



COURSE OVERVIEW IE0579

Petroleum Custody Transfer in Marine Transportation

Course Title

Petroleum Custody Transfer in Marine Transportation

Course Date/Venue

December 21-25, 2025/Boardroom 2, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference

IE0579

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 Petroleum Custody Transfer in Marine Transportation. It covers the importance of custody transfer, regulatory frameworks and standards; the marine transportation systems, key regulations and industry standards and measurement techniques and systems; the documentation and record keeping as well as safety and risk management in marine custody transfer; the flow metering technologies, volume measurement systems, mass measurement systems and custody transfer equipment; and the automated control systems for accurate transfer, pre-transfer preparations and transfer procedures and best practices.

During this interactive course, participants will learn the volume and mass transfer calculations, marine loading and unloading operations and quality control in custody transfer; the post-transfer documentation and reporting and dispute resolution in custody transfer; the legal and contractual aspects, handling measurement discrepancies and the challenges in custody transfer operations; the technology and innovation in custody transfer covering the latest innovations in custody transfer technologies and the role of AI and machine learning in improving operations; the future trends in marine transportation systems; enhancing automation for better accuracy and efficiency; and the best practices and continuous improvement.





Course Objectives

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

- Apply and gain an in-depth knowledge on petroleum custody transfer in marine transportation
- Discuss the importance of custody transfer, regulatory frameworks and standards
- Recognize marine transportation systems, key regulations and industry standards and measurement techniques and systems
- Carryout documentation and record keeping as well as safety and risk management in marine custody transfer
- Discuss flow metering technologies, volume measurement systems, mass measurement systems and custody transfer equipment
- Apply automated control systems for accurate transfer, pre-transfer preparations and transfer procedures and best practices
- Employ volume and mass transfer calculations, marine loading and unloading operations and quality control in custody transfer
- Carryout post-transfer documentation and reporting and dispute resolution in custody transfer
- Discuss legal and contractual aspects, handle measurement discrepancies and identify the challenges in custody transfer operations
- Explain the technology and innovation in custody transfer covering the latest innovations in custody transfer technologies and the role of AI and machine learning in improving operations
- Interpret the future trends in marine transportation systems, enhance automation for better accuracy and efficiency and apply best practices and continuous improvement

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 petroleum custody transfer in marine transportation for instrumentation engineers, electrical and automation engineers, process and facilities engineers, measurement and instrumentation specialists and other technical staff.

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 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

Haward's 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**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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.

Accommodation

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

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

This course will be conducted by the following instructor. However, we have the right to change the course instructor prior to the course date and inform participants accordingly:



Dr. Ahmed El-Sayed, PhD, MSc, BSc, is a **Senior Electromechanical Engineer** with over **30 years** of extensive experience in the **Custody Transfer, Marine Transportation Systems, Measurement Techniques & Systems, Flow Metering Technologies, Custody Transfer Equipment, Marine Loading & Unloading Operations, Power, Petroleum, Petrochemical and Utilities**. He specializes in **SIMATIC S7-300 & S7-1500**: Basic PLC Programming & Operation, Maintenance & Troubleshooting for **SIMATIC S7-300/S7-1500** Systems, Process Automation with **SIMATIC S7-1500** & PID Control, **SIMATIC S7-300**: Hardware Configuration & Commissioning, **SIMATIC S7-300** Safety Systems: Fail-Safe Programming, **SIMATIC S7-300** Communication, **SIMATIC S7-1500**: Hardware Configuration, Commissioning & Diagnostics, **HV/LV Equipment, High Voltage Electrical Safety, LV & HV Electrical System, HV Equipments Inspection & Maintenance, HV Switchgear Operation & Maintenance, LV Distribution Switchgear & Equipment, HV Switchgear Maintenance, HV/LV Electrical Authorisation, Hazardous Area Classification, Power Quality, Disturbance Analysis, Blackout, Power Network, Power Distribution, Power Systems Control, Power Systems Security, Power Electronics, ETAP, Electrical Substations, Tariff Design & Structure Analysis, Engineering Drawings, Codes & Standards, P&ID Reading, Interpretation & Developing, PLC, SCADA, DCS, Process Control, Instrumentation, Automation, Power Generation, Process Control Instrumentation, SIS, SIL, ESD, Alarm Management Systems, Fieldbus Systems and Fiber Optics** as well as the service pricing of these. Further, he is also well versed in **Pumps, Valves, Boilers, Pressure Vessels, Heat Recovery Steam Generators (HRSG), Bearings, Compressors, Motors, Turbines, Actuators, Carbon Footprint, Energy Efficiency, Power Plant Performance & Efficiency, P&ID, Engineering Drawing, Codes & Standards and Hydraulic Systems** He is currently the **Systems Control Manager** of **Siemens** where he is in-charge of Security & Control of Power **Transmission Distribution & High Voltage** Systems and he further takes part in the Load Records Evaluation & Transmission Services Pricing.

During his career life, Dr. Ahmed has been actively involved in different Power System Activities including Roles in Power System Planning, Analysis, Engineering, **HV Substation** Design, Electrical Service Pricing, Evaluations & Tariffs, Project Management and also in Teaching and Consulting. His vast industrial experience was honed greatly when he joined many International and National Companies such as **Siemens, Electricity Authority** and **ACETO** industries where he focused more on dealing with Technology Transfer, System Integration Process and Improving Localization. He was further greatly involved in manufacturing some of **Power System and Control & Instrumentation Components** such as Series of Digital Protection **Relays, MV VFD, PLC and SCADA** System with intelligent features.

Dr. Ahmed is well-versed in different electrical and instrumentation fields like Load Management Concepts, **PLC** Programming, Installation, Operation and Troubleshooting, **AC Drives** Theory, Application and Troubleshooting, Industrial Power Systems Analysis, **AC & DC Motors**, Electric Motor **Protection, DCS SCADA, Control** and Maintenance Techniques, Industrial Intelligent Control System, **Power Quality** Standards, Power Generators and Voltage Regulators, Circuit Breaker and Switchgear Application and Testing Techniques, **Transformer** and **Switchgear** Application, Grounding for Industrial and Commercial Assets, Power Quality and **Harmonics, Protective Relays** (O/C Protection, Line Differential, Bus Bar Protection and **Breaker Failure Relay**) and Project Management Basics (PMB).

Dr. Ahmed has **PhD, Master's & Bachelor's** degree in **Electrical and Instrumentation Engineering** from the **University of Wisconsin Madison, USA**. Further, he has numerous papers published internationally in the areas of Power Quality, Superconductive Magnetic Energy Storage, SMES role in Power Systems, Power System **Blackout** Analysis, and Intelligent Load Shedding Techniques for preventing Power System Blackouts, **HV Substation Automation** and Power System Stability.



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, 21st of December 2025

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Overview of Custody Transfer Definition & Importance of Custody Transfer • Role in Marine Transportation • Regulatory Frameworks & Standards • Key Stakeholders in Custody Transfer
0930 – 0945	Break
0945 – 1030	Marine Transportation Systems Overview of Marine Transportation for Petroleum • Types of Vessels Used in Custody Transfer • Different Modes of Transportation: Tankers versus Pipelines • Infrastructure Considerations (Ports, Terminals)
1030 – 1130	Key Regulations & Industry Standards International Maritime Organization (IMO) Regulations • API & ISO Standards in Custody Transfer • National Regulations & Compliance (e.g., USCG, Transport Canada) • Industry-Specific Best Practices
1130 – 1230	Measurement Techniques & Systems Flow Meters & Their Applications • Volume & Mass Measurement • Pressure & Temperature Monitoring • Real-Time Data Acquisition Systems
1230 – 1245	Break
1245 – 1330	Documentation & Record Keeping Essential Documents in Custody Transfer • Electronic versus Paper-Based Records • Audit Trails & Regulatory Requirements • Managing Documentation for Transparency
1330 – 1420	Safety & Risk Management in Marine Custody Transfer Safety Protocols During Transfer • Risk Assessments & Hazard Identification • Emergency Response Procedures • Health, Safety & Environmental (HSE) Considerations
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: Monday, 22nd of December 2025

0730 – 0830	Flow Metering Technologies Types of Flow Meters (e.g., Turbine, Ultrasonic, Magnetic) • Installation & Calibration • Performance Testing & Validation • Troubleshooting & Error Handling
0830 – 0930	Volume Measurement Systems Calculation of Volume During Marine Transfer • Using Temperature & Pressure for Volume Correction • Volume Compensation for Different Conditions • Calibration of Volume Measurement Systems
0930 – 0945	Break
0945 – 1045	Mass Measurement Systems Methods for Determining Mass of Petroleum • Use of Density Meters • Importance of Accurate Density Measurements • Mass Flow Controllers in Marine Transportation



1045 – 1200	Custody Transfer Equipment Pumps, Hoses & Valves Used in Custody Transfer • Equipment Maintenance & Calibration • Safety Features of Custody Transfer Systems • Technological Advancements in Custody Transfer Equipment
1200 – 1215	Break
1215 – 1330	Automation in Custody Transfer Role of Automation in Marine Operations • Data Collection & Processing Systems • Automated Control Systems for Accurate Transfer • Benefits & Challenges of Automation
1330 – 1420	Inspection & Certification of Equipment Inspection Schedules & Certification Bodies • Role of Third-Party Inspectors • Understanding Certificates of Calibration • Legal Implications of Improper Certifications
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: Tuesday, 23rd of December 2025

0730 – 0830	Pre-Transfer Preparations Planning & Coordination for Custody Transfer • Crew & Equipment Readiness • Communication Protocols Between Parties • Verifying Transfer Documentation
0830 – 0930	Transfer Procedures & Best Practices Step-by-Step Guide to the Transfer Process • Key Personnel Involved During the Operation • Monitoring the Transfer & Ensuring Accuracy • Troubleshooting Common Issues During Transfer
0930 – 0945	Break
0945 – 1130	Volume & Mass Transfer Calculations Determining Total Quantity Transferred • Using Flow Rates, Pressure & Temperature for Calculations • Impact of Environmental Factors on Measurements • Methods to Ensure Measurement Accuracy During Transfer
1130 – 1230	Marine Loading & Unloading Operations Processes Involved in Loading Petroleum onto Ships • Procedures for Unloading at the Receiving Terminal • Safety Considerations During Loading & Unloading • Understanding Custody Transfer During the Full Cycle
1230 – 1245	Break
1245 – 1330	Quality Control in Custody Transfer Ensuring Product Quality During Marine Transportation • Role of Sampling & Testing • Managing Contamination Risks • Addressing Disputes Over Quality During Transfer
1330 – 1420	Post-Transfer Documentation & Reporting Recording & Verifying the Final Quantities • Reporting & Communication with Stakeholders • Handling Discrepancies in Reported Quantities • Auditing & Inspection of Post-Transfer Documents
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: Wednesday, 24th of December 2025

0730 – 0930	Dispute Resolution in Custody Transfer <i>Common Causes of Disputes (e.g., Measurement Discrepancies) • Protocols for Resolving Disputes • Role of Third-Party Mediators & Inspectors • Case Studies of Resolved Disputes</i>
0930 - 0945	Break
0945 – 1130	Legal & Contractual Aspects <i>Understanding Contractual Obligations • Role of Legal Documentation in Custody Transfer • Dispute Clauses in Marine Transfer Contracts • Handling Breach of Contract Situations</i>
1130 - 1230	Handling Measurement Discrepancies <i>Identifying Causes of Measurement Discrepancies • Methods to Prevent & Correct Errors • The Role of Calibration in Minimizing Discrepancies • Handling Disagreements Over Measurement Results</i>
1230 - 1245	Break
1245 - 1420	Challenges in Custody Transfer Operations <i>Impact of Weather & Environmental Conditions • Challenges Related to Infrastructure & Equipment • Human Error & Its Role in Transfer Accuracy • Technological Limitations in Current Systems</i>
1420 – 1430	Recap <i>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</i>
1430	Lunch & End of Day Four

Day 5: Thursday, 25th of December 2025

0730 – 0930	Technology & Innovation in Custody Transfer <i>Latest Innovations in Custody Transfer Technologies • The Role of AI & Machine Learning in Improving Operations • Future Trends in Marine Transportation Systems • Enhancing Automation for Better Accuracy & Efficiency</i>
0930 - 0945	Break
0945 – 1100	Best Practices & Continuous Improvement <i>Importance of Regular Reviews & Improvements • Developing a Culture of Safety & Efficiency • Training & Development for Operational Staff • Future of Marine Custody Transfer Operations</i>
1100 – 1200	Case Study on Custody Transfer Disputes <i>Review of Real-World Case Studies • Analysis of Disputes & Resolutions • Lessons Learned from Past Challenges • Best Practices Drawn from Industry Examples</i>
1200 - 1215	Break
1215 – 1345	Simulation & Role-Play Exercise <i>Interactive Simulation of Custody Transfer Scenarios • Hands-on Experience in Handling Typical Transfer Operations • Participants Role-Playing Different Positions in the Transfer • Reviewing & Assessing the Simulation Outcomes</i>
1345 – 1400	Course Conclusion <i>Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course</i>
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 one of our state-of-the-art simulators “Allen Bradley SLC 500”, “AB Micrologix 1000 (Digital or Analog)”, “AB SLC5/03”, “AB WS5610 PLC”, “Siemens S7-1200”, “Siemens S7-400”, “Siemens SIMATIC S7-300”, “Siemens S7-200”, “GE Fanuc Series 90-30 PLC”, “Siemens SIMATIC Step 7 Professional Software” and “PLCLogix 5000 Software”.



Allen Bradley SLC 500 Simulator



Allen Bradley Micrologix 1000 Simulator (Digital)



Allen Bradley Micrologix 1000 Simulator (Analog)



Allen Bradley SLC 5/03



Allen Bradley WS5610 PLC Simulator PLC5



Siemens S7-1200 Simulator



Siemens S7-400 Simulator



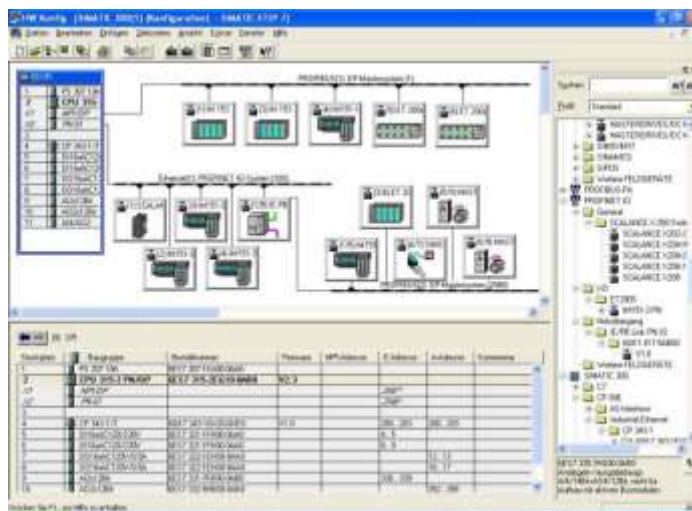
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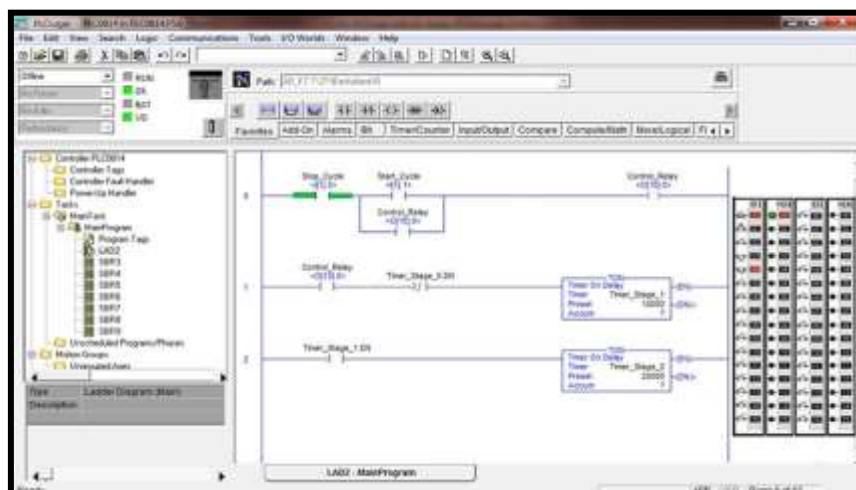
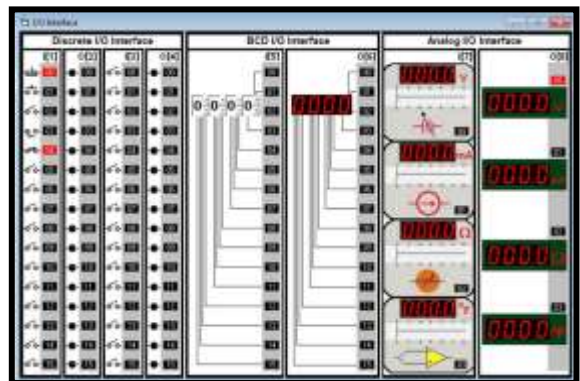
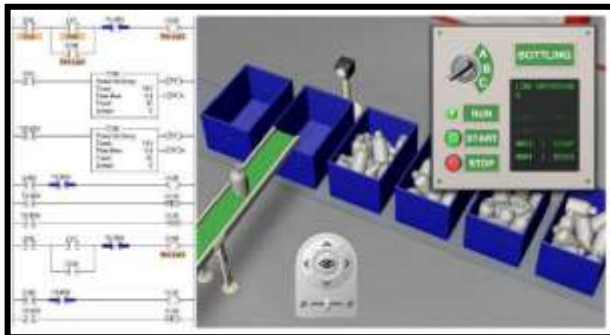
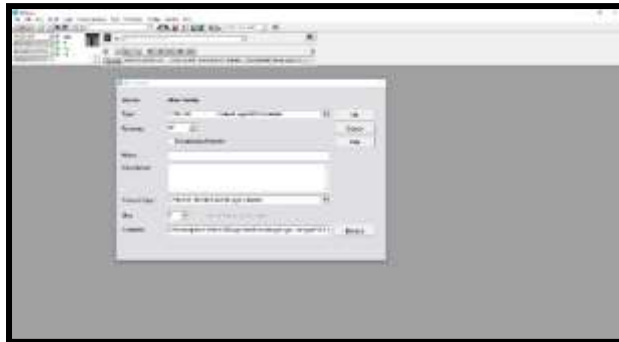
Siemens S7-200 Simulator



GE Fanuc Series 90-30 PLC Simulator



Siemens SIMATIC Step 7 Professional Software



PLCLogix 5000 Software

Course Coordinator

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