

Installation of RTS Fail-Safe Electric Actuators on Wellhead Improves Operational Reliability for Major Oil Company

RESULTS

- Improved operational reliability and less maintenance
- Fail-safe operation strictly mechanical - no batteries, no super capacitors, no air or hydraulics dependency
- No reset/recharge time after fail-safe operation
- Independently adjustable open and close times during electric and fail-safe operation



APPLICATION

The customer needed a more reliable fail-safe electric valve solution for oil/gas well kill high pressure ball valves. Well kills may be planned or unintended making safety and reliability a major factor.

CUSTOMER

A global Fortune 100 oil and gas producer with numerous unmanned, remote oil and gas wells throughout North America.

CHALLENGE

The oil and gas producer needed a more reliable actuator solution for small remotely operated well kill ball valves with proven safety and fail-safe reliability without need to manually re-set actuators after fail-safe operation (ESD on loss of power, loss of control signal, remote shutdown and spills).

Remote locations do not have instrument air, process gas or utility electric power. The only power is from a 24 VDC solar power system. Actuated valves must operate at line pressures up to 6,000 psig. Existing actuators the oil producer is currently using for this application has integral battery back-ups which recharge time after fail-safe operation. Recharging takes time.

Safety and Fail-Safe Reliability

Well control in general is an extremely expensive and dangerous operation. This oil producer needed a proven and more reliable electric actuator solution with fail-safe capability to protect well heads and pipelines. Unmanned well-heads must safely shut down on detection of a dangerous condition to protect people, equipment, and the environment. Actuators need hazardous area certification.

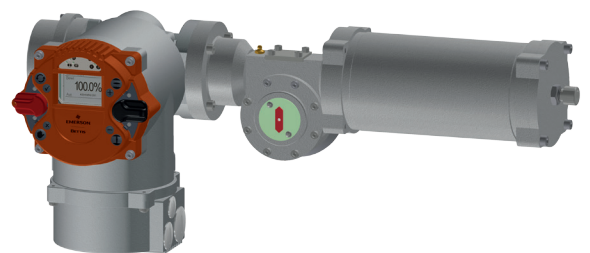
Remote Operation

Valves are located in remote, unmanned locations. Actuators must operate from discrete control signals to open or close valves from the customer's remote DCS/SCADA system. Actuators must report valve position even if power is lost.

“A non-intrusive, electric actuator with absolute position detection with configurable speed options and mechanical spring-return is ideal for emergency shutdown reliability in remote and harsh conditions.”



Bettis RTS FL Fail-Safe Linear



Bettis RTS FQ Fail-Safe Quarter-Turn

Simple Manual Operation

Technicians needed a simple way to operate actuators or valves during service events. To prevent unauthorized operation manual operation, actuators must be lockable.

SOLUTION

The company chose the Emerson RTS Fail-Safe electric actuator solution because of its proven reliability, performance, technology, standard 24 VDC input power and fast-acting spring based mechanical energy storage for fail-safe operation.

Even though the RTS Fail-Safe solution cost more than the currently installed actuators, customer said, "For safety systems, the fundamental requirement is reliability so cost is not the only driver in our decision process." Local sales and local service support with backup inventory from the Emerson Automation Solutions LBP was an important consideration.

Four RTS fail-safe actuators and valves are now being installed for a 3-month pilot at the customer facility. After the pilot, the RTS Fail-Safe solution shall become the fail-safe standard for this customer. There is a retrofit sales potential to replace other automated assemblies at the customer's other facilities.

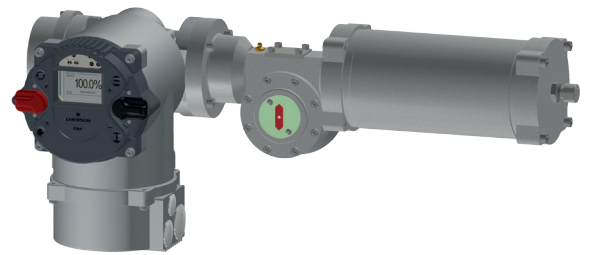
Other key factors influencing the customer's selection of the RTS Fail-Safe solution, no batteries, air or hydraulics are used, adjustable fail-safe operating time, low power consumption and SIL-3 rating. RTS Fail-Safe actuators offer selectable fail modes such as fail-safe open or close direction; fail-safe on loss of power; fail-safe on loss of control signal, or fail-safe on control signal.

RTS standard features influencing customer's decision:

- Brushless DC motor, frequency converter controlled, provides configurable speed control
- Low power consumption
- Absolute position detection
- Padlock capable manual handwheel
- LCD display with Hall-Effect (contactless) local control station with open-stop- close and local-remote selector knobs, and continuous position indication
- Non-intrusive setup and actuator parameters displayed
- 5+1 binary inputs (24 VDC, 48 VDC and 60 VDC)
- 8 Configurable Digital Outputs - ESD ready, open and close positions, running close and running open directions, over torque, selector switch in local or remote position
- Continuous microprocessor monitoring of all mechanical drive train components in powered and fail-safe modes with local display alarm locally and remote signal
- PST auto test mode to close valve 5% with remote open and close capability still active
- Adjustable fail-safe time uses an eddy current brake with no friction devices (no wear) to protect valves
- Separate terminal chamber for field wiring prevents exposing electronics to environment
- UL, CSA, ATEX and IECEx certification
- Long maintenance intervals – 10,000 to 20,000 operating hours (5 years), and 10 years after delivery by Emerson
- Two year warranty



EIM RTS FL Fail-Safe Linear



EIM RTS FQ Fail-Safe Quarter-Turn

The RTS Fail-Safe solution provides highly reliable operation without relying on batteries. The company's current actuators rely on batteries. Batteries and super capacitors have recharge times after fail-safe operation and may not be immediately available. Batteries and super capacitors are maintenance prone, require periodic replacement (hot work permit needed) and are affected by low and high temperatures. The RTS Fail-Safe solution reduces the maintenance and recharge times.

The RTS Fail-Safe solution is easy to install and setup. Configuration parameters can be easily downloaded from one actuator using the Bluetooth interface and uploaded to other RTS actuator. Operation and configuration data can easily be sent to Emerson for online diagnosis to ease preventative maintenance and quickly remedy malfunction. RTS Fail-Safe actuators can also be upgraded with a SD (secure digital) card for downloading software updates or for importing or exporting data.

The RTS LCD local display with Smartcon technology provides different user level information (user, service engineer, expert) for setup, operation, diagnostics and preventative maintenance. Menu screens display power on cycles, operating hours, power on time, motor runtime and number of torque warnings/failures.

For this major Fortune 100 oil producing company, overall the RTS Fail-Safe solution will provide utmost reliability, safety and less maintenance/cost than the currently installed actuators.

Reliable – Trusted – Safe.

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