

Index of Simulations:

The JaSim model range starts from simple control loops (level, pressure, flow, temperature) to complete process industry plant systems and sub-systems such as distillation columns and refrigeration systems. The range is expanding constantly with a new basic Batch Reactor to be launched in 2007.

JaSim is ideal for improving skills and workforce development or as an introduction to process control, to control dynamics, and to key plant equipment.

The models are fully functional, engineering quality, dynamic process simulations of real plant. The TSC Range of simulations are used to train plant operators for site specific plant and equipment used by **ExxonMobil, Shell, British Gas, BP** and **AMEC** to name but a few. Our simulations are also in place in a large number of Universities and Training Centres throughout the world, many of them leaders in their field. These include the Caspian Technical Training Centre for **BP** in Baku, the Excel Training Centre for **Shell** at Stanlow and for **Loughborough University** in the UK, **Cape Breton University** in Canada and **Training Partners Limited** in Houston, USA

The JaSim range presently comprises:

- **J1010** Three Term Control Loop

An introduction to the concept of PID control loops. Using a simple level control loop this model demonstrates the basic principles of process control. The model can be used to develop an understanding of each of the components of the PID controller, the proportional, integral and derivative terms. By allowing a variable feed to the level controlled system it is then possible to tune the response of this controller to various conditions, this is explained in a set of assignments contained within the model.

- **J1030** Flow, Pressure and Level Control

An introduction to two phase separation and the implications on control loop interaction. Using a simple two phase separator this model demonstrates the basic principles of separation by allowing the pressure, flow and temperature of a vessel to be changed allowing varying degrees of separation. The model includes a flow controller on the vessel feed, level control in the flash vessel and vessel pressure control. The effect of both the flash compositions and each of these control loops is explained in a series of assignments contained within the model.

- **J2010** Direct and Cascade Control

An introduction to cascade control. Using a comparison between a simple level control loop and level – flow cascaded loop this model can be used to develop a basic understanding of the uses and benefits of cascade control. By varying the flow to the two loops comparisons can be made between the two sets of control strategy. Contained within the model is a set of assignments explaining how to control each of the loops for optimum performance.

- **J2020** Three Phase Separation

Using a simple three phase separator with weir, this model demonstrates the basic principles of separating a feed into a gas, a light liquid phase and water. The model includes level control both sides of the weir in the separation vessel as well as over head pressure control. By allowing changes to the feed stream and through a set of assignments contained within the model this system can be used to teach the principles of separation and its associated control.

- **J2100** Basic Pump Operations

An introduction to pumping liquids. Using a feed drum and a set of two pumps which can be run singly, in parallel or used for procedural changeover. This model can be used develop an understanding of the principles involved with pumping a liquid. The model includes a cascade level control loop on the feed drum as well as a minimum flow protection loop for the pumps. The set of assignments contained within the model this system can also be used to plot the pump characteristic curve.

- **J3010 Basic Centrifugal Compressor**

An introduction to centrifugal compressors. Using a basic centrifugal compressor system with a suction and discharge flash drum this model can be used to develop an understanding of basic compressor operation. With assignments contained within this model it can be used to teach the principles of anti surge control and stone wall conditions. By allowing the user to vary pressure and temperatures of the feed, the effect on efficiency, power consumption and flow of operating of operating the compressor under different conditions can also be demonstrated.

- **J3020 Basic Distillation Column**

An introduction to distillation. Using a simple column system with a full reboiler and condenser this model can be used to develop an understanding of the basics of distillation. By allowing the user to change feed conditions as well as reboiler temperature and reflux rates this model can be used to demonstrate the full range of operation of a column. The model contains pressure and temperature profiles through the column allowing the different operating areas of a column to be demonstrated. This model will be released in Autumn 2007.

- **J3070 Basic Refrigeration System**

An introduction to refrigeration. Using a simple refrigeration loop containing compression, cooling, expansion and evaporation stages; this model can be used to develop a basic understanding of the fundamentals of refrigeration. All the associated control loops are included within the model allowing a user to run the refrigeration loop under a full range of conditions, to demonstrate the refrigeration cycle. A fully functional ESD system is used for start up of the compressor. This model will be released in Autumn 2007.