



**Shell Accelerates Planning, Improves Margins with
Aspen PIMS-AO in the Cloud**



“The two biggest benefits in our first site were margin uplift and work-life balance for the economists. The margin uplift comes from more thorough optionality analysis; we can deliver that. And, the economists can achieve these results without having to take their laptops home to make runs.”

- Partha Sengupta

Manufacturing Margin Optimization – Principal Advisor
Shell Oil Company



Estimated \$10M/yr
in margin increase at
one large integrated
complex

Up to 20 times faster processing

CHALLENGE

Speed-up large planning runs to consider more optionality and sensitivity

SOLUTION

Hardware and software solution—including Aspen PIMS-AO—to burst into AWS enabling faster review of many more planning scenarios

BENEFITS

Increased margins and higher productivity across Shell’s medium and large integrated complexes

- **Speed:** 5-20 times faster processing
- **Optimization:** improved analysis and decision-making
- **Profitability:** potentially delivering \$10M/yr margin increase at a single site
- **Scale:** runs over 800 cases in 30 minutes



Customer Profile

Shell Oil Company is a global energy and petrochemicals company that produces natural gas, gasoline, oil, and many bulk and specialty chemical products for customers worldwide.

Shell's Manufacturing Margin Optimization team uses AspenTech solutions to optimize its energy and petrochemicals business, including planning and scheduling applications.

A Proven Solution Made Better

As part of production planning and optimization, Shell uses Aspen PIMS-AO at 15 sites globally, including its central hubs. The solution has been globally adopted at Shell since 2015. Prior to that, Shell used Aspen PIMS for many years.

Using Aspen PIMS-AO, Shell found substantial reduction in run times for running cases due to multi-core PCs on desktops. PIMS-AO also demonstrated robust performance with high convergence rates and fewer instances of false-positive cases (mathematically, known as local optima). Shell also adopted PIMS-AO with no structural changes to existing work processes.

“Aspen PIMS-AO has been globally adopted at Shell since 2015.”

- Partha Sengupta - Principal Advisor - Shell Oil Company

What is PIMS-AO on AWS?

During a weekly planning run, the number of cases, scenarios and possibilities that could be analyzed by economists at Shell's large integrated complexes was restricted by their limited computing power.

The objective for this project was to enable faster, larger, more accurate planning runs, allowing users to consider more optionality and sensitivity.

The project grew out of a proof of concept demonstrated by AspenTech Research and Development and Shell Margin Optimization experts. AspenTech collaborated with Shell to ensure a successful pilot and implementation.

Aspen PIMS-AO on AWS leverages both hardware and software to burst into the cloud and explore a range of scenarios. When a planner initiates cases, they can select "Run in Cloud" which will upload the job (including model files and case table) to a virtual private cloud on AWS. The scheduler starts the job as soon as hardware is available. PIMS writes the results to an RDS database with SQL instance, later accessed from the user's local machine.

Initial Deployment Goes Global

The solution was piloted at Shell Pulau Bukom in Singapore. The project was a resounding success, and the "Run in Cloud" option was made available to all users in early 2018. The three largest Shell refining sites in Asia and Europe depend on this system nearly exclusively for crude valuation runs. Multiple medium sites, especially in the US, are also using the solution. Remaining sites are in the process of active evaluation for possible use.

After the initial deployment, usage has been very steady. The worldwide economists are very satisfied with the tool, and the system is easy to use and runs well, plus there is practically no maintenance required.

"The system rolled out at Shell is very easy to use and runs very well. There is practically no maintenance required."

- Partha Sengupta - Principal Advisor - Shell Oil Company

Faster, More Accurate Planning—and More

The cloud bursting solution is dramatically speedier than before, approximately 5-20 times faster or even more.

For example:

- Large refinery crude valuation case study with 4 case sets of 200+ each (800+ cases total) is completed in 30 minutes versus 4 hours on local desktop
- Medium refinery operating plan study of 240 cases over 7 periods (1680 cases total) can be completed in under 30 minutes

This performance improvement enables better analysis and better decision making. For example, at a large integrated complex, this faster execution of crude valuation cases and scenarios is expected to deliver up to \$10 million USD per year in margin uplift.

The overall performance improvement also provides Shell's economists a much better work-life balance.

There are many myths about the high cost of cloud services. Since the cloud machines are on-demand, the provider only charges when processing occurs, which typically results in very low costs for cloud services. Because of this and the fact that economists no longer require high-performance PCs to run models locally, the PIMS-AO on AWS solution delivers a net savings.

Conclusion

In conclusion, deploying Aspen PIMS-AO on AWS was a successful, highly collaborative global project between Shell and AspenTech that resulted in margin uplift, improved work-life balance and reduced IT costs.



About Aspen Technology

Aspen Technology (AspenTech) is a leading software supplier for optimizing asset performance. Our products thrive in complex, industrial environments where it is critical to optimize the asset design, operation and maintenance lifecycle. AspenTech uniquely combines decades of process modeling expertise with machine learning. Our purpose-built software platform automates knowledge work and builds sustainable competitive advantage by delivering high returns over the entire asset lifecycle. As a result, companies in capital-intensive industries can maximize uptime and push the limits of performance, running their assets safer, greener, longer and faster.

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