

Process simulation

With more than 20 years experience offering both dynamic and steady state process simulation consultancy and advice, Atkins delivers benefits to Oil and Gas development projects both onshore and offshore throughout the Asset lifecycle. Our focus is on the development and application of dynamic simulation techniques, combined with traditional process engineering knowledge to provide practical solutions to engineering issues.

Recent projects

- Validation of overall plant controllability and operability during design phase;
- Development of start-up procedures;
- Troubleshooting spurious process trips in an oil export system;
- Dynamic analysis of existing flare system capacity in order to sanction production upgrade with minimal change;
- Assessment of slugging and separation train level control dynamics for sanction of produced water upgrade;
- Sizing of compressor anti-surge valves / hot gas bypasses;
- Simulation and generation of Heat and Material Balances for large-scale onshore gas gathering processing facilities;
- Analysis and prediction of turbo-expander operation;
- Prediction of peak pressures following heat exchanger tube rupture with recommendations on bursting disk placement and piping loads;
- Analysis of high integrity pressure protection systems (HIPPs) to define effective setpoints, response times and valve closure times;
- Verification of shutdown logic;
- Analysis and optimization of multi-stage / multi-train compressor control logic;
- Fast-track resolution of HAZOP queries;
- Examination of transient scenarios to ensure adequate relief provisions;
- Investigation into surge issues in water injection, firewater, seawater, cooling medium and oil export systems;
- Analysis of multiphase flow hydraulics in pipelines and risers with potential for pipeline-process interactions;
- Control system check-out;
- Development of operator training systems.

Simulation software

Hysys Dynamics is our preferred simulation tool for dynamic modeling and we are considered expert users. However, as independent consultants, Atkins has access to the best in class commercially available simulation packages. This provides Atkins with the flexibility to use the most appropriate package for any given problem.

Plan Design Enable

Atkins has also used the dynamics extensibility capability of Hysys to extend the capabilities of key unit operations to better meet our client requirements whilst continuing to deliver a high fidelity transient response. Our upgraded models include centrifugal and screw compressors, turbo-expander and 3rd-party anti-surge controller elements including load balancing. We also have extensive experience in the use of equation based process modelling tools e.g. Aspen Custom Modeler and gPROMS to build rigorous plant models where bespoke modelling elements are required.

Atkins has access to a number of tools available to investigate pipeline-process interactions and has extensive experience in linked subsea-topsides modeling. OLGA is our preferred simulation software for transient modeling of multiphase pipelines, but we also have experience with ProFES.

Fast transient (waterhammer) surge analysis is also a recognized specialty of the group. For this kind of analysis we use WANDA 3 (supplied by Deltares) as well as our own in-house software, AUPHYAS.

