COURSE OVERVIEW PE0785
Refinery Operational Economics, Planning & Profitability

Course Title
Refinery Operational Economics, Planning & Profitability

Course Date/Venue
November 03-07, 2024/TBA Meeting Room, The H Hotel, Sheikh Zayed Road, Dubai, UAE

Course Reference
PE0785

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 the "MS Excel" applications.

The petroleum refining industry processes crude oil and produces a variety of products that are used in the transportation, residential, commercial, and industrial sectors of the economy.

In 2006, over two thirds of refinery output went to transportation uses, nearly a quarter went to industrial uses, and the remainder was used in residences, commercial activities, and electricity generation. The transportation sector remains the most heavily dependent on petroleum, drawing over 95% of its fuel needs from refineries.

Because the refining industry plays such a key role in providing energy for the economy, its structure and economic condition are matters of national interest. In recent years the industry has undergone significant change.

The traditional industry model, based on ownership by vertically integrated oil companies with profitability viewed within the context of a linked supply chain, has been altered by companies and joint ventures whose primary business is refining. Increasingly, the business model for these firms, as well as the integrated oil companies, is the standalone profit center.

Refiners now must earn market rates of return for investors, as well as returns sufficient to make investments in expansion, technological improvements, possible business restructuring, and to meet environmental regulations, both with respect to refined product specifications and refinery site operations and expansion.

The aim of this course is to provide participants with a complete and up-to-date overview of the refinery operational economics, planning and profitability. Upon the successful completion of this course, participant will gain a satisfactory understanding of the concepts of operational profitability, refinery configuration, planning objectives and tools, key crude and product qualities, crude and product pricing, practical refinery modelling, market dynamics, managing risk, performance measures and benchmarking. Actual case studies from around the world will be demonstrated to highlight the topics discussed.

Course Objectives

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

- Apply a comprehensive knowledge in operational economics, planning and profitability of modern oil refineries
- Discuss the concepts of operational profitability including gross refining margin (GRM), net refining margin and contribution margin
- Determine refinery configuration covering topping, hydroskimming, cracking, full conversion and niche products
- Identify and carryout planning objectives including production plans, selecting feedstock, feasibility, optimality, optimal product mix, marginal economics, investment opportunities and planning versus scheduling
- List the various planning tools, employ blending methods and illustrate process models
- Enumerate modeling tools covering simple stock balances (spreadsheet), linear programming (LP's), non-linear programming (NLP's), distributed error recursion and integer programming
- Identify the various model types pertaining to blending, multi-refinery and distribution, single refinery and time period
- Describe key crude and product qualities as well as crude and product pricing
- Illustrate practical refinery modeling covering simple LP construction, pooling problem, delta-base modeling, convexity constraints, marginal values or shadow prices, crude ranking and evaluation as well as weight and volume basis
- Recognize market dynamics covering the supply and demand vise as well as global versus local markets
- Manage risk using term contracts, hedging and risk versus reward
- Employ performance measures covering benchmark margin analysis, model validation and back-casting

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, sample video clips of the instructor's actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of refinery operational economics, planning and profitability. Planning engineers, process engineers, production engineers, scheduling engineers, marketing engineers and estimation engineers will definitely benefit from the practical approach of the course. Finance managers, commercial managers, estimation managers, section heads, supervisors and refineries/process plant consultants will gain an excellent knowledge from the operational aspects of this course.

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$ 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.

Accommodation

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

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.

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. Pete Du Plessis, MSc, BSc, is a **Senior Process & Safety Engineer** within the **Oil**, **Gas** and **Petrochemical** industries. His expertise widely covers in the areas of **Process Plant** Troubleshooting, Engineering Problem Solving, **Process Plant Optimization** Technology & Continuous Improvement, **Refinery Operational** Planning & Profitability, **Process Plant** Rehabilitation, **Revamping & Debottlenecking**, **Chemical Plants** Troubleshooting, **Flare Relief** Systems, **Risk Assessment** within Production Operation, **Hazard** Identification, **Safety Auditing**, **Site Inspection**, Quantified Risk Assessment (**QRA**), Process Hazard Analysis (**PHA**), Process Safety Management (**PSM**), **HAZOP** Studies & Leadership, **FMEA**, **Waste** Management, Industrial Effluents, **Chemical Handling**, **Emergency Response** Services, **HAZCOM**, **HAZWOPER** and **HAZMAT** with over **30 years** of practical experience in the **process** industry. His wide experience also includes **Environmental Management** (**ISO 14001**), **Safety Management** (**OHSAS 18001**), **Quality Management** (**ISO 9001**).

While Mr. Du Plessis has been very active in the process industry he has likewise headed Consultancy projects for major **petrochemical companies**. In all his projects, he utilizes a systems approach which includes **risk management**, **process safety**, health & environmental management, human behaviour and quality management. Furthermore, he has come to share his expertise through the **numerous international trainings** he has held on **PHA**, **HAZOP**, **Risk Assessment**, Handling **Hazardous Materials** & Chemicals, Petroleum Products Handling & Transportation. Moreover, he completed various assignments as a consultant, trainer, facilitator, auditor & designer and conducted numerous licensed international Safety, Technology and Auditing Awareness & Implementing training courses including **IMS**, **ISO 9001**, **ISO 14001**, **ISO 27001**, **ISO 17799**, **OHSAS 18001** audits & assessments. With his accomplishments and achievements, he had been a **Safety Superintendent**, **Senior Safety Official** and **Senior Process Controller** for several international petrochemical companies.

Mr. Plessis has **Bachelor's** degree with **Honours** in **Industrial Engineering** & **Management**. Further, he has gained **Diploma** in **Quality & Production Management**. He is also a **Certified Assessor** & **Moderator** with the Manufacturing, Engineering & Related Services Education and Training Authority (MERSETA), a **Certified Trainer/Assessor** by the **Institute of Leadership & Management** (**ILM**) and a **Certified Instructor/Trainer** by the APICS. He has further delivered numerous trainings, courses, seminars, conferences and workshops 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, 03rd of November 2024

0730 – 0745	*Registration & Coffee*
0745 – 0800	*Welcome & Introduction*
0800 – 0815	***PRE-TEST***
0815 – 0900	***Concepts of Operational Profitability*** *Gross Refining Margin (GRM) ● Net Refining Margin ● Contribution Margin*
0900 – 0930	***Refinery Configuration*** *Topping ● Hydroskimming ● Cracking (FCC & Hydrocracking)*
0930 – 0945	*Break*
0945 – 1215	***Refinery Configuration (cont'd)*** *Full Conversion (Coking) ● Niche Products (Lubes, Asphalt, Solvents, Aromatics, other Petrochemicals)*
1215 – 1230	*Break*
1230 – 1420	***Case Study***
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, 24th of November 2024

0730 – 0930	***Planning Objectives*** *Production Plans (Unit Operating Goals, Blending Operations) ● Feedstock Selection ● Feasibility ● Optimality (Minimum Cost, Maximum Profit)*
0930 – 0945	*Break*
0945 – 1100	***Planning Objectives (cont'd)*** *Optimal Product Mix ● Marginal Economics ● Investment Opportunities ● Planning versus Scheduling*
1100 – 1215	***Planning Tools*** *Blending Methods (Linear (Volume/Weight), Blending Indices, Interaction Coefficients) ● Process Models (Fixed Yield, Operational Modes, Simulation)*
1215 – 1230	*Break*
1230 – 1420	***Planning Tools (cont'd)*** *Modeling Tools (Simple Stock Balances (Spreadsheet), Linear Programming (LP's), Feasibility, Linear Relationships, Non-Linear Programming (NLP's), Feasibility, Local Optima, Distributed Error Recursion & Integer Programming) ● Model Types (Blending, Single Refinery, Multi-Refinery and Distribution & Time Period)*
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, 25th of November 2024

0730 – 0930	***Key Crude & Product Qualities*** *Sulfur & Gravity ● Other Properties*
0930 – 0945	*Break*
0945 – 1100	***Key Crude & Product Qualities (cont'd)*** *Environmental Regulations*
1100 – 1215	***Crude & Product Pricing*** *Pricing Basis (FOB, CIF & Import Parity)*
1215 – 1230	*Break*
1230 – 1420	***Case Study***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4: Wednesday, 26th of November 2024

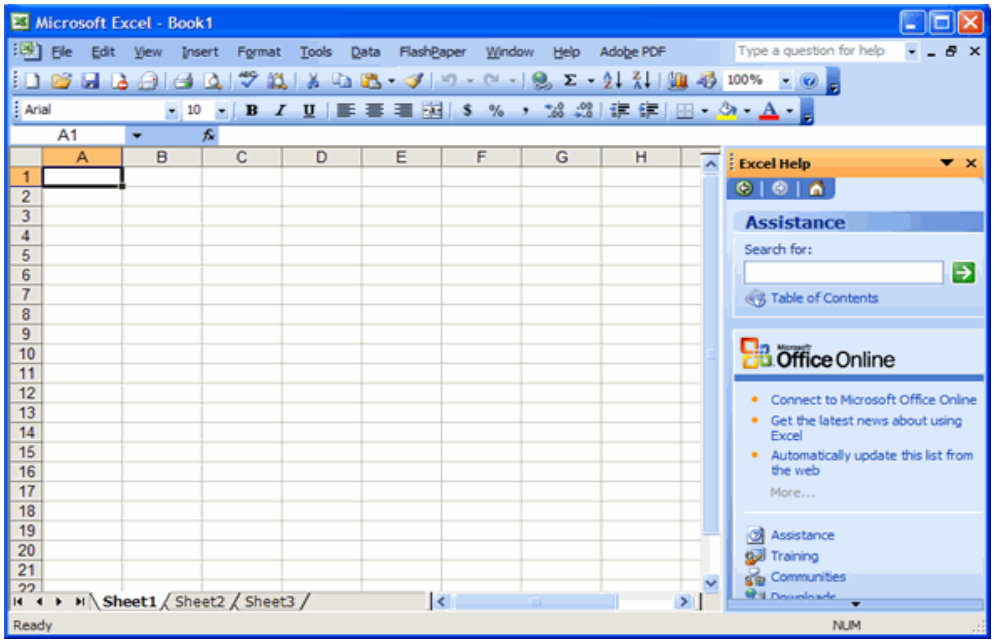
0730 – 0930	***Practical Refinery Modeling*** *Constructing a Simple LP ● The Real World is Non-Linear (The Pooling Problem, Delta-Base Modeling & Convexity Constraints) ● Marginal Values or Shadow Prices*
0930 – 0945	*Break*
0945 – 1100	***Practical Refinery Modeling (cont'd)*** *Crude Ranking & Evaluation ● Weight versus Volume Basis*
1100 – 1215	***Market Dynamics*** *The Supply-Demand Vise ● Global versus Local Markets*
1215 – 1230	*Break*
1230 – 1420	***Case Study***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5: Thursday, 27th of November 2024

0730 – 0930	***Managing Risk*** *Term Contracts ● Hedging (Futures & Arbitrage) ● Risk versus Reward*
0930 – 0945	*Break*
0945 – 1100	***Performance Measures*** *Benchmark Margin Analysis ● Model Validation*
1100 – 1215	***Performance Measures (cont'd)*** *Back-Casting ● "The Farmer & the Bale of Hay"*
1215 – 1230	*Break*
1230 – 1345	***Case Study***
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

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 “MS-Excel” application.



MS Excel

Course Coordinator

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