Non-Contacting Area-Velocity Flow Measurement Without a PMD

At a wastewater treatment plant in Asia, the end-user needed to gain flow measurement at a location where the installation of a Primary Measuring Device (PMD) would have been difficult.

Primary Measurement Devices

Weirs and flumes are both examples of primary measurement devices that can be used to monitor the flow in a partially filled pipe or channel. When a primary device is installed, it creates a relationship between water level and flow rate by manipulating the flow area and slope within the PMD itself. This change in level is then measured and used to calculate the flow rate. Usually, to gain level measurement on a primary measurement device such as a Parshall Flume, or V-Notch Weir, it requires the use of a secondary sensor such as an ultrasonic or radar level sensor.

If a site does not already have a primary flow measurement device installed, this can be something quite costly to implement. The installation of a PMD requires a lot of civil engineering work and would typically need to be factored into the design at the beginning of a project. Besides the cost of getting one installed, sometimes the hydraulics of a site do not allow for the installation of one.

Flow Measurement Without a PMD

Just because there is no primary measurement device installed, it doesn't take away the fact that users need flow measurement in these applications. At a wastewater treatment site in Asia, the end user was looking to get flow measurement at a location where the hydraulics of the site did not allow for the installation of a PMD.

HSA Asia, one of Pulsar Measurement's trusted partners in Asia, knew the exact system that could provide the end user

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with what they were looking for, an area-velocity flow measurement system. The MicroFlow, dBMACH3 and FlowCERT are the components of a non-contacting area velocity flow measurement system that has been designed specifically for sites without a PMD.

MicroFlow

The MicroFlow provides a non-contacting velocity measurement solution for open channels and can either be used with the MicroFlow as a stand-alone sensor for velocity measurement only, or it can be paired with a MicroFlow and dB Ultrasonic Transducer for a complete area-velocity system.

The MicroFlow sensor uses K-Band radar technology and Pulsar Measurement's unique analysis software takes readings from the whole width of the radar beam. The technology works by using short pulses of microwaves which are transmitted by an enclosed antenna on the face of the unit. When these pulses are reflected off a moving surface, the returned signal experiences a shift in frequency. The reflected signal is captured by the onboard microprocessor via the antenna and analyzed to determine the velocity.

dBMACH3 High Accuracy Open Channel Flow Transducer

Featuring unique sun and submergence shields, the dBMACH3 is designed specifically for open channel flow applications. dBMACH3 is the first ultrasonic transducer with zero effective blanking distance beyond the nose cone, allowing it to be installed as little as a few millimeters from the high-flow level.

The readings from both the dBMACH3 and MicroFlow are sent back to the FlowCERT, which does all the flow calculations for you based on the programmed channel shape and size, then displays flow rate on its onboard screen. With built-in data logger functionality, the logger records a wealth of information onto the supplied 32GB Micro SD card, enabling the end user to log and download data for the lifetime of the installation.

Successful Installation

This system was absolutely ideal for this application where the end user did not want to modify the existing channel. With it, they were able to measure the flow rate of the raw water inlet at their wastewater treatment facility in Asia. Performance was so good, it even allowed them to countercheck the flowrate of the inlet pump device, helping them to verify that their existing equipment was operating efficiently.

More Information

FlowCERT: https://pulsarmeasurement.com/en/flowcert
dBMACH3: https://pulsarmeasurement.com/en/dbmach3-db3-with-sun-shield
MicroFlow: https://pulsarmeasurement.com/en/microflow

Partner Locator: https://pulsarmeasurement.com/en/partnerlocator

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