PS3000: Refinery Operations Simulator

The PS-3000 is a simulation software package with rigorous and detailed simulation models of Refinery process plants. The benefits of this package are:

For Academic

- ▶ Industrial Exposure for Students
- ▶ In-depth Process Understanding
- ▶ Carry out In-house projects
- ▶ Sound Fundamental Concepts of Process Control and safety with DCS Operations
- ▶ Understanding the Intricacy & Complexity of process dynamics
- ▶ Employability

For Industries

- ▶ Improved Plant Safety
- ▶ Smooth Startup & Shutdown
- ▶ Evaluation of Operator Proficiency
- ▶ Faster Recovery from External/Internal Process Disturbances
- ▶ Increased familiarity of Controls & Interlock Systems

The package consists of simulation models for various refinery plants. Each model simulates a refinery plant with its control, instrumentation and safety systems and field devices. The Instructor can invoke malfunctions, disturbances and instrument failures and evaluate the trainee performance. Trainee can perform normal operations, emergency operations as well as startup / shutdown operations on these models.

PS-3001: Atmospheric Distillation Unit:

The model simulates a refinery Atmospheric Distillation Unit which includes Preheat trains, Desalter, Crude heater, Atmospheric column, side strippers, and pump around systems, overhead system and stabilizer

PS-3002: Vacuum Distillation Unit:

The model simulates a refinery Vacuum Distillation Unit which includes vacuum heater, vacuum distillation column, overhead steam ejectors, hotwell, product strippers and coolers.

PS-3003: Fluid Catalytic Cracking Unit:

The model simulates a refinery fluid catalytic cracking Unit which includes feed section, reactor—regenerator section, Fractionation section and Gas concentration section.

PS-3004: Hydrogen Generation Unit:

The model simulates a refinery Hydrogen plant which includes the following sections: Desulphurization, Reforming, CO conversion (shift section), Separation of H2 and Steam Generation.

PS-3005: Hydrodesulphurization Unit:

The model simulates a refinery hydrodesulphurization plant which includes feed section, preheat system, heater, reactor, High Pressure system and Product Section.

PS-3006: Catalytic Reforming Unit:

The model simulates a refinery catalytic reformer unit which includes feed preheat section, reactor section, Product Separator section and Debutanizer section.

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PS-3007: Continuous Catalyst Regeneration Unit:

The CCR unit simulates Catalyst transfer and Catalyst regeneration. In Catalyst transfer, the catalyst is transferred from the Catalytic reforming reactors to the Regenerator and back again as regenerated catalyst back to the reactors. In Catalyst regeneration, the coke is burned off at a high temperature and low oxygen concentration and the catalyst passes into the Chlorination Zone where it is oxidized at high temperature and high oxygen concentration. The "Logic" is divided into Master Controller, Lock Hopper No.1 and No.2 Controllers

PS-3008: Hydrocracker unit:

This model simulates a refinery Hydrocracker unit which includes Feed preheat exchangers and surge drum, Lead and Main reactors, HP, LP Hot Separators, HP, LP Cold Separators, H2S absorber, Recycle Gas compressor, Makeup Hydrogen compressor trains, Fractionator furnace, Main Fractionator and Product strippers.

PS-3009: Sulphur Recovery Unit:

This model simulates a Sulphur recovery unit which includes Feed gas knockout drums, Combustion chamber, Reaction furnace, Sulfur condensers, Steam re-heaters, Catalytic converters and Sulphur pit.

PS-3010: Amine Treating Unit:

This model simulates an Amine Treating Unit which consists of Absorber Section, Turbines and Pumps Section and Stripper Section.

PS-3011: Delayed Coker Unit:

The model simulates a Delayed Coking Unit which consists of Coker furnace, Fractionator, Coke drums and Pre heat exchangers.

PS-3012: Diesel Hydrotreater unit:

The model simulates a diesel hydrotreater Unit which consists of Feed Coalescer, Feed surge Drum, Reactor feed heater, DHDT Reactor, Cold HP Separator, Cold LP Separator, Make-up gas compressor and Recycle gas compressor.

PS-3013: Naphtha Hydrotreater Unit:

The model simulates a Naphtha Hydrotreater Unit which consists of Feed surge Drum, Reactor feed heater, Lead and main Reactors, Hot Separator, Recycle gas compressor and Naphtha stripper.

PS-3014: Isomerization Unit:

The model simulates a Kerosene isomerization Unit which consists of Feed surge Drum, H2 makeup compressor, Feed dryer, Hydrogen dryer, Isomerization reactors and Stabilizer.

PS-3015: Kerosene Hydrotreater Unit:

The model simulates a Kerosene Hydrotreater Unit which consists of Feed surge drum, Reactor heater, Hydrotreater reactor and Stripper.