

Distillation Debottlenecking & Optimisation

A Eurotek training course



ERS Distillation Debottlenecking & Optimisation

An introduction:

Refining of crude oil and the recovery of saleable products from the many processes in oil and chemical sites rely heavily on distillation units. Although in some respects distillation technology is fairly mature, today there remains considerable opportunities for improved optimisation utilising the latest technology in process simulation, advanced control and equipment design. Such is the scale of the refining and chemical distillation processes, even relatively small incremental improvements in efficiency and reliability, for a single unit, can generate benefits of many millions \$/yr. This course will provide participants with a thorough understanding of the fundamentals of distillation. Practical methodologies for unit optimisation and design will be discussed and illustrated via case studies. These optimisation principles and practices will be transferable to the participants' sites and locations, and indirectly should be highly beneficial to the bottom line of their operations.

Learning objectives:

This course will cover all the main areas relating to distillation operations from basic principles to design and optimisation. There will be strong focus on using case study examples to identify opportunities to improve and revamp existing operations. Optimisation methods will be presented which should allow the participant to apply these methods and learnings at their own sites. Some of these optimisation tools will ultimately require the use of a process simulator in order to accurately estimate yield benefits. However, for this particular course, optimisation principles will be covered and the participant will not be required to use or access a simulation package.

Other areas covered in this course which should add value to participants' operating sites include: preparation for turnarounds; column internals installation and inspection checks; troubleshooting methodology.

Upon completion of this course participants will have gained an understanding of:

- basic principles affecting all distillation columns
- key factors for unit optimisation
- importance of using simulation for quantifying optimisation opportunities
- when to use trays or packed internals
- key monitoring activities for a unit engineer
- specific process safety issues relating to distillation units
- how to plan for a turnaround and identify possible unit revamps
- how to carry out a unit internals inspection
- how to troubleshoot a unit
- the design methodology for a new column



Who should attend?

The ERS Distillation course is a comprehensive core skills course for professionals Distillation Unit. The course will be highly valuable to all engineers involved in the operation and design of Distillation facilities. Additionally, the course will be useful to any technical personnel wishing to gain an insight into the practical aspects of Distillation. Those who are experienced in other fields and seek a review of the fundamentals of Distillation will also find this course beneficial.

Job Titles/Functions Appropriate for the Course Include:

- Process, Project, and Plant Engineers
- Computer/System Analysts and Refinery Modelling Engineers
- Operations Economic Evaluators
- Product, Equipment, Chemicals, Supplies or Services Sales Personnel

Course Presenter

This course will be presented by Stuart Fraser. Stuart was formerly head of the Separations Group in BP Refining for 13 years, and worked in a number of process engineering, simulation and technical roles in BP for over 30 years. He has extensive experience of distillation design, revamps, troubleshooting and optimisation. He is also an expert user of simulation tools. Stuart was formerly a member of FRI Technical Committee, and also Vice Chair of IChemE Fluid Separations subject group.



Course programme

Day 1 :

Scale of the Technology and Example of Optimisation benefits
Crude Oil Feed Characterisation and Crude Assays
Refinery Crude and Vacuum Unit configurations
Key Parameters affecting unit performance (pumparounds, overflash, strip steam, product draw locations)

Day 2 :

Column Internals (Trays, Packed internals and High Capacity trays) and worked examples showing internals rating tools

Day 3 :

Focus on Simulation – how to tune a simulation to match plant data for simple fractionators (eg. naphtha splitters, debutanisers, etc)
How to simulate and match plant data for crude fractionators
Best practices for summarising and reporting Sim results
Once you have a tuned Sim – what's next
(unit constraint plots)
Other Fractionators – FCC, HCK, Coker Fracs and Gas Plants
(what are the KPI's for these units)

Day 4 :

Main Technical Activities for Separations Process Engineer
(safety and availability, Unit performance monitoring, future development of the unit)
Case studies of optimisation opportunities
Design methodology for a new unit

Day 5 :

Unit Turnarounds – how do you prepare for TAR inspections
TAR inspections – what do you look for and how do you report inspections
Troubleshooting – methodology and case studies





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