EnVision
e-Learning & Universal Simulation

Delayed Coker Unit

A self-paced MultiMedia based Tutorial/CBT and real-time dynamic simulation of a Delayed Coker Unit.

Tutorial/CBT:

This interactive tutorial provides an Overview, Fundamental Principles, and Control and Operating Principles for a Delayed Coker Unit using Voice, Video, Animation and Graphics.

Overview
- Introduction
- Importance of Delayed Coking
- Process Overview

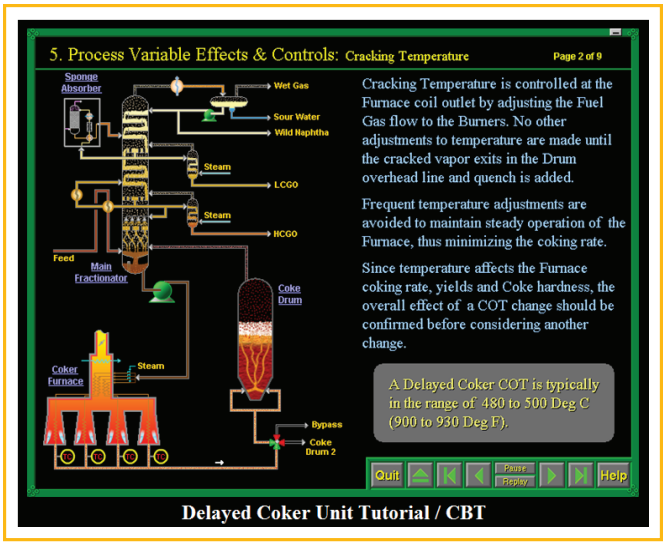
Delayed Coking Process Components
- Feed & Preheat
- Fractionator Bottoms & Fresh Feed
- Coker Furnaces
- Coke Drums
- Heavy Gas Oil System
- Light Gas Oil System
- Fractionator Overhead

Coke Drum Decoking Components
- Coker Quench System
- Blowdown System
- Hydraulic Decoking System
- Coke Handling Systems
- Coker Condensate System

Principles
- Feed and Coke Quality
- Cracking Chemistry
- Conversion & Yields
- Operating Philosophy

Process Variable Effects & Controls
- Feed Rate & Control
- Cracking Temperature
- Recycle Ratio or CFR
- Steam & Residence Time
- Coke Drum Filling & Control
- HCGO Wash Rate
- Drum Switch Effects
- HCGO, LCGO & Naphtha Cut-Points

Unit Startup
- Introduction
- Fill Liquid Inventories
- Circulate Startup Oil
- Unit Warm Up
- Start of Coking



Delayed Coker Unit Tutorial / CBT

Drum Switch & Coke Removal
- Introduction
- Drum Switching & Steaming
- Coke Bed Quenching
- Draining & Unheading
- Coke Cutting & Re-heading
- Drum Warm-up
- Automation & Interlocks

Unit Shutdown
- Introduction
- Replace Residue feed
- Finish Coking, Cool Down
- Clear & Purge Process Piping

Troubleshooting
- Furnace & Transfer Line Coking
- Coke Drum Foam-Over
- Coke Drum Vapor Line Coking
- Fractionator Coke Fouling
- Furnace Emergency Shutdowns
- Fractionator Tray Failures
- Coke Drum Decoking Problems
- Blowdown System

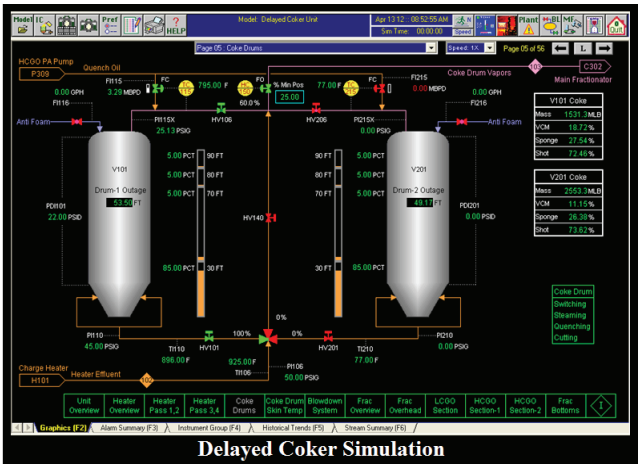
- Tutorial has a built-in Quiz and comes with a Learning Management System (LMS) called TutAdmin. The LMS allows an instructor to register trainees and monitor their performance and Quiz scores
- Tutorial is available as a Standalone or Web based application
- Available in English, Chinese, Danish, Dutch, 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
- Drum switching, steaming, quenching and warmup
- Control Exercises
- Troubleshoot and practice recovery from Equipment, Instrument, and Control Valve Malfunctions

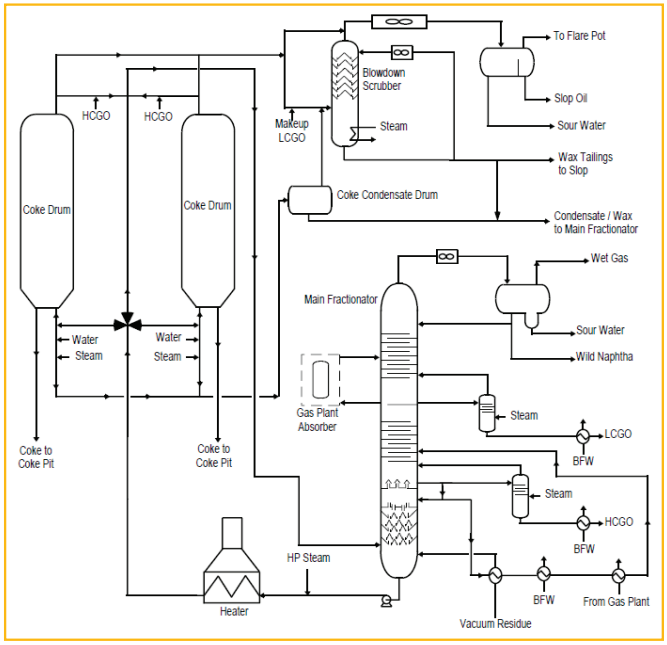


Major Equipment:

- Charge Heater
- Coke Drums
- Main Fractionator
- LCGO Stripper
- HCGO Stripper
- Blowdown Scrubber
- Coke Condensate Drum

Key Operating Variables:

• Feed:	189 M3/H	(28.5 MBPD	)
• Wet Gas:	21.2 KNM3/H	(18.0 MMSCFD	)
• Wild Naphtha:	31 M3/H	(4.7 MBPD	)
• LCGO:	40 M3/H	(6 MBPD	)
• HCGO:	61 M3/H	(9.2 MBPD	)
• Coke:	1310 TPD	(2880 MLBPD	)
• Main Frac. Pressure:	1 BAR	(15 PSIG	)
• Combined Feed Ratio:	1.08		
• Heater Outlet Temp.:	496 C	(925 F	)



- 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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