Production Losses</i> <i>Types of Leakes • mFatigue Crack • Stress Corrosion Cracking • Surged Induced Vibration • Meter Performance</i>
1100 – 1230	<i>Marine Terminal & SPM Operations</i>
1230 – 1245	<i>Break</i>
1245 – 1345	<i>Product Specifications</i>
1345 – 1420	<i>Blending</i>
1420 – 1430	Recap
1430	<i>Lunch & End of Day Three</i>

Day 4

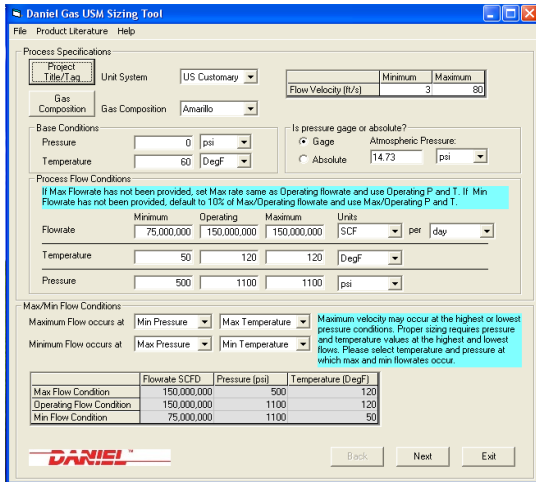
0730 - 0815	Tank Mixing
0815 - 0900	Meters & Meter Proving
0900 - 0915	<i>Break</i>
0915 - 1100	Cleaning of Crude Oil & Leaded Gasoline Tanks
1100 - 1230	Static Electricity
1230 - 1245	<i>Break</i>
1245 - 1420	Oil Spill Emergencies
1420 - 1430	Recap
1430	<i>Lunch & End of Day Four</i>

Day 5

0730 - 0900	Gas Transmission Lines: Operation & Cathodic Protection
0900 - 0915	<i>Break</i>
0915 - 1100	Pigging of Crude & Gas Pipelines
1100 - 1230	Ship Loading
1230 - 1245	<i>Break</i>
1245 - 1315	Quality Assurance, Control & Work Permit System
1315 - 1345	The Ship Shore Interface <i>Supervision & Control • Communications • Discussion Prior to Cargo Transfer • Ship-Shore Check List • Fire Fighting</i>
1345 - 1400	Course Conclusion
1400 - 1415	POST-TEST
1415 - 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch & End of Course</i>

Simulators (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”, “Orifice Flow Calculator” and “ASPEN HYSYS” simulator.



Daniel Gas USM Sizing Tool

Process Specifications

Unit System: US Customary

Gas Composition: Amairillo

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

Base Conditions

Pressure: 0 psi

Temperature: 60 DegF

Process Flow Conditions

Flowrate: Minimum 75,000,000, Operating 150,000,000, Maximum 150,000,000 SCF per day

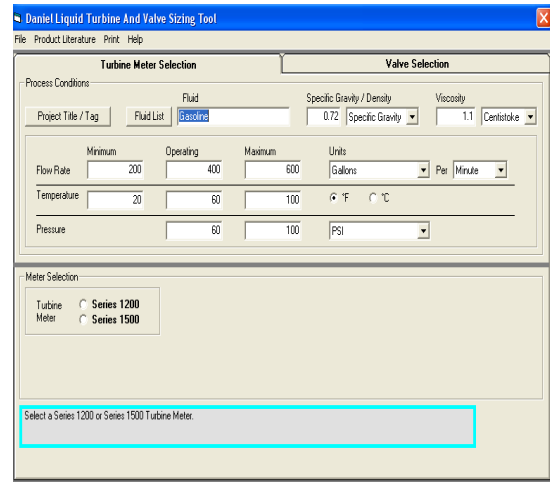
Temperature: 50, 120, 120 DegF

Pressure: 500, 1100, 1100 psi

Max/Min Flow Conditions

Condition	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 Software



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

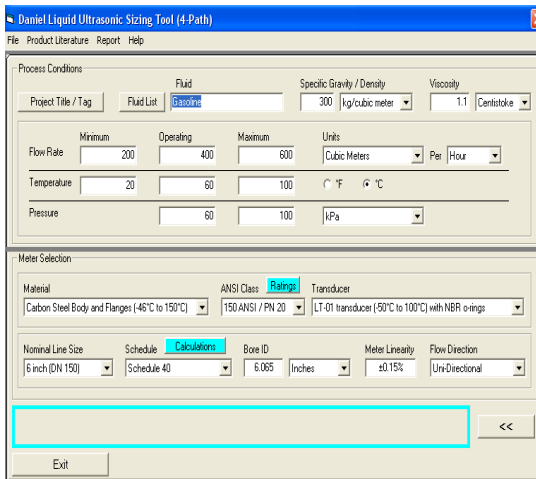
Turbine Meter

Series 1200

Series 1500

Select a Series 1200 or Series 1500 Turbine Meter.

Liquid Turbine Meter and Control Valve Sizing Tool Software



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 (-46°C to 150°C)

ANSI Class: Ratings

Transducer: LT-01 transducer (50°C to 100°C) with NBR orings

Nominal Line Size: 6 inch (DN 150)

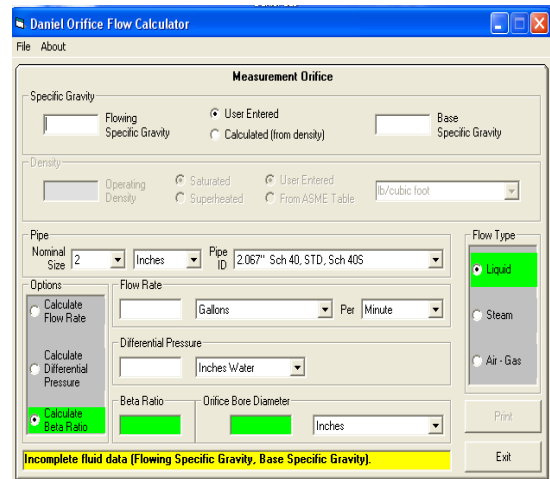
Schedule: Calculations

Bores ID: 6.065 Inches

Meter Linearity: ±0.15%

Flow Direction: Uni-Directional

Liquid Ultrasonic Meter Sizing Tool Software



Daniel Orifice Flow Calculator

Measurement Orifice

Specific Gravity: User Entered

Density: Operating Density

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

Flow Type: Liquid

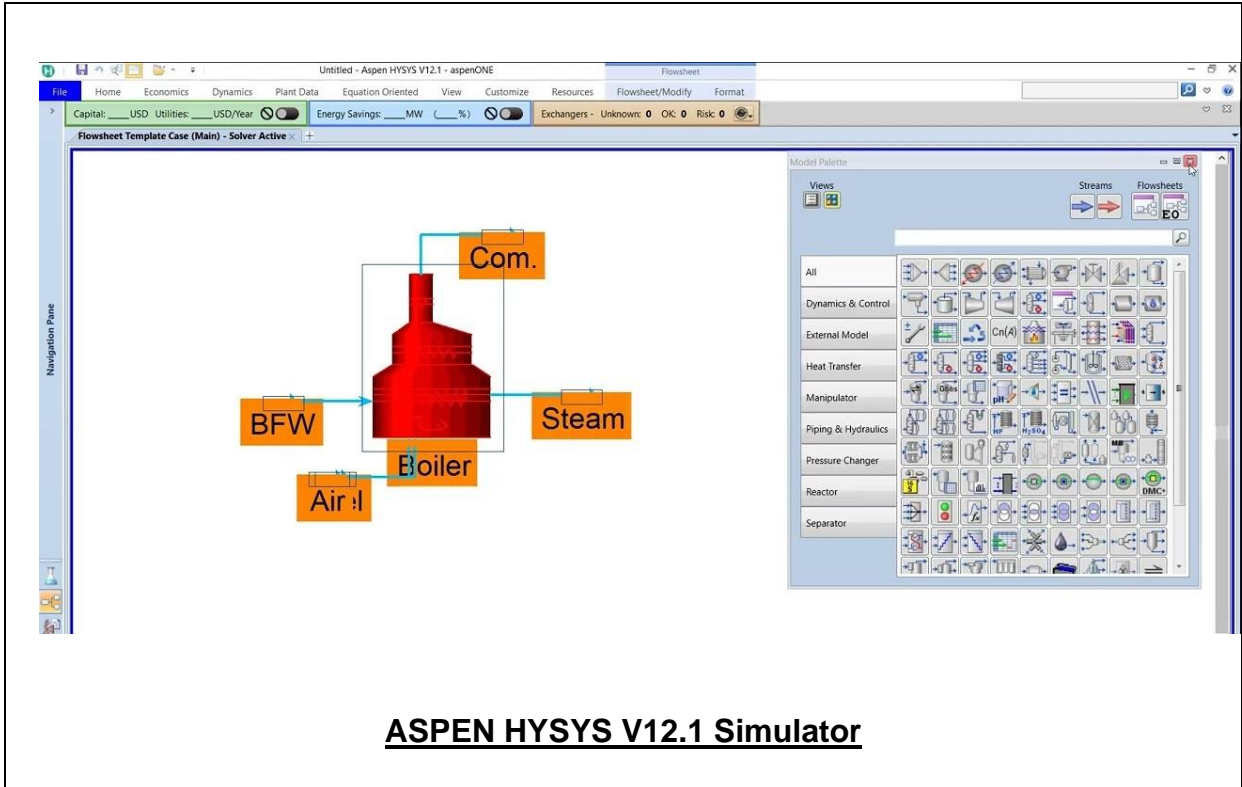
Options: Calculate Flow Rate

Differential Pressure: Inches Water

Beta Ratio: Orifice Bore Diameter: Inches

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

Orifice Flow Calculator Software



Course Coordinator

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