

Improve Profit Margins Through a Refinery-Wide Process Model

Stephen Dziuk, Business Consultant, Aspen Technology, Inc.

Sandeep Mohan, Product Marketing, Aspen Technology, Inc.



Profit margin analysis is a crucial exercise for refineries operating on tight profit margins. Engineering process simulation software that enables refinery-wide modeling can greatly improve and facilitate profit margin analysis for both process engineers and planners in the refinery. By modeling the refinery in one flowsheet, process engineers can evaluate the economic impact of operational improvements and unexpected events, and they can help planners in achieving a more accurate assessment of profit margins. The process engineer can use the rigorous model data to easily evaluate why profit margins are low, suggest remedial actions, and predict the effect on profit margins.

In the past, Aspen Technology has provided refineries worldwide with the capability to develop refinery-wide models through its planning and scheduling software products such as Aspen PIMS and Aspen Petroleum Scheduler. Now, AspenTech has expanded its refinery-wide modeling to Aspen HYSYS® with the release of aspenONE® Engineering version 8.8. This new capability allows process engineers to develop a refinery-wide model that is accurate and easy to manage and maintain.

A major challenge with some rigorous refinery-wide process models is their cumbersome nature. These models can take a long lead time to develop and run. They often require a high level of expertise to operate, keeping refineries dependent on expensive third-party service providers to develop and use the models. The ideal solution — now offered by AspenTech — is a refinery-wide model that is a mixture of short-cut and rigorous sub-models. Over the years, AspenTech has improved the integration between its planning tool (Aspen PIMS) and its process simulation tool (Aspen HYSYS), allowing users to quickly reproduce their Aspen PIMS refinery-wide model in Aspen HYSYS. This integration provides the process engineer with a simple refinery-wide process

model that has the same credibility of an Aspen PIMS model. Now — with a newly expanded, complete suite of rigorous reactor models available in the process simulation environment — the process engineer can enhance the rigor of the refinery-wide process model by selectively upgrading sub-models to rigorous models in Aspen HYSYS. This capability allows refinery process engineers to easily manage and maintain the model, while ensuring the rigor required for accurate refinery margin analysis.

The refinery-wide process simulation model enabled by AspenTech has a wide range of use. It can be used to predict the impact of capital projects such as reconfigurations planned to tailor the refinery to different crude and product mixes. It can also be used to evaluate the economic feasibility of operational improvements such as a change in the catalyst for the FCC unit, or to determine the right response to unexpected events such as breakdown of a key pump. Most importantly, this capability initiates a culture of true partnership between planners and process engineers in enhancing and sustaining refinery profit margins. It builds a work system where planners use refinery-wide Aspen PIMS planning models to conduct rapid economic evaluation of the refinery, while process engineers use Aspen HYSYS to provide a more accurate profit margin assessment on a case-by-case basis.

When using the refinery-wide modeling available in Aspen HYSYS, process engineers also benefit from their access to the entire aspenONE suite of products. The suite allows process engineers to model rigorous heat exchangers, assess energy consumption and the operating expenditure of the plant, and design pressure safety valves all within one process simulation environment. [Learn more](#) about how to use a refinery-wide process model or find more information on the [aspenONE Engineering suite](#).

AspenTech is a leading supplier of software that optimizes process manufacturing—for energy, chemicals, engineering and construction, and other industries that manufacture and produce products from a chemical process. With integrated aspenONE® solutions, process manufacturers can implement best practices for optimizing their engineering, manufacturing, and supply chain operations. As a result, AspenTech customers are better able to increase capacity, improve margins, reduce costs, and become more energy efficient. To see how the world's leading process manufacturers rely on AspenTech to achieve their operational excellence goals, visit www.aspentech.com.

Worldwide Headquarters

Aspen Technology, Inc.
20 Crosby Drive | Bedford, MA 01730 | United States
phone: +1-781-221-6400 | fax: +1-781-221-6410 | info@aspentech.com

Regional Headquarters

Houston, TX | United States
phone: +1-281-584-1000

São Paulo | Brazil
phone: +55-11-3443-6261

Reading | United Kingdom
phone: +44-(0)-1189-226400

Singapore | Republic of Singapore
phone: +65-6395-3900

Manama | Bahrain
phone: +973-13606-400

For a complete list of offices, please visit www.aspentech.com/locations