

PEMEX Simplifies and Improves Regulatory Loop Tuning with Innovative APC Technology

Automated loop monitoring and tuning enabled by aspenONE® Advanced Process Control streamlines regulatory control maintenance and increases benefits from APC applications.

Petroleos Mexicanos (PEMEX), the largest enterprise in Mexico and Latin America, is one of a few oil companies in the world that develops the entire productive chain of the industry—upstream, downstream, and final product commercialization.

As part of their APC activities, PEMEX undertook a project to improve the performance of principal loops and update several critical control strategies in an ethylene plant. The methodology included a pre-test phase for checking and evaluating all loops to achieve more stability in the plant regulatory control layer. The project needed to deliver rapid benefits in order to gain approvals.

The assessment plots provided by Aspen PID Watch helped PEMEX analyze the PID closed-loop performance. The performance index and service factor measure how the loop is performing, and the oscillation index shows how much a loop has been oscillating.

An impulse response graph compares the impulse response identified by Aspen PID Watch with the reference trajectory response. This function is a direct measure of how the PID controller is performing in rejecting disturbances or tracking setpoint changes.

“I had forgotten that this loop was in auto because it now operates very well.”

— DCS Operator, PEMEX

Customer Profile

Petroleos Mexicanos (PEMEX) Chemicals

Challenge:

Maintain regulatory loop performance to maximize benefits from APC applications

Solution:

Sustainability features of aspenONE APC reduce the time and effort to tune regulatory loops

Best Practice:

Use loop monitoring and tuning tools

Benefits:

- Reduce the time and effort required to monitor loops
- Ensure rapid re-tuning of problem loops
- Provide detailed diagnostics for valve stiction, loop oscillations, and related issues



An Effective Arsenal of Diagnostics and Corrective Action

Aspen PID Watch provided the PEMEX team with detailed diagnostics of current loop performance, as well as identification and prioritization of remediation tasks, which proved invaluable in maximizing APC performance.

Stiction Plots

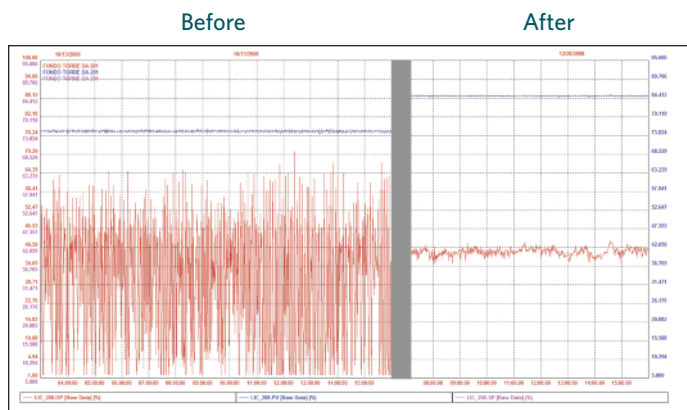
The valve analysis plot includes several indices for estimated control valve stiction. The term "stiction" is a combination of the words "stick" and "friction" created to emphasize the difference between static and dynamic friction, and is defined as resistance to the start of motion. This particular condition occurs when the control valve is stuck in a certain position due to high static friction, and the PID control action ultimately increases until this condition is overcome and the valve moves to a new position.

Comparing Loop Tuning

Loop interactions can be minimized by setting different velocities for each tuning. Loops are tuned individually to achieve the desired characteristics while avoiding interactions between them.

Improved Loop Performance after Tuning

The plot below illustrates the dramatic performance improvement of one of the loops before and after the new tuning parameters were implemented.



PEMEX Achievements

With aspenONE APC, PEMEX has been able to:

- Evaluate more than 250 control loops
- Perform more than 27 tunings with Aspen PID Watch during a three week pre-test
- Implement four new loops
- Propose five new control strategies
- Implement new calculations (PCT and QC)

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.



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