Case Study

Water and Wastewater CS37

Teledyne ISCO Comes Through with Accurate, Durable Solution to Hospital Effluent Monitoring System

6712FR sampler and Signature flowmeter at Al Amiri Hospital in Kuwait

Teledyne ISCO 6712FR stationary refrigerated sampler and Signature® integrated flowmeter with TIENet® 360 LaserFlow® sensor are used to monitor quality and quantity of effluents at a hospital in Kuwait City. The system is integrated with the customer's SCADA system to quickly respond to threshold events.

Project Overview

Hydrotek Engineering Co. of Kuwait was contracted by Kuwait City to collect samples of wastewater and measure flowrate from hospitals at a point before the effluent entered the main municipal sewer line. Environment Public Authority of Kuwait receives the samples for laboratory testing, with the results used to determine if the medical waste has entered the primary sewer system. The laboratory analyses include 30 physic and chemical parameters, such as pH, BOD, COD, heavy metals, oil and grease, bacteria, and others.

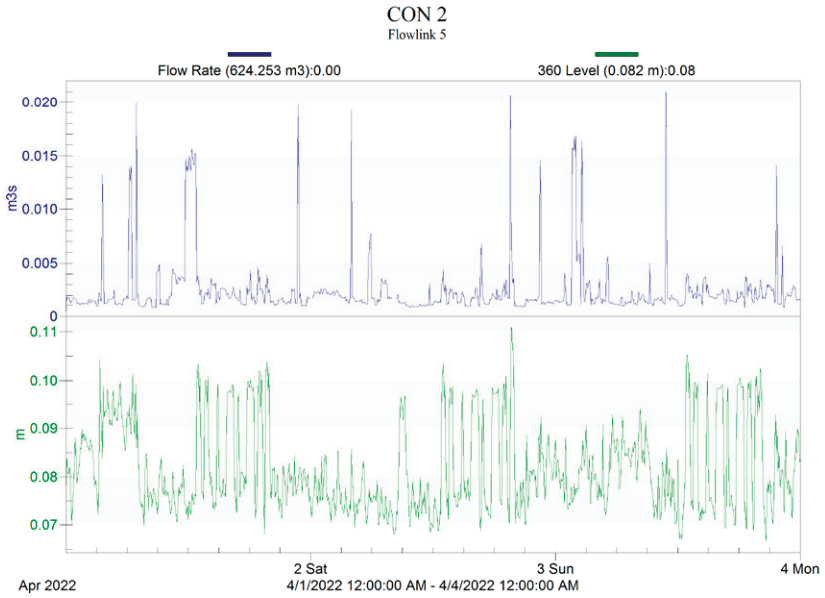
If the effluent is found to be polluted with medical waste, the main valve between the hospital discharge point and the municipal sewer channel can be closed either manually or remotely, and government agencies will step in to direct the hospital in remediation.

Beyond health hazards and environmental concerns, medical wastewater would increase the volume of effluent entering the sewer system, limiting the capacity of the municipal pump station to handle the additional flow. Some contaminants present in medical wastewater also can, over time, damage the pumps and other equipment in the sewer system.

Site Challenges

The low flow conditions (graph 1), small channel diameters and aggressive chemicals included in the wastewater were crucial considerations in the selection process. Also, flow measurement accuracy couldn't be compromised, as flow was to be used for billing purposes. Therefore, the main site requirements were non-contact technology and high flow-measurement accuracy in the entire range, including near-zero flows.

In addition, both sampler and flowmeter had to be installed within the hospitals' boundaries. In this regard, proper positioning and mounting of the sensor in the existing sewer discharge points was crucial.



Graph 1

LaserFlow sensor installed in a hospital wastewater effluent.

LaserFlow and 6712FR sampler solution

Hydrotek Engineering Company, the Teledyne ISCO distributor in Kuwait, recommended using the non-contact LaserFlow® sensors, Signature® flowmeter, and 6712FR samplers in consideration of the existing site conditions.

The LaserFLow technology allowed for the flow sensor to be positioned above the wastewater, so it didn't interfere with the flow stream. Its ability to measure near-zero levels was very advantageous, for the effluent points also would be used for billing purposes.

Integrating the 6712FR sampler with the LaserFlow sensor allows for flow proportional and event-based sampling. The high-flow events are immediately recorded, and the event sample is collected. If the wastewater contaminants exceed the prescribed limits, or in the case of the high flow event, the Environment Public Authority can close a hospital discharge point, keeping the pump station operating properly and preventing interference in biochemical processes at the city WWTP.

Feedback from the customer

Monitoring system including Teledyne ISCO 6712FR sampler and LaserFlow sensor meets the requirements of Environment Public Authority. The maintenance and service is very low, making the system a very economical solution for the end user.

TIENet® 360 LaserFlow® Sensor

The TIENet 360 LaserFlow sensor is an area-velocity flow and water-level measurement device that remotely senses flows in open channels using non-contact Laser Doppler Velocity Sensing and non-contact Ultrasonic Level Sensing technologies. The sensor uses advanced technology to measure velocity with a laser beam directed at single or multiple points below the surface of the wastewater stream. Therefore, unlike radar technology, it does not require the creation of ripples on the surface of the stream.

- Zero deadband from measurement point in non-contact level and velocity measurements. Continuous measurements in submerged conditions
- Advanced velocity diagnostics for data quality evaluation and analysis
- Bidirectional velocity measurement
- Low level velocity measurement
- Certified MCERTS Class 2
- The LaserFlow Ex is certified for hazardous areas classified as Class 1, Div 1, Zone 0 and ATEX category 1G.

Signature® Flowmeter

The Signature flowmeter from Teledyne ISCO, designed for open channel flow monitoring, supports flow measurement methods including bubbler, non-contact laser area velocity, ultrasonic, and submerged Doppler ultrasonic area velocity.

With the ability to connect up to 9 sensors*, the Signature flowmeter provides a broad range of I/O and communications options:

- pH and temperature
- SDI-12
- RS485
- 4–20 mA output
- Ethernet
- GSM/GPRS modem

The Signature flowmeter is rugged (IP 66) even if the cover of the lid is open. It performs data logging with variable rate data storage and data integrity verification, and has the ability to connect a USB drive for data/report retrieval and programming.

** Performance, response and speed will vary depending on type and number of TIENet devices connected to a Signature flowmeter. Check with your sales representative to ensure the best configuration for your application.*

6712FR Fiberglass Refrigerated Sampler

The 6712FR is a sequential or composite refrigerated sampler designed to withstand the harshest indoor or outdoor environments. It features our unequalled “FR” model corrosion-proof refrigerator cabinet molded from polyester resin fiberglass and supported by a stainless steel frame. A UV-resistant gel coat provides a smooth, non-porous finish for added protection and easy cleaning. Thick, foamed-in-place insulation helps keep samples preserved at the EPA-recommended 39 °F (4 °C).

- Automatic built-in heater ensures that samples won’t freeze, even when ambient temperatures drop to -20 °F (-29 °C).
- Corrosion-proof refrigerator cabinet is molded from polyester resin fiberglass and UV-resistant gel coat
- SDI-12 interface provides “plug-and-play” connection with compatible measuring devices

About Teledyne ISCO

Teledyne ISCO is a leading manufacturer of a wide range of innovative products designed to increase productivity while improving the quality of life on our planet. Our standard and customized products are used across multiple sectors including water and wastewater, pharmaceutical, academia, oil exploration, and reactant feed. Teledyne ISCO is continually improving its products and reserves the right to change product specifications, replacement parts, schematics, and instructions without notice.

For further information contact your local Teledyne ISCO representative.

TELEDYNE ISCO
Everywhereyoulook™

4700 Superior St.
Lincoln, Nebraska, 68504 USA

Phone: +1 402.464.0231
www.teledyneisco.com

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