



Case Study

Remote control prevents yearly street flooding

In the face of heavy rainfall and stormy weather, Aquestia's Smart Water Solution CONDOR - prevents flooding and overflows

Background Severe seasonal flooding

One of the largest cities in Israel, with 200,000 residents suffers from severe flooding, frequent blockages, and overflows related to heavy seasonal rainfall. The past three winters saw the city's streets and parking lots flooded, cars submerged, extensive damage to property and in some cases, lives lost. Flooding is a problem worldwide and remains one of the most expensive natural disasters, costing the US nearly \$10 billion annually and Europe \$1.4 billion [source: Jerusalem Post]. Water management and sanitation projects are having great success in preventing flooding by implementing information and communications technology, integrated with smart water management systems.



Challenges Draining heavy rainwater in time to save lives

The city's water drainage system comprised a mechanical valve, located off the sewerage line, that was manually opened in the event of heavy rain and street floods. This meant that water utility personnel had to physically attend the site to open a bypass and direct the water to a different reservoir. But, in some cases, the underground valve chamber could not be located nor accessed due to flooding. Delays in draining the rainwater led to several catastrophes, as streets and parking lots were completely flooded, and people were trapped in their homes. The regional water and sewage corporation responsible for water management and sanitation in the city sought a smart, remote-controlled solution that would enable water operators to predict flooding, and take preventative action to rapidly drain high volumes of rainwater, without causing the city's sewerage network to collapse. A further challenge was a lack of pressure in the pipeline, which would be needed to open a hydraulic valve.

Solution Remote control enables a proactive approach



Aquestia's engineers installed a Dorot S100 10" valve and CONDOR Controller to provide remote control of the on/off EL valve. In the event of a flood warning, water utility personnel can now command the valve to fully open as needed. In the case of unforeseen or flash floods, a 4-20 signal from an ultrasonic water level sensor issues an alert to the CONDOR. Located below street level, the ultrasonic sensor enables the system to monitor the water level inside the valve chamber; when it reaches a pre-configured level or is suddenly flooded by heavy rain, the sensor automatically activates the opening of the valve, allowing the area to properly drain. The CONDOR, together with the valve's control trim were placed inside a metal cabinet – the "Smart Box" - located at street level, enabling easy access for operation, maintenance or servicing. It is powered by a solar panel mounted on the top of the Smart Box. The on/off valve connected to the CONDOR is located inside the valve chamber, below street level. Regarding the water pressure challenge, a work around was found in the form of a bypass from a high-pressure potable water line, located at street level. A venturi tube was installed just above the valve control chamber, 2-3 meters below street level. When the CONDOR sends a command to the on/off valve to open, water from the high-pressure potable water line goes through the venturi tube, creating a vacuum which pulls up the valve diaphragm.

Results Instant success

Following installation of the system, a date was set for commissioning and testing. However, in the meantime, an emergency call was received from the water corporation advising the Aquestia team that heavy rain was imminent - the system needed to be operated urgently. Aquestia launched into action, immediately training the water utility staff to use the SKYplatform to remotely control the CONDOR and the valve. When the rainfall began, water utility personnel successfully opened the valve via the remote control system, with no one being required on site. The rainwater was successfully drained in time to prevent street flooding.

The water corporation was so impressed with the results, that it has since commissioned a number of additional Aquestia Smart Solution systems.

"We installed a DOROT S100 model 77 with the CONDOR controller. I can say for certain that the product works and makes our job easier, as proven this winter. We are now planning to purchase two additional solutions of this kind for other sewerage-rain pipe connections in our network."

Water utility corporation engineer