MTBE production

AXENS MTBE PROCESS

OPERATIONS TRAINING

Objective: To provide in-depth knowledge of the **MTBE** 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 shutdown activities
  (NB: a detailed review of procedures is not included in the course).
- A sound knowledge of the main troubleshooting actions

Duration: The training course lasts 5 days. The duration can be tailored to the participants' level of understanding.

Attendance: This course 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

MTBE 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
   - Resins
   - Resin contaminants

Day 2

4. **Process Description**
   - Process Flow Diagrams
   - Piping & Instrumentation Diagrams
   - Main equipment (Drawings, pictures and functions)
   - Focus on Catacol technology
5. **Start up Preparation**
   - Pre-commissioning operations
   - Commissioning operations:
     - Leak tests
     - MTBE unit equipment washing
     - Reactor loading
     - Catalytic column loading

Day 3

6. **Main Start up Operations**
   - Detailed description of the steps involved in introducing fresh feed :
     - Resins drying by Methanol circulation
     - Methanol /water column start-up
     - Drying of main and finishing reactor
     - Drying of catalytic column
     - Water inventory
     - Filling up the system with unreactive C_4
     - Reactive feed injection
     - Methanol adjustment

Day 4

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

Day 5

9. **Troubleshooting**
   - Typical causes and resolution of product quality incidents
   - Operational disturbances
10. **Emergency Situation Description**
    - Emergency procedures
    - Interlock loops
11. **Resins Special Procedures**
    - Unloading replacement
    - Backwashing traps
12. **Health, Safety and Environment**
13. **Quiz**