

# Oil producer boosts production, sustainability and safety with fail-safe electric actuators for wellhead ESD

## RESULTS

- Enhanced operational reliability and performance with less downtime
- Eliminated methane emissions by using electric powered actuators
- Reduced energy usage compared to conventional pneumatic actuation solutions
- Faster deployment and implementation of the solution, improving time-to-market

## APPLICATION

Shutdown valves at production wellheads, which ensure reliable operation, especially during emergency shutdown (ESD) conditions

## CUSTOMER

Leading energy producer in the United States

## CHALLENGE

The oil producer was looking to upgrade their existing traditional actuator systems, which relied on regulated line gas or instrument air, on shutdown valves at production wellheads. The traditional systems had presented the customer with a number of challenges:

- During power outages, the pressure and quality of the air supply system degraded, leading to actuator failures and, consequently, frequent operational disruptions.
- The actuators' instrument air supply lines were prone to freezing during colder seasons, affecting performance.
- Due to air leaks, diaphragm wear and corrosion in the air lines, the actuators required frequent manual intervention, which decreased efficiency and increased safety concerns.
- Operating the existing actuators produced greenhouse gas (GHG) emissions with each actuator stroke.
- The existing systems required extensive maintenance, leading to a high total cost of ownership.



*An actuator's ability to deliver a fail-safe stroke quickly in case of a power failure or other emergency condition is a crucial requirement in wellhead applications.*

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These challenges, combined with the need to support the company's environmental, social and governance (ESG) goals, led them to search for a more reliable and sustainable actuator solution.

### SOLUTION

Working with Emerson and Puffer-Sweiven, their local Emerson Impact Partner, the customer began to evaluate new actuator technologies and design a solution to meet the following requirements:

- Capable of operating in harsh conditions with a wide operating temperature range: from -40 °F to +140 °F (-40 °C to +60 °C)
- Mechanical fail-safe to support emergency shutdown (ESD) applications with the necessary response time, able to achieve Safety Integrity Level 3 (SIL3)
- Reliable electric actuator, eliminating the need for air compressors, filtration and tubing
- Elimination of methane emissions from gas-powered instrumentation
- Independence from the main power grid, with a fail-safe 24 V DC circuit
- Onboard diagnostic features to enable remote monitoring and troubleshooting, including partial valve stroke test (PVST).

The collaborative effort between the three companies resulted in the selection of two Bettis™ RTS electric valve actuators: the FQ Series fail-safe quarter-turn actuator mounted on a ball valve, and the FL Series fail-safe linear actuator mounted on a reverse-acting gate valve. These two solutions fully met the technical requirements, and the Emerson Impact Partner Network was able to provide local field support and personnel training on the new system.

The Bettis RTS solution has been successfully pilot-tested in the field and delivered a number of benefits: lower power consumption, fewer surge events, time to market (TTM) improvement and support for data-based maintenance decisions. The successful pilot project has led to the solution being widely deployed by the customer across multiple oilfields.



*The Bettis RTS Series electric actuators incorporate several advanced features that allow them to meet the safety, sustainability and reliability requirements of demanding onshore production environments.*

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