

Molecular Sieve Switching Valves

Lower total cost-of-ownership

Location: Kazakhstan
Plant type: Natural gas processing
Industry: Upstream oil and gas
Application: Sour gas molecular sieve switching valves (27% H₂S)
Product: ValvTechnologies' V1-4 metal seated ball valves

Background: In the molecular sieve process, the produced gas is a by-product of oil production and re-injection is required to maintain reservoir pressure. If the gas drying stops and injection ceases, oil production stops at a cost of an estimated \$2 million per hour. The valves used in the plant were failing and the customer was faced with lost revenues of \$1 billion over five years due to reliability issues in the dehydration unit due to:

- Unplanned outages due to valve failures
- High cost of replacement parts
- Environmental unit
- Safety issues
- Threat to integrity of injection wells

Facing hundreds of millions of dollars in production losses annually, the company reached out to ValvTechnologies for a solution to replace their existing rising stem ball valves.

Requirement: The issues in this service, which handles gas with an H₂S content of over 20%, included leakage to atmosphere, unreliable operation, mechanical breakdowns and unscheduled shutdowns. In addition to the safety and environmental concerns, the client faced threats to the integrity of the downstream equipment. The initial response to these challenges included the planning of a full parallel dehydration facility to cope with the ongoing concerns with the legacy equipment.

Solution: For over a decade ValvTechnologies has provided molecular sieve switching valves in similar applications throughout the world. This proven track record gave our customer the confidence to engage ValvTechnologies in a conversation regarding their challenges. Upon careful review of the application and in consultation with ValvTechnologies' senior engineering staff, the selection was made to employ ValvTechnologies' V1-4 seat supported design technology. The selected materials included Inconel 825 for the valve body components and Inconel 718 for the internals.

The supply, which included full pneumatic automation of all the valves, was completed in less than 20 weeks - in time for a scheduled shutdown in 2013. ValvTechnologies assisted with the site testing, installation, commissioning and startup.

The operational performance of the valves since startup has exceeded the client's expectations. With this experience, the client felt confident to cancel the scheduled parallel installation project, which saved them hundreds of millions of dollars.



ValvTechnologies' zero-leakage high-performance isolation valves improve a plant's heat rate performance up to 5-6%.

After one year of service the valves performed perfectly including:

- No unscheduled outages (previously every 90 days)
- No releases to atmosphere (previously a common occurrence)
- Hundreds of millions in savings credited valve reliability
- Oil production targets met for first time credited to valve reliability

ValvTechnologies assists its clients in meeting their goals regarding safety, the environment, cash flow and asset protection.