



Pipeline control stations employ 12 and 16in ball valves automated by Rotork IQ electric actuators. Each valve has a solar panel

ACTUATORS IN ACTION

Liam Jones details how electric actuators were used in a solar-powered automation project on produced water pipelines

Recently, a US water management company requested help to develop solar-powered control stations for some of its water-gathering pipelines in West Texas and New Mexico.

Produced water, a by-product of oil and gas production, is taken from wells and gathered via a pipeline to transfer it to temporary storage at either a disposal well or a central treatment facility.

THE REASON

To improve its water-gathering operation, the customer worked with an industrial equipment supplier to investigate automated valve technology to control flow in the high-pressure pipelines.

The customer had specific requirements for the valve application, including the need to control system pressure to and from well sites, shut down lines in the event of a leak or other failure, and to eliminate high maintenance devices such as air compressors and other rotating equipment.

THE SOLUTION

With a lack of available gas and electricity in the isolated locations, the use of solar power to control pipeline flow was regarded as the most effective alternative.

The customer wanted valves installed every five miles in off-the-grid areas, so a solution combining solar panels with control stations and Rotork IQ3 electric actuators was devised. Each control station includes an IQ3 multi-turn actuator to control either a 12 or 16in ball valve and each assembly is fitted with solar panels to power either a 24, 48 or 120 VDC motor.

The solar power stations offer an efficient way of powering the control stations, while also preventing harm to the environment and cutting installation costs by removing the need to install power lines along the length of the pipeline.

The customer provided Rotork with the solar panels and necessary details to correctly size them to the actuators, allowing Rotork Site Services to assemble the systems.

Each station was then given its own solar set to create the power needed to actuate single-stage modulating and isolation valves as well as run a 24 VDC Programmable Logic Controller (PLC).

A control panel is also being used to operate voltage regulators that monitor battery voltage. The batteries are only charged when the voltage drops below a specified level to prevent degradation by over-charging the battery.

Rotork engineers were also able to help test the valves and confirm they would continue to stroke with no sunlight for at least two days.

Due to the presence of complete sunlight on the day of the test, covers were placed over the solar panels. Battery power was used to stroke the valves fully open and closed five times each day during a three-day period.

When the covers were removed, the batteries began charging immediately and reached full capacity in two to three hours.

THE RESULTS

The water management company now has an innovative and safe solution to assist with transporting contaminants to water-gathering and disposal facilities.

The use of Rotork's intelligent IQ3 actuators in an innovative solar set solution allows the appropriate voltage to safely operate isolation and modulating valves along the pipeline. ●

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