Success Story: Retrofitting in a Fertilizer Production Plant

The Challenge

Fertilizers are essential for agriculture and result from complex industrial processes. Nitrogen, a key nutrient, is synthesized from air to produce ammonia, the foundation for all nitrogen-based fertilizers. A leading European company in fertilizer production faced a critical issue at one of its plants: a Between Bearing pump manufactured by Flowserve experienced frequent mechanical seal failures.

This issue led to:
- Recurring machine downtime
- Production disruptions
- Increased maintenance costs

Fluiten was engaged to develop a solution to eliminate these problems, enhancing reliability and reducing overall costs.

Project Objective

Improve operational performance with a focus on:
- Solving the mechanical seal issue
- Delivering the solution within tight deadlines during a plant shutdown
- Achieving maintenance cost savings by offering a competitive price-quality ratio for both initial installation and spare parts.

Outcome: Fluiten was selected as the supplier for new machinery and future interventions at the plant.

Technical Analysis

Problem Diagnosis

Operating limits:

- Product: ammonia
- Temperature: 30°C
- Pressure: 13-17 barg
- Vapor pressure: 13.4 bar

The minimal margins between the vapor pressure of the pumped fluid and the pressure in the stuffing box led to evaporation of the liquid film between the sealing surfaces, causing:

- Overheating of the seal and secondary gaskets
- Formation of blistering and premature wear on the surfaces

Alternative Evaluation:
To avoid modifications to the existing flushing system, an **improved solution** was devised while maintaining the current flush plan (11-52, with an atmospheric pressure tank).

Adopted Technical Solution:

- Fluiten **BM6T** cartridge mechanical seal, compliant with API682 4th Edition.
- Shrink sleeve on the process side to increase internal pressure.
- Orifice modification on **plan 11** to enhance flushing flow.
- High-efficiency circulation device for **plan 52**, providing better cooling.
- Narrow face design to reduce heat generated by the seal during operation.

The configuration was designed to be fully **interchange**zable with the existing system without requiring modifications to the pump stuffing box

Intervention Execution

- Timeline: **20 working days**
- Involved Departments: Sales, technical, production, and logistics teams

Results

Technical Improvements
- Increased seal reliability: MTBR (Mean Time Between Repair) increased from 2–3 months to 24–36 months.

Economic Benefits
- Reduction in specific and overall maintenance costs related to the machine and the plant.
- Improved production cycles with reduced machine downtime

Why Choose Fluiten?

Fluiten's ability to analyze complex issues and develop tailored solutions has established it as a strategic partner for the client, contributing to the operational and financial success of their plant.

Useful tip for your plant:
Don't wait for a failure—schedule a technical check-up today with the Fluiten Service Hub.
A preventive evaluation of your mechanical seals can uncover hidden issues and improve operational efficiency.

For more information about our products and available solutions, **contact** us or visit our website.
www.fluiten.com