EI Oil and Gas Training 2010

energy INSTITUTE

Refining portfolio

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argus

Fundamentals of petroleum refining processes

4-7 May 2010, London, UK

EI member £2,585.00 inc VAT Non-member £2,820.00 inc VAT*

***includes complimentary Affiliate membership to the Energy Institute**

This **4-day** course examines the composition, main characteristics and new trends of petroleum products, examining the roles of the different refining units and their process characteristics. Participants will gain an understanding of the main manufacturing schemes encountered in the oil refining field and look at the overall economic context of this industry.

Course content

Petroleum products
- Energy and non-energy products and their main uses
- Principal components of petroleum products; general hydrocarbon classification and main impurities
- Quality requirements imposed on petroleum products in view of their utilisation – quality specifications measured by standard tests, characteristics related to the product composition, origin and processing routes
- New trends in market structure and product characteristics (reformulated gasoline, biofuels, etc.)

Refining processes
Crude oil fractionation
- Origin, overall characteristics and classification of crude oils
- Yields and properties of straight-run cuts obtained by distillation
- Industrial units: distillation, vacuum distillation, light-ends fractionation; various process schemes, operating conditions, energy consumption

Catalytic reforming and isomerisation
- Octane improvement of virgin naphthas
- Basics of processes, types of catalyst, product yields
- Industrial units: process schemes, operating conditions, equipment, energy consumption

Hydrorefining processes
- Main features of impurities removal by catalytic hydrogen treatment
- Main refining applications
- Example of a gas oil desulphurisation unit

Conversion units
- Outline of conversion and various cracking processes
- Characteristics and origin of feeds to be cracked
- Conversion by means of thermal cracking: visbreaker, various cokers
- Conversion by means of catalytic cracking: FCC and related units (gasoline sweetening, alkylation, MTBE and ETBE) hydrocracker and related units, hydrogen production
- Recent developments in hydrotreatment and hydroconversion of heavy residues
- Scrubbing treatments: amine washing, sulphur production, treatment of residual gases from Claus units

Manufacturing schemes
Main routes to major products; base lube oil manufacturing

Main economic features of refinery operations
Prices of crudes and products, operating costs, economic margin of a refinery; flexibility examples in operation and their economic consequences.

Who should attend?
Anyone working in the oil and gas and related sectors whose activity, whether technical, commercial, legal, financial, or human resources, is in some way connected with oil refining. Auditors and others associated with administration of the commercial aspects of the sector.

Safety in refinery and petrochemical plant operation

12-15 October 2010, London, UK

EI member £2,585.00 inc VAT Non-member £2,820.00 inc VAT*

***includes complimentary Affiliate membership to the Energy Institute**

This **4-day** course outlines the risks inherent in the products and equipment handled in the operation of refinery and petrochemical plant. It is designed to assist participants understand and develop the type of attitude that fosters greater safety in plant operations.

On completion of the course, participants will be familiar with the:

- common risks in the oil industry
- main prevention approaches
- typical safety management practices

Course content

Plant operations and safety

Product-related risks

Flammability

- Risks incurred by flammable products; flash point, explosive limits
- Ignition sources; flames, self-ignition temperature, sparks and static electricity, pyrophoric products
- Presence of oxygen; risks incurred by inlet of air
- Preventive measures and precautions: during normal conditions, during draining and sampling; in the event of leaks; with regard to storage tanks; during loading and unloading; during repair work
- B.L.E.V.E.

Fluid behaviour and related hazards

- Vessel pressure and consequences of an increase or decrease in temperature: thermal expansion, vaporization, collapsing due to vacuum, freezing due to pressure relief

Physical hazards involving personnel

- Poisoning: ingestion, metabolism and elimination
- Cases related to specific products: chlorine, hydrogen sulfide, benzene, acids, alkalis, additives, inhibiters

Equipment – related Risks

- Main risks
- Avoidance of risks through the correct use of commonplace equipment: safety valves, rupture discs
- Corrosion hazards and control

Safety in process operations

- Precautions and risks related to the use of utilities: inert gases, liquid water, steam, air, gas oil, fuel gas
- Safety related to blowdown and drainage toward: flare, slops, tanks, oily water
- Blending procedures: conditions for installing blinds or stoppers
- Degassing-inerting: steam, nitrogen, water, vacuum, work permits
- Entry into vessels - atmosphere analysis: oxygen content, explosivity, toxicity
- Start-up: checks, accessibility and cleanliness, line up, nitrogen-, water-, steam- or vacuumed-aeration
- Seal tests

Hazard analysis in design and operations

- Basic concepts; hazards rating
- Basic techniques used: check-lists, HAZAN, what-if, HAZOP
- Hazards related to modifications

Safety management

- Human factors in risk management
- Safe and unsafe habits, motivation
- Difficulties in improving safety results
- Typical safety organisation
- Ten keys for good safety management in the field

Various sections of this course are based on a number of actual case studies and on the analysis of incidents and accidents.

Planning and economics of refinery operations

19–22 October 2010, London, UK

EI member £2,585.00 inc VAT Non-member £2,820.00 inc VAT*

***includes complimentary Affiliate membership to the Energy Institute**

This intensive, **4-day** course will enable delegates to understand the essential elements of refinery operations and investment economics, to review the various parameters which affect refinery profitability and to develop a working knowledge of the management tools used in the refining industry.

Course content

Technical resumé
Review of petroleum products' applications, characteristics and specifications. Main refining process units. Refining schemes.
Basic economics of the various process units.

Refinery margins and costs
Crude oil, product markets and prices. Analysis of refining costs.
The calculation of refining margins. How refining margins have developed.

Refinery simulation
Simulation of product manufacturing using spreadsheets. Analysis of the main constraints affecting product manufacturing.

Present situation of the refining industry
The development of refining capacities, product demand, different refining schemes and conversion plants.

Optimisation of refinery operations
Basics of Linear Programming (LP). The 'Simplex' method. Simplified example of refinery modelisation.
Analysis of an LP solution: material balance, marginal costs, opportunity costs, incentives to construction.
Sensitivity analysis.

Construction of a new process unit: Economic evaluation
Basics of profitability analysis.
Case study: construction of a new isomerisation unit
– simulation of material balance
– cash flow calculation
– investment and cost
– Internal Rate of Return calculation

Scheduling of refinery operations
Review of scheduling problems.
Control of results and practical application in a refinery.

How to improve refinery profitability
Future of the refining industry. Forecast development of oil consumption.
Environmental constraints. Impact on refining economics.

Delegates will learn:

- How to assess the latest trends in product specifications, process unit yields and refining schemes
- How to calculate product value, refinery margins and process unit margins
- How costs and margins compare
- How to simulate refinery operations and product blending
- How to optimise refinery operations, crude oil selection and product manufacturing
- How to analyse marginal costs from the optimisation of an LP model
- How to schedule refinery operations from the monthly plan to daily operations
- How to evaluate the profitability of a new process unit.

Who should attend?

- *Technical, operating and engineering personnel working in the refining industry*
- *Analysts and planners*
- *Trading and commercial specialists*

Economics of refining and oil quality

1-3 December 2010 Cambridge, UK

EI member £1,800.00 plus VAT Non-member £1,850.00 plus VAT*

***includes complimentary Affiliate membership to the Energy Institute**

This course opens the Refinery 'Black Box' and explains the capabilities and constraints of each main process, enabling delegates to be more effective in their jobs. Crude oil selection and the effects of crude quality on key properties of both intermediates and finished products are explored. The value and opportunities presented by quality slacks are identified.

Delegates will discover the key trading profit opportunities through a Processing Deal that has recently been agreed at one of Invincible's fictional refineries. The Deal not only has the advantage of enabling this highly flexible complex refinery to run at near capacity, but also highlights how the capabilities of its hardware and the qualities of its product pools generate opportunities for making additional profits.

It is the delegate's ability to identify, evaluate and fully exploit these opportunities that enables additional gains to be realised. Emphasis is placed on the interface between refinery activity and international oil trading.

As with all Invincible training, the course will consist of a mixture of formal lectures, exercises and plays demonstrating the main commercial aspects of the refining/oil trading interface.

The work on a number of exercises is performed in syndicates, with comprehensive debriefs studying the consequences of the decisions made. The course expects a high degree of participation from delegates and there is a high staff-to-pupil ratio.

Course content:

Day one
Crude oil evaluation and selection criteria; capabilities and limitations of the main refining processes; scheduling constraints; processing deals; capacity constraints; costs of crude changeover and reprocessing; cost of under-running refineries; crude oil blending; speciality crudes; cut points and severities.

Day two
Product quality measurement; key product quality parameters (naphtha, mogas, middle distillates and fuel oils); product blending; additives; selection of fuel oil viscosity cutter stock; problem crude oils; petrochemical return streams; refinery operating costs; refinery fuel selection

Day three
Comparison of crude oil and fuel oil feedstocks; valuation of reformer feedstocks; supply chain optimization; refinery linkages and operational limitations; refinery benchmarking.

What will you learn?
From this course you will be able to:
- Recognise the capabilities and constraints of the main refining process.
- Construct and understand the elements of a processing deal.
- Differentiate between the cost and value of refinery feedstocks, intermediates and products.
- Perform linear blending calculations.

You will understand:
- The economic features of the main refining units.
- Refiners' flexibilities.
- The value of key quality parameters.
- Contaminants and the effect of reprocessing.
- The value of additives.
- Refinery hardware limitations.
- The opportunities presented by the refinery from the oil trader's perspective.

Registration form

UK Entry Visas – Please note that there have been recent changes to the UK Entry Visa application system. Given this, it now takes a minimum of 15 working days/3 weeks, to process any applications. If you wish to attend a course and need a visa, you are urged to apply at least 1 calendar month prior to the start date of the course. Full information at: **www.ukvisas.gov.uk/en/howtoapply/wheretoapply/**

To register, by post or fax, please complete this registration form in BLOCK CAPITALS and return it to the address below, together with payment of all fees. Nick Wilkinson, EI Oil and Gas Training, Energy Institute, 61 New Cavendish Street, London W1G 7AR, UK f: +44 (0)20 7255 1472 To register by email, please provide the same contact details (shown below), together with the relevant course details and send to: **nwilkinson@energyinst.org** To book online, visit: **www.energyinst.org**

I am/my employer is a member of the EI and entitled to the EI member's rate. EI Membership Number: .....

Mr/Mrs/Miss/Ms/Dr/Other: ..... Name: .....

Job title or present position: ..... Company/Organisation: .....

Name and address against which an invoice should be raised: .....

.....

t: ..... f: .....

e: .....

Mailing address for joining instructions (if different to invoice address above): .....

.....

Please indicate if you have any particular dietary requirements: .....

I confirm that I have read and agree to the conditions of registration as specified in the General Information section.

Signature: ..... Date: .....

Under UK Excise Regulations, delegates from all countries are required to pay VAT on any course taking place in the UK.

Course Title: .....

Course date: ..... Cost of course: £ .....

Less 10% discount for each **subsequent** delegate from the **same** company attending the **same** course on the **same** date

£.....

I enclose my remittance, made payable to the Energy Institute, for: **TOTAL PAYMENT** £ .....inc VAT

The total amount may be paid by Sterling Cheque or Draft drawn on a bank in the UK.

To pay by Credit or Charge Card, circle appropriate card name and give card details below:

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Please enter your 3-digit* security code above. This will be deleted upon authorisation. *4-digits for Amex users.

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Payment: Full payment must be received before a place can be guaranteed. Under UK Excise Regulations, delegates from all countries are required to pay VAT on any event taking place in the UK. Please note that VAT may be liable to amendment. All prices are correct at the time of going to press, but may be subject to change without prior notice.

Acknowledgement of registration: Confirmation of registration and a VAT receipt will be sent to all delegates. Joining instructions will be sent out prior to the start date of the course. If you have not received your acknowledgement seven days prior to the start date of the course, please contact EI Oil and Gas Training at the Energy Institute to confirm your booking.

Language and course materials: All presentations, course materials and supporting documentation will be presented in English. Audio-visual recording of presentations is strictly forbidden. Course materials cannot be purchased by non-attendees.

Cancellation: In the event of a delegate cancelling, a refund of the registration fee less a 20% administration charge will be made provided that notice is received in writing at least 28 days before the date of the course. No refunds will be paid after that date. However, course papers, as supplied to attendees, will be provided after the event.

Substitution
If you are unable to attend, a substitute delegate may attend in your place, provided that EI Oil and GasTraining is notified in advance.

Enquiries
EI Oil and Gas Training, Energy Institute, 61 New Cavendish Street, London W1G 7AR, UK
t: +44 (0)20 7467 7100 f: +44 (0)20 7255 1472
e: **nwilkinson@energyinst.org www.energyinst.org**

DATA PROTECTION ACT
The EI will hold your personal data on its computer database. This information may be accessed, retrieved and used by the EI and its associates for normal administrative purposes. If you are based outside the European Economic Area (the 'EEA'), information about you may be transferred outside the EEA. The EI may also periodically send you information on membership, training courses, events, conferences and publications in which you may be interested. If you do not wish to receive such information, please tick this box ☐

The EI would also like to share your personal information with carefully selected third parties in order to provide you with information on other events and benefits that may be of interest to you. Your data may be managed by a third party in the capacity of a list processor only and the data owner will at all times be the EI. If you are happy for your details to be used in this way, please tick this box ☐

Please note that all courses are available on a prvate/in-house basis.
For more information please contact Nick Wilkinson
t: +44 (0)20 7467 7100 f: +44 (0)20 7255 1472 e: nwilkinson@energyinst.org