Catalytic Reforming Continuous Regeneration Simulation and Tutorial

A self-paced MultiMedia based Tutorial/CBT and real-time dynamic simulation of a Catalytic Reforming Unit - Continuous Regeneration.

Tutorial/CBT:

This interactive tutorial provides an Overview, Fundamental Principles, and Control and Operating Principles for a Catalytic Reforming Unit - Continuous Regeneration using Voice, Video, Animation and Graphics.

Overview
- Introduction
- Importance of Reformer in Refineries & Petrochemical Plants
- Feedstock Types
- Classifications of Reformer
- Process Overview

Reformer Components
- Feed Preparation and Preheat System
- Reactor and Furnace System
- Reactor Effluent Cooling and Separation System
- Recontacting System
- Product Stabilization and Fractionation System
- Catalyst Transfer and Regeneration System

Principles of the Reformer
- Reforming Catalysts
- Catalytic Reforming Reactions
- Reactor Conversion

Safeguard System
- Introduction
- Emergency Unit Shutdown
- Naphtha Feed Shutdown
- Reactor Furnace Shutdown
- Recycle Gas Compressor Protection
- Product Separator Low Level Protection
- Booster Compressor Protection
- Recontact Drum Low Level Protection
- Stabilizer Reboiler Furnace Shutdown
- Regenerator Shutdown

Key Controlled and Operating Variables
- Reactor Temperatures
- WAIT and WABT
- Reactor Pressure
- H2 to HC Ratio
- Space Velocity
- Feedstock Properties
- Chloride and Water Injection
- Regenerator Controls

Startup Operation
- Pre-Startup Check
- Nitrogen Purge
- Hydrogen Circulation
- Booster Compressor Commissioning
- WHB Commissioning
- Reactor Warm-up
- Stabilizer Commissioning
- Naphtha Feed Cut-in & Stabilization
- Regenerator Commissioning

Shutdown Operation
- Regenerator Shutdown
- Reduce Naphtha Feed Flow
- Reactor Furnace Shutdown
- Waste Heat Boiler Shutdown
- Stabilizer Shutdown

Troubleshooting
- Loss of Naphtha Feed
- Loss of Recycle Gas
- Loss of Reactor Furnace
- Loss of Cooling
- Loss of Stabilizer Reboiler
- Sulfur Catalyst Poisoning

- Tutorial has a built-in Quiz and comes with a Learning Management System (LMS) called TutAdmin. The LMS allows an instructor to register trainees and monitor their performance and Quiz scores
- Tutorial is available as a Standalone or Web based application
- Available in English, Chinese, Danish, Dutch, French, German, Spanish and Swedish
Simulation

GSE's EnVision simulation is a real-time dynamic process simulation program used for Operator Training. It is based upon a rigorous and High-Fidelity mathematical process model to provide a realistic dynamic response of a process unit.

The Simulator allows a Trainee to Practice:
- Startup and Shutdown Operations
- Normal Operations
- Emergency Shutdown Operation
- Control Exercises
- Troubleshoot and practice recovery from Equipment, Instrument, and Control Valve Malfunctions

Major Equipment:
- Feed Surge Drum
- Stacked Reactors (Four)
- Reactor Furnaces (Four)
- Reactor Furnace Waste
- Heat Boiler
- Product Separator
- Recycle Gas Compressor
- Net Gas Booster Compressor
- Stabilizer
- Regenerator

Key Operating Variables:
- Reactor Feed Total: 200.0 M3/H (30 MBPD)
- High Quality Naphtha: 100.0 M3/H (15 MBPD)
- Low Quality Naphtha: 100.0 M3/H (15 MBPD)
- Recycle Gas Flow: 85.0 KNM3/H (3000 MSCFH)
- H2 / HC Mole Ratio: 2.2
- Reformate Product: 152.0 M3/H (22.8 MBPD)
- Overhead LPG: 15.7 M3/H (2.4 MBPD)
- Stabilizer Off Gas: 0.80 KNM/H (28 MSCFH)
- Make Gas Flow: 58.5 KNM3/H (2065 MSCFH)
- Reactor Temperatures: 525.0 C (977 F)
- Separator Pressure: 5.2 BAR (75 PSIG)
- Make Gas H2 Purity: 88.0 %
- Reformate Octane Number: 102.0
- Catalyst Circulation: 400.0 KG/H (881.8 LB/H)
- Coke on Spent Catalyst: 5.1 WT%

- Simulation comes with a Learning Management System (LMS) called SimAdmin that allows an instructor to register trainees and monitor their performance
- Simulation is available as Standalone (Single or Dual Monitor) and Instructor-Trainee versions