

The benefits of flow control within the water industry

The involvement of flow control within water industries can be split into two main areas: potable water and wastewater. Both areas are essential in the lives of us all; the availability of drinking water when we turn on the tap and how effluent and sewage is managed are key services we all rely on. Actuators are key items of equipment in potable and wastewater applications. This article will look at the requirements and challenges of these applications and will focus on examples of how flow control equipment allows the smooth running and success of water sites around the world.

What is flow control?

Actuators operate and move valves and are the key items of equipment in flow control. They can be electrically, hydraulically or pneumatically controlled. Effective flow control helps to improve efficiencies and increase water supply. Many operators in water require valves and dampers to move repeatedly between set positions. They are involved in a variety of applications including filtration, desalination, distribution, dams, reservoirs and irrigation systems. The ability of actuators to do this makes processes more efficient, minimises waste and reduces energy consumption.

Electric actuators are common within the wider water industry. They provide precise operation, with repeatability and resolution. Flow control equipment within water applications must have ingress protection to provide con-



tinuing operation and ensured reliability. Actuators within Rotork's IQ range are environmentally sealed in the factory. They are double-sealed to IP66/68 at 7m for 72hrs, protecting the internal components from water; moisture, dirt and dust. Robust, long-lasting equipment with minimal maintenance even in extreme environments is necessary within water applications. For example, in 2021 Rotork supplied IQ3 actuators to several water treatment sites in New Zealand. Previously, the sites had pneumatic actuators but required environmentally sealed electric actuators because of the damp, chlorinated atmosphere. The new actuators provide control of filters, as well as the chemical dosing and storage of potable water. Electric actuators have another benefit for operators: they do not need power compressors to provide an air supply to pneumatic actuators.

Potable water

There are different ways of creating water suitable for drinking. Flow control can be found in almost every process control application in sea water desalination plants and freshwater treatment plants, from import to distribution. Filtration is a key process in these applications. Partially treated water passes through a medium that strains it, such as sand or anthracite. Different types of filters are used, such as simple slow sand filters or rapid gravity sand filters.

Flow control is critical in the filtration process. 300 IQ actuators were installed at a US water filtration plant as part of an upgrade in 2020. They operate 12-to-30-inch butterfly valves at Eugene Sawyer Water Purifi-

cation Plant in Chicago to provide improved flow control for water travelling into and out of the facility's sand filters.

Wastewater treatment

The treatment of wastewater and its future discharge or reuse (such as within irrigation systems) requires specialist equipment and precise control to comply with strict environmental regulations. The use of actuators and subsequent automation ensures efficient effluent treatment and protection of the environment. Treated water is often returned to the sea or other water sources, subject to local policies. Flow control is cen-

actuators have been specified for use at the Water Resource Recovery Facility (WRRF) in East Lansing, Michigan USA. This activated sludge/tertiary filtration plant has the capacity to process approximately 18.75 million gallons of water every single day and provides wastewater treatment for the City of East Lansing, Michigan State University and the Meridian Charter Township.

Over 100 actuators have been ordered, consisting of various IQ3 and IQT3 range part-turn electric actuators, including the IQ18, IQ25, IQT-125, 500, 1000 and 2000. These actuators serve a variety of vital roles, including the operation of flow control valves, sluice gates, ball control valves, AWWA butterfly valves and eccentric plug valves. They were installed alongside IV Mk2 quarter-turn worm gearboxes.

The actuators are able to accurately control the exact amount of



tral to this process. In 2020 electric CK actuators were ordered to control the flow at Ergene Basin Deep Marine Discharge Project, Turkey, one of the longest sea discharge lines in Europe. The electric actuators operate penstocks at the treatment plants. It is essential that actuators in this context can reliably operate within high temperatures and demanding environments.

Water resource recovery facility

Rotork IQT part-turn electric

flow. Going beyond simple open/close functions, they can move the valves and gates to exact positions to provide complete control of flow in the process. In addition to this modulating service, the actuators also provide an isolating service in a new digester process. The digester process breaks down the waste material to produce biogas and the actuators ensure that the flow of municipal wastewater can be stopped, should it be necessary to do so.

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