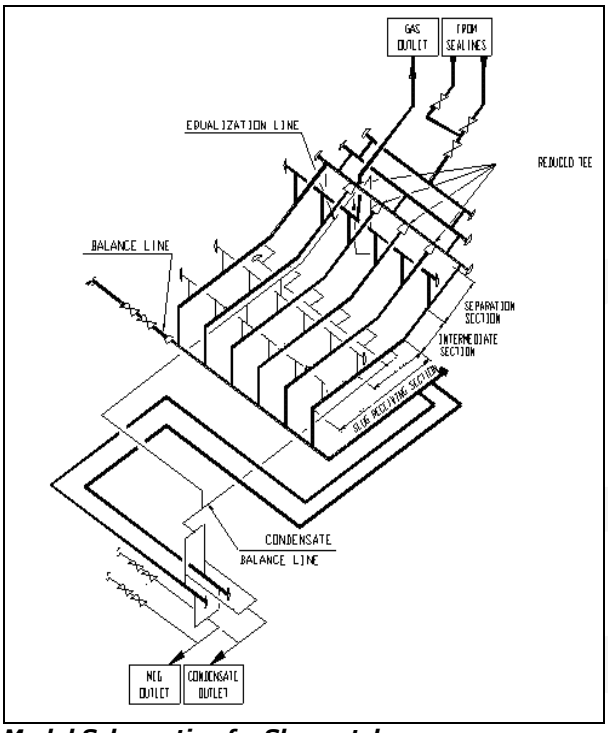
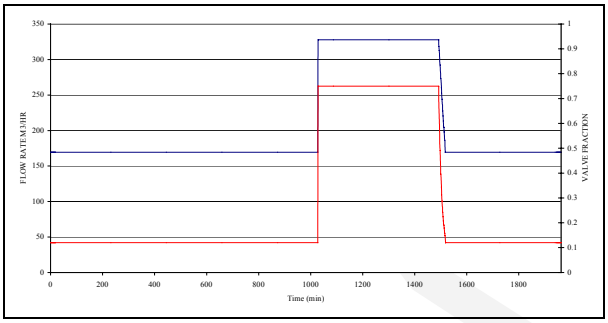
Case Study: DYNAMIC SIMULATION OF A SLUGCATCHER



Model Schematic of a Slug catcher



Total Flowrate and Valve Fraction Through a Control Valve on a slug catcher Unit

Scope of Study

- Trident was commissioned to conduct dynamic hydraulic and mechanical simulation studies to verify the design of a slug catcher unit
- Verification of the phase separation efficiency, fluid velocities, flow distribution, pressure levels, control system, balance pipe size and piping forces/moments in the inlet facilities during slugging flow is required

Trident Approach

- Construct a hydraulic model of the arrival piping and the slug catcher including the associated control systems;
- Tune the control system and internally audit the model;
- Obtain the steady states required for the runs.
- Perform dynamic runs to calculate pressures, separation efficiencies (droplet carryover and liquid/liquid separation), forces on pipework, flow distribution levels, and velocities in the piping and the slug catcher

Trident Conclusions

- There is negligible carry over of liquid into the gas phase during the upsets considered
- The slug catcher is adequately sized however water may be carried over to the oil outlet during mechanical pigging
- Insert expander nozzles on the inlet to the inner fingers from the distribution header in order to correct the flow imbalance between the fingers

TRIDENT CONSULTANTS