EnVision
e-Learning & Universal Simulation

Catalytic Reforming Unit - Continuous Regeneration

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.

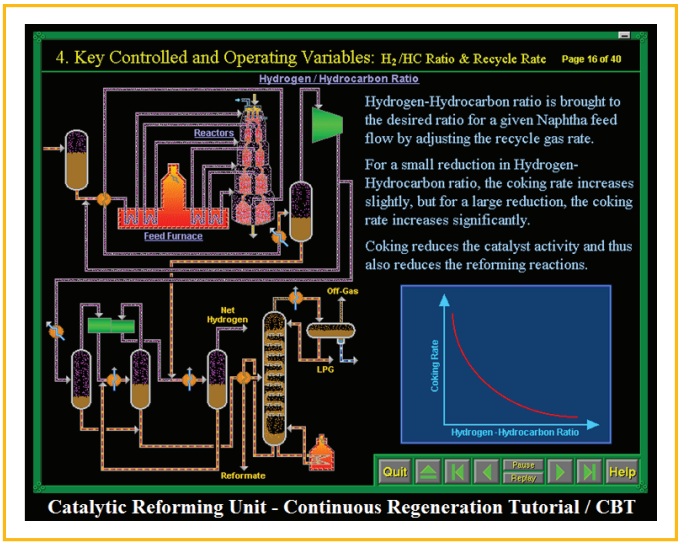
Overview
- Introduction
- Importance of Reformer in Refineries & Petrochemical Plants
- Feed stock Types
- Classifications of Reformer
- Process Overview

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

Principles of the Reformer
- Reforming Catalysts
- Catalytic Reforming Reactions
- Reactor Conversion
- Catalyst Deactivation
- Catalyst Regeneration

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

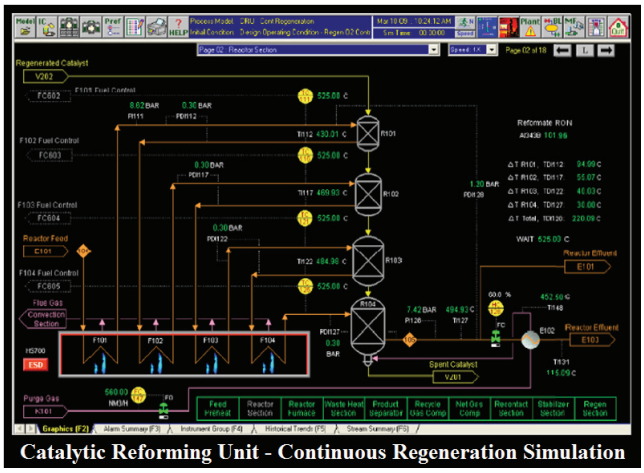
- Tutorial has a built-in Quiz and comes with a Learning Management System (LMS) called TutAdmin. The LMS allows an instructor to register trainees and monitor their performance and Quiz scores
- Tutorial is available as a Standalone or Web based application
- Available in English, Chinese, Danish, Dutch,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



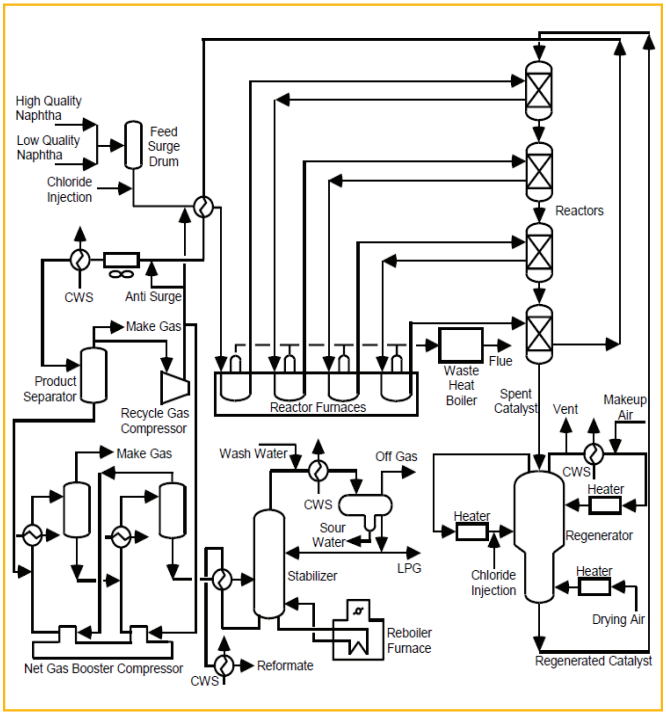
Catalytic Reforming Unit - Continuous Regeneration Simulation

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

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