

RELY ON EXCELLENCE

RoTechBooster skids for pipeline compressors

Reliable seal gas supply solution



Alliance Pipeline is a 2,300 mile line delivering rich gas from North East British Columbia, Canada and the Williston Basin in North Dakota to the Chicago market, USA.



The pipeline system's success is based on low maintenance costs, high reliability, minimum fuel usage, application of best practices, direct access to manufacturers' technology, and strategic alliances and partnerships to resolve technical issues. All of these factors are critical for the pipeline to meet the owners' expectations and profitability. Reduced gas volumes due to poor compressor reliability result in losses for all parties involved. Strategic alliances with key providers such as EagleBurgmann are contributing factors for Alliance Pipeline's success.

EagleBurgmann PDGS seals are installed in the pipelines' 30 compressor stations across Canada (e.g. Windfall, Morinville) and the US (e.g. Tampico).

New gas stream causes seal failures

The pipeline was operated very successfully for more than 12 years until a new major gas stream with compositional differences in the NGL was brought on line. Dry gas seals are more susceptible to liquid contamination and failures when heavier hydrocarbons are present in the process or transported gas.

As a result of the new gas stream composition, dry gas seal failures increased from a historic 0-to-1 per year to 14 failures in 2011.

Together Alliance and EagleBurgmann identified causes for the increased seal failures, developed solutions and implemented the best technology to solve the problem.

Two failure modes identified:

- liquid contamination from the seal gas supply during normal operation
- contamination from the process (compressor casing) shortly after start-up



CASE STUDY

- **Reference:** Alliance Gas Pipeline (Canada/USA)
- **Client:** Alliance Pipeline
- **Industry:** Oil & Gas
- **Challenge:** New gas stream leads to contamination and seal failures
- **EagleBurgmann services:** Identify causes, develop counter measures, collaboration to define and implement effective and efficient solution
- **Technical solution:** Ready-to-install 225H-120 & 225L-120 RoTechBooster model skids

Compressor drive during installation



The role of a reliable seal gas supply

Seal gas supply is taken from the discharge line in pipeline compressors, which is at a higher pressure than the internal casing pressure. During start up conditions the discharge line is at the same pressure as the internal casing pressure, so no clean seal gas is provided to the dry gas seal. This allows contamination to enter the seals reducing their reliability and leading to premature dry gas seal failures.

With the presence of heavy hydrocarbons the gas dew point also becomes an issue. When the discharge gas is at normal operating temperatures the components in the gas are gaseous. As the pressure and/or temperature of the gas are lowered some of these components will precipitate into liquids.

The discharge gas passing through lines to the seal gas panel also lowers the gas temperature, as the ambient temperature cools these lines. The gas pressure is regulated down to the sealing pressure, which is typically just above suction pressure.

This results in additional temperature and pressure reduction causing components in the gas to turn to liquid. Depending on the types of filtration in a seal gas system limitations can be present for the amount of liquids they can handle, which was the case for the Alliance filters.

The next piece in dealing with the heavy hydrocarbons is the seal itself. The pressure drops from the sealing pressure down to almost atmospheric pressure as it passes across the seal faces. As the pressure drops across the seal faces components in the gas can turn to liquid, which sooner or later results in seal failures.



The solution: RoTechBooster® Skids

The first important component was to ensure seal gas was being provided to the dry gas seals at all times. As this is a pipeline application no other gas sources are available, so incorporating a booster into the system was required to provide pressure/flow for reliable delivery of seal gas.

Advantages of RoTechBoosters

The RoTechBooster ensures abundant, reliable, and consistent seal gas flow, through fluctuating operating conditions; thus, clean and dry gas is supplied to the gas seal in every situation.

- Simple to set-up, easy to operate
- High reliability and availability
- Unlimited continuous operation
- Avoid seal failures
- Low maintenance costs
- Energy efficient
- Eliminates the concern of unreliable external seal gas source



Available booster designs were either air driven piston boosters or electric driven RoTechBoosters.

Air-driven boosters require a considerable amount of instrument air to support the air drive for achieving the necessary flow requirements. Continuous failures and high maintenance have been the industry experience with air driven boosters.

RoTechBoosters consume less energy and require fewer utilities to operate, as electrical power, compressed air and signals to and from the PLC are all that is required. A small amount of compressed air is used to operate an air actuated control valve and the signal to and from the PLC initiates the operation of the booster and provide alarms.

To manage the dew point of the seal gas a two-stage coalescing filter system and an electric heater were incorporated into the seal gas supply system. These two components manage liquids in the seal gas and maintaining a seal gas temperature ensuring after the 2 stage filter system all components in the seal gas remain gaseous.

Skid for easy system integration

For trouble-free installation at site, the RoTechBoosters came as ready-to-install

skids. Models applied are 225H-120 and 225L-120 with 11 kW and 15 kW motors. Depending on the application, the power consumption is about 60 % of the motor power. Runtime varies for each job - from 24/7 down to one time per year.



Result

With the incorporation of these solutions the seal failures from process contaminants and liquids in the seal gas have been completely eliminated. Eliminating the need for seal removal, seal repairs, unit outages and lost production due to seal failures increase profits and reduce costs. The minimum investment for the proven reliability of a RoTechBooster and seal gas conditioning quickly validated their worth with the reduction in seal failures.



Further information on RoTechBooster

EagleBurgmann – at the leading edge of industrial sealing technology

Our products are used wherever safety and reliability count: in the industries of oil & gas, refineries, petrochemicals, chemicals, pharmaceuticals, food, energy, water and many more. About 6,000 employees contribute their ideas, solutions and dedication every day to ensure that customers around the globe can rely on our seals. With our modular TotalSealCare Service, we emphasize our strong customer orientation and offer custom-tailored services for every need. [Rely on excellence.](#)

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