REFINERY OPTIMISATION: ECONOMICS AND PROCESS EXCELLENCE

Maximising the potential of refinery profitability through process optimisation

Kuala Lumpur, Malaysia | 26th - 28th September 2017

COURSE FACILITATOR

M.I.C.E GLOBAL EVENTS 2017

Karl Kolmetz

Principal
KLM Technology Group, USA and Malaysia

- Over 20 years progressive experience in the design, construction, commissioning, and operations management of process units from the US Gulf Coast through Asia
- Over 15 years of refining experience in Houston, Texas and Total Refinery in Port Arthur Texas
- Over 12 years Ethylene experience with the Westlake / Titan Group, Chandra Asri Petrochemicals, JG Summit Petrochemicals and Indorama Ventures
- Over 10 years of specialty distillation experience as Asian Technical Manager for Sulzer Chemtech, a major distillation company, Westlake Group and KLM Technology Group
- Publications include authoring and co-authoring over 40 technical papers on a variety of subjects for product recovery, distillation troubleshooting, training, project management, and process design with safety and environmental concerns

PRE-COURSE QUESTIONNAIRE

Delegates are required to complete a Pre-course Questionnaire to establish your training expectations.
The completed questionnaires will be annalysed by our cousrse trainer to ensure the course will be conducted at an appropriate level and relevant questions will be addressed.

KEY BENEFITS OF ATTENDING

Upon completion of this training, you will be able to:

- Gain a thorough understanding of the refinery operations, processes and economics
- Understand the characteristics of crude oil and other raw materials, their importance to modern refineries and effects on quality
- Understand key refineries processes, critical product quality and blending methodology
- Perform economic analysis for refining feeds, products for capital and operating costs
- Optimisation framework for refinery
- Statistical Process Control
- Determination of marginal values of feeds and products based on optimisation and its applications

WORKSHOP OVERVIEW

This course will guide participates to develop key concepts and techniques for the refining of petroleum processes and economics. These key concepts can be utilised to make operating decisions that can improve unit's performance.

Many aspects of petroleum refining operations and management can be improved through product recoveries, purities and energy utilisation, and safety. This cannot be achieved without first a thorough understanding of the fundamental principles of design and operation. These principles need to be understood in advance of operation in order for problem solving to be effective.

This course focuses on the core building blocks of the refining process systems, equipment and economics. This programme emphasizes refining process unit operation fundamentals, safe utilisation of these fundamentals by operations and maintenance personnel, and equipment troubleshooting techniques.

Day 1 – 26th September 2017

Session One
Introduction and Review of Process Incidents
- Overview of the Chemical Processing Industry
- Safety for the Refining Groups

Session Two
Fundamentals of Petroleum Chemistry
- Description of a Hydrocarbon Molecule
- Types of Hydrocarbon Molecules
- Definition and Function of a Catalyst

Session Three
Characteristics of Crude Oil
- Sources of Crude
- Composition of Crude
- Description of Crude Oil Fractions
- Definition of Physical and Chemical Processes
- Crude Oil Testing
- Crude Assays

Session Four
Crude Oil Distillation
- Description of the Distillation Process
- Cut Points of the Various Fractions
- Crude Tower Design
- Vacuum Tower Design

Day 2 – 27th September 2017

Session One
Introduction to Refinery Equipment
- Distillation
- Absorption
- Heat Exchange
- Reactors
- Pumps
- Compressors
- Furnaces

Session Two
Introduction to the Refinery Flow Sheet
- Refinery Flow Sheet
- Gasoline Processing Options
- Bottoms Heavy Oil Processing Options
- Alkylation
- Hydrotreating
- Gas Sweeting
- Sulfur Recovery

Session Three
Crude Oil Quality and Refinery Flow sheets
- Crude Oil Types for Different Refinery Configurations
- Light vs. Heavy
- Sweet vs. Sour
- Paraffinic vs. Naphthenic
- Crude Oil Selection Methods

Day 3 – 28th September 2017

Session One
Gasoline Production Processes
- Catalytic Reforming
  - Process Chemistry and Catalyst
  - Process Variables and Economics
- Isomerisation
  - Process Chemistry and Catalyst
  - Process Variables and Economics
- Fluid Catalytic Cracking
  - Process Chemistry and Catalyst
  - Process Variables and Economics
- Alkylation
  - Process Chemistry and Catalyst
  - Process Variables and Economics
- Economics of Gasoline Production Processes

Session Two
Fundamentals of Hydroprocessing
- Hydrotreating
  - Process Chemistry and Catalyst
  - Process Variables and Economics
- Hydrocracking
  - Process Chemistry and Catalyst
  - Process Variables and Economics

Session Three
Options for Heavy Oil Processing
- Delayed Coking
- Solvent Deasphalting
- Visbreaking
- Residual Oil Hydroprocessing
- Lube Oil Processing
- Economics of Heavy Oil Production Processes

Session Four
Refining Margins
- Refinery Operating Costs
- Refinery Profit Margins
- Conversion Unit Processing Costs
- Relative Value of Crude Oil versus Products
- Refining Process Capital Costs

M.I.C.E GLOBAL EVENTS 2017

WHO SHOULD ATTEND

This training will be relevant to those involved in making day to day decisions regarding operation, design, and economics of processing plants:

- Operation Supervisors
- Maintenance Supervisors
- Senior Plant Supervisors
- Operations Engineers
- Process Support Engineers

From the petroleum industry involved in refinery design or refinery planning, or in engineering and consultancy companies servicing the industry.

ABOUT OUR COURSE FACILITATOR

Karl Kolmetz | Principal, KLM Technology Group, USA and Malaysia

Karl has over twenty years of progressive experience in the design, construction, commissioning, and operations management of process units from the US Gulf Coast through Asia. His strengths encompass design details that originate from a strong operations background, with the ability to incorporate positive ideas from differing sources. High safety awareness that was developed from commissioning experiences, HAZOP Facilitation and the positive results of Process Safety Management.

Karl's industry experience includes over fifteen years (15) of refining experience in Houston, Texas and Total Refinery in Port Arthur Texas. Over 12 years (12) Ethylene experience with the Westlake / Titan Group, Chandra Asri Petrochemicals, JG Summit Petrochemicals and Indorama Ventures.

Concurrently, Karl has over ten years (10) of specialty distillation experience as Asian Technical Manager for Sulzer Chemtech, a major distillation company, Westlake Group and KLM Technology Group. Process Safety Management experience on multiple projects and roles for over 20 years. He is also experienced as a HAZOP participant, facilitator and HAZOP Team Leader Trainer.

Publications include authoring and co-authoring over 40 technical papers on a variety of subjects for product recovery, distillation troubleshooting, training, project management, and process design with safety and environmental concerns. Karl is authoring a book on Process Equipment Design. He is an industrial lecturer at Universities and has taught many courses for the process industry. He has a Bachelor of Science in Chemical Engineering from The University of Houston, and is a member of the American Institute of Chemical Engineers.

List of companies Karl worked with:

- Indorama Ventures Sulphur
- Total Refinery
- Technip USA
- Linde Process Plants
- PT Chandra Asri
- GTC Technology
- Sulzer Chemtech
- Westlake Group

Companies that have attended Karl's Training Course:

- Titan Chemicals
- Sunoco
- TOTAL
- BASF
- Shell
- Petronas
- Valero

WHY YOU CANNOT MISS THIS EVENT

The success of every company depends on each employee's understanding of the key business components. Employee training and development will unlock the companies' reliability and profitability. When people, processes and technology work together as a team developing practical solutions; a company can maximise profitability and assets in a sustainable manner.

It is strategically important that your operations team understands the fundamentals of process unit operations concepts. This is the difference between being in the best quartile of operational ability and being in the last quartile. There is vast difference in the operational ability of operating companies and most benchmarking studies have confirmed this gap in operational abilities.

Whether you have a team of new or seasoned employees, an introduction or review of these concepts is very beneficial in closing the gap if you are not in the best quartile, or maintaining a leadership position. Most studies show that a continuous reinforcement of best practices in operational principles is the most effective way to obtain the desired results.