

**COURSE OVERVIEW PE0348(KP4)**  
**Hydro-Treating Technology**

**Course Title**

Hydro-Treating Technology

**Course Date/Venue**

February 25-29, 2024/Karatas Meeting Room,  
 Crowne Plaza Istanbul-Harbiye, an IHG Hotel,  
 Istanbul, Turkey

**Course Reference**

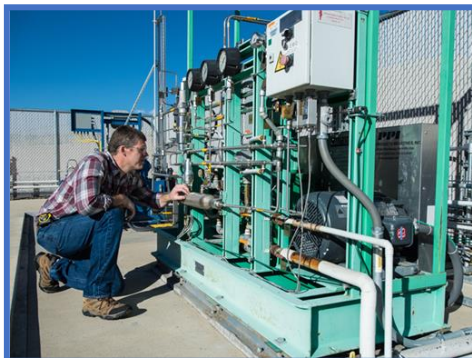
PE0348(KP4)

**Course Duration/Credits**

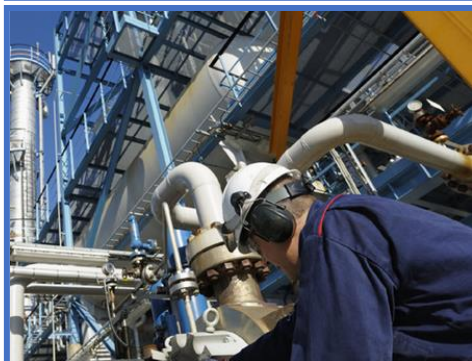
Five days/3.0 CEUs/30 PDHs



**Course Description**



***This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.***



This course is designed to provide participants with a detailed and up-to-date overview of hydro-treating technology. It covers the performance of the large panel of the existing hydro-treatment process in the refining industry; the hydro-treatment units and hydrogen balance; the potential disturbances and their remedies; the impurities content in the petroleum cuts and products; the various treatments with hydrogen and integration in the refining scheme; and the characteristics of chemical reactions and catalysts for hydropurification and for hydrogenation.



During this interactive course, participants will learn the loading of the catalyst and the internals in the reactor; the presulfiding procedures; the operating conditions and compositions of the main streams; the significance of the operating variables and their influence on the process; and the advanced process control, optimization process and management of the hydrogen network in refinery.

### Course Objectives

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

- Apply and gain an in-depth knowledge and skills on hydro-treating technology
- Discuss the performance of the large panel of the existing hydro-treatment process in the refining industry
- Operate hydro-treatment units and manage hydrogen balance
- Identify the potential disturbances and their remedies as well as the impurities content in the petroleum cuts and products
- Illustrate various treatments with hydrogen and integration in the refining scheme
- Enumerate the characteristics of chemical reactions and catalysts for hydropurification and for hydrogenation
- Perform loading of the catalyst and recognize the internals in the reactor
- Carryout presulfiding procedures as well as identify operating conditions and compositions of the main streams
- Define the significance of the operating variables and their influence on the process
- Employ advanced process control, optimization process and management of the hydrogen network in refinery

### Who Should Attend

This course provides an overview of all significant aspects and considerations of hydro-treating technology for process supervisors and other process, instrument and mechanical 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 Fee


**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.

### 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.

### Accommodation

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

### 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: Sunday, 25<sup>th</sup> of February 2024**

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	<b>PRE-TEST</b>
0830 – 0930	<b>Comprehensive Understanding of the Aim and the Performance of the Large Panel of the Existing Hydro-treatment Process in the Refining Industry</b>
0930 – 0945	Break
0945 – 1100	<b>Knowledge of the Operation of the Hydro-treatment Units and the Management of the Hydrogen Balance</b>
1100 – 1230	<b>Understanding of the Potential Disturbances and their Remedies</b>
1230 – 1245	Break
1245 – 1420	<b>Impurities Content in the Petroleum Cuts and Products</b> Impacts on the Health, the Environment and on the other Refining Processes • Highly Refractory Compounds
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day One

#### **Day 2: Monday, 26<sup>th</sup> of February 2024**

0730 – 0930	<b>Aim of the Various Treatments with Hydrogen and Integration in the Refining Scheme</b> Hydropurifications of Straight Run Cuts • Stabilization or Saturation of Cracked Cuts
0930 – 0945	Break
0945 – 1100	<b>Characteristics of the Chemical Reactions</b> Thermodynamic and Kinetic Aspects • Consequences on the Operation of the Units • Side Reactions and Optimum Operating Conditions to Deplete their Evolution • Special Features of Reversion Reactions
1100 – 1230	<b>Characteristics of the Catalysts for Hydropurification and for Hydrogenation</b> Effects of Molybdenum • Cobalt and Nickel Importance of the Substrate
1230 – 1245	Break
1245 – 1420	<b>Characteristics of the Catalysts for Hydropurification and for Hydrogenation (cont'd)</b> Criteria for the Best Choice Facing a Hydrotreatment Problem • Top Gradings
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Two

#### **Day 3: Tuesday, 27<sup>th</sup> of February 2024**

0730 – 0930	<b>Loading of the Catalyst</b>
0930 – 0945	Break

0945 – 1100	<b>Internals in the Reactor</b>
1100 – 1215	<b>Presulfiding Procedures</b> Role
1215 – 1230	Break
1230 – 1420	<b>Presulfiding Procedures (cont'd)</b> Steps and Details of the Different Methods
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Three

**Day 4: Wednesday, 28<sup>th</sup> of February 2024**

0730 – 0930	<b>Operating Conditions and Compositions of the Main Streams</b> Mass Balance and Yields
0930 – 0945	Break
0945 – 1100	<b>Operating Conditions and Compositions of the Main Streams (cont'd)</b> Sulfur Balance
1100 – 1215	<b>Operating Conditions and Compositions of the Main Streams (cont'd)</b> Hydrogen Balance
1215 – 1230	Break
1230 – 1420	<b>Operating Conditions and Compositions of the Main Streams (cont'd)</b> Consumption
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Four

**Day 5: Thursday, 29<sup>th</sup> of February 2024**

0730 – 0930	<b>Definition, Significance of the Operating Variables and their Influence on the Process</b> Mean Temperatures and Profile • Pressures • Partial Pressure of Hydrogen • Recycle Rate
0930 – 0945	Break
0945 – 1100	<b>Definition, Significance of the Operating Variables and their Influence on the Process (cont'd)</b> Quench Ratio • Feed Flow Rate • Space Velocity
1100 – 1215	<b>Advanced Process Control and Optimization of the Process</b>
1215 – 1230	Break
1230 – 1345	<b>Management of the Hydrogen Network in the Refinery</b> Effect of Feed Composition and Origin
1345 – 1400	<b>Course Conclusion</b>
1400 – 1415	<b>POST-TEST</b>
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course

### **Practical Sessions**

This practical and highly-interactive course includes real-life case studies and exercises:-



### **Course Coordinator**

Mari Nakintu, Tel: +971 2 30 91 714, Email: [mari1@haward.org](mailto:mari1@haward.org)