

# Training - Catalytic Reforming for Refining and Petrochemicals



REFCAT-EN-P



Face-to-face only



5 days

This course provides a thorough technical understanding of semi-regenerative and continuous regenerative catalytic reforming processes, for refining and petrochemistry

## Level

Skilled

## Public

- Engineers, senior operations personnel or technical supervisory staff involved in the operation, optimization or monitoring of hydrogen and aromatics production units
- Engineers from research centers and engineering companies involved in the different aspects of the operation and process control of these processes

## Objectives

Attendees will be able to implement the following skills:

- Cite the main physico-chemical characteristics of the process
- Describe the steps of the process
- Justify process and operational safety measures

## Pedagogical & technical resources

- Applications, teamwork, case studies and interactive workshops based on typical real situations
- The duration and content of the training course can be customized to the needs of the client site and the profile of the participants
- Possible contribution of experienced staff reporting his industrial experience of the operation on a daily basis
- Parts of or whole session adaptable to virtual classroom

## Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

## Prerequisites

No prerequisites are necessary to follow this course

## Responsible

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

## Program

### THE CATALYTIC REFORMER WITHIN THE REFINERY SCHEME

0.5 day

Quality specifications of gasolines; reformulated gasoline and future trends.

Octane improving processes, integration within the refining processes.  
Needs in hydrogen. Aromatic complex overview, need for benzene, toluene and xylenes.

## **CATALYTIC REFORMING REACTIONS & CATALYSTS**

1 day

Review of the characteristics of all the chemical reactions: thermodynamics and kinetics.  
Influence of the operating parameters on the production of aromatics, hydrogen, octane number, and other yields.  
Consequences for SR and CCR units.  
Catalyst properties: role of the acidic and metallic functions, of the support, of the different promoters and their impact on chemical reactions and yields. Water/chlorine balance and management.  
Poisons and ageing factors. Activity follow up and cycle length prediction for semi-regenerative units.  
Catalyst regeneration. Management of each step for an optimal activity recovery for SR units. Operating parameters for CCR regeneration loops.

## **OPERATING PARAMETERS OF A CATALYTIC REFORMER**

1 day

Process flow diagrams and operating parameters of semi-regenerative (SR) and Continuous Catalyst Regeneration (CCR) units.  
Main control loops. Typical range of yields.  
Material balance. Energy consumption.  
Operating variables: WABT, WAIT, H<sub>2</sub>/HC ratio, flow rates, treat gas characteristics.  
Main equipment and metallurgy.  
Specific features for low pressure equipment. Moving bed technology, recontacting section, catalyst circulation: lifts,  $\Delta P$  control, seal legs, nitrogen loops for regeneration, etc.  
Analyzers and process control.

## **OPERATION & OPTIMIZATION FOR CATALYTIC REFORMING**

1 day

Monitoring the operating variables and optimization, for semi-regenerative and regenerative units. Operation case studies.  
Adjusting to changes in feedstocks origins, N+2A.  
High severity of the CCR towards optimized yield in Aromatics. Performance follow-up.  
Maximizing the performances of the unit under constraints or limit conditions.  
Main steps for start-up and shutdown.

## **TROUBLESHOOTING FOR CATALYTIC REFORMING**

0.5 day

Case studies: main symptoms encountered in operation, diagnosis and remedies.  
Specific troubles of CCR units linked to catalyst circulation and regeneration loops.  
Catalyst regeneration problems.  
ESD, main safety sequences.

## **THE REFORMER IN THE AROMATIC COMPLEX**

1 day

Outlets and main uses of BX (Benzene, Xylenes), ethylbenzene.  
Basic scheme to upgrade benzene and paraxylene. Aromatic loop.  
Transformation processes involved: hydrodealkylation, disproportionation, transalkylation and isomerization. Associated separation processes.  
Operating conditions for a typical arrangement.

To French entities : IFP Training is referenced to DataDock ; you may contact your OPCO about potential funding.  
Please contact our disabled persons referent to check the accessibility of this training program : [referent.handicap@ifptraining.com](mailto:referent.handicap@ifptraining.com)