

Brazil's Top Energy Company Improves Potential Profits at REVAP Refinery \$13K/Day with Real-Time Optimization

Petrobras has successfully implemented AspenTech's process optimization solution in its first equation-oriented RTO initiative. Now the company looks to increase profitability across other sites as it moves to a closed-loop RTO solution.

Brazil's state-run oil company, Petrobras, operates the 250,000 barrel-per-day REVAP refinery in Sao Jose de Campos in southeastern Sao Paulo state. It produces approximately 15% of Brazil's oil derivatives after completing an upgrade as part of a refinery modernization program.

Petrobras identified Real Time Optimization (RTO) as a strategic and "highly sustainable" technology to improve business operations and profitability at the REVAP refinery. After a thorough and competitive evaluation, Petrobras selected AspenTech software and services to help implement an RTO solution for the refinery's distillation unit.

To ensure a more manageable adoption of this cutting-edge RTO technology, Petrobras chose to initially commission RTO in an open-loop format. An average of nine RTO runs were performed daily, including model adjustments for feed reconciliation and optimization, which led to a potential daily increase in profit of up to \$13K. Such a significant improvement has convinced Petrobras to start deploying RTO as a closed-loop solution, and use this technology at other sites in the future.

"The success of using Aspen Plus Optimizer confirms the value of using EO technology in future RTO projects at Petrobras."

— Fábio dos Santos Liporace, D.Sc., Process Engineer, Petrobras

Customer Profile

Petrobras
Petroleum Refining

Challenge:

Optimizing feed selection using RTO to improve business operations and profitability

Solution:

aspenONE® with the Aspen Plus Optimizer provides power, flexibility, and the ability to enable EO optimization for complex RTO

Best Practice:

Demonstrates the value of using models in operations as a best practice in the refining industry

Benefits:

- Optimizes feed selection to raise heavy crude processing capacity
- Supports nine RTO runs per day with complex model and constraints
- Drives a potential profitability increase of up to \$13K/day



Optimization at the REVAP Refinery

Early on in the modernization program, Petrobras recognized the need to optimize the feed selection as a way to raise the heavy oil processing capacity of the refinery, while improving the quality and diversification of the product portfolio. The switch to heavier crudes allows the use of more affordable, nationally produced crudes, and reduces the dependency on lighter crudes that must be imported at a higher cost.

The optimization accurately models operating conditions, as well as feed and product qualities, to support adjustments for feed reconciliation. The more that is known of the feed composition, the better the optimization results. At REVAP, the initial feed composition for every RTO cycle is determined by understanding which tank is feeding the unit, and all crudes from the Petrobras Crude Assay Databank are integrated into the RTO system.

Modeling Solution for Optimization

Petrobras worked closely with AspenTech to implement the project, using **aspenONE** and the **Aspen Plus Optimizer** as the primary tool due to its power, flexibility, and ability to enable Equation Oriented (EO) optimization for complex integrated processes. The RTO model comprises 38 independent variables, all of the constraints from the Advanced Control system, plus other critical constraints. EO-based technology delivers the performance required for proper feed reconciliation and optimization. More importantly, the RTO system is indicating a potential increase of profitability by up to US \$13,000 per day by adjusting the unit to process an adequate crude slate and meet all products' flow and quality requirements. Closing the loop in the next phase is expected to capture these benefits and also "extend" them across the refinery.

RTO in Petrobras Going Forward

This project confirmed the value of using EO-based technology in RTO applications, and supports Petrobras' strategy of leveraging RTO to improve operations and profitability. In addition to the results achieved in open-loop optimization, RTO also benefited other areas, including variables and parameter monitoring, operational analysis and troubleshooting, and crudes and scenarios evaluation. Furthermore, the use of models in refining operations enhances collaboration among Process Engineering, Planning, Automation, IT, Instrumentation, Laboratory, and Production, improving overall efficiency at the REVAP refinery.

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