

Electric actuation reduces emissions and power consumption at remote well pad separator locations

RESULTS

- Achieved ESG goals with a clean, zero-emission electric actuator solution
- Improved operational efficiency by reducing energy use through solar powered 24 V DC systems
- Enhanced equipment reliability and reduced maintenance costs by minimizing the need for traditional compressed equipment and site visits

APPLICATION

A well pad separator is the first stage in surface processing after gas and fluids are extracted from a wellhead. It separates the multiphase flow into oil, gas and water streams. The separator usually has one inlet and multiple outlets for each phase. Back pressure valves are installed at the outlets (particularly the oil and gas legs) to maintain adequate pressure inside the separator. This helps ensure effective phase separation and stable flow conditions in downstream pipelines.

This case study is focused on the back pressure control valve solution.

CUSTOMER

A mid-size U.S. energy producer operating in the Midland and Maverick Basins in Texas. The company focuses on sustainability, high-quality assets and operational efficiency, positioning itself as a competitive entity within its market segment.

CHALLENGE

As part of its commitment to ESG leadership, the company began researching sustainable technologies aimed at reducing methane emissions and energy consumption at their remote sites where meeting environmental regulations has been especially challenging.

- The legacy well pads and new installations must meet the OOOO (Quad-O) emissions standards from the U.S. Environmental Protection Agency (EPA).
- The existing gas-powered actuation equipment vents process gas during operation by design. To avoid these emissions would require air compressors on site.
- Aging pneumatic controls cause additional natural gas leaks.



Remote onshore well pads frequently do not have access to grid power, making it challenging to reduce emissions from traditional gas-powered actuators. Energy-efficient electric actuators powered by solar panels provide a zero-emission solution for these locations.

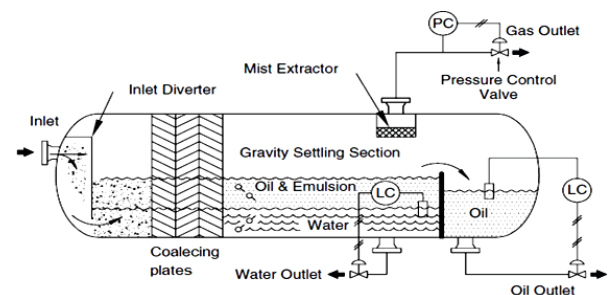


Figure 1: Back Pressure Valve on Well Pad Separator

- Intermittent gas/air supply quality issues result in inconsistent actuator performance and reduced operational efficiency and reliability.
- Frequent site visits are required to service and maintain the current equipment: compressor oil changes and oil level checks, airline filter maintenance, and draining water from compressor separators.
- Remote installation locations often do not have access to grid power, making it difficult or not sustainable to replace gas with compressed air.
- An alternative solar power source relies on reliable, 24 V-powered equipment. However, finding equipment that meets acceptable maintenance standards and low power consumption requirements for remote locations was a challenge.

SOLUTION

Working with Emerson Impact Partner Puffer-Sweiven and Emerson actuation experts, the oil and gas producer replaced their existing pneumatically powered Fisher™ globe valves with new Fisher globe valves paired with Bettis™ RTS CM32 and linear drives.

This solution delivers advanced operational excellence and offers the following key characteristics and benefits:

- **Zero emissions:** 100% electric with a 24 V power supply and low power consumption; eliminates methane venting
- **No dependence on air supply:** Ideal for remote locations where instrument air is unavailable or unreliable
- **Consistent and precise operation:** Provides repeatable positioning with high precision ($\pm 0.2\%$), optimizing performance in dynamic conditions
- **Faster and more responsive adjustments:** Offers precise modulation and immediate response to control signals, ensuring rapid adjustments utilizing speed control to maintain stable backpressure, even in changing operational environments
- **Lower maintenance and downtime:** Having fewer moving parts than legacy solutions reduces wear and tear, enhancing reliability and extending equipment lifespan

The proven success of the Bettis RTS actuator in field testing demonstrated not only reduced environmental impact and enhanced operational performance but also created an opportunity to expand electrification across additional well pad assets in support of broader sustainability goals.

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The Bettis RTS CM intelligent electric actuator provides zero-emissions actuation with precise modulation and high reliability.

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