

Methane is a powerful greenhouse gas that traps heat in the atmosphere. It is the second most abundant human-made greenhouse gas, after carbon dioxide, and is more than 28 times as potent at trapping heat in the atmosphere over a 100-year period.^[1] It has, therefore, become increasingly important for governments and companies internationally to try and reduce their overall methane emissions throughout industrial processes.

The oil and gas industry is responsible for approximately 80Mt of methane emissions annually, representing about 40% of methane emissions from human activity. These emissions can be reduced by over 75% with solutions such as leak detection, repair programmes, and upgrading leaky equipment. Methane abatement in oil and gas can be achieved cost effectively. Around 40% of methane emissions could be avoided at no net cost.^[2]

Automation in upstream oil and gas operations and processes helps reduce emissions while delivering advanced control, lower power consumption, high reliability, and easy field serviceability. One way of reducing upstream methane emissions is the installation of electric actuators over pneumatic ones.

ELECTRIC ACTUATORS FOR UPSTREAM OIL AND GAS APPLICATIONS

Electric actuators use electricity as their power source instead of well-stream natural gas. Upstream production process control valves have traditionally been operated by pneumatic diaphragm actuators that use the well-stream gas for their motive power, releasing methane every time the valve is stroked. Electric actuators do not vent during operation.

Maintenance requirements for electric actuators are significantly lower than those for pneumatic actuators and control instruments. Rotork electric actuators deliver self-contained one-piece actuation solutions, which reduce the risk of failure compared with a typical pneumatic solution that comprises multiple pieces of equipment.

Servicing a self-contained electric actuator versus a pneumatic solution with multiple parts and systems also results in cost savings and increased



A production tree with IQTF actuator

ADVANCES IN AUTOMATION

Chris Hardy discusses how automation in upstream oil and gas processes can help reduce methane emissions

operational efficiency.

Rotork electric actuators, like the intelligent IQ, CMA and CVA process control actuators, feature user-friendly interfaces and software tools that simplify the commissioning process, making them an ideal solution for valve applications in the oil and gas industry.

Electric actuators have other significant benefits over pneumatic technologies. Pneumatic actuators consist of multiple parts, not just an actuator, and all parts can suffer from air-quality fluctuations, temperature variations, and other environmental factors.

Electric actuators are less susceptible to these influences. They are more energy efficient as they only consume electricity when in operation. By contrast, pneumatic actuators and controls require a constant supply of either motive pipeline gas or locally produced compressed air.

Many electric actuators from Rotork are available with fail-to-position

options that automatically return valves to a predetermined position in case of power loss or emergencies, thereby enhancing safety and preventing potential damage to equipment.

They also feature advanced diagnostics, enabling remote monitoring of condition, performance, and other potential issues. This allows for early identification and resolution of problems, preventing unexpected failures and associated downtime.

Reliable and advanced automation solutions can help operators reduce emissions, improve process efficiencies and increase production output. ●

^[1] Overview of Greenhouse Gases | US EPA

^[2] Information source: International Energy Agency, Global Methane Tracker 2023

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