Toilet flushing with a fresh sea breeze

Quality monitoring of seawater with Turbimax CUS52D

In Hong Kong about 80% of the inhabitants flush their toilets with sea water.

Benefits at a glance:

- Accurate, stable and reproducible measured values in the required measuring range.
- No more time-consuming and error-prone laboratory measurements necessary.
- Compact measuring points, clear panel layout and one transmitter for all parameters.
- Easy maintenance, which is only required once a month and is carried out by Endress+Hauser Service.

By using seawater to flush toilets, Hong Kong has been able to reduce drinking water consumption by 20%. Pumping stations on the coast ensure a constant supply of seawater to the population, regardless of weather and sea conditions.

Challenge

Before the water is made available to consumers, it must be ensured that the water quality complies with the guidelines of the Water Quality Objectives (WQO) despite constantly changing sea conditions. For this reason it was decided to replace the previous time-consuming and error-prone laboratory measurements with a reliable online monitoring system.
In the pumping station, the seawater is first sieved to remove dirt and particles. It is then disinfected with sodium hypochlorite.
Turbidity is one of the decisive quality criteria of the WQO. High-quality seawater typically has a low turbidity level and therefore carries a lower risk of diseases caused by germs. Therefore, turbidity monitoring in the range 0 - 100 NTU must be continuously ensured - otherwise the water supply must be stopped. This requires a high degree of reliability and a high measuring performance of the turbidity sensor. In addition, the sensor must not pose a risk of contamination of seawater, it must be suitable for use in pumping stations with salt water and a harsh outdoor environment and the measuring point must be compatible with the existing SCADA system. The customer also wanted unlimited access to the web-based asset management information system, including all test and calibration protocols.

Our solution

In order to comply with the water quality guidelines, free chlorine, dissolved oxygen and the pH value should be measured in addition to turbidity.

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Therefore, the customer decided on a water analysis panel on which, in addition to the Turbimax CUS52D, sensors for real-time monitoring of the other parameters were also installed. To ensure reliable measurements in salty and polluted seawater, the Turbimax CUS52D is equipped with an ultrasonic cleaning unit and an air bubble trap for self-cleaning and calibration. The application has now been running for more than two years and the customer has already equipped 16 measuring points with the analysis panel. By connecting the Liquiline transmitter to the customer's SCADA system, a simple and reliable process control in the seawater supply station is realized.

Results

The Turbimax CUS52D turbidity sensor made of stainless steel, with ultrasonic cleaning unit and air bubble trap, has shown that it is perfectly suited for this saltwater application and can cover the wide turbidity range of seawater. The customer benefits from accurate, stable and reproducible measured values and can dispense with time-consuming and error-prone laboratory measurements. The sensors for monitoring the various parameters are all installed on a clearly arranged panel and require only one Liquiline transmitter. Maintenance of the panel and the measuring points installed on it is only required once a month and is reliably carried out by Endress+Hauser Service. All in all a convenient solution that has made it very easy to comply with water quality directives.

The following components are installed on the analysis panel:

- Transmitter: Liquiline CM444
- Turbidity sensor Turbimax CUS52D-AA1BA2+GE
- Ultrasonic cleaning system CYR52
- pH sensor CPS11D-7AS21
- Dissolved oxygen sensor COS61D-AAA1A4
- Free chlorine sensor CCS142D-AAS80

Turbimax CUS52D

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