VGO HTR-SIM™ Technical Datasheet

KBC
A Yokogawa Company

Benefits

Optimise unit performance
- Determine the best trade-off of severity versus run length
- Determine the most profitable operation for a given hydrotreater unit given pricing for feeds, products, utilities, and unit shutdown
- Determine new operating parameters as sulphur specifications are reduced to meet tighter industry requirements
- Determine the best operating strategy to take into account the impact on the resulting FCCU operation

Maintain the refinery LP
- Generate a consistent set of yield vectors for different feeds and severities
- Regenerate data when the model or LP structure changes

Understand unit behaviour
- Predict hydrogen requirements for changing process conditions
- Train engineers and operators new to hydroprocessing by using the model to illustrate cause and effect through simulation runs

Monitor unit performance
- Accurately monitor catalyst deactivation and determine time to shutdown
- Track mass balance, hydrogen consumption, and other key process indicators
- Compare actual yields versus predicted versus normalised

Overview Summary

Hydrotreating operations are key to adhering to finished product regulations and operating downstream units effectively. How will various feeds perform in your hydrotreater with respect to hydrogen consumption, effect on ultimate catalyst run length and product qualities? VGO HTR-SIM can help determine the answers.
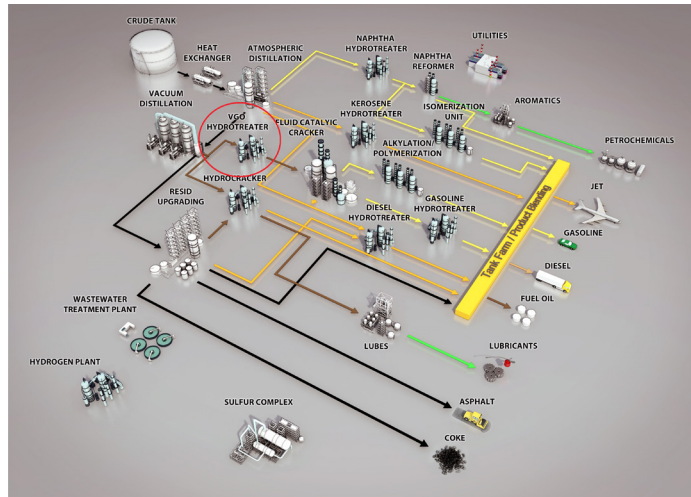
The VGO HTR-SIM model combines a detailed, rigorous kinetic simulation of the reactor and accurate product separation to produce the industry's most trusted analytical tool for hydrotreating of vacuum gas oils, coker heavy gas oils, FCC heavy cycle oils, or similar streams.
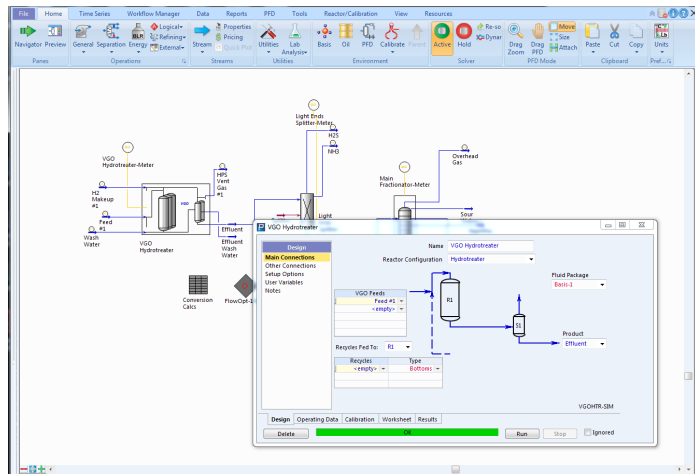
VGO HTR-SIM is a valuable tool to determine run lengths with different feeds, monitor deactivation, develop a consistent set of LP yield vectors and establish more profitable operations.

Features

- A detailed simulation of the reactor section of the hydrotreater, including quenches and downstream flashes, as well as the recycle gas loop

- Rigorous kinetic representation of all key hydrotreating reactions – Hydrodesulphurisation (HDS), Hydrodenitrogenation (HDN), Hydrodemetallisation (HDM), aromatics saturation, Conradson carbon removal, olefin saturation, cracking and ring-opening

- Detailed heat balances to allow the calculation of bed temperature rises and resulting quench requirements

- Accurate modelling of catalyst deactivation based on catalyst temperature, hydrogen partial pressure, and feedstock qualities

- Detailed feed pseudo-component characterisation by paraffin, aromatic, and naphthene content and carbon number

- Estimation of multiple sulphur species and separate reaction pathways, providing accurate representation of gas oil desulphurisation

- Two phase bed pressure drop calculation

- Reaction section scaling for reconfiguration studies

- A built-in data reconciliation tool for reconciling mass and elemental balances

- Automatic data validation support to assess the quality of input data to the model

- A built-in optimiser allows you to identify the most profitable operation given feed/product pricing, catalyst costs, and unit constraints

- Direct access to process data historians

- Convenient and efficient platform for developing and maintaining LP vectors

Interface Options

VGO HTR-SIM is available through a graphical user interface with the same user-friendly look and feel as other unit operations within the Petro-SIM family of process simulators. Make configuration changes through simple drag and drop techniques on a process flowsheet diagram, compare plant data results in a meter view, and perform case studies and optimisations all within a single environment.

VGO HTR-SIM supports a real integration with Microsoft Excel® allowing you to readily create a customisable Excel application workbook for driving calibration, prediction, and even optimisation case runs. Analyse the results of several cases directly from within this Excel environment. Multiple charting options allow easy analysis of data and model predictions. Excel interfaces are automatically generated and can be customised to your specific needs.

VGO HTR-SIM™ and Petro-SIM™

Because VGO HTR-SIM is available within the Petro-SIM environment, users with a Petro-SIM license can build very detailed process unit models that take advantage of Petro-SIM's sophisticated analysis tools, such as the popular LP Utility for easy generation and maintenance of LP submodels. Generate detailed models using downstream separation and auxiliary unit operations, link with assay and feed libraries and crude units to investigate feedstock effects, or use VGO HTR-SIM as part of a complete refinery wide model, at a level of detail unsurpassed by any other process simulation package.
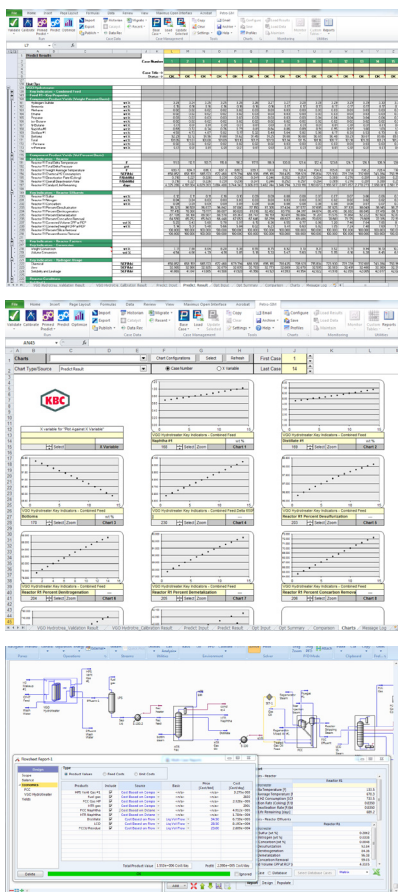
KBC ADVANCED TECHNOLOGIES
www.kbcat.com