Yara – Pressure Reducing System

The Client

Yara International, based in Norway, specializes in agricultural products and environmental protection agents. Operating globally, their offerings range from exhaust gas treatments to animal nutrition and fertilizers. In 2015, Yara's revenue was approximately $13 billion, with over 13,000 employees worldwide.

The Challenge

Yara Norge AS, located in Glomfjord, Norway, required a fail-safe hydraulic solution to ensure a 24/7 water supply with full redundancy. The system needed to reduce pressure through two separate lines, even in catastrophic failure scenarios. This initiative was part of Yara's commitment to safe operations, aiming to reduce total recordable injuries from 4.5 per one million work hours in early 2016 to just 1.4 by the third quarter of 2018.

Yara's facility features two water branches fed by a small reservoir, servicing two production sectors. The DN400 branch operates at a static 16.9 bar pressure, with a minimum of 15.0 bar. Its flow range varies from a minimum of 300 cubic meters per hour to an average of 500, peaking at 1000 m^3/hour. Similarly, the DN700 branch maintains the same pressure range, but with a flow range of 2000 to 4000 m^3/hour and a nominal flow of 2500 m^3/hour.

Given the production requirement of six to seven bar pressure, Yara sought a reliable hydraulic solution to handle massive pressure differentials. Bermad was chosen for its reputation for safety, reliability, and functionality in continuous operations.

The Bermad Solution

Bermad collaborated with Yara engineers to design two redundant pressure reducing stations for the DN400 and DN700 branches.

For the DN400 branch:

- A two-inch air valve
- A standard 16-inch pressure releasing valve
- A backup 16-inch pressure releasing valve
- An additional four-inch air valve
- A 16-inch safety relief valve

For the DN700 branch:

- A larger six-inch air valve
- 28-inch models of the standard pressure releasing valve
- A safety relief valve

- A backup pressure releasing valve

Both stations operate similarly:

- The standard pressure reducing valve reduces downstream pressure from 15 bar to approximately 7 bar.
- The backup PRV is on standby in case of a primary valve failure.
- The safety relief valve remains closed but can open momentarily if excessive pressure occurs.

Results

The two pressure reducing stations were commissioned in just three days and have effectively managed over-pressure situations at Yara Norge AS since 2017. The system's robustness was proven during an unforeseen event involving fractured cartridge filters that polluted the system. The Bermad solution performed flawlessly, maintaining system integrity and preventing damage.

This case study highlights how Bermad's pressure reducing system provided Yara with a reliable, efficient, and safe solution for their hydraulic pressure management needs.