EnVision
e-Learning & Universal Simulation

Acetylene Converter

A self-paced MultiMedia based Tutorial/CBT and real-time dynamic simulation of an Acetylene Converter.

Tutorial/CBT:

This interactive tutorial provides an Overview, Fundamental Principles, and Control and Operating Principles for an Acetylene Converter Reactor used in Ethylene Plants using Voice, Video, Animation and Graphics.

Introduction to Ethylene Process
- Uses of ethylene
- Overview of the Ethylene Manufacturing Process

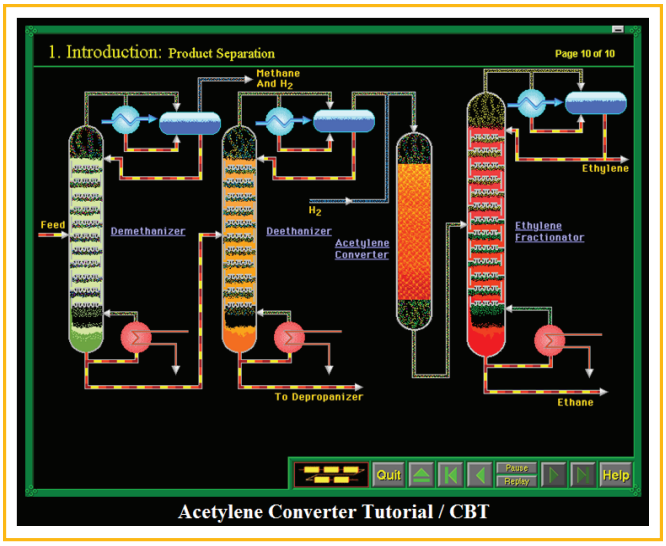
Importance of Ethylene Purity
- Formation of Acetylene
- Consequence of Acetylene Breakthrough

Acetylene Removal Methods
- Removal Types
- Hydrogenation Reactor

Difficulties in Reactor Operation
- Competing Reactions
- Activity and Selectivity
- Catalyst Aging
- Green Oil Formation

Carbon Monoxide Moderation
- Sensitivity of Reaction to CO
- Sources of CO

Potential Hazards
- Runaway Reactions
- Case History of Failures



Acetylene Converter Tutorial / CBT

Reaction Control
- Inlet and Outlet Acetylene
- CO in Feed and Hydrogen
- Hydrogen Purity

Basic Control Strategy
- Temperature control
- Pure and CO Rich Hydrogen

Troubleshooting
- Hydrogen Supply Problems
- Methanator and PSA Problems
- Hydrogen Variations
- Deethanizer Problems
- CO content in Raw Hydrogen
- Typical Maintenance/ Instrument Errors

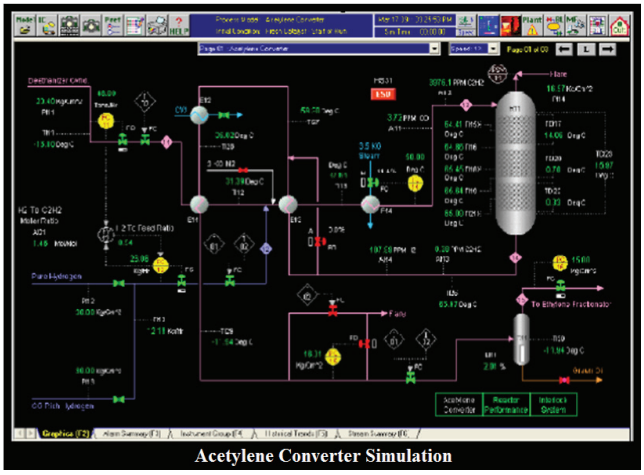
- Tutorial has a built-in Quiz and comes with a Learning Management System (LMS) called TutAdmin. The LMS allows an instructor to register trainees and monitor their performance and Quiz scores
- Tutorial is available as a Standalone or Web based application
- Available in English, Chinese, Danish, Dutch,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



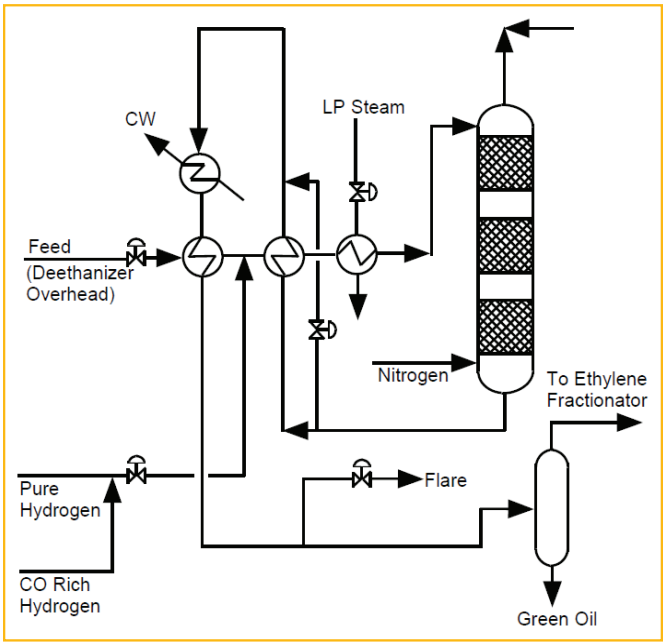
Acetylene Converter Simulation

Major Equipment:

- Reactor with 3 Beds
- Effluent - Feed Exchangers
- Steam Preheat Exchanger
- Green Oil Knock Out Drum

Key Operating Variables:

• Feed Flow:	48.0	T/H	(105.8 MLB/HR)
• Feed Temperature:	16.0	C	(3.2 F)
• Reactor:			
• Pressure:	16.6	BAR	(241.0 PSIG)
• Inlet Temperature:	50.0	C	(122.0 F)
• Outlet Temperature:	66.0	C	(150.7 F)
• Inlet C2H2:	0.40	Mole %	
• Outlet C2H2:	0.39	PPM	
• H2 to C2H2 Ratio:	1.46		



- 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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