

SIEMENS

PROCESS INSTRUMENTATION

Certified accurate: MCERTS inspectors and process instrumentation

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Three percent. Of all the world's water, only three percent of it is fresh water. Rivers, lakes, groundwater, and ice—that's all we have for drinking, growing food, raising animals. Three percent.

So when the UK's MCERTS inspectors arrive at a water or wastewater facility, they are fully aware of the important task set before them: to ensure accurate flow measurement in order to enable proper water treatment.

With help from process instrumentation and rigorous inspection techniques, SIRIS Environmental in Sunderland, UK does just that. Every day.

First things first in wastewater

Flumes and weirs are primary measuring devices that millions of megaliters of water flow through each day in wastewater treatment plants (WWTPs).

However, with continual buildup adding itself to every part of these open channels, WWTP operators need more precision.

Open channel monitoring by process instrumentation provides operators with the information they need to begin the wastewater treatment process.

With ultrasonic transducers mounted above a channel, connected to a high-precision controller, the water height, or head level measurement, is within one millimeter and an accurate flow rate can be calculated.

Eight percent is the magic number for MCERTS inspectors. Over a 24-hour monitoring period, technicians must take 96 readings of wastewater effluent flowing through a flume or weir – in other words, one reading every 15 minutes.



Inspectors install a target reference plate directly below the measuring device – in this case an Echomax XRS-5 ultrasonic transducer from Siemens.

These measurements are averaged and compared to the flume or weir's calculated measurement – or what the ideal flow volume would be without the effect of any buildup on the flume or weir.

If a site's total "uncertainty budget" is at or below ± 8 percent, the WWTP's open channel system will pass inspection and be issued an MCERTS Compliance Certificate; any higher and the site will fail. In the latter case, MCERTS inspectors would then provide the WWTP with a list of recommendations to be used in preparation for a follow-up inspection.

Instrumentation inspection

Since water and wastewater treatment facilities depend so heavily on process instrumentation at every step of their operations, part of the inspection duties include close evaluation of a site's open channel monitoring system.

Inspectors place a target reference plate in the path of a level measurement sensor and then compare the actual distance to the one reported by the level measurement device.

For example, with an Echomax ultrasonic transducer from Siemens mounted above an open channel and connected to a SITRANS LUT400 ultrasonic controller, inspectors would find an extremely precise reading.

This ultrasonic system from Siemens includes the world's most accurate level measurement controller, with one-millimeter accuracy. Inspectors include the difference between actual and reported distance as part of a site's uncertainty budget. Precise instrumentation with high



A sunshield installed over the ultrasonic transducer helps increase accurate open channel readings by reducing temperature fluctuations caused by sun exposure.

repeatability is therefore an important piece of a WWTP's overall MCERTS score.

In addition to installing reliable level measurement devices, the use of a sun shield is recommended above any instrument that is exposed to direct sunlight. The sun's rays can affect an instrument's readings by causing temperature fluctuations. A sun shield minimises these types of fluctuations, helping the level system to provide more accurate measurements.

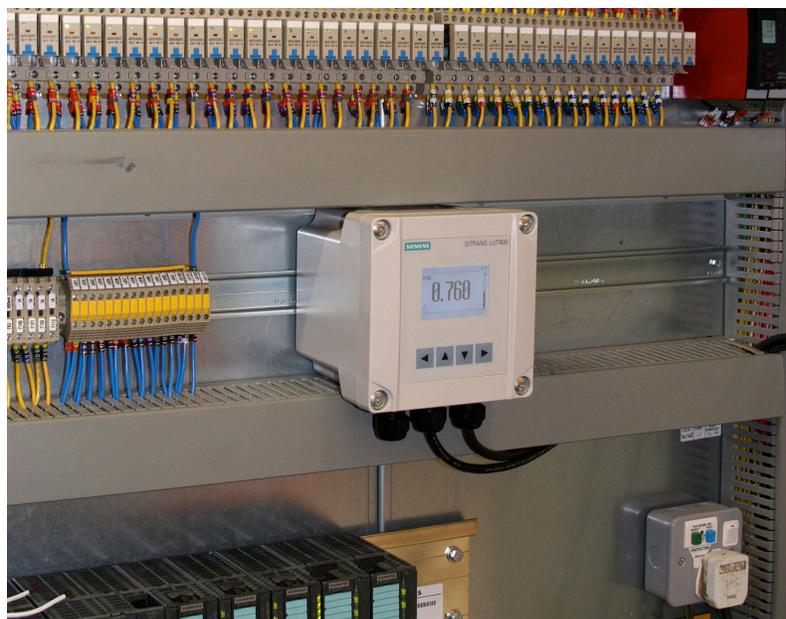
The demand for datalogging

For both inspectors as well as for a WWTP, historical wastewater treatment information is extremely important. First, facilities must submit their effluent totals to local environmental agencies; failure to do so – or submitting information with missing records for a certain number of days – and the WWTP will be fined.

For MCERTS inspectors, historical datalogs of effluent amounts help with the inspection process. If a site has an issue in their readings, the ability to review historical records can help inspectors and operators narrow down and eliminate the problem.

For example, historical data allows the MCERTS inspector:

- To see if the flume is correctly sized for the amount of flow that actually passes through the flume. If the flume is sized incorrectly, then the inaccuracy of the flow measurement could be increased.
- To see minimum/maximum flow amounts, which are based on the correct sizing of the flume.



SITRANS LUT400 can be installed quickly and in a variety of mounting locations, saving technicians a great deal of time in setup and programming.

- To review average daily flows, which can assist inspectors with calculating the maximum uncertainty error.
- To use these logs as a backup to any telemetry logging.

SITRANS LUT400's integrated datalogger allows users to quickly and easily review the instrument's historical performance.

WWTP operators can download logs to a computer using the device's USB connection, and the device saves dataloggs even during power outages.

With over 7000 MCERTS-approved water sites in the UK, inspectors have a busy job. A combination of experienced personnel, thorough inspection protocols, and applying reliable process instrumentation on a site make each day just that much easier.

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