APPLICATION REPORT

Water & Wastewater

Non-contact level measurement in wastewater pumping stations

- Cost-effective level measurement for pump control in a wastewater system
- 80 GHz radar enables cost-effective and maintenance-free operation without sensor cleaning
- Rapid parameterisation of level transmitters via mobile phone and Bluetooth®
- Replacing submersible level probes has reduced service callouts and maintenance costs

1. Background

The municipality of Aurskog-Høland, located in Akershus, Norway, covers a vast area of over 1,100 km² / 425 sq mi but is relatively sparsely populated, with approximately 18,000 inhabitants. The local public utility therefore operates an extensive sewage network with numerous pumping stations distributed across the municipality.

Aurskog-Høland's wastewater system comprises 86 pumping stations and more than 340 municipal pipelines, which transport sewage to five wastewater treatment plants. The municipality is committed to continuous innovation, aiming to improve the operation of its pumping stations and reduce overall costs – with the highest possible service quality at the lowest possible expense.

2. Measurement requirements

To ensure efficient pump control and avoid issues such as overfilling or dry running, continuous level monitoring in the pumping stations is essential. The pumps are controlled by a programmable logic controller (PLC) based on these readings, keeping levels within defined limits.

Until recently, the customer used submersible level probes, but these proved to be maintenance-prone. Debris such as clothing and wet wipes frequently clogged the sensors, disrupting level measurement and affecting both pump control and overall system performance. When the probes operated outside their specifications, alarms were triggered, requiring immediate intervention by the municipality's service engineers. This frequent, unplanned cleaning was not only undesirable from a health and environmental perspective but also time-consuming and costly.

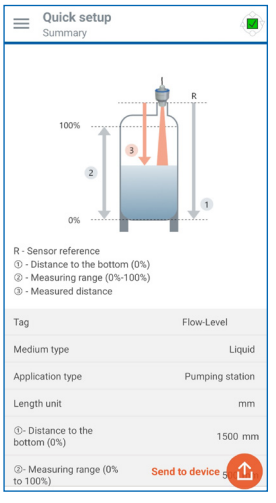
Callouts, especially those outside regular working hours, remain a major cost driver for the operator. To ensure reliable pump control while reducing operational expenditure, the utility was looking for a cost-effective yet more reliable instrumentation.

KROHNE

3. KROHNE solution

KROHNE suggested trying the OPTIWAVE 1520 radar level transmitter for non-contact level measurement in the pumping stations. The cost-effective, compact 2-wire 80 GHz device is specifically designed for wastewater applications, including harsh environments of pumping stations. The performance of the device is not affected by condensation on the antenna, which can easily occur due to temperature differences between the pumping station and the outside environment. The small footprint allowed it to be installed into the small access point, a circular cut-out in the concrete floor of the pumping station. Both the antenna and housing of the OPTIWAVE 1520 are made of robust PVDF. KROHNE recommended the IP68-rated version of the radar to make it resistant to flooding.

The municipality began testing the radar at one of its pumping stations. A provisional installation was carried out using the OPTICHECK Level Mobile app. The 80 GHz radar was up and running in under 30 minutes. The app offers predefined templates for a wide range of applications – including pumping stations – allowing even less experienced service personnel to commission the device by entering just a few application-specific parameters. The start and stop functions of the pump were successfully tested and verified.



OPTICHECK Level Mobile template for installation of a KROHNE 80 GHz radar in pumping stations

4. Customer benefits

The KROHNE device fully met expectations and was adopted as a permanent installation. The cost-effective, non-contact radar has convinced the municipality, which has since expanded its installed base of OPTIWAVE 1520 level transmitters. The operator now also holds a stock of new KROHNE 80 GHz radar devices, which will be used to replace the remaining submersible level sensors as required.

Installation of OPTIWAVE 1520 radar level transmitter

The KROHNE level transmitter provides reliable, stable and continuous level measurement for pump control in Aurskog-Høland's pumping stations. Maintenance and manual intervention have been significantly reduced. The elimination of frequent servicing and cleaning of submersible level probes – often with callouts after working hours – has led to reduced costs for the municipality and its residents. In addition, the reduced exposure of service personnel to the wastewater has significantly improved health conditions, thereby enhancing occupational and environmental safety.

The compact 2-wire devices connect directly to the control system (PLC) without the need for additional signal converters or control units, keeping both capital and operating expenditure to a minimum. The flexible setup with wireless Bluetooth® communication, a mobile app and a step-by-step installation wizard makes replacements straightforward and time-saving. The operator also benefits from *OPTICHECK technology built-in* diagnostics such as radar signal strength analysis. This ensures optimal installation and measurement conditions for reliable and long-term stable level readings.

5. Product used

OPTIWAVE 1520

- Compact 80 GHz radar level transmitter for pumping stations
- Cost-effective non-contact level measurement up to 10 m / 32.8 ft
- Robust PVDF housing and flush-mounted Lens antenna
- User-friendly commissioning via Bluetooth® and the OPTICHECK Level Mobile app

Contact

Would you like further information about these or other applications?
Do you require technical advice for your application?
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Please visit our website for a current list of all KROHNE contacts and addresses.

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