

THE FUTURE OF FLOW CONTROL

Nicola Curtis discusses the role of flow control in a sustainable energy future

Issues surrounding sustainability are important in many sectors but perhaps are especially relevant within the wider oil and gas industry. The modern world relies on the energy sector; emission concerns means that action must be taken to minimise the impact that it has upon the environment. Efforts to tackle the climate crisis through transformation of energy systems is an essential tool in limiting global temperature rises and to achieving a net-zero future.

Flow control (the practice of controlling liquids and gases) is at the heart of many industries, markets and applications, including in diverse and varied applications in the oil and gas sector. Actuators mechanically operate valves. Automatic operation, instead of manual control, is often chosen because of safety requirements, including ability to provide emergency shutdown or fail-safe options. The right flow control options result in high degrees of reliability, repeatability, accuracy, safety and efficiency. Actuators must be able to operate in the challenging and demanding environments found within oil and gas. Within upstream, midstream and downstream areas, equipment such as actuators reliably control the flow of liquid and gas. Actuators control flow of crude oil, water, gas and condensate at upstream, offer day-to-day flow control at tank farms and provide critical safety duties at all stages. Flow control can also reduce emissions and minimise environmental impact, the focus of which increases in importance every day. Electric actuators are important within a sustainability context as they are a flow control option that does not release fugitive emissions, compared to spring diaphragm pneumatic actuators that are powered by the produced gas



IQT actuators provide flow control at gas compressor sites in Belgium

and then release bleed gas emissions. The reduction of these kind of emissions are an important tool in achieving net-zero.

REDUCING ENVIRONMENTAL IMPACT

The oil and gas industry is subject to a variety of mandates related to emissions and environmental impact, some of which are general in nature and some that apply specifically to oil and gas operations. All are part of the worldwide effort to keep rises in temperatures to 1.5°C of pre-industrial levels and the race to net-zero.

Electrification of oil and gas sites plays a key role in reducing the levels of emissions produced both within their extraction/production processes and an

overall reduction in carbon as part of a green energy transition. Often, the electricity will be sourced from renewable power, but any electrification efforts assist in significantly reducing levels of CO₂. Replacing high-bleed fluid power actuators with electric versions through retrofit, or installing electric ones on new sites, is increasingly popular. Rotork's intelligent electric actuators offer lower power consumption and because they are powered by electricity, they don't release emissions into the atmosphere. The company's flagship intelligent electric actuator is the IQ3. In 2021, Rotork provided an all-electric flow control solution to the new Johan Sverdrup oil field in the North Sea, aiding in its

electrification project. Hundreds of IQ3 multi and part-turn intelligent electric actuators were ordered to provide an extensive range of flow control services across the drilling, riser, process and living quarters. They control everything from the supply of water to engineers in their living quarters on the platform, to the precise control of flow needed for the extraction of oil. IQ actuators have low inactive energy use and no need for gas venting.

An example of a retrofit that brought the benefits of electric actuators was the replacement of existing pneumatic actuators at gas pressure reducing stations in Belgium. Rotork's IQT part-turn actuators were ordered by Fluxys Belgium to operate butterfly valves on boilers on unmanned gas pressure reducing stations. The gas then flows through a network at a lower pressure and to customers, without the release of undesirable greenhouse gas emissions.

FLOW CONTROL IN EMERGING ENERGY INDUSTRIES

Investment in emerging energy provision that is greener than traditional production is another clear way in which operators can work towards a more sustainable future. Liquefied natural gas (LNG) offers reduced



IQ3 actuators offer an all-electric solution at Johan Sverdrup

impact on the environment than other energy sources, with a cleaner burn than fuels such as coal. Flow control is used at multiple stages within LNG production, transportation and distribution; efficient electric control from Rotork has been seen across multiple LNG projects in Australia. Carriers are one of the most common ways of transporting LNG across long distances. Process control actuators from Rotork's CMA range have been used to minimise VOC emissions on these specialist carriers.

Flow control plays an essential role in oil and gas operations. Reliable and efficient electric actuation is at the heart of energy transition, as operators make changes to reduce emissions and adapt operations to minimise impact on the environment. ●

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