MANCHESTER 1824
The University of Manchester

COLSEQ Overview

COLSEQ is the software package used for the design of distillation systems.

COLSEQ supports the conceptual design and optimisation of distillation systems by screening alternative column configurations, evaluating operating pressures, and assessing energy-integration options. It is intended for early-stage process design, where engineers need to compare feasible separation sequences before moving to detailed simulation.

Physical property calculations can be performed using **COLSEQ's** own facilities or through interfaces to external simulation software packages.

COLSEQ can screen and optimise sequences of simple and complex columns.
Simple columns, including sloppy separations, prefractionators, side-strippers, side-rectifiers, fully thermally coupled columns such as Petlyuk and dividing wall arrangements, and complex column designs using stripping steam can all be studied in **COLSEQ**. The software identifies the most appropriate combination for a given separation problem, investigates the energy-integration implications of each design.

COLSEQ addresses the following design issues:

- Sequencing of simple distillation columns
- Sequencing of complex column configurations
- Simultaneous optimisation of pressure and configuration
- Heat integration of distillation sequences

Distillation System Design

COLSEQ can be used to screen sequences of simple and complex columns. It identifies appropriate arrangements of simple columns, including sloppy separations, side strippers, side rectifiers, prefractionators, and fully thermally coupled columns such as Petlyuk and dividing wall columns. Column pressures are optimised simultaneously with configuration, based on vapour load, energy consumption or utilities costs. This facility allows novel distillation system designs to be identified and enables the interactions between the distillation system and the supporting utility system to be examined, together with the sensitivity of the design to changes in feedstock.

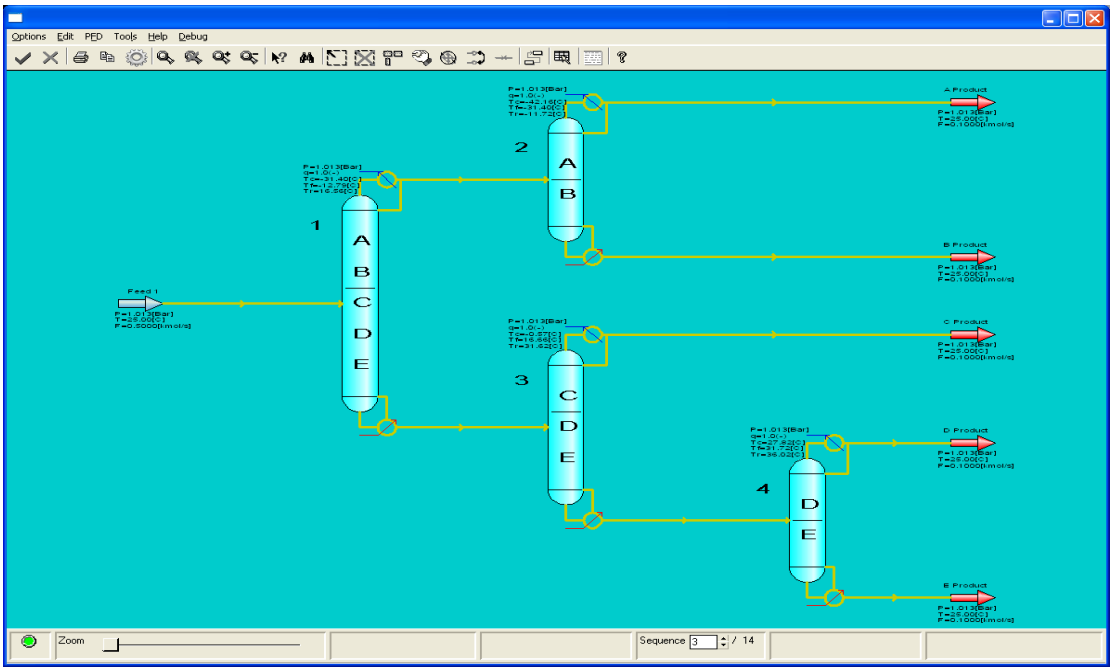


Figure: sequence design using simple columns.

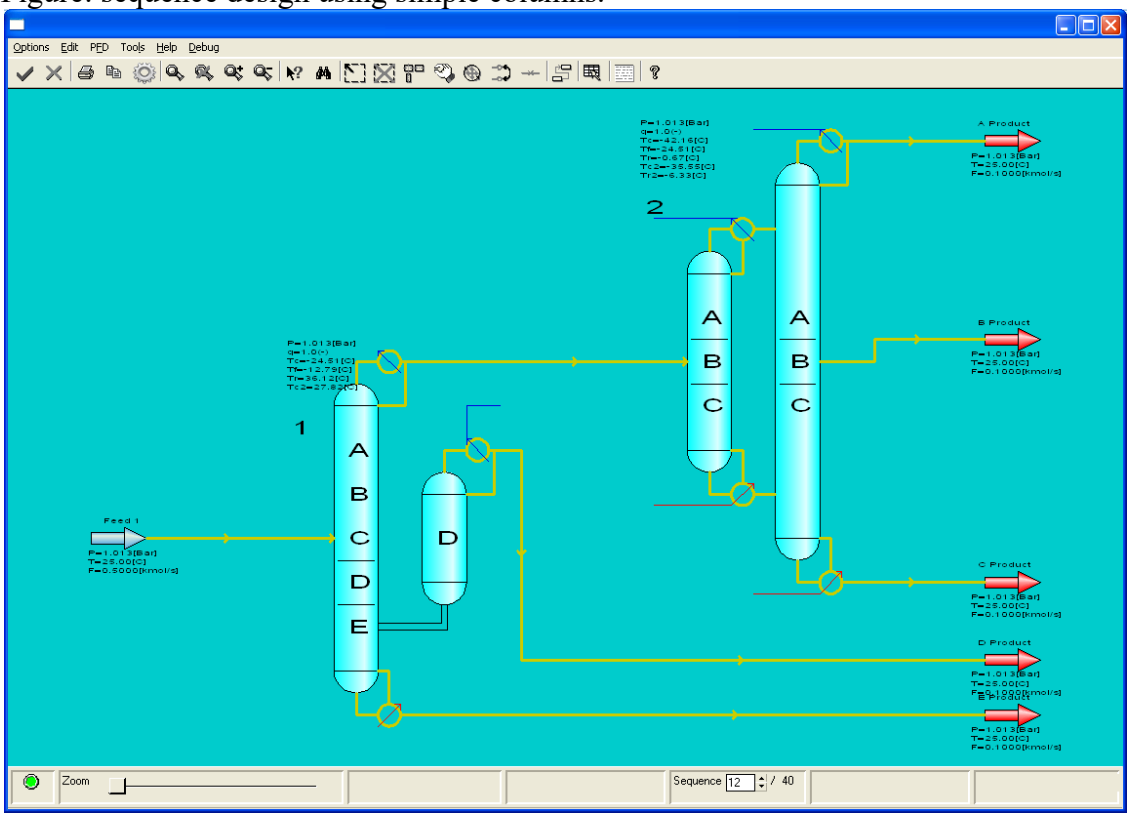
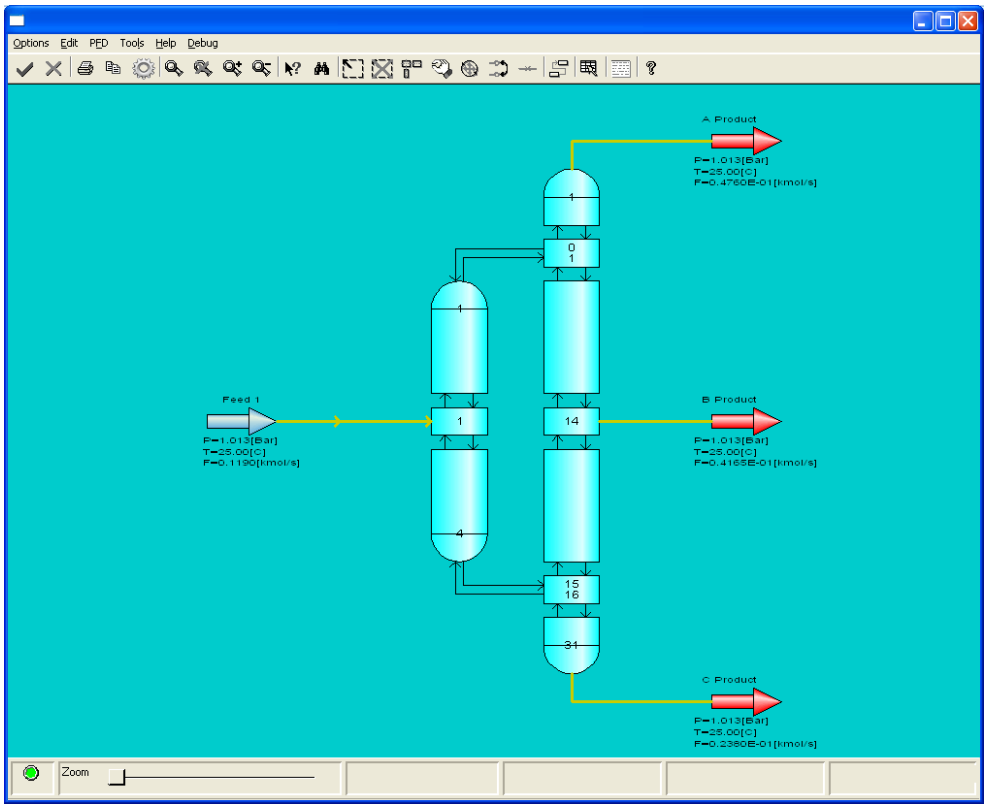
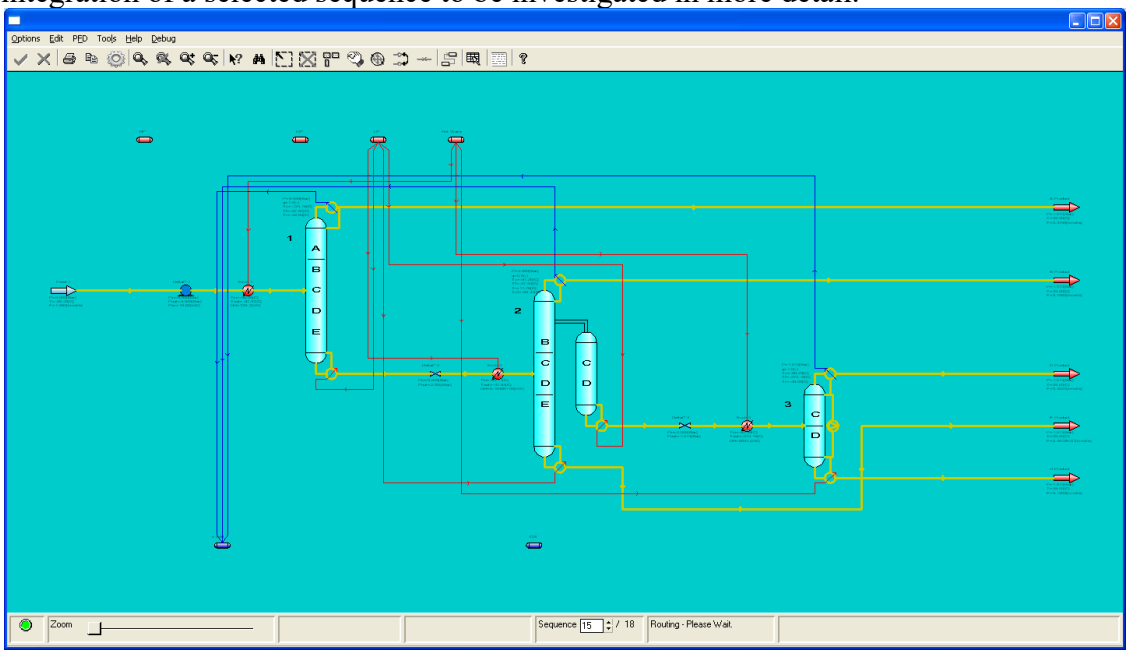


Figure: sequence design using simple and complex columns.

Dividing Wall Distillation

Dividing wall distillation features additional degrees of freedom compared with conventional distillation. **COLSEQ** provides facilities to optimise these degrees of freedom, scope and screen design options, and initialise rigorous simulation.



Heat Integration of Column Sequences

COLSEQ can assess the energy-integration implications of a proposed design. It can also export reboiler and condenser data to **STAR** or **SPRINT**, allowing the heat integration of a selected sequence to be investigated in more detail.