



Leading Oil & Gas Producer Develops Large System Performance Model with Aspen Fidelis[™]



aspentech | Case Study

Working with AspenTech, the oil & gas producer developed a fully integrated and visionary model of its entire hydrocarbon supply chain, reducing a 6-9 month robustness analysis to just a few weeks. It is the largest Aspen Fidelis software model ever built.

CHALLENGE

The company's robustness analysis of its hydrocarbon delivery chain had significant limitations, including reliance on manual analysis from siloed decision-makers, focus on single failures rather than system-wide impacts.

SOLUTION

Aspen Fidelis from AspenTech's Asset Performance Management software suite helped the customer develop a large model for robustness analysis in its hydrocarbon supply chain.

VALUE CREATED

- Enabled improved speed and discipline of capital project planning
- Increased collaboration across stakeholders and removed internal silos
- Enabled efficient modeling of changes in forecast or demand to identify new potential blockages in the system



Introduction

A leading integrated energy and chemical company operates oil and gas production fields and processing plants. Its operations span the full hydrocarbon lifecycle, from exploration to production and distribution. The provider has three core focus areas: Energy Products, Sustainable Business Operations and Technology Development.

An Expansive Distribution Challenge

The energy company invests billions of dollars in the facilities required to move valuable natural resources from the reservoirs to the market. To help prioritize and justify spend, it instituted an annual robustness assessment program of the hydrocarbon delivery chain. The program relied on manual analysis from multiple groups and faced some internal limitations. The analysis often encountered siloed decision-making that was unable to identify associated barriers in the system.

Oil/condensate, gas and water produced by any of the company's oil and gas facilities must be gathered, separated, processed, stored and then processed further by downstream gas and Natural Gas Liquids (NGL) plants, refineries, chemical plants, etc., and finally delivered to market. These flow networks are complex, integrated and dynamic. For example, the impact of the outage of a gas plant taking gas from an oil facility could not be properly assessed. Additionally, the manual process was extremely time-consuming, taking six to nine months to update analysis. Furthermore, it generally focused on single failures, rather than system-wide impacts.



The Aspen Fidelis Solution

As part of its digital transformation vision of moving away from traditional, manual processes, the provider wanted a tool to address more complex scenarios, stochastic perspectives and multiple failures scenarios. After evaluating several software solutions, the Aspen Fidelis solution was selected. Working with AspenTech, the company sought to develop the largest Aspen Fidelis system performance, quantification and risk analysis simulation to model its entire hydrocarbon delivery chain with two primary goals:

- Reduce the risk and uncertainty involved in capital spend decisions
- Demonstrate the overall robustness of the hydrocarbon delivery chain

To achieve these two objectives, the model building process was broken into four phases:

- 1. Oil network on a grade-by-grade basis
- 2. Gas and NGL networks
- 3. Refining, distribution and terminals network
- 4. Utilities and interconnecting pipeline networks

This segmentation enabled each model to be separately validated before being integrated into a single comprehensive model. Aspen Fidelis is uniquely suited to simulate the current and future flow through the system, identify where and when any snags may occur and most importantly, quantify the potential lost production or lost dollars associated with each individual bottleneck or piece of equipment. The model is used to enhance the company's robustness assessment methodology, allowing for quicker, more comprehensive and accurate forecasting of bottlenecks and deliverability, and simplifying the process of decision-making around when and where to spend limited capital budgets. The model enables production and demand forecasts as well as pricing to be quickly and easily updated over time. The system performance model also enables What-If simulations, stochastic analysis and complex robustness scenarios to be considered across the entire region. Stakeholders can utilize the Aspen Fidelis model to predict future performance, prioritize capital spending and reduce risk in decision-making.

A Fully Integrated, Visionary Model

Working together with AspenTech, the energy producer has developed a fully integrated and visionary model of the entire hydrocarbon supply chain—the largest Aspen Fidelis software model ever built. The model is currently being used for robustness assessments. The company expects to use for validating business cases of capital projects at some point in the future.

Conclusion

In the coming months, the company hopes to begin leveraging the Aspen Fidelis model to quantify the benefits of new proposed capital projects and become more confident about return on investment. The completeness of the model and speed of analysis enables a more disciplined approach to how it allocates CAPEX budgets, and is also helping to efficiently model changes in forecast or demand to identify potential new bottlenecks in the system. This Aspen Fidelis deployment is unique in the model's scope, enabling a full hydrocarbon delivery chain.





About Aspen Technology

Aspen Technology, Inc. (NASDAQ: AZPN) is a global software leader helping industries at the forefront of the world's dual challenge meet the increasing demand for resources from a rapidly growing population in a profitable and sustainable manner. AspenTech solutions address complex environments where it is critical to optimize the asset design, operation and maintenance life-cycle. Through our unique combination of deep domain expertise and innovation, customers in asset-intensive industries can run their assets safer, greener, longer and faster to improve their operational excellence.

aspentech.com

©2024 Aspen Technology, Inc. All rights reserved. AT-2724

