

**COURSE OVERVIEW PE0095**  
**Catalyst Material Handling**

*Loading, Unloading, Oxidation, Reduction & Techniques*

**Course Title**

Catalyst Material Handling: *Loading, Unloading, Oxidation, Reduction & Techniques*

**Course Reference**

PE0095

**Course Duration/Credits**

Five days/3.0 CEUs/30 PDHS

**Course Date/Venue**

Session(s)	Date	Venue
1	October 13-17, 2024	Horus Meeting Room, Holiday Inn & Suites Maadi, Cairo, Egypt
2	December 15-19, 2024	
3	February 16-20, 2025	



**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 on catalyst material handling, loading, unloading, oxidation, reduction and technique. It covers the preparation of catalyst change plan; executing the catalyst project efficiently and safely; the catalyst change operation main requirement; the work in inert and toxic atmospheres plus hot and hostile environments; the reactor cooling utilizing a proprietary liquid nitrogen system; the unloading and loading of catalyst under inert or normal atmospheres; the dense phase loading systems; and the innovative, purpose built-equipment ensuring low catalyst attrition rate.

Further, the course also covers the catalyst sampling and particle measurement; the vacuum unloading with closed loop nitrogen re-circulation; the catalyst transportation, storage & containment (un approved); the tubular reformer loadings using unidense® loading and conventional techniques; the pre-sulphiding (DMDS injection); the metals reclamation and disposal of materials; the shutdown planning, coordination and execution; the edge equipment; the modifications for catalytic reactors, vessels on a blinds to blinds' basis; and the confined space and inert/toxic entry operations.

During this interactive course, participants will learn the unloading of catalyst under inert/toxic atmosphere; the screening of catalyst under continuous nitrogen purging; the loading by conventional and licensed loading technologies; the HSE requirement; the environment requirement; the catalyst change/replacement report; and the catalyst change learned lessons and case studies.

### **Course Objectives**

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

- Apply systematic techniques in handling, loading, unloading, oxidation and reduction of catalyst material handling
- Prepare catalyst change plan and execute catalyst projects efficiently and safety with minimal delays from fusing, minimal catalyst attrition and dust control systems
- Identify catalyst change operation main requirement including pre-commissioning of reactors and vessels
- Determine work in inert and toxic atmospheres in hot and hostile environments as well as reactor cooling utilizing a proprietary liquid nitrogen system
- Unload and load catalyst under inert or normal atmospheres and dense phase loading systems
- Use dense phase loading system in transferring catalyst directly from grade to reactor man way without using cranes and hoppers
- Describe innovative and purpose build-equipment ensuring low catalyst attrition rate and perform catalyst sampling and particle measurement
- Employ vacuum unloading with closed loop nitrogen re-circulation and catalyst transportation, storage and containment
- Use tubular reformer loadings using unidense loading and conventional techniques
- Perform pre-sulphiding, metals reclamation, disposal of materials, shutdown planning, coordination and execution
- Describe edge equipment, modification for catalyst reactors, vessels on a blinds to blinds basis, confined space and inert toxic entry operations
- Unload catalyst under inert/toxic atmosphere, screen catalyst under continuous nitrogen purging and apply loading by convention and licensed loading technologies
- Enumerate HSE requirement, environment requirement, catalyst change/replacement report and lesson learned

### **Who Should Attend**

This course covers systematic techniques of catalyst material handling for those who are involved in loading, unloading, oxidation and reduction. This includes refinery, chemicals and petrochemical engineers, supervisors and operations staff.

### 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: -

-  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.

-  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. Mohammad Hamami**, is a **Senior Process Engineer** with an extensive practical experience within the **Oil, Gas, Refinery, Petrochemical** and **Power** industries. His experience covers **Clean Fuel Technology & Standards, Clean Fuel Specification, Emission Regulation, Crude Oil Production, Desulphurization, Synthesis Gas Production, Naphtha Isomerization, Diesel Fuel Additives, Storage Tanks Filtration, Fuel Quality Inspection, Process Plant Troubleshooting & Engineering Problem Solving, Process Equipment Operation, Process Plant Operation, Process Plant Start-up & Commissioning, Process Plant Optimization, Oil & Gas Field Operation, Oil Movement, Storage & Troubleshooting, Petroleum Refinery Process, Process Reactor Operation & Troubleshooting, LPG Oil & Gas Operation & Troubleshooting, Crude Oil & LNG Storage, LNG & LPG Plants Gas Processing, Refinery Process Operations Technology, Liquid Bulk Cargo Handling, Gas Conditioning & Processing Technology, Distillation Column Design & Operation and Gasoline & Diesel Fuel Technology**. Further he is also well-versed in **Refinery Operational Economics & Profitability, Aromatics Manufacturing Process, Hydrogen Production Operation, Steam Reforming Technology, Gas Treating, Hydro-treating & Hydro-Cracking, Catalyst Material Handling, Gas Sweetening & Sulfur Recovery, Hydro Carbon Dew Point (HCDP) Control, Heat Exchangers & Fired Heaters, Amine Gas Sweetening, Plastic Additives Selection & Application, Crude & Vacuum Process Technology, Flare & Pressure Relief Systems, Stock Management & Tank Dipping Calculation, NGL Recovery & Fractionation, Refrigerant & NGL Extraction and Catalytic Cracking & Reforming**.

During his long professional career, Mr. Mohammad worked as a **Refinery Manager, Operations Manager, Section Head/Superintendent** and **Process Engineer for Process Units, Utilities & Oil Movement** in various companies. He has been responsible for a number of **technological-driven world-scale hydrocarbon processing projects from beginning to successful start-up**.

Mr. Mohammad has a **Bachelor's degree in Chemical Engineering**. He is an **active member** of the **American Institute of Chemical Engineers (AIChE)** and has presented **technical papers** at its **several national meetings**. He has largely participated in the **start-up of seven world-scale process plants** which made him an **International Expert in Process Plant Start-Up and Oil Movement** and a **Certified Instructor/Trainer**.

### 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.

### **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 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	<b><i>Preparing Catalyst Change Plan</i></b>
0900 – 0915	<i>Break</i>
0915 – 1030	<b><i>Execute Catalyst Project Efficiently &amp; Safely</i></b> <i>Minimal Delays from Fusing • Minimal Catalyst Attrition • Dust Control Systems</i>
1030 – 1200	<b><i>Catalyst Change Operation Main Requirement</i></b> <i>Pre-Commissioning of Reactors &amp; Vessels</i>
1200 – 1215	<i>Break</i>
1215 – 1330	<b><i>Work in Inert &amp; Toxic Atmospheres Plus Hot &amp; Hostile Environments</i></b>
1330 – 1420	<b><i>Case Study &amp; Related Video</i></b>
1420 – 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day One</i>

#### **Day 2**

0730 – 0900	<b><i>Reactor Cooling Utilizing a Proprietary Liquid Nitrogen System</i></b>
0900 – 0915	<i>Break</i>
0915 – 1030	<b><i>Unloading &amp; Loading of Catalyst Under Inert or Normal Atmospheres</i></b>
1030 – 1200	<b><i>Dense Phase Loading Systems</i></b> <i>Transfer of Catalyst Directly from Grade to Reactor Man Way, Without the Use of Cranes &amp; Hoppers</i>
1200 – 1215	<i>Break</i>
1215 – 1330	<b><i>Innovative, Purpose Built-Equipment Ensuring Low Catalyst Attrition Rate</i></b>
1330 – 1420	<b><i>Case Studies &amp; Related Video</i></b>
1420 – 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day Two</i>

### Day 3

0730 – 0900	<b>Catalyst Sampling &amp; Particle Measurement</b>
0900 – 0915	Break
0915 – 1000	<b>Vacuum Unloading with Closed Loop Nitrogen Re-Circulation</b>
1000 – 1100	<b>Catalyst Transportation, Storage &amp; Containment (UN approved)</b> Catalyst Loading of Reactors Using UOP® Dense Loading & Conventional Techniques
1100 – 1200	<b>Tubular Reformer Loadings using Unidense® Loading &amp; Conventional Techniques</b>
1200 – 1215	Break
1215 – 1330	<b>Pre-Sulphiding (DMDS Injection)</b>
1330 – 1420	<b>Case Studies &amp; Related Video</b>
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Three

### Day 4

0730 – 0900	<b>Metals Reclamation &amp; Disposal of Materials</b>
0900 – 0915	Break
0915 – 1000	<b>Shutdown Planning, Coordination &amp; Execution</b>
1000 – 1100	<b>Edge Equipment</b> Life Support Systems • Vacuum Unloading • Screening Equipment • Modular Equipment
1100 – 1200	<b>Modifications for Catalytic Reactors, Vessels Etc. on a Blinds to Blinds' Basis</b>
1200 – 1215	Break
1215 – 1330	<b>Confined Space &amp; Inert/Toxic Entry Operations</b>
1330 – 1420	<b>Case Studies &amp; Related Video</b>
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Four

### Day 5

0730 – 0900	<b>Unloading of Catalyst Under Inert/Toxic Atmosphere</b>
0900 – 0915	Break
0915 – 1000	<b>Screening of Catalyst Under Continuous Nitrogen Purging Loading by Conventional &amp; Licensed Loading Technologies</b>
1000 – 1100	<b>HSE Requirement</b>
1100 – 1200	<b>Environment Requirement</b> <b>Catalyst Change/Replacement Report</b>
1200 – 1215	Break
1215 – 1345	<b>Catalyst Change Learned Lessons</b>
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 the following real-life case studies:-



**Course Coordinator**

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