Low benzene content reformate production

AXENS BENFREE™

OPERATIONS TRAINING

Objective: To provide an in-depth knowledge of the **BENFREE™** process and particularly the client's unit. By the end of the course, the participants will have:

- A general understanding of the significance of the unit within the refinery scheme
- A broad technical understanding of the catalyst and the chemical reactions involved in the process
- A solid knowledge of the Process Flow Diagram and equipment
- A thorough knowledge of operating conditions and their impact on performance
- A good overview of the start-up and shut-down activities
  (NB: a detailed review of procedures is not included in the course).
- A working knowledge of the main troubleshooting actions

Duration: The training course lasts 2 days. The duration can be tailored to the participants' level of understanding.

Attendance: This training is targeted to unit process engineers, unit technical managers, shift leaders, and board men. Suitably qualified or experienced outside operators may attend to enhance their process knowledge.

Program: The program below may be modified due to specific customer requirements, subject to an agreement between the customer and AXENS.

AXENS' OPERATIONS TRAINING PROGRAM

Benfree™ : Low Benzene reformate production

Day 1

1. **Introduction**
   - Supply/demand situation
   - Market trends
   - Environmental regulation
   - Focus on the unit in its context
2. **Process Objectives**
   - General information
   - Feed characteristics
   - Unit duty
   - Products' specifications
   - Material Balance
3. **Chemical Reactions**
   - Chemistry and catalysis basics
   - Feed chemical composition
   - Chemical reactions
   - Catalysts
   - Catalyst contaminants
4. **Process Description**
   - Process Flow Diagrams
   - Piping & Instrumentation Diagrams
   - Main equipment (Drawings, pictures and functions)
5. **Start-up Preparation**
   - Pre-commissioning operations
   - Commissioning operations:
     - > Leak tests
     - > Dry out
     - > Inerting
     - > Catalyst loading…

Day 2

6. **Main Start-up Operations**
   - Detailed description of the steps involved in introducing fresh feed:
     - ➢ Inerting & purging of air
     - ➢ Activation of the catalyst
     - ➢ Initial filling and start-up of the splitter
     - ➢ Filling and start-up the Benfree reactor
     - ➢ Hydrogen introduction
     - ➢ Adjustment of the unit
7. **Normal Operation and Operating Parameters**
   - Summary of main operating conditions
   - Operating variables
   - Adjusting operating conditions
   - Analytical control
8. **Shutdown and Restart**
   - Planned shutdown
   - Normal restart
9. **Troubleshooting**
   - Typical causes and resolution of product quality incidents
   - Operational disturbances
10. **Emergency Situation Description**
    - Emergency procedures
    - Interlock loops
11. **Catalyst Special Procedures**
    - Activation
    - Oxidation
    - Unloading
12. **Health, Safety and Environment**
13. **Quiz**