EnVision
e-Learning & Universal Simulation

Catalytic Reforming Unit - Fixed Bed

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

Tutorial/CBT:

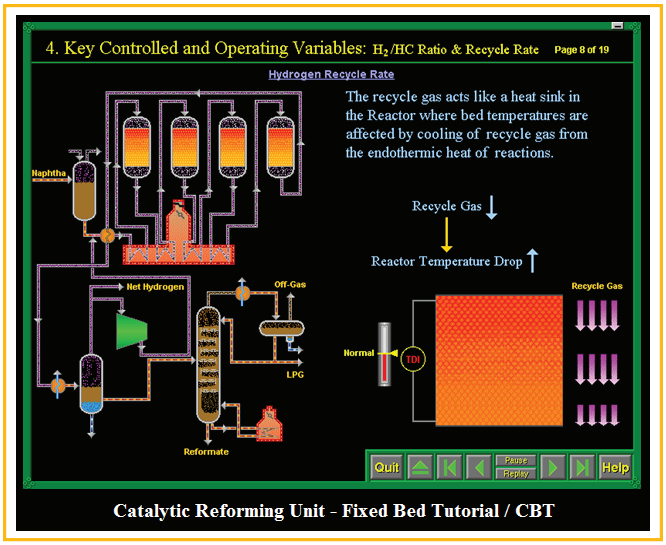
This interactive tutorial provides an Overview, Fundamental Principles, and Control and Operating Principles for Fixed-Bed Semi-Regenerative Catalytic Reforming Unit using Voice, Video, Animation and Graphics.

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

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

Principles of Reformer
- Reforming Catalysts
- Catalytic Reforming Reactions
- Reactor Conversion and Reformate Yield
- Catalyst Deactivation
- Catalyst Regeneration

Key Controlled and Operating Variables
- Reactor Inlet and Differential Temperatures
- WAIT and WABT
- Reactor Pressure
- Hydrogen to Hydrocarbon Ratio and Recycle Rate
- Feed Rate or Space Velocity
- Feedstock Properties
- Chloride and Water Injection



Catalytic Reforming Unit - Fixed Bed Tutorial / CBT

Safeguard System
- Introduction
- Emergency Unit Shutdown (ESD)
- Naphtha Feed Shutdown
- Reactor Furnace Shutdown
- Recycle Gas Compressor Protection
- Product Separator Low Level Protection
- Stabilizer Reboiler Furnace Shutdown

Startup Operation

Shutdown Operation

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

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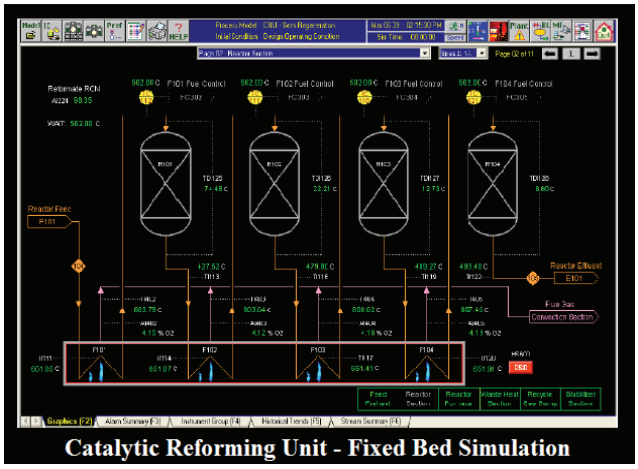
Simulation

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

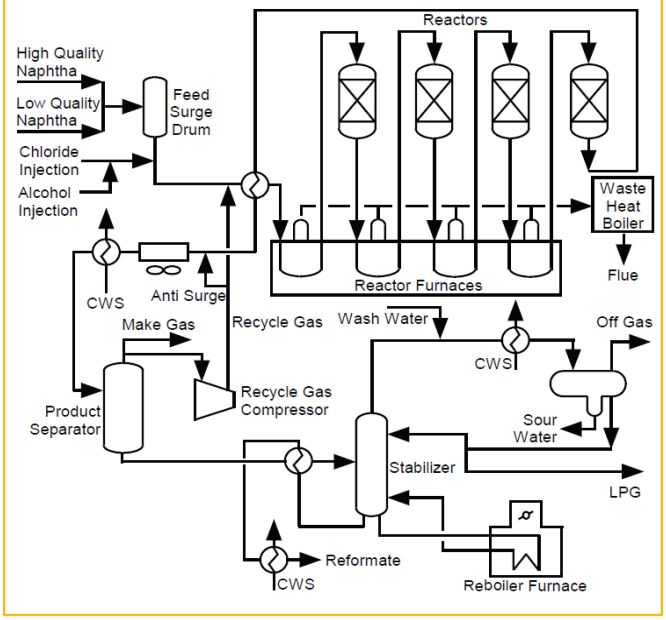

Catalytic Reforming Unit - Fixed Bed Simulation

Major Equipment:

- Feed Surge Drum
- Feed / Effluent Exchanger
- Reactors (Four)
- Reactor Furnaces (Four)
- Reactor Furnace Waste Heat Boiler
- Product Separator
- Recycle Gas Compressor
- Stabilizer

Key Operating Variables:

• Reactor Feed Total:	100.0	M3/H	(15.0 MBPD)
• High Quality Naphtha:	50.0	M3/H	(7.5 MBPD)
• Low Quality Naphtha:	50.0	M3/H	(7.5 MBPD)
• Recycle Gas Flow:	85.0	KNM3/H	(3000 MSCFH)
• H2 / HC Mole Ratio:	4.4		
• Reformate Product:	81.0	M3/H	(12.1 MBPD)
• Overhead LPG:	5.8	M3/H	(873 BPD)
• Stabilizer Off Gas:	0.83	KNM/H	(29 MSCFH)
• Make Gas Flow:	18.9	KNM3/H	(660 MSCFH)
• Reactor Temperatures:	502.0	C	(935 F)
• Separator Pressure:	19.0	BAR	(275 PSIG)
• Make Gas H2 Purity:	85.7	%	
• Reformate Octane Number:	98.3		



- 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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