APPLICATION NOTE

Water & Wastewater

Dosing of sodium hypochlorite solution for drinking water disinfection

- Increased process safety and reduced consumption of liquid bleach in the chlorination plant of a water purveyor
- Reliable and long-term stable flow measurement of an aggressive liquid by using an electromagnetic flowmeter with ceramic measuring tube
- Additional flow instrumentation for the pumping station from one source
- Reduced service costs: Performance verification of all flowmeters with one single service tool

1. Background

A Spanish water purveyor provides one of the country's largest municipalities with potable water. The water gets thoroughly cleaned in a water treatment plant first and is then stored in a water reservoir for supply to the distribution network. Before it enters the water reservoir, the drinking water passes through a chlorination station.

2. Measurement requirements

The water is disinfected by way of chlorine bleaching. To this end, the water company adds a dilute solution with sodium hypochlorite (NaClO) to the water, which guarantees an extended disinfecting effect right up to the drinking water supply point. Accurate dosing of the chlorine solution is of the essence to comply with the domestic drinking water regulations by meeting the required min./max. thresholds.

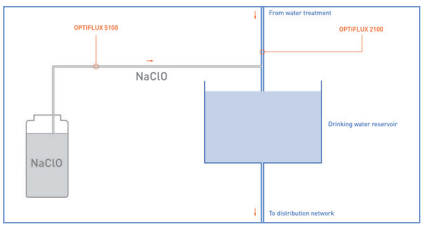
The client previously used electromagnetic flowmeters (EMF) from a competitor. These flowmeters were frequently damaged by corrosion. Their plastic liners were not up to the challenge of the aggressive disinfectant. As a result, chlorine dosing was badly affected. The damaged flowmeters even caused leakage in the chlorine line. In the end, chlorine dosing was only based on pumping rate and time as accurate flow readings were not available at all.

The water purveyor was therefore in urgent need for a chemically resistant flow instrumentation with a long life of service that allowed reliable and long-term stable dosing of the sodium hypochlorite solution. At the same time, the water utility intended to retrofit its water pumping systems with new flowmeters.

KROHNE

3. KROHNE solution

KROHNE recommended using the OPTIFLUX 5100 C electromagnetic flowmeter for flow measurement of sodium hypochlorite solution. This EMF features a high-tech ceramic measuring tube with sintered electrodes for demanding applications with aggressive chemicals. It is therefore ideally suited for chlorine dosing in water treatment. Thanks to the unique combination of material properties such as surface hardness and finish, mechanical strength or resistance to corrosion, it outclasses all traditionally lined EMFs. A total of 13 OPTIFLUX 5100 were provided in different sizes (DN6...25) with space-saving sandwich connection for different flow rates ranging from 200...2000 l/h.



Simplified process flowsheet with measurement points of OPTIFLUX 5100 and OPTIFLUX 2100

In addition, the pumping station for the treated water was equipped with the OPTIFLUX 2100 C. Two units of the EMF were supplied with flange connections from DN25...50 for a water flow rate of 350...900 l/h. This flowmeter for general water applications has a wear resistant liner and a full-bore design. It is thus almost maintenance-free, which makes it an effective replacement of the mechanical water meters used before.


OPTIFLUX 5100 for dosing of sodium hypochlorite solution

An annual on-site verification of the EMFs is carried out with the OPTICHECK Master. Since KROHNE, as a long-standing partner, has already supplied flowmeters for the water distribution network of the utility company, the client has already been using this service tool for device verification for some time.

4. Customer benefits

Process safety and efficiency have been vastly increased. Chlorine dosing with the OPTIFLUX 5100 has been optimised, leading to reduced chlorine consumption. The water purveyor only adds as much sodium hypochlorite solution as is actually needed. Determining the disinfectant quantity by estimation is a thing of the past. Safe drinking water supply in accordance with regulations is achieved. Due to its patented corrosion-resistant measuring tube, the KROHNE flowmeter provides a long service life and also does not cause any leakages, reducing the risks for working staff significantly. Constant maintenance and flowmeter replacement is also no longer an issue.

The water purveyor also benefits from reduced service expenses due to economies of scale using the OPTICHECK Master. As the water utility has been using the service tool for some time and is familiar with it, no additional training was required. All the different KROHNE EMFs can now be checked and verified with one single device. This enables the water utility to carry out field service on their own. In this way, field service support from KROHNE can be reduced, minimizing service fees for the water purveyor.

5. Products used

OPTIFLUX 5100 C
- Electromagnetic flowmeter with chemically resistant ceramic tube for demanding applications with aggressive and abrasive media

OPTIFLUX 2100 C
- Electromagnetic flowmeter for all standard water and wastewater applications

OPTICHECK Master
- Handheld for in-depth verification, device commissioning and monitoring

Contact

Would you like further information about these or other applications?
Do you require technical advice for your application?
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