



Leading Asia-Pacific Company Simulates Gas Separation to Increase Capacity, Drive Incremental Benefit of \$60K/Day

Thailand's PTT Group turns to *aspenONE*[®] Engineering and *Aspen HYSYS*[®] modeling to optimize the country's largest gas plant, increasing production and minimizing cost-per-ton of product.

PTT Group is one of the top leaders in the oil and gas, refining, and petrochemical business in Asia-Pacific. Based in Thailand, PTT integrates gas, refining, and petrochemical operations to more efficiently manage national resources.

The company's Gas Separation Plant No.5 (GSP5) is the largest facility of its kind in Thailand with a design capacity of 530 MMSCFD. Producing ethane, propane, LPG, and NGL, the plant had achieved only 95% capacity since it came online due to limitations of its gas turbine driving the sale gas compressor.

Having already used Aspen HYSYS extensively at other gas plants, PTT once again selected the simulation tool to optimize GSP5. The company identified its Ethane Recovery Unit (ERU) as the primary target for optimization, but created a simulation model for the entire plant.

Shortly after implementing the Aspen HYSYS solution, PTT began to realize significant, measurable results, specifically an increase in plant capacity (106% of design) and an incremental benefit of an additional US \$60K per day.

"By using the optimization technique in Aspen HYSYS simulation, we can increase the plant capacity up to 106% of design and the daily profit by \$60K."

—Supachai Laorrattanasak, PTT's Rayong Gas Separation Plant

Customer Profile

PTT

Refining/Gas Processing

Challenge:

Increase plant capacity and gas production

Solution:

aspenONE Engineering and Aspen HYSYS to create process simulation model and improve performance at Ethane Recovery Unit

Best Practice:

Use models in operations for plant optimization

Benefits:

- Optimizes Ethane Recovery Unit
- Achieves 106% of design capacity
- Improves daily profitability by \$60K per day



Increasing Plant Capacity

The Ethane Recovery Unit (ERU) is one of the most important processes in a gas separation plant, and that's where PTT determined optimization would increase overall plant capacity. After removing mercury, carbon dioxide, and water, natural gas is sent to the ERU for cool down by refrigeration and turbo-expander. Then sale gas (mainly C1) and C2+ are separated in the demethanizer column from which the sale gas is then compressed by the sale gas compressor for delivery to the pipeline; the remaining gas (10%) is recycled back to the demethanizer as column reflux.

However, due to the constraint of the gas turbine for its sale gas compressor, the plant capacity is limited. This limitation in power of the sale gas compressor can be optimized through the sale gas recycle process, which can reduce compressor load and allow increased feed gas throughput. In the past, this challenge was addressed by operators adjusting process conditions using a trial/error approach.

Simulation Model for Optimization

Aspen HYSYS has been very useful for PTT in cases where plant operating conditions have not been optimized due to the complicated processes. In addition, when there is a challenge to debottleneck the plant capacity, HYSYS has been used to identify the bottleneck and deliver a solution. The software has proven to provide ease of use and technical robustness to deliver accurate results. A steady-state process simulation model of GSP5 was created using HYSYS in order to identify the necessary changes for optimization.

Based on the results of simulation on the ERU at GSP5, the ratio of recycled sale gas was adjusted together with the optimization of refrigeration system. The gas plant was then able to produce at the maximum capacity at 106% of design capacity by keeping the same product specification. This increase in production drove up profitability at the plant by an estimated \$60K per day.

RTO in the Future

As a result of the benefits realized by the Aspen HYSYS solution, PTT has identified Real Time Optimization (RTO) as a strategic technology to implement in the future to further improve business operations and profitability at other GSPs. This enterprise-wide initiative will enhance the current use of models and deliver more accurate solutions to address complex process challenges.

About AspenTech

AspenTech is a leading supplier of software that optimizes process manufacturing—including oil and gas, petroleum, chemicals, pharmaceuticals 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.
200 Wheeler Road
Burlington, MA 01803
phone: +1-781-221-6400
fax: +1-781-221-6410
info@aspentech.com

EMEA Headquarters

AspenTech Ltd.
C1, Reading Int'l Business Park
Basingstoke Road
Reading UK
RG2 6DT
phone: +44-(0)-1189-226400
fax: +44-(0)-1189-226401
ATE_info@aspentech.com

APAC Headquarters

AspenTech - Shanghai
3rd Floor, North Wing
Zhe Da Wang Xin Building
2966 Jin Ke Road
Zhangjiang High-Tech Zone
Pudong, Shanghai
201203, China
phone: +86-21-5137-5000
fax: +86-21-5137-5100
apac_marketing@aspentech.com