Honeywell unveiled UniSim® Design Suite R440, the latest release of Honeywell’s steady state and dynamic process simulation technology. UniSim Design Suite is part of Honeywell’s family of simulation software and engineering solutions for process simulation, design, analysis, performance monitoring, optimization and business planning for the oil and gas production, gas processing, petroleum, refining and chemical industries.

Included in UniSim Design® Suite R440 are several products for process/equipment design and simulation, conceptual design of heat exchanger networks using pinch technology, as well as in-depth thermodynamic studies.

Enhanced Thermodynamics and Physical Properties
Thermodynamics and physical properties form the basis of steady state and dynamic simulation. Powerful new methods and tools have been introduced.

- The LNG GERG 2008 Thermo Package has been added. This equation of state is based on 21 natural gas components and has been adopted as an ISO Standard for natural gas.
- Used for gas treatment application this release improves the Glycol property package providing a close match to the research data published by the Gas Processors Association (GPA). In addition, the thermal conductivity calculation is extended to EG-Water and DEG-water systems and a new Water Solubility option for the Glycol package is introduced. Also critical to gas processing applications is the prediction of Hydrate formation. The Hydrate Utility is enhanced to provide better visibility of the results.
- When setting up a simulation it is important to make sure the models are based on accurate data. To help engineers with this task the UniSim Thermo Workbench Regression Tool is migrated to UniSim Design. This is the first phase of the migration. A new Fluid Phase Regression environment has been set up inside UniSim Design which allows the engineer to take experimental data specifically chosen for the system conditions and tune the equation of state. Also it is now possible to perform UniSim Design Calculations with the Dortmund Databank of VLE data using DDBSP to compare
predictions vs. experimental data. Other features added or enhanced include

- OLI Electrolyte GEMSE databank is supported for OLI Electrolyte packages.
- The compound property view is supported for OLI Electrolyte packages.
- Additional formulae have been added to the UniSim Design Basis Environment User Properties page to extend the range of properties that can be calculated to include those refinery properties calculated using property index methods.
- Improvement to speed and robustness of flash and physical property calculation.

New and Enhanced Unit Operations and Utilities

The Blowdown utility and Equation Oriented feature development roadmap continues to the next phase with the Blowdown calculations now deployed within a UniSim EO flowsheet environment. The new utility models multi-dimensional heat conduction in the vessel walls and has an improved modeling of fire and external fluxes utilizing the latest version of API 521. It also expands on the reporting capability of depressuring simulation results and performance results.

Standard Unit Operations are the building blocks through which a simulation model is constructed. Engineering requirements are evolving as innovations in design practice are introduced. In this release, many improvements have been made to the pipe segment unit operation in UniSim Design to provide new functionality and improve engineering efficiency. They include:

- Angle/Ambient Temperature – Calculated results for Angle and Ambient Temperature have been added to the Performance Page. Ambient temperature can be user specified or based on gradient (Air, Water, Ground).
- Wall Thickness – A wall thickness can now be entered in the table.
- Transpose Table – On the Sizing page, users now have the option to transpose the table for flexibility in viewing and entering data.
- Pipeline Editing – There is a pipeline editing mode where the user can choose to enter the length/elevation or X/Y data.
- Global Values – The addition of a Global button allows users to configure global values for all segments on length/elevation and X/Y data.
- Multiple Add – Users are able to add/insert segments using multiple add which allows for adding multiple segments at once.
- Copy/Paste to Excel – Data can be copied and pasted to and from an Excel spreadsheet.
- Origin for Elevation/Distance – On the Pipeline Profile page, the user can now add the pipeline origin for elevation and distance.
- X-Y Plot – The X-Y Plot button allows users to view a pipeline profile X-Y graph.

Many enhancements have been made to the compressor unit operation reduced curve feature in this release, principally aimed at improved robustness, stability and usability. Additionally in response to user requests a new option has been deployed to allow the compressor to support multiple phase fluids. The existing compressor unit operation has been extended to handle multiple sets of performance curves corresponding to different values of gas volumetric fraction (GVF) at the inlet - for each value of GVF there will be a set of curves at different speeds. Thermodynamic and hydraulic behavior is now extended to multiple phase fluids by using the mixture properties with the same underlining equations already in the compressor. This is supported in both dynamics and steady state.

The vessel model is enhanced to include ellipsoidal or hemispherical ends for vertical or horizontal vessels so that data can be used directly from a data sheet rather than having to use offline tools to calculate revised T/T length and NLL values due to vessel end types.
User Interface, Solvers and Workflow Tools

The efficiency for individual engineers when doing their work is an important factor for the overall user community. The UniSim Design development roadmap includes the introduction of new and enhanced engineering effectiveness features:

- **Broyden Solver for Simultaneous Adjust Recycle Manager.** The Adjust-Recycle Manager controls the execution of Recycles that have been combined into a Group. As members of a Group, both multiple Adjusts and multiple Recycles can be solved simultaneously by the Broyden method. The Broyden method was included in the first release of the Adjust-Recycle Manager, and can be used successfully for an individual, single member Adjust “Group”. The capabilities have now been extended to multi-member, mixed Adjust and Recycle groups.

- **Spreadsheet Tolerance.** The user may now define Tolerances. The Tolerance controls the updating of the import or export value from or to the cell. This is useful when a user wishes to control the convergence of the flowsheet.

- **USE-IT and USD Browser Integration.** With R440 these two tools have been integrated into the UniSim Excel Interface Tool. The integrated tool combines the intuitive object browser of USD Browser and its in-cell formulae with the case study capability of USE-IT. Spreadsheets from earlier versions of either of these tools can be seamlessly migrated to the integrated tool.

- **Case Scenario Manager and Scenario Transition Monitor** are productivity tools used for the change management of case files in a structured way for variable propagation and comparisons to assist with case study activities. Enhancements include:
  - Customized data filtering option is added to the Variable Propagation feature of the CSM.
  - “Append a Scenario” in the CSM enables users to highlight multiple cases to append multiple scenario files at the same time in the File Selection dialogue.
  - A CSM-STM link has been implemented in order to run CSM variable propagation with STM control. This automation will help the scenario case to reach convergence more reliably, and will relieve user’s load in tuning a flowsheet to converge.

- **Module Coupling Interface** is a productivity tool for managing the parallel workflow required to support generation of vary large flowsheets by teams of engineers working on separate parts of the model that then need to be re-integrated. For MCI, many productivity and usability features have been introduced based on feedback from users.

- **OPC Client Tag Browser.** The OPC Client has been enhanced to have browsing capability of the tags exposed by the OPC server. This includes Text filter, Accessibility filter, and Tag item properties.

- **Other general user interface improvements include:**
  - User Variables may be displayed on the Workbook.
  - Streams with user specified compositions can be recognized in the PFD.
  - There is an option to show indices on component lists. This makes for easier comparisons for large number of components.

**UniSim License Manager (ULM)**

The following new features have been implemented providing users with added flexibility in license management and better protection of their assets:

- Enhanced support for user definition in AccessControl.xml groups.
- Alerts for commuted or returned licenses.
- WebULM integrated cloud downloads
- Improved management of commuted licenses
UniSim Heat Exchangers and UniSim Flare

In this release, several defects identified and reported by our customers have been fixed in all the UniSim Heat Exchanger packages and UniSim Flare. These span several areas, including compatibility with previous versions, display, calculation, and reporting issues. Full details on the improvements are available in the UniSim Heat Exchangers R440 and UniSim Flare 440 Release notes.

“Help me get into” Videos

The “Help me get into” campaign – a series of videos that provide quick demonstrations of new features and enhancements introduced with the R410 release and continued with the R430 release has been proving popular with users. These short (2-4 minute) videos are aimed to increase user awareness of selected UniSim Design functionalities, and can be easily downloaded and shared with the user community.

Additional videos highlighting UniSim Design R440 features have been added to the UniSim Design Suite Customer Support Centre.

To gain access to all available and upcoming videos, please visit the UniSim Design Suite Customer Support Centre: [http://UniSim.supportportal.com](http://UniSim.supportportal.com). Sign in is required to access this content.

For More Information

Learn more about how Honeywell's UniSim Design can improve your process performance visit our website [www.honeywellprocess.com/software](http://www.honeywellprocess.com/software) or contact your Honeywell account manager.

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