

CASE STUDY



World Leader in Refining Reduces Planning Run Times from Hours to Minutes and Achieves the Most Profitable Solutions

"We continue to strive for excellence. With Aspen PIMS-AO™, we not only achieved zero local optima, we also reduced solution solve times from 30 hours to 90 minutes – exceeding our expectations."

– Vice President



This leading Asian refining company, which owns and operates some of the largest refinery complexes in the world, is ranked in the top 125 on the Fortune Global 500 list. The company is present in many business sectors, including textiles, science and technology, energy and more.

The company's manufacturing division is the world's largest refining hub. It has transformed their country from being a net importer of petroleum products to a net exporter, thereby ensuring the nation's energy security. With a crude processing capacity of over 700 thousand barrels per day (BPD), efficiency and profitable operations are critical.

We achieved zero local optima - the best possible solution - within our planning runs with Aspen PIMS-AO.

CUSTOMER PROFILE - Refining & Marketing

CHALLENGE

- Reduce planning run times while increasing solution quality
- Gain time to explore complex, multiple price and operation scenarios
- Eliminate the occurrence of local optima

SOLUTION

The parallel processing capability of Aspen PIMS-AO, combined with global optimization, exceeded desired results with the expanded use of the software.

BENEFITS

- Reduced solution run times from 30 hours to 90 minutes, making the process 95% faster
- Achieved zero local optima
- Increased ability to run multiple price and operation scenarios
- Achieved faster response times and the ability to capture more crude trading opportunities
- Leveraged the latest advancements in Aspen PIMS-AO for superior decision support

The company originally adopted Aspen PIMS-AO in 2008. The main drivers for the use of Aspen PIMS-AO were the software's superior optimization capabilities, including:

- Global optimization – features such as multi-start help to validate the solution against local optima
- Ranging solution – automated feature to determine how relevant a feedstock, product or capacity is to the objective function
- Parametric analysis – the ability to easily and rapidly setup and run parametric analysis for any variable or groups of variables and review the results graphically
- Goal programming – the capability of including secondary and tertiary objectives into the optimization

In order to leverage Aspen PIMS-AO to its fullest capacity, we had to learn to unlearn traditional practices used when running Aspen PIMS™. (The advanced optimization capabilities in Aspen PIMS-AO are far superior.)

CHALLENGE

The decision to add focus to and expand the use of Aspen PIMS-AO was because of the recently enhanced global optimization capabilities with the new Aspen PIMS-AO V8.7 algorithm and the intention to explore the parallel processing feature for the maximum business impact. The company also wanted to increase internal customer satisfaction through faster response times to different business processes and have the ability to capture and explore more opportunities.

This ability to leverage new developments in Aspen PIMS-AO for superior decision-making led the company to upgrade to the latest release of Aspen PIMS-AO as part of its expansion plan to achieve:

- Robust plans by running multiple price/operation scenarios.
- Internal customer satisfaction through faster response times (providing time to explore new opportunities.)
- Elimination of local optima, or sub-optimal solutions, to ensure maximum confidence in the plan.

SOLUTION

The ability to achieve faster run times with zero local optima required discipline among the planning and optimization team to adopt the best practices recommended when using Aspen PIMS-AO. Through this process, the company was able to:

- Develop a work process to eliminate the occurrence of local optima by generating an optimized input solution and running the case stack varying the "epsilon" parameter.
- Test several high-performance server machines to establish the optimal number of CPU cores.
- Discover, after months of testing, that the optimal number of cores is 40.

RESULTS

The company has successfully reduced their planning run times from 30 hours to 90 minutes with Aspen PIMS-AO, making the process 95% faster; a huge difference that enables them to further analyze results and different scenarios. This has opened the gateway to a world of new opportunities that they are able to explore for even more profit opportunities. In addition to the faster solve times, they have consistently achieved zero local optima – ensuring that they are achieving the best solutions.

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BUSINESS BENEFITS

Due to the success of the Aspen PIMS-AO expansion project, the company continues to adopt the latest versions of the software as it becomes available. By employing parallel processing and the global optimization features, they have greatly increased the speed, reliability and robustness of the planning process. Through the extensive use of the product, they achieved their goals, including:

- Reduced planning run times from 30 hours to 90 minutes – a 95% reduction
- Achieved zero local optima
- Improved internal customer satisfaction
- Increased the number of scenarios explored to make more informed decisions

LOOKING AHEAD

The successful partnership with AspenTech has helped the company to help achieve their goals for the Aspen PIMS-AO expansion project. This collaboration was critical due to the complex models employed by the company. In addition to this, the planning and optimization team now has more time to explore opportunities that are beneficial to the company. Moving forward, they plan to work collaboratively with AspenTech to deploy in a cloud environment.

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.

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