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Please contact us for product questions or purchasing

WirelessHART

Sump Monitoring with Polymer Absorption Sensor and WirelessHART Technology – Case Study

Results

- Early leak detection and notification
- Public and environmental protection
- Immunity to false alarms

Application

Facility integrity monitoring

Customer

Petroleum storage facility operator in Canada

Application Characteristics

Monitoring an aboveground storage tank (AST) sump for product and high water level

Challenge

A sump was designed to fill with drainage water from beneath an AST. Product would seep into the sump if the AST bottom failed. A system was needed that could detect both product and high sump water level.

The customer wanted a temporary standalone system that would monitor the sump until device data could be integrated into their existing DCS/SCADA. The feasibility of installing wired sump monitoring devices was limited due to existing infrastructure, so wireless options were considered. There was also a problem with structures and equipment hindering wireless communication.

The region has harsh environmental conditions. Winter temperatures can drop below -35°C (-31°F) and summer temperatures can rise above 35°C (95°F). Clear skies are typical for the region so facility equipment has exposure to prolonged periods for direct sunlight and UV radiation. Significant snowfall accumulation has occurred in previous winters. Strong thunderstorms with heavy rainfall, gusty winds, and large hail have occurred in previous summers.

Syscor's Polymer Absorption Sensor and WirelessHART technology was developed in close cooperation with the petroleum industry

Syscor's PCU-X00 Repeater mounted to an existing pole with the Universal Mounting Bracket and U-bolt.

Innovation driven by safety

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Solution

Syscor's Intrinsically Safe and completely wireless HC-Tracker™ monitoring system was deployed on the in-service AST sump. Assembly and installation required no hot or cold work. All of Syscor's deployed monitoring devices have a battery life of 10+ years based in a sampling rate of once per minute.

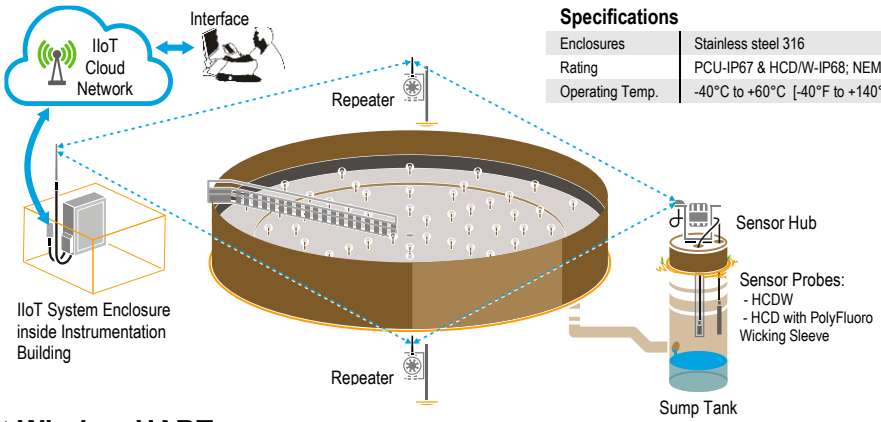
Installation: A PCU-X01 Sensor Hub was mounted to the sump lid with a Floating Roof Mounting Bracket and magnets. Two sensor probes, the Hydrocarbon Detector with Water Level (HCDW) and Hydrocarbon Detector (HCD), were wired to the Sensor Hub using robust, UV resistant Instrumentation Cables and then placed through existing sump lid holes.

HCDW Sensor Probe: The HCDW was lowered several feet into the sump to detect hydrocarbons and water level. Syscor's monitoring software alerts when hydrocarbons, butane and heavier, touch the Polymer Absorption (PA) Sensors within the sensor probe. Water is detected at a certain sump level and measured in 1/2 inch increments (up to 5 inches).

Redundant HCD Sensor Probe: The customer wanted a second hydrocarbon detecting sensor probe to add redundancy. The HCD, also containing PA Sensors, provides this redundancy and was lowered into the sump next to the HCDW. A PolyFluoro Wicking Sleeve covers the HCD to trap and direct small hydrocarbon volumes to the PA Sensors; thereby increasing detection probability when the sensor probe is submerged in water or encased in ice.

Repeater: Due to line-of-sight challenges, multiple Repeaters were installed to transmit Sensor Hub and HCD/W data to the IIoT System Enclosure. They will also serve future expansion of WirelessHART devices at this site.

IIoT System Enclosure: A temporary standalone Industrial-Internet-of-Things (IIoT) System Enclosure was installed indoors and powered with 120 VAC supply. The enclosure's WirelessHART Gateway communicates with the Repeater and transmits Sensor Hub and HCD/W data to the cellular modem. The operator views the data through Syscor's monitoring software. An optional enclosure heater was installed to protect internal devices from cold temperatures. When Syscor's monitoring devices are successfully integrated within the site's existing DCS/SCADA, the IIoT System Enclosure will be removed from service.



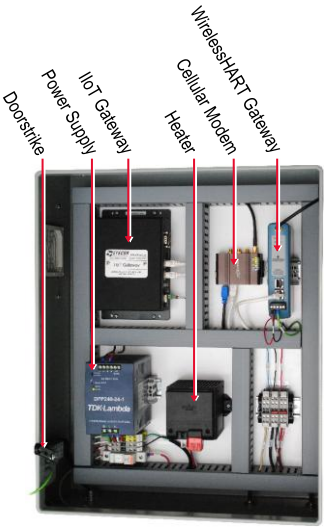
Specifications

Enclosures	Stainless steel 316
Rating	PCU-IP67 & HCD/W-IP68; NEMA 4X
Operating Temp.	-40°C to +60°C [-40°F to +140°F]

Components

PCU-X01 Sensor Hub w. HCD/Ws

PCU-X00 Repeater



IIoT System Enclosure

About WirelessHART

WirelessHART is a communication standard (IEC 62591; 2.5 GHz DSSS) adopted by the petroleum industry. It is a secure, scalable, and self-forming mesh network protocol. Device data interconnects with site DCS/SCADA through a WirelessHART Gateway. Configuration of mesh communication paths is not required. WirelessHART security is robust consisting of industry standard techniques. WirelessHART devices add redundancy to existing operations and monitor conditions where wired alternatives were not previously feasible.

Syscor reserves the right to change product designs, specifications, and information without notice.