A self-paced MultiMedia based Tutorial/CBT and real-time dynamic simulation of an Ultra-Low Sulfur Diesel Hydrotreating Unit.

**Tutorial/CBT:**

This interactive tutorial provides an Overview, Fundamental Principles, and Control and Operating Principles for an Ultra-Low Sulfur Diesel / Gas-Oil Hydrotreater Unit using Voice, Video, Animation and Graphics.

**Overview**
- Introduction
- Importance of Hydrotreating (HDS)
- Various Hydrotreating (HDS) Processes
- Diesel-HDS Unit Overview

**Key Process Variables**
- Unit Pressure
- Reactor Temperature
- Quench Strategy
- Separator Temperatures
- Wash Water
- Treat Gas Rate and Hydrogen Purity
- Feed Vaporization
- Hydrogen Partial Pressure
- Hydrogen Consumption
- Product Stripper and Vacuum Drier

**HDS Components**
- Feed Preparation and Preheat Section
- Reactor Section
- Reactor Effluent Cooling and Separation Section
- Amine Absorber
- Recycle Gas Compressor
- Make-up Hydrogen
- Product Stripping Section

**Principles of HDS**
- Hydrotreating Reactions
- Reaction Kinetics
- Hydrotreating Catalyst
- Catalyst Deactivation and Regeneration

**Startup Operation**

**Shutdown Operation**

**Safeguard System**
- Introduction
- Unit Depressurization
- Reactor High Temperature Shutdown
- Reactor Feed Shutdown
- Feed Furnace Shutdown
- Recycle Gas Compressor Shutdown
- High Pressure Separator Safeguards

**Troubleshooting**
- High Reactor Temperature
- Loss of Feed to Reactor
- Loss of Recycle Gas Compressor
- Loss of Make-up Hydrogen
- Loss of Stripping Steam
- Wet Diesel Product

- 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

GSE Systems
www.gses.com/EnVision
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 Equipment:
- Feed Surge Drum
- Feed Furnace
- Reactor with Three Beds
- Hot & Cold High Pressure Separator

Key Operating Variables:
- Reactor Feed Total: 331.0 M3/H (50 MBPD)
- SR LGO: 165.5 M3/H (25 MBPD)
- Kerosene: 66.2 M3/H (10 MBPD)
- LCO: 66.2 M3/H (10 MBPD)
- Coker / Visbreaker LGO: 33.1 M3/H (5 MBPD)
- Make-up Hydrogen: 27.5 KNM3/H (968 MSCFH)
- Diesel Product: 325.7 M3/H (49.2 MBPD)
- Wild Naphtha: 10.2 M3/H (1.55 MBPD)
- Off Gas Product: 4487 NM3/H (159 MSCFH)
- Reactor Inlet Pressure: 70 BAR (1015 PSIG)
- Reactor Inlet Temperature: 321.0 C (609.8 F)
- Reactor WABT: 347.7 C (658.0 F)
- Feed Sulfur: 0.92 Wt% S
- Feed Nitrogen: 289.2 PPM N
- Product Sulfur: 8.90 PPM S
- Product Nitrogen: 0.87 PPM N

- 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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