COLSEQ enhancements

Please look in general enhancement for non-program specific enhancements. The enhancements refer to the current release of the software with the same version number as not all enhancement warrant changing the version number

Version 2.9-150 (11/12/2023)

Version 2.9-148 (19/09/2023)
- An issue relating to the initialisation of the NLP optimisation for sequence with merged column has been resolved
- The GA solver formulation was allowing the feed quality (q) to be optimised over a specified range. This has been resolved
- The internal cost correlation for the column capital cost have been updated to 2021 values

Version 2.9-146
- An issue relating to data corruption for sloppy prefractionators and prefractionator models in the 'task' based model has been resolved
- The dephlegmator model was returning incorrect values. This has been resolved
- The sequence heat recovery can now be based on targets rather than a detailed MILP transportation formulation
- In some circumstances (i.e. low pressure, volatile components) the reboiler duty would be less than zero. This situation is now handled correctly
- The stream data in when design in targeting mode could fail to initialise correctly when the targets failed. This has been corrected
- The user constraints can now be used to   specify condenser type based on product composition rather than column type
- The EMAT for sub-ambient stream was not being applied in when the sequence HEN design was in targeting mode. This has been corrected
- The side stripper and side rectifier models were using an incorrect condenser type in some situation. This has been resolved
- The light and heavy key recoveries were not been correctly determined for system with non-sharp splits. This was causing significant differences between the column product composition and the feed to any downstream column. This has been resolved.

Version 2.9-145

- The feed quality (q) can now be optimised over a specified range rather than 0 or 1. There is an option to only use 0 or 1 for the feed condition.
- The default condition of side stream for complex columns (pre-fractionators, dividing wall) can now be specified (saturated liquid or saturated vapour). The condition can also be optimised.
- When a vapour need to be compressed in the stream conditioning , there is an option to permit vapour stream to be first cooled to a liquid, then compressed using a liquid

pump and then re-heated to the desired temperature. This can be beneficial where power is expensive but heating and cooling are relatively cheap. This can also be achieve by changing the upstream condenser to a total condenser There is an new option to only permit this feature where there is no upstream condenser (.i.e. side streams of pre-fractionators , dividing wall etc.)

- A column sensitivity function has been included to permit you to explore how the column operating condition (i.e. condenser/reboiler load and temperatures) change relative to a change in one of the input specifications
- The default column pressure has been added to the column design detailed editor
- The letdown valve was not drawn on the flowsheet under some circumstances
- The multi-stage compressor model was not returning the correct outlet temperature in some circumstances. It was also incorrectly applying inter-cooling to single stage machines
- The user can no longer specify the relative volatilities and a physical properties source must be specified.
- The rebolier heat load are now determined by an energy balance around the column
- The relative volatiles are now determined at the top and bottom of the column ad the geometric mean is used in the Underwood equation. An option is available to calculate the relative volatilities at either the condenser and reboiler inlet composition or the product compositions
- The specified product recoveries were not being achieve in some column models
- A facility has been add so the user can define and simulate a given sequence
- An option has been added to control if the sequence optimisation results are reset after a data modification. This can be used to investigate how changes to specifications can change the optimised sequences

Version 2.9-144

- A function has been added to limit the column pressure either the condenser or reboiler produce a product. It some situations the column will be above the critical pressure for the product composition resulting in the failure to correctly estimate the reboiler or condenser heatload
- The flowsheet was reporting the product conditioning specification when the "what is" tool is used. It now report the actual product stream properties
- BY default the maximum column pressure is now set as a fraction of the critical pressure or the maximum permitted pressure, whichever is the lower. The critical pressure is calculated using the bottom product composition of the column. The critical pressures for the product are now shown in the sequence data editor\products
- The defaults for the reflux scale-up and column critical section have been changed
- The "move" routines and probabilities for the SA sequence flowsheet have been revised.
- The design constraints for utilities now are applied in the SA design section
- The information in the sequence simulation report is now configurable
- A function has been included to analyse the optimisation trials. Key parameters are stored and can be plot as a guide to the solution space. Pareto front profiles can be generated
- Additional default column design parameters can now be specified
- The HTML version of the flowsheet simulation report had been enhance with link to enable easier navigation.

Version 2.9-142

- New Development environment libraries

- Restructure on-line help
- The sequence selection option and ranking did not differentiate identical structure under some circumstances
- The SA sequence selection can now initialised using the best existing sequence
- The default condenser/reboiler HTC have be revised
- Some cost elements were not being included correctly in the SA optimisation objective function
- Additional sequence flowsheet layout options have been included.
- Some of the menu windows menu name have been shortened due to a limitation in windows

Version 2.9-141

- The heat recovery method used in the SA/GA sequencing has been replaced with an MILP transportation formulation
- The internal cost correlation for a dephlemator was returning that value in correct units giving artificially low values.
- The heat recovery network complexity can now be controlled by setting limits on the number of connect a given heat source/sink may have
- The sloppy prefractionator cost terms in the task based sequencing were incorrect.

Version 2.9-140

- The flowsheet annotation layout is now user configurable
- Feed and product properties has been added to the flowsheet
- The column details table function has been enhanced
- In task base sequencing the secondary condenser and reboiler utility cost were being ignored. This has been corrected
- The sloppy prefractionator connection to multi-feed column layout has been improved in the flowsheet
- Issues relating to the sloppy prefractionator task based optimisation have been resolved

Version 2.9-130

- Extracted from COLOM software. First independent version