

SEAL RELIABILITY BP BAKU

Dry gas seal contamination removal
and compressor reliability recovery.



THE CHALLENGE

Centrifugal compressors rely on dry gas seal (DGS) systems to maintain safe and reliable operation.

Over time, operational factors can lead to the accumulation of contamination within seal gas piping systems, negatively impacting seal performance and increasing the risk of premature failure.

Contaminants such as carbon deposits, graphite particles, fine particulates, oil residue, and moisture can accumulate within the seal gas system and are not always effectively removed through conventional nitrogen purging or standard filtration methods alone.

If allowed to migrate across the seal faces, these contaminants can cause seal face damage, increased leakage rates, reduced reliability, and ultimately unplanned compressor shutdowns.

The operator required a reliable and controlled cleaning methodology capable of restoring seal gas system cleanliness, reducing the risk of seal failure, and enabling compressors to safely return to service without costly seal replacement or extended downtime.

THE SOLUTION

EnerMech developed and deployed a proven cleaning methodology based on turbulent isopropyl alcohol (IPA) flushing, designed to remove contamination from (DGS) systems and restore the cleanliness levels required for reliable operation.

The scope included the design and deployment of a purpose-built closed-loop flushing system capable of handling flammable solvents. Controlled flow rates were established to achieve turbulent flow conditions, maximizing contaminant removal from seal gas piping and associated components.

High-efficiency filtration using 0.5–1 micron filters was applied to capture fine particulates and carbon contamination during flushing.

The methodology was successfully applied across multiple compressor services, including flash gas, gas injection, and gas export compressors, enabling the effective removal of contamination while minimizing disruption to plant operations.

THE OUTCOME

EnerMech successfully restored seal gas system cleanliness, enabling compressors to safely return to service without the need for seal replacement in several cases.

The removal of carbon fines, graphite particles, and other particulate contamination significantly reduced the risk of seal-face damage and improved overall (DGS) reliability.

The methodology delivered measurable benefits to the operator by the successful removal of contamination from the seal gas system, helping reduce the risk of seal-face damage, unplanned downtime, and costly maintenance interventions.

By applying a repeatable and controlled flushing methodology, we provided an effective solution for contamination-related seal performance issues, restoring confidence in the condition and reliability of critical compressor systems.

Filter inspections confirmed the removal of significant quantities of carbon fines, graphite particles, and other particulate contamination from the seal gas system.

This innovative, field proven cleaning solution transforms DGS (dry gas seal) cleaning into a proactive maintenance strategy, reducing contamination-related failures, extending dry gas seal service life, and minimizing the risk of unexpected compressor trips and prolonged shutdowns, while improving plant availability and reducing lifecycle maintenance costs.

KEY HIGHLIGHTS

ADVANCED CONTAMINATION REMOVAL

Effective removal of carbon, graphite, and fine particulates beyond conventional purging methods.

PROVEN ENGINEERED METHODOLOGY

Turbulent IPA flushing delivered in line with API 692 guidance.

COMPRESSOR RELIABILITY IMPROVED

Reduced seal failure risk and improved operational performance.

REDUCED DOWNTIME & COST

Enabled safe restart without seal replacement in multiple cases.

REPEATABLE, FIELD-VALIDATED SOLUTION

Applicable across multiple compressor types and lifecycle stages.

