APPLICATION NOTE

Water & Wastewater

Level measurement of a water sump at a sewage treatment plant

- Reliable measurement of wastewater levels at a sewage pumping station
- Economical 80 GHz radar provides high measuring dynamics for rapid level changes
- Non-contact level measurement in a wet well prone to flooding

1. Background

A major city council in South-East Queensland, Australia, maintains and operates a wastewater treatment plant (WWTP) for municipal, industrial and agricultural wastewater. At the inlet of the sewage treatment plant, the received wastewater loads cross the wet well of a sewage pumping station (SPS).

2. Measurement requirements

The SPS is exposed to heavily fluctuating water levels. Due to the risk of flooding, the water sump must be continuously monitored. Only if the operator has factual information about the dynamic changes in the water level can additional pump capacities be activated to counteract the discharge of wastewater into the sump environment.

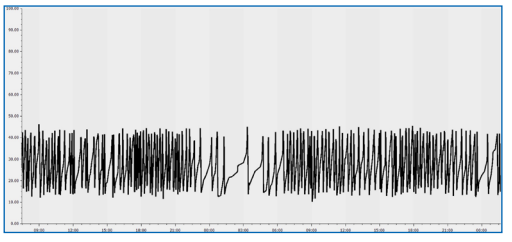
Previously, the utility had been using a competitor's hydrostatic level probe, which lacked the desired measurement dynamics and didn't respond as fast as required. The submersible probe was also prone to clogging and maintenance. The council was therefore looking for an alternative solution that would provide reliable performance during extreme weather events where rapid level changes can occur.

3. KROHNE solution

A trial with the OPTIWAVE 1540 radar level transmitter has convinced the operator. The very cost-effective 80 GHz radar is designed for non-contact level measurement of wastewater and very well suited for continuous level measurement in sewage pumping stations. It's high signal dynamics enable fast response to rapidly changing water levels.

KROHNE

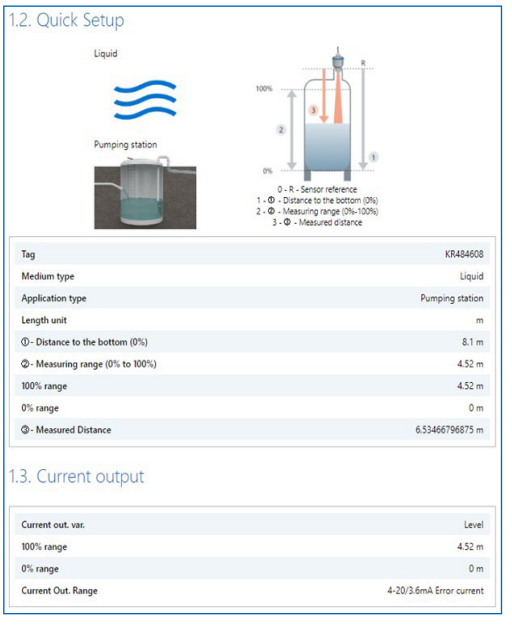
With its narrow beam-angle it can also be mounted fairly close to the wall of the pit. The radar was installed with a flush-mounted DN40 Lens antenna. The radar is suspended above an 8 m / 26.2 ft high concrete pit using a hydrostatic cable clamp assembly and a 5 m / 16.4 ft cable length.



Readings of the OPTIWAVE 1540: High dynamic range at rapidly changing water levels

Unlike hydrostatic probes, the OPTIWAVE 1540 is not affected by sludge build-up on the sensor. As a non-contact level transmitter, the OPTIWAVE 1540 provides durability with no wear and tear. Its PVDF antenna material is chemically resistant to a wide range of products and vapours. As the instrument comes with IP 68 ingress protection, the device will be undamaged even in the event of overflow occurring and regain measurement when the level drops.

The 80 GHz radar was easily configured via the OPTICHECK Level Mobile app, which uses a pre-configured, application-specific template for quick level radar set-up. Having entered the basic application parameters, the client quickly commissioned the KROHNE device via secure Bluetooth® communication.



Quick set-up of the OPTIWAVE 1540 80 GHz radar via the OPTICHECK Level Mobile app

4. Customer benefits

The economical and extremely compact 80 GHz radar provides the utility company with reliable performance, offering ±2mm / ±0.08" accuracy at a price point comparable to hydrostatic level measurement. Due to its excellent response time, the customer can continuously monitor rising water levels and take immediate action to control the sewer, activate a seconary pump and prevent flooding of the sump in high flow and high-level weather events. In addition, the operator was able to easily convert the level readings into the DCS. The radar was flexibly adapted to the scale of the previous pressure transmitter using the presetting provided by the mobile app.

The OPTICHECK Level Mobile app made commissioning of the radar level transmitter straightforward and convenient. The Bluetooth® connection enabled device setup via mobile phone from a safe distance, eliminating the need for service engineers to lean over the pit or manually operate the device for configuration changes or generating reports. With "OPTICHECK technology built-in" device diagnostics, the OPTIWAVE 1540 can be easily verified through the app, providing quick access to diagnostics and reporting features, which can be swiftly sent for analysis in the event of unusual measurements or just for regular performance and device status monitoring.

5. Product used

OPTIWAVE 1540

- 80 GHz radar level transmitter for basic water and wastewater applications with high accuracy requirements
- Continuous, non-contact level measurement of pumping stations
- IP68 rated version for use in flood risk areas
- 2-wire 4...20 mA HART®7; user-friendly commissioning via Bluetooth® using the OPTICHECK Level Mobile app
- Measuring range: 0...15 m / 49.2 ft

Contact

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