

**COURSE OVERVIEW PE0987**  
**De-Sulfurization Technology**

**Course Title**

De-Sulfurization Technology

**Course Date/Venue**

Please see page 3

**Course Reference**

PE0987

**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.***



Atmospheric residue desulfurization (ARDS) process is extensively used in upgrading of heavy petroleum oils and residues to more valuable clean environmentally friendly transportation fuels and to partially convert the residues to produce low-sulfur fuel oil and hydrotreated feedstocks. Graded catalyst systems in multiple reactors are used in the process in order to achieve hydrodesulfurization (HDS), hydrodemetallization (HDM), hydrodenitrogenation (HDN), and conversion of residues to distillates at desired levels. The characteristics of the feedstocks processed in different reactors are significantly different. The quality of the feed entering the second reactor is strongly dependent on the operating severity in the first reactor and can have an important impact on the performance of the catalysts in the following reactor with regard to various conversions and deactivation rate.



Atmospheric Residue Desulfurization (ARDS) is a well-established hydro treating process, operated primarily to desulfurize atmospheric residues from Crude units and to prepare feed stocks for downstream conversion units like Hydrocrackers and Delayed Coker units. The product, desulfurized residue, is not only low in sulfur but has improved pour points and lower viscosities as well.

This course is designed to provide participants with a detailed and up-to-date overview of atmospheric residue desulfurization unit. It covers the hydrotreating chemistry, thermodynamics, hydrodesulfurization, hydrodenitrogenation and hydrodeasphalting; the aromatic hydrogenation, the effects of feedstock and non-catalytic residue upgrading processes; the solvent deasphalting and correlations for solvent deasphalting; the thermal process, catalysis, catalysts supports, catalytic processes and residue-fluidized catalytic cracking; the hydroprocessing, fixed bed process, moving bed process, ebullated bed process and slurry bed process; and the aquaconversion, HDM catalysis and catalysts deactivation.

During this interactive course, participants will learn to employ catalyst regeneration, metals recovery and the transportation fuels from the bottom of the barrel of Chevron lummus global RDS/VRDS hydrotreating; apply selective hydrogen processes, UOP unionfining technology, UOP RCD unionfining process and catalytic dewaxing processes; identify the UOP unisar process for saturation of aromatics; apply start-up and shutdown, isocracking-hydrocracking for superior fuels and lubes and UOP unicracking process for hydrocracking; recycle H<sub>2</sub> purification process and hydrocracking consumption; and carryout H<sub>2</sub>S removal, reactor internals and FCC FEED hydrotreating.

### **Course Objectives**

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

- Apply and gain an in-depth knowledge on de-sulfurization technology
- Discuss hydrotreating chemistry, thermodynamics, hydrodesulfurization, hydrodenitrogenation and hydrodeasphalting
- Identify aromatic hydrogenation, the effects of feedstock and non-catalytic residue upgrading processes
- Recognize solvent deasphalting and correlations for solvent deasphalting
- Illustrate thermal process, catalysis, catalysts supports, catalytic processes and residue-fluidized catalytic cracking
- Carryout hydroprocessing, fixed bed process, moving bed process, ebullated bed process and slurry bed process
- Apply aquaconversion, HDM catalysis and catalysts deactivation
- Employ catalyst regeneration, metals recovery and the transportation fuels from the bottom of the barrel of Chevron lummus global RDS/VRDS hydrotreating
- Apply selective hydrogen processes, UOP unionfining technology, UOP RCD unionfining process and catalytic dewaxing processes
- Identify UOP unisar process for saturation of aromatics
- Describe Chervon lummus global ebullated bed bottom -of-the barrel hydroconversion (LC-finining) process
- Employ start-up and shutdown, isocracking-hydrocracking for superior fuels and lubes and UOP unicracking process for hydrocracking
- Recycle H<sub>2</sub> purification process and hydrocracking consumption
- Carryout H<sub>2</sub>S removal, reactor internals and FCC FEED hydrotreating

**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 desulfurization technology for engineers.

**Course Date/Venue**

Session(s)	Date	Venue
1	April 27-May 01, 2026	Salon Expo, NH Hotel Plaza de Armas, Seville, Spain
2	June 15-19, 2026	Ruben Boardroom, The Rubens at The Palace, Buckingham Palace Road, London, United Kingdom
3	August 23-27, 2026	Meeting Plus 9, City Centre Rotana, Doha, Qatar
4	September 20-24, 2026	Meeting Room 4, Four Seasons Hotel Cairo at Nile Plaza, Corniche El Nil, Garden City, Cairo, Egypt
5	October 18-22, 2026	Pierre Lotti Meeting Room, Movenpick Hotel Istanbul Golden Horn, Istanbul, Turkey
6	December 20-24, 2026	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
7	January 11-15, 2027	Salon Expo, NH Hotel Plaza de Armas, Seville, Spain
8	January 31-February 04, 2027	Meeting Plus 9, City Centre Rotana, Doha, Qatar
9	February 08-12, 2027	Ruben Boardroom, The Rubens at The Palace, Buckingham Palace Road, London, United Kingdom
10	March 14-18, 2027	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE

**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:

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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**. 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.

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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.

### 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. Henry Beer** is a **Senior Process Engineer** with over **35 years** of indepth industrial experience within the **Petrochemical, Oil & Gas** industries specializing in **Hydrocarbon Process Equipment, DOX Unit Operation & Troubleshooting, Polyethylene & Polypropylene Processing, Oil Movement Storage & Troubleshooting, Power Plant Chemistry, Fuel Quality Monitoring System Fundamentals, Liquid Bulk Cargo Handling, Oil Refinery Cost Management, Flare & Blowdown Operation, Pressure Relief Systems Maintenance & Troubleshooting, Refinery SRU, Tail Gas Treating, Sour Water & Amine Recovery Units, Propylene Compressor and Turbine, Clean Fuel Technology & Standards, Principles of Operations Planning, Heat Exchangers & Fired Heaters Operation & Troubleshooting, Plastic Extrusion Technology Operation & Troubleshooting, Chemical Engineering for Non-Chemical Engineers, Process Plant Troubleshooting, Process Plant Optimization Technology, Engineering Problem Solving, Process Plant Performance & Efficiency, Process Plant Start-up & Shutdown, Process Plant Commissioning, Process Plant Turn-around & Shutdown, Pumps & Compressors Troubleshooting, Fired Heaters & Air Coolers Maintenance, Pressure Vessels & Valves Repair, Polymers, Plastics, Polyolefin & Catalysts, Polymerization, Thermal Analysis Techniques, Rheology, Thermoplastics, Thermosets, Coating Systems and Fibre Reinforced Polymer Matrix Composites**. Further, he is also well-versed in **Water Hydraulic Modelling, Efficient Shutdowns, Turnaround & Outages, Pump Selection and Installation, Operation and Maintenance of Pumps, Demand & Supply Management, Catalyst Manufacturing Techniques, Fuel Systems Management, Aviation Fuel, Diesel, Jet Fuel, Petrol and IP Octane, Cetane Control and related Logistics, Road, Rail and Pipeline Distribution, Process Design and Optimisation, Boiler Feed Water Preparation, Flocculation Sedimentation, Hot Lime Water Softening Processes, Desalination Processes, Reverse Osmosis, Molecular Sieves, activated Sludge Aerobic/Anaerobic, Sludge Removal and Incineration Process Control, Domestic Sewage Plants Optimisation, Process Cooling Water System, High Pressure and Low Pressure Tank Farm Management, Hydrocarbon and Chemical products and GTL (Gas to Liquids)**.

During his career life, Mr. Beer holds significant key positions such as the **Director, Global Commissioning Manager, Process Engineering Manager, Senior Business Analyst, Process Engineer, Chemical Engineer, Senior Technician, Technical Sales Engineer, Entrepreneur, Financial Consultant, Business Analyst, Business Financial Planner and Independent Financial Planner** to various international companies such as the **Sasol, SASOLChem, TAG Solvents, Virgin Solvent Products, SARS & SAPIA (South African Petroleum Industry Association)** and **RFS Financial Servi**

### Course Fee

Doha	<b>US\$ 6,000</b> per Delegate. This rate includes H-STK <sup>®</sup> (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Istanbul	<b>US\$ 6,000</b> per Delegate + <b>VAT</b> . This rate includes H-STK <sup>®</sup> (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	<b>US\$ 5,500</b> per Delegate + <b>VAT</b> . This rate includes H-STK <sup>®</sup> (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
London	<b>US\$ 8,800</b> per Delegate + <b>VAT</b> . This rate includes H-STK <sup>®</sup> (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Seville	<b>US\$ 8,800</b> per Delegate + <b>VAT</b> . This rate includes H-STK <sup>®</sup> (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Cairo	<b>US\$ 5,500</b> per Delegate + <b>VAT</b> . This rate includes H-STK <sup>®</sup> (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

### 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 &amp; Coffee</i>
0800 – 0815	<i>Welcome &amp; Introduction</i>
0815 – 0830	<b>PRE-TEST</b>
0830 – 0900	<i>Introduction to Atmospheric Residue Desulfurization Unit (ARDS)</i>
0900 – 0930	<i>Hydrotreating Chemistry</i>
0930 – 0945	<i>Break</i>
0945 – 1045	<i>Thermodynamics</i>
1045 – 1130	<i>Hydrodesulfurization</i>
1130 – 1200	<i>Hydrodenitrogenation</i>
1200 – 1245	<i>Hydrodeasphalting</i>
1245 – 1300	<i>Break</i>
1300 – 1330	<i>Aromatic Hydrogenation</i>
1330 – 1420	<i>Feedstock Effects</i>
1420 – 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day One</i>

#### **Day 2**

0730 – 0830	<i>Non-Catalytic Residue Upgrading Processes</i>
0830 – 0930	<i>Solvent Deasphalting</i>
0930 – 0945	<i>Break</i>



0945 – 1030	<b>Correlations for Solvent Deasphalting</b>
1030 - 1100	<b>Thermal Processes</b>
1100 – 1130	<b>Catalysis</b>
1130 - 1215	<b>Catalyst Supports</b>
1215 – 1230	<i>Break</i>
1230 – 1330	<b>Catalytic Processes</b>
1330 - 1420	<b>Residue-Fluidized Catalytic Cracking</b>
1420 – 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day Two</i>

**Day 3**

0730 – 0830	<b>Hydroprocessing</b>
0830 - 0930	<b>Fixed Bed Process</b>
0930 – 0945	<i>Break</i>
0945 – 1030	<b>Moving Bed Process</b>
1030 - 1100	<b>Ebullated Bed Process</b>
1100 – 1130	<b>Slurry Bed Process</b>
1130 - 1215	<b>Aquaconversion</b>
1215 – 1230	<i>Break</i>
1230 – 1315	<b>HDM Catalysis</b>
1315 - 1420	<b>Catalysts Deactivation</b>
1420 – 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day Three</i>

**Day 4**

0730 – 0800	<b>Catalyst Regeneration &amp; Metals Recovery</b>
0800 - 0900	<b>Chevron Lummus Global RDS/VRDS Hydrotreating – Transportation Fuels from the Bottom of the Barrel</b>
0900 – 0915	<i>Break</i>
0915 – 1000	<b>Selective Hydrogen Processes</b>
1000 - 1030	<b>UOP Unionfining Technology</b>
1030 – 1115	<b>UOP RCD Unionfining Process</b>
1115 - 1200	<b>UOP Catalytic Dewaxing Process</b>
1200 – 1215	<i>Break</i>
1215 – 1315	<b>UOP Unisar Process for Saturation of Aromatics</b>
1315 - 1420	<b>Chervon Lummus Global Ebullated Bed Bottom-of-the-Barrel Hydroconversion (LC-Fining) Process</b>
1420 – 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day Four</i>

**Day 5**

0730 – 0830	<b>Start-up &amp; Shutdown</b>
0830 - 0930	<b>Isocracking-Hydrocracking for Superior Fuels &amp; Lubes</b>
0930 – 0945	<i>Break</i>
0945 – 1015	<b>UOP Unicracking Process for Hydrocracking</b>
1015 - 1045	<b>Recycle H<sub>2</sub> Purification Processes</b>
1045 - 1115	<b>Hydrogen Consumption</b>
1115 – 1200	<b>H<sub>2</sub>s Removal</b>
1200 – 1215	<i>Break</i>

1215 - 1300	<i>Reactor Internals</i>
1300 - 1330	<i>FCC FEED Hydrotreating</i>
1330 - 1400	<i>Course Conclusion</i>
1400 - 1415	<i>POST-TEST</i>
1415 - 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch &amp; End of Course</i>

**Practical Sessions**

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



**Course Coordinator**

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