



APPLICATION REPORT

Water & Wastewater

Flow measuring system for self-monitoring of effluent approved by Environment Agency

JACOBS

- Storage caverns created through solution mining by injecting seawater
- Emission monitoring standards require measurement of effluent brine in partially filled pipe before discharged to sea
- First non-water industrial site approved by MCERTS

1. Background

Scottish and Southern Energy's (SSE) Aldbrough Gas Storage Facility is building an underground gas storage facility in East Riding, Yorkshire (UK). Costing \$385 million, the project is managed by Jacobs Engineering. It involves the creation of caverns a mile underground through solution mining, a process where seawater is injected into wells within a salt bed to dissolve the minerals and to create caverns. During solution mining, brine is pumped out of the cavern along a pipeline and discharged into the North Sea.

This process is authorised by the Environment Agency. It involves England's first non-water industry flow monitoring installation to receive MCERTS (Monitoring Certification Scheme) approval for self monitoring of effluent flow by the Environment Agency. MCERTS, set up by the Environment Agency, sets the minimum requirements for the quality, installation and control of self monitoring of effluent flow. It is now being rolled out across other industry sectors and has also been extended to include the requirement to measure, collect and collate monitoring data.

2. Measurement requirements

As part of the discharge consent conditions, a flow monitoring system is required that meets the MCERTS self monitoring of effluent flow standard. Jacobs looked for a flowmeter capable of accurately and reliably measuring the flow rate of the brine despite the pipe only being partially filled. This can be as low as 10%. The flowmeter was to be capable of measuring a maximum flow rate of 2.052 m³/h. Because the brine can contain particles like sand and stones, the sensor needs to be abrasion resistant.

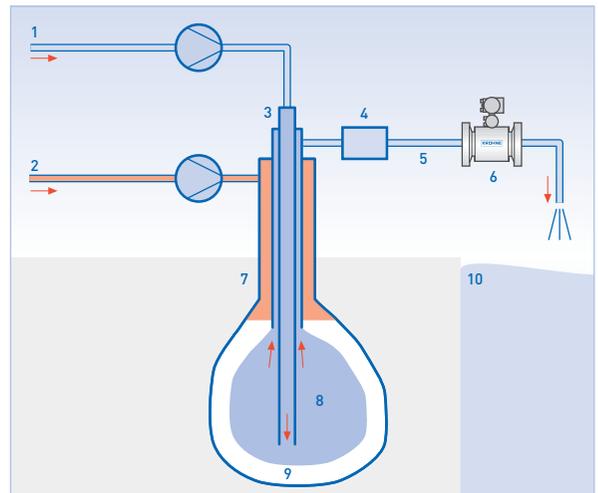
KROHNE

3. KROHNE solution

A key factor in Jacobs' decision to select KROHNE's TIDALFLUX for this application has been its capability to measure partially filled pipes with a high accuracy and reliability. Flow measurements possible down to 10% filling of pipe. TIDALFLUX is designed to provide reliable measurements between 10% and 100% of the pipe cross section. The accuracy in partially filled pipes is better than 1% of full scale (under reference conditions), and the accuracy in full pipes is better than 1% of the MV (under reference conditions).

The filling level is measured by means of capacitive plates and high frequency electronics. TIDALFLUX uses a patented, non-contact level measurement. The integrated level sensors are integrated in the liner and have no contact with the liquid. Therefore they are unaffected by any residues that may be floating on the water surface or particles in water.

The TIDALFLUX has a polyurethane liner, which has an excellent resistance to abrasion that may be caused by particles such as sand and stones suspended in the brine.



1 Seawater, 2 Blanket, 3 Pump station (seawater, blanket, brine), 4 Separator, 5 Pipeline partially filled with brine, 6 TIDALFLUX 2300, 7 Well, 8 Brine, 9 Saltbed, 10 North Sea

4. Customer benefits

Dr Roger Wilde from Jacobs said: "Achieving the MCERTS self monitoring of effluent flow standard was important to the success of this project. This is the first time that the Environment Agency has approved an industrial flow measuring system to this standard outside the water industry and KROHNE's TIDALFLUX has formed an essential role in us gaining this certificate."

Paul Wiggins, technical advisor at the Environment Agency, said: "As the first non-water industry site to be put through the MCERTS self monitoring of effluent flow scheme, I am pleased to say that the SSE Aldbrough site set up met the requirements and it is great to see the first industry MCERTS site conformity certificate being awarded."

5. Product used

TIDALFLUX 2300 F

- Accurate measurement with partially filled pipes
- Measurement possible down to 10% filling of pipe
- Diameters from DN 200 up to DN 1600 (8" to 64")
- Abrasion resistant liner
- Absence of internal moving parts prevents clogging
- No on-site calibration required
- Low risk of sedimentation with relative higher flow velocities
- Gravity feed saves energy costs of pumps



Contact

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