



THE CHEMICAL ENGINEERING MAJOR

Energy Optimisation of Oil Refineries

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Introduction

This Energy Optimisation of Oil Refineries training course is uniquely designed as a tool-box that provides an insight into the variety of energy optimisations topics - offers the knowledge of the Best Practices in energy and prepares the refinery energy managers, process engineers and technical staff involved in energy and the top management's energy sponsors for their important roles.

Refinery energy efficiency is a multidisciplinary subject. It involves process operations, the utility system, the equipment, power generation, housekeeping, process control, retrofit design, advanced thermodynamic concepts such as Pinch Technology, and effective management. A comprehensive energy saving program that pushes a refinery to the forefront of energy efficiency and profitability must incorporate all these disciplines.

The training course will feature:

- Lectures, tutorials and group work in all areas of refinery energy efficiency
- Real-life Case Studies that illustrate technical solutions and obtainable benefits
- Transfer of instructor's extensive hands-on industrial experience
- Use of basic energy software tools that will be made available to participants
- Open discussion on actual problems in participant's own refinery

Training Objectives

What are the Goals?

By the end of this BTS training course, the participants will be able to apply techniques which will enable them to conduct following activities in their refineries:

- Assess energy efficiency of refinery and individual processes
- Calculate the potential for improvement
- Optimise refinery utility systems (steam and power)
- Apply energy saving techniques to develop energy saving projects
- Introduce effective Energy Management procedures.

Target Audience

Who is this Training Course for?

Professionals working in the petroleum processing industry will benefit from this course, especially those with a responsibility for refinery energy management and efficiency. The material presented is relevant to all engineers working in industrial processes, including operations, design and maintenance personnel.

Job Titles/Functions Appropriate for the Course Include:

- Personnel responsible for inspection, maintenance and reliability
- Thermal and stationary equipment engineers
- Process Engineers
- Plant Engineers
- Project Engineers
- Plant energy managers/coordinators

Training Methods

How will this Training Course be Presented?

The presenter will use a variety of proven learning techniques to ensure maximum understanding, comprehension and retention of the information presented. This includes a course manual, suggested reading before and after the course, tutorials, group exercises and discussions, and where possible, problem-solving for the participant's own organisations.

The training course will be interactive and will challenge delegates to think differently and comprehensively about energy practices.

Much of the course time is dedicated to (1) developing thorough understanding of refinery energy topics, particularly how much, where, why and at what efficiency the energy is consumed, and (2) introducing the practical application of energy saving techniques.

Simulation examples are used throughout the course to enhance the understanding. The participants will receive several basic energy software tools that they may find useful in their daily work.

Daily Agenda

Day One: Introduction to Energy Efficiency; the Effect of Energy on the Bottom Line

- Energy and its Effect on Refinery Profitability
- Refinery Energy Balance
- Energy Benchmarking; Site Efficiency Assessment
- Potential for improvement
- Approach to energy saving
- Fuel, power and steam costing methodology

Day Two: Energy Features of Refinery Key Process Units and how to Improve their Energy Efficiency

- Distillation: Crude Unit, Vacuum Unit
- Binary Distillation Columns
- Hydrotreating, Distillate and Naphtha
- Catalytic Reforming
- Fluid Catalytic Cracking
- Hydrocracking

Day Three: Refinery Utility System

- Steam Systems
- Power generation
- Steam Turbines, Cycles, Efficiencies
- Gas turbines
- Cogeneration and its benefits
- Optimisation of Steam & Power system

Day Four: Process Heat Integration

- How heat integration works?
- Introduction to Pinch Technology
- Heat availability Curves and Energy Targeting
- Pinch Technology for refinery operators
- Retrofitting heat exchange networks for improved performance
- Intuitive versus Systematic Network Revamp

Day Five: Equipment Efficiency; Effective Energy Management

- Fired heaters
- Rotating equipment
- Heat Exchangers
- Energy Focused Organisation
- The Energy Team
- Developing internal competence in energy