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Cost-Effective, 24/7 Leak Detection Based On Thermal Imaging

To remove the labour-intensive job of monitoring the integrity of pipeline networks, the video analytics specialist, IntelliView has developed a smart camera solution, at the heart of which, is FLIR thermal imaging technology.

Corrosion, ageing pipes and fittings are the common causes of leaks with control valves, pig traps and receivers, meters and pressure gauges being especially susceptible. Although leaks often start small, delayed detection can cause significant financial losses as well as environmental and reputational damage.

As a result, oil and gas operators typically apply a multi-layered, multi-technology approach to early leak detection and a new method that is proving particularly effective is the intelligent video analytics-based system developed by IntelliView.

“We knew that a fixed, camera-based leak detection system would be an ideal approach for monitoring unmanned pump stations,” explains IntelliView’s Chris Beadle. “The combination of visual and thermal camera technologies enabled us to offer an effective method of detecting and alerting operators to very small, above-ground fluid spills within a couple of seconds.”

IntelliView’s leak detection solution is called DCAM (Dual Camera Analytic Module). It is a compact combination of visual and FLIR thermal cameras with built-in proprietary leak analytics, wireless connectivity and automatic climate control.

Within its field of view, the DCAM can see an oil leak as small as 0.36 cubic metres per hour from a distance of up to 60 metres. The software then automatically analyses the event based on user defined leak parameters and, if a critical condition is determined, an alert notification with image and video is generated for instant verification.

The FLIR model chosen for this task is the FLIR A65, a compact IR camera that produces high-quality thermal images with 640 x 512 image resolution and visualises small temperature differences. The series has ten field-of-view options for greater control over the measurement areas and can operate in all weather conditions and temperatures up to 60°C.

“The compact FLIR A65 is easy to integrate into the DCAM,” Chris Beadle continues. “It is a complete solution with a wide range of lenses and ability to discern absolute temperatures, critical information for use in our analytic algorithms.”

The IntelliView DCAM not only detects leaks based on temperature differences presented by the thermal camera but also based on smart video analytics that take into account liquid movement and leak size. This results in a very low false alert rate. The analytics work together with a series of algorithms to filter out unwanted events such as moving vehicles, snow, heavy rain, glare and shadowing. And any alert by the thermal camera can always be verified by an operator on the visual video image.

Chris Beadle concludes: “The IntelliView DCAM system is proving to be a very efficient way to monitor the safety of above-line piping facilities on a 24/7 basis. It not only helps organisations to enhance response time but also reduce manpower and save costs.”

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