



**Process Ecology Reduces Capital
Costs and Prevents Downtime by
Using Aspen HYSYS® Family**

“We rely on AspenTech engineering software for most of our projects. Without it, we wouldn’t have the ability to accurately simulate a wide range of oil and gas processes — including gathering systems and corresponding issues, such as transient slug formation.”

- James Holoboff, Director, Process Ecology

Reduced capital costs by

60%

CHALLENGE

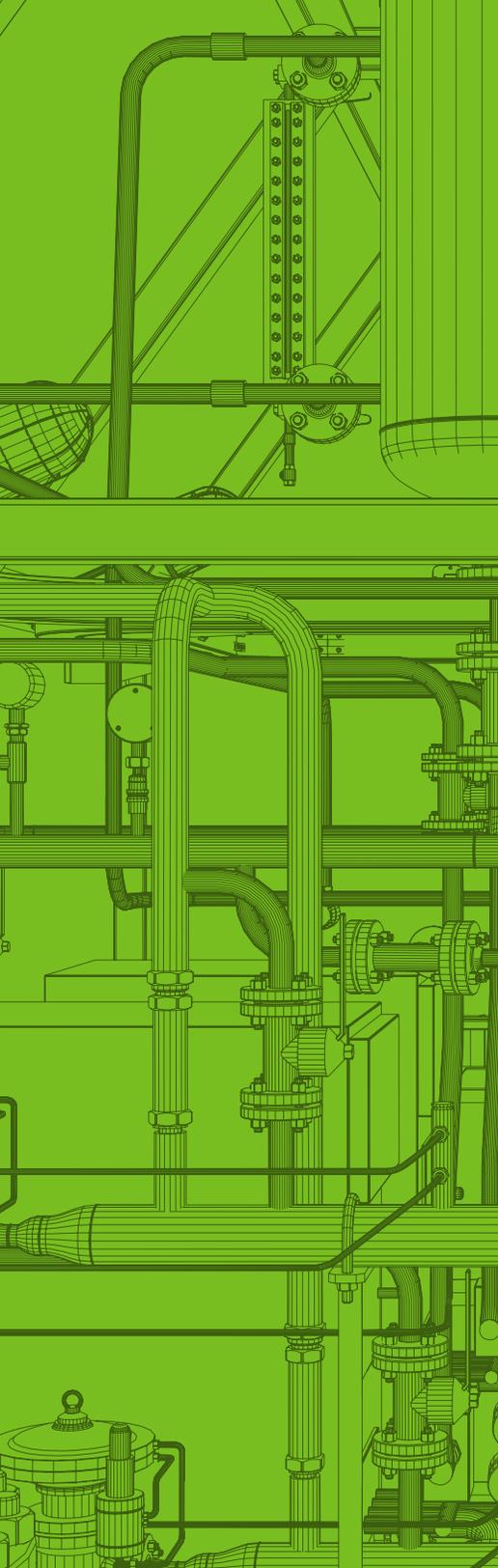
Slug catchers that manage the impact of condensed heavy fractions (slugs) in natural gas need to be optimally sized to minimize CAPEX.

SOLUTION

Aspen HYSYS and Aspen HYSYS Upstream were used to estimate the slug volumes and duration to appropriately size the slug catcher.

BENEFITS

- Saved substantial capital costs by properly sizing equipment in gas gathering systems, 60% in this case
- Gained insight into pipe flow and prevented downtime in gas production, which has tight revenue margins
- Predicted process constraints and understood the process sensitivity with respect to feed consumption



Process Ecology is an oil and gas consultancy based out of Calgary, Canada, that assists companies in the operation of their facilities. With extensive industry experience and expertise, as well as detailed knowledge of process simulation, Process Ecology provides solutions for many operations in the oil and gas industry — including gas plant rating, flare system analysis, heat recovery and optimization.

Process Ecology has assisted clients by designing and optimizing gas processes, including pipelines and slug catchers. Other services include providing process support, building complex simulation models and generating plant validation and performance tools. The company utilizes Aspen HYSYS Upstream to simulate flow through natural gas pipelines, preventing critical flow assurance issues such as hydrate formation and corrosion.

Using the full aspenONE® Engineering suite, Process Ecology has developed a solution for predicting the volume and duration of terrain, hydrodynamic and pig-induced slugs to adequately predict the size of the slug catchers needed to manage the impact of slugs when they reach gas processing facilities.

Understanding Pipeline Composition to Appropriately Size Equipment

As natural gas is transported via pipelines, associated condensation occurring in the pipeline may result in liquid slug formation. Slug catchers “catch” the slugs before they reach their destinations at gas treatment facilities and manage their impact where they might disrupt downstream operations and potentially cause downtime. Three types of slugging include: terrain-induced slugging caused by changes in elevation, hydrodynamic slugging caused by the formation of waves on the liquid surface as a result of the faster moving gas and pig-induced slugging caused by pigging operations in the pipeline used to push liquid contents to the outlet.

By accurately predicting slugging volumes and durations, engineers can anticipate slug catcher volumes. A slug catcher which is too large will waste valuable capital costs, while a slug catcher that is too small risks downtime due to the disturbances that slugs might cause in gas processing operations.



Predict Slugging Using Aspen HYSYS and Aspen HYSYS Upstream

Engineers at Process Ecology used the Aspen HYSYS pipe segment slug analysis tool to predict the potential for hydrodynamic slugging. Stratified flow was tested for instability from small disturbances and then analyzed in the unstable region to determine if slug flow was a possibility. Aspen Hydraulics, a tool available in Aspen HYSYS Upstream, was used to determine terrain-induced slugging using an elevation profile and slug prediction tools built into Aspen Hydraulics. Lastly, the company used liquid holdup and the dynamic mode in Aspen Hydraulics to predict pig-induced slugging.

At the conclusion of the project, engineers at Process Ecology discovered that, as expected, results were highly sensitive to the composition of the heavy ends of the natural gas being transported. They also discovered that by using client predictions for the composition, a slug catcher with a volume of only 1,000 bbl — one-third the conservative estimate of 3,000 bbl — was needed, saving significant capital costs.

Process Simulation For Sustainable Operations

With continual improvements in available technology and changing variations of raw materials, companies in the oil and gas industry must be astute and adaptable. With Aspen HYSYS and Aspen HYSYS Upstream, companies like Process Ecology can simulate a wide range of oil and gas processes and ensure that they find the best and most accurate solutions for compliance and sustainability. Furthermore, Process Ecology can rely on the flexible method to quickly adapt to new customer needs and changes in regulations.

AspenTech is a leading software supplier for optimizing asset performance. Our products thrive in complex, industrial environments where it is critical to optimize the asset design, operation and maintenance lifecycle. AspenTech uniquely combines decades of process modeling expertise with machine learning. Our purpose-built software platform automates knowledge work and builds sustainable competitive advantage by delivering high returns over the entire asset lifecycle. As a result, companies in capital-intensive industries can maximize uptime and push the limits of performance, running their assets faster, safer, longer and greener.

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