EnVision
e-Learning & Universal Simulation

Visbreaker Unit

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

Tutorial/CBT:

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

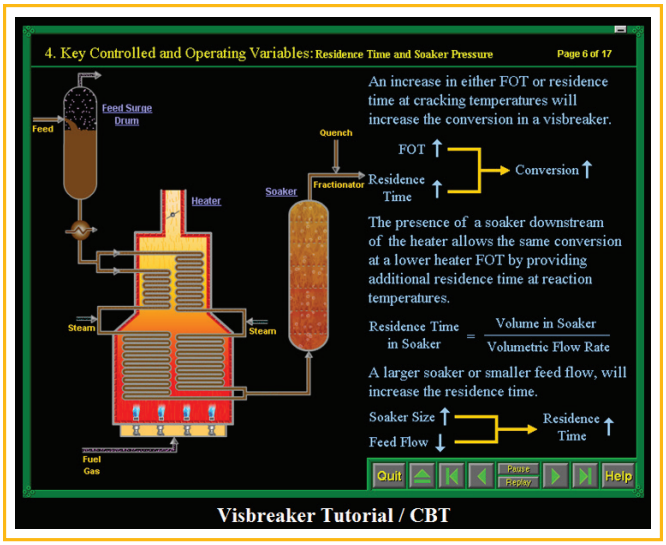
Overview
- Introduction
- Importance of the Visbreaker Unit
- Process Overview

Visbreaker Components
- Feed Surge Drum and Preheat
- Cracking and Soaking
- Quench and Preflash
- Fractionator
- Vacuum Flasher
- Additives

Principles of Visbreaking
- Heavy Oil Structure and Characterization
- Cracking Chemistry and Viscosity Reduction
- Conversion and Yields
- Vacuum Systems
- Stability of Visbreaker Residual Product
- Process Enhancements and Alternate Designs

Key Controlled and Operating Variables
- Feed Quality
- Cracking Temperature
- Residence Time and Soaker Pressure
- Quench and Flash Temperature
- Fractionator Overhead Temperature and Pressure
- Vacuum Flasher Pressure and Distillate Flow
- Product Draw Rates

Startup Operations
- Introduction and Preparation
- Unit Pressurization and Cutter Stock Circulation
- Commissioning the Heater
- Commissioning the Fractionator



Visbreaker Tutorial / CBT

- Commissioning the Vacuum Flasher
- Introduction of Charge
- Stabilization at Normal Operating Conditions

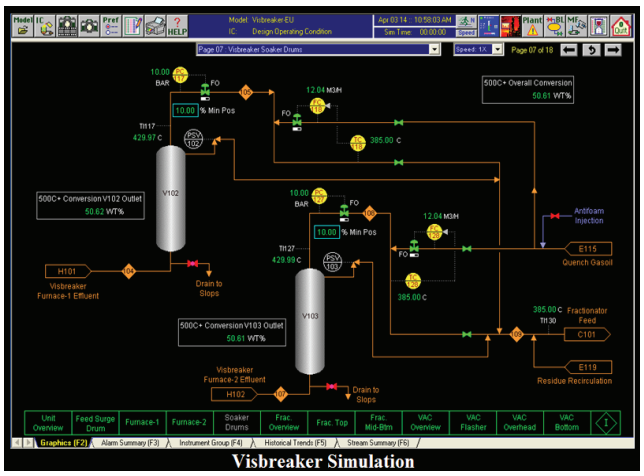
Shutdown Operations
- Introduction
- Reduce Heater Outlet Temperature and Charge Rate
- Shutdown of the Heater and Separation Columns
- Empty and Purge
- Emergency Shutdown

Troubleshooting
- Fouling of Preheat Exchangers
- Furnace Coking
- Soaker Coking
- Non-uniform Operation in Heater Tubes
- Foaming in the Cyclone or Fractionator
- Fractionator Coking
- Vacuum Flasher Coke Fouling
- Filter Plugging and Toluene Insolubles

- 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:

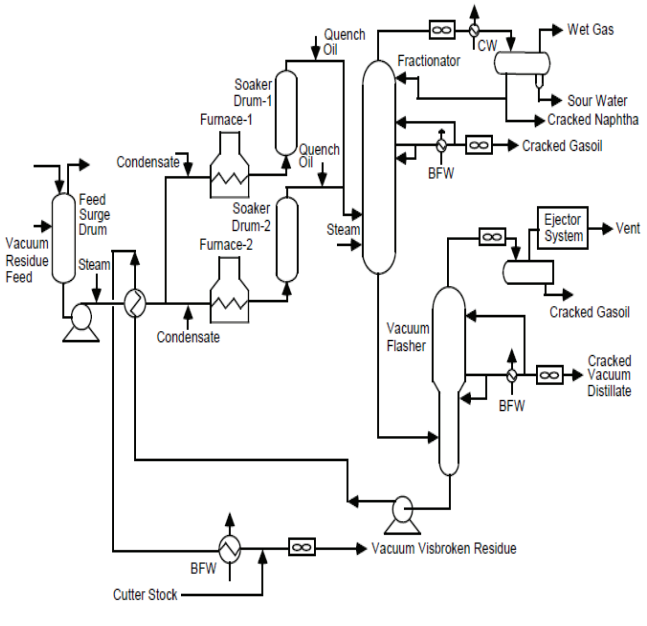
- Startup and Shutdown Operations
- Normal Operations
- Emergency Shutdown Operation
- Control Exercises
- Troubleshoot and practice recovery from Equipment, Instrument, and Control Valve Malfunctions

Major Units:

- Surge Drum
- Furnace & Soaker Drums
- Fractionator
- Vacuum Flasher

Key Operating Variables:

• Feed:	160 M3/H	(24 MBPD	)
• Wet Gas:	3200 NM3/H	(113 MSCFH	)
• Cracked Naphtha:	10.2 M3/H	(1.5 MBPD	)
• Cracked Gasoil:	24.3 M3/H	(3.7 MBPD	)
• Cracked Vacuum Distillate:	29.4 M3/H	(4.4 MBPD	)
• Vacuum Flasher Bottoms:	103.2 M3/H	(15.6 MBPD	)
• Cutter Stock:	20 M3/H	(3 MBPD	)
• Vacuum Visbroken Residue:	123.2 M3/H	(18.6 MBPD	)
• Furnace Outlet Temperature:	450 C	(840 F	)
• Soaker Drum Pressure	10 BAR	(145 PSIG	)
• Fractionator Top Pressure:	1.8 BAR	(25 PSIG	)
• Fractionator Bottom Temperature:	374 C	(705 F	)
• Vacuum Flasher Top Pressure:	30 mBARA	(0.9 INHG ABS	)



- 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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