



CUSTOMER CASE STUDY

Pressure Swing Absorber Utilization Improvement

BKOAI's engineers utilized advanced process control improvements and automated valve-reset logic to increase the utilization, stability, and reliability of the pressure swing systems

Industry: Petrochemicals

GOALS

- Increase the overall utilization rate of the pressure swing absorber unit.
- Enhance process control stability during standard and transitional operations.
- Minimize operational limitations that restrict daily absorption capacity.
- Establish a reliable foundation for continuous and stable gas separation.

SOLUTIONS

- Implemented advanced process control improvements to stabilize the absorber unit.
- Adjusted control loop tuning to optimize overall system responsiveness and stability.
- Modified split-range logic to eliminate existing operating constraints during transitions.
- Programmed automatic valve reset logic to streamline recovery during unit trips.

CHALLENGES

- Control limitations constrained the pressure swing absorber from reaching full operational utilization.
- Suboptimal control behavior caused performance bottlenecks during crucial operating transitions.
- Outdated split-range logic created unnecessary restrictions on system responsiveness and stability.
- Manual or inefficient valve reset procedures delayed recovery during unexpected unit trips.

RESULTS

- Achieved higher pressure swing absorber utilization rates across all operational phases.
- Demonstrated significant improvements in loop control stability under diverse conditions.
- Secured more reliable operating performance during critical unit transitions.
- Reduced process variability and unexpected downtime caused by valve reset delays.

EXECUTIVE SUMMARY

BKOAI's engineers utilized advanced process control improvements and automated valve-reset logic to increase the utilization, stability, and reliability of the pressure swing systems. The work addressed control limitations, poor transition behavior, outdated split-range logic, and inefficient valve-reset procedures. Targeted loop tuning, split-range logic changes, and automatic valve reset improved process stability, reduced downtime, and increased operational utilization.

Addressing Control Limitations

The pressure swing absorber was constrained by control limitations that prevented full operational utilization. Performance bottlenecks were especially visible during crucial transitions, while outdated split-range logic limited responsiveness and stability.

Improving Control Logic and Recovery

BKOAI stabilized the absorber through advanced process-control improvements and targeted loop tuning. Split-range logic was modified to remove operating constraints, and automatic valve-reset logic was programmed to streamline recovery during unexpected unit trips.

Increasing Utilization and Reliability

The changes increased utilization across operating phases, improved loop-control stability under diverse conditions, and delivered more reliable performance during critical transitions. Reduced valve-reset delays also lowered process variability and unexpected downtime.