



COURSE OVERVIEW PE1067 Delayed Coker Technology Bechtel

Course Title

Delayed Coker Technology Bechtel

Course Date/Venue

December 07-11, 2025/Tamra Meeting Room, Al Bandar Rotana - Creek, Dubai, UAE

Course Reference

PE1067

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



Course Description



This practical and highly-interactive course includes real-life case studies 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 Delayed Coker Technology Bechtel. It covers the purpose and advantages of delayed coking, feedstock types and yield expectations; the role of dockers in refinery configuration, integration with vacuum distillation unit (VDU), product blending and downstream units; the feedstock characteristics, coking chemistry and reaction mechanisms and delayed coker unit (DCU) process flow diagram (PFD); and the types of coking processes and technologies, coke drums and heater design and operation.



Further, the course will also discuss the fractionator tower design and performance, blowdown, quenching systems, decoking and cutting systems; the instrumentation and control systems, startup and shutdown procedures and coking cycle management; and the common operational challenges, health, safety and environmental concerns and troubleshooting scenarios.



During this interactive course, participants will learn the emergency response procedures, Bechtel design best practices and energy efficiency improvement; the distillate recovery, minimizing gas and coke make, online yield estimation methods and role of antifoam and feed pre-treatment; the coke quality and handling, advanced monitoring and control, mechanical integrity and reliability; the common bottlenecks and solutions, adding drums or upgrading heaters, automation and control system upgrades; and the cost-benefit analysis of revamps.

Course Objectives

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

- Apply and gain an in-depth knowledge on delayed coker technology Bechtel
- Discuss the purpose and advantages of delayed coking, feedstock types and yield expectations
- Identify the role of docker in refinery configuration, integration with vacuum distillation unit (VDU), product blending and downstream units
- Recognize feedstock characteristics, coking chemistry and reaction mechanisms and delayed coker unit (DCU) process flow diagram (PFD)
- Identify the types of coking processes and technologies, coke drums and heater design and operation
- Discuss fractionator tower design and performance, blowdown, quenching systems, decoking and cutting systems
- Recognize instrumentation and control systems and apply startup and shutdown procedures and coking cycle management
- Explain common operational challenges, health, safety and environmental concerns and troubleshooting scenarios
- Carryout emergency response procedures, Bechtel design best practices and energy efficiency improvement
- Maximize distillate recovery, minimize gas and coke make, apply online yield estimation methods and identify the role of antifoam and feed pre-treatment
- Employ coke quality and handling, advanced monitoring and control including mechanical integrity and reliability
- Recognize common bottlenecks and solutions, add drums or upgrade heaters, discuss automation and control system upgrades and apply cost-benefit analysis of revamps

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 delayed coker technology Bechtel for process engineers, operations and maintenance personnel operations and maintenance personnel, project engineers and managers, refinery planners and economists, safety and environmental engineers, inspectors and reliability engineers and other technical 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

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.



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. Adel Abdallah is a **Senior Process & Chemical Engineer** with over **20 years** of extensive experience within the **Petrochemical, Refinery and Oil & Gas** industries. His expertise covers **Fundamentals of Process Operations, Crude Oil & Refinery Products, Delayed Coking Technology Bechtel, Refinery Configuration & Integration, Coking Chemistry & Reaction Mechanisms, Coke Drums, Blowdown & Quenching Systems, Decoking & Cutting Systems, Coking Cycle Management, Process Optimization, Sampling & Feed/Product Quality, Process Troubleshooting & Problem Solving, Hydro-Treating Technology, Catalysts, Distillation Column, Process Heaters/Furnaces, Reboilers, Condensers, Piping System and P&ID.** He is also well-versed in **Positive Displacement & Centrifugal Pumps, Compressors, Turbines, Fans, Blowers, Electric Motors, Gears & Transmission Equipment, Heat Exchangers, Valves, Packing & Mechanical Seal, Bearing, Couplings, Alignment, Water & Wastewater Treatment, Steam Boiler, Air Compressors** and **ISO system.**

During Mr. Abdallah's career life, he has handled challenging positions wherein he has acquired his wide technical and practical experience in the field of process & chemical industry such as the **Technical Instructor/Consultant, Senior Chemical Engineer, Chemical Engineer, Process Engineer, Technical Engineer** and **Production Supervisor** for various companies such as the **Jordan Petroleum Refinery, Jordanian Tunisian Chemicals Co., Al-Mas Resin Factory, Tabuk Chemical Fertilizer Factory, UIP-FCEC JV Design and Build Company, Degussa MBT** and **National Chlorine Company** in the Middle East.

Mr. Abdallah has a **Bachelor** degree in **Chemical Engineering** from the **University of Jordan**. Further, he is a **Certified Instructor/Trainer** and delivered various trainings internally in his previous companies.

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.

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 Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the workshop for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: Sunday, 07th of December 2025

0730 – 0800	<i>Registration & Coffee</i>
0800 – 0815	<i>Welcome & Introduction</i>
0815 – 0830	PRE-TEST
0830 – 0930	Introduction to Delayed Coking Technology Bechtel <i>Historical Background & Evolution • Purpose & Advantages of Delayed Coking • Feedstock Types & Yield Expectations • Global Outlook & Bechtel's Project Contributions</i>
0930 – 0945	<i>Break</i>
0945 – 1030	Overview of Refinery Configuration & Integration <i>Role of the Coker in Refinery Configuration • Integration with Vacuum Distillation Unit (VDU) • Product Blending & Downstream Units • Impact on Refinery Economics</i>
1030 – 1130	Feedstock Characteristics <i>Vacuum Resid Properties & Analysis • Metals, Sulfur, Asphaltene Content • Conradson Carbon Residue (CCR) • Feed Quality Impact on Coke & Product Yield</i>
1130 – 1215	Coking Chemistry & Reaction Mechanisms <i>Thermal Cracking Reactions • Coke Formation Mechanisms • Hydrocarbon Phase Changes • Free Radical Reaction Pathways</i>
1215 – 1230	<i>Break</i>
1230 – 1330	Delayed Coker Unit (DCU) Process Flow Diagram (PFD) <i>Major Equipment Blocks & Flow Path • Heater to Coke Drum Sequencing • Fractionator Roles & Internals • Vapor Recovery & Gas Handling</i>
1330 – 1420	Types of Coking Processes & Technologies <i>Bechtel/Conocophillips ThruPlus® Technology • Conventional versus Flexicoking • Shot Coke versus Sponge Coke versus Needle Coke • Slurry Coking & Fluid Coking Overview</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	<i>Lunch & End of Day One</i>



Day 2: Monday, 08th of December 2025

0730 – 0830	Coke Drums Drum Design & Metallurgy • Drum Switching Operations • Thermal Cycles & Stress Analysis • Online versus Offline Inspections
0830 – 0930	Heater Design & Operation Furnace Configuration & Firing Schemes • Coking Tendency & Fouling Control • Coil Outlet Temperature (COT) Management • Shock Heating & Residence Time
0930 – 0945	Break
0945 – 1100	Fractionator Tower Design & Performance Overhead & Wash Sections • Pump-Around Circuits & Quench Zone • Draw Tray Configurations • Antifoam Injection Systems
1100 – 1215	Blowdown & Quenching Systems Vapors & Pressure Control • Quench Water & Steam Introduction • System Isolation & Safety Interlocks • Environmental Compliance
1215 – 1230	Break
1230 – 1330	Decoking & Cutting Systems Hydraulic versus Mechanical Cutting • Top/Bottom Unheading Systems • Coke Pit Operations & Water Handling • Coke Drum Safety Interlocks
1330 – 1420	Instrumentation & Control Systems Key Process Control Parameters • Drum Pressure, Temperature & Level Controls • Safety Shutdown Systems (SIS) • Advanced Process Control (APC) Integration
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, 09th of December 2025

0730 – 0830	Startup & Shutdown Procedures Pre-Start Checks & Lineups • Warm-up & Pressure Ramping • Sequence Logic for Drum Cycles • Safe Shutdown Practices
0830 – 0930	Coking Cycle Management Coking, Quenching, Draining & Decoking Steps • Heat Balance & Cycle Timing • Automation of Switching Valves • Real-Time Drum Performance Monitoring
0930 – 0945	Break
0945 – 1100	Common Operational Challenges Hot Spots & Furnace Fouling • Drum Foaming & Carryover • Pressure Surges & Relief Events • Fractionator Flooding & Entrainment
1100 – 1215	Health, Safety & Environmental Concerns Personnel Exposure to Hydrocarbons & Heat • Steam & Water Blowout Risks • Flaring Minimization Strategies • Handling of Contaminated Water & Solids
1215 – 1230	Break
1230 – 1330	Troubleshooting Scenarios Heater Tube Coking • Poor Coke Quality (Density, Hardness) • Loss of Fractionator Separation • Valve Malfunctions in Switching Operations



1330 – 1420	Emergency Response Procedures Drum Overpressure • Heater Tube Rupture • Blocked Quench or Drain Lines • Fire & Explosion Hazards
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, 10th of December 2025

0730 – 0830	Bechtel Design Best Practices Thruplus® Delayed Coking Process Design • Process Integration with Upstream/Downstream Units • Design for Operability & Maintainability • Modifications & Revamp Strategies
0830 – 0930	Energy Efficiency Improvement Heat Integration with VDU & Preheaters • Furnace Energy Optimization • Steam & Quench System Optimization • Minimizing Pressure Drop & Recirculation Losses
0930 – 0945	Break
0945 – 1100	Product Yield Optimization Maximizing Distillate Recovery • Minimizing Gas & Coke Make • Online Yield Estimation Methods • Role of Antifoam & Feed Pre-Treatment
1100 – 1215	Coke Quality & Handling Properties of Sponge, Needle & Shot Coke • Factors Affecting Coke Morphology • Coke Cutting & Dewatering Optimization • Coke Logistics & Handling Issues
1215 – 1230	Break
1230 – 1330	Advanced Monitoring & Control DCS & SIS System Integration • APC & Optimization Software Tools • Use of AI/ML for Coking Unit Prediction • Predictive Maintenance Tools
1330 – 1420	Mechanical Integrity & Reliability Inspection Intervals & NDT Methods • Refractory Maintenance in Heaters • Drum Bulging & Fatigue Cracking • Valve Reliability & Pressure Sealing
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 Four

Day 5: Thursday, 11th of December 2025

0730 – 0830	Bechtel Project Case Studies Coker Unit Performance Benchmarking • Design-to-Operation Success Stories • Lessons Learned from Global Deployments • Bechtel Design Optimization Outcomes
0830 – 0930	Simulation of Delayed Coking Operations Real-Time Simulation Exercises • Drum Switching Cycle Simulation • Response to Feed & Temperature Variations • Troubleshooting through Simulation
0930 – 0945	Break
0945 – 1030	Process Optimization Workshop Data-Driven Performance Review • Yield & Energy Efficiency Calculations • Process Control Tuning • Scenario-Based Improvement Analysis



1030 – 1215	Interactive Troubleshooting Exercises <i>Group-Based Problem-Solving • Root Cause Analysis • Use of Diagnostic Data from Real Plant Cases • Fault Tree Analysis (FTA)</i>
1215 – 1230	<i>Break</i>
1230 – 1345	Coking Unit Revamp & Debottlenecking <i>Common Bottlenecks & Solutions • Adding Drums or Upgrading Heaters • Automation & Control System Upgrades • Cost-Benefit Analysis of Revamps</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	<i>Presentation of Course Certificates</i>
1430	<i>Lunch & End of Course</i>

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