



DATA ANALYSIS

CASE STUDY

Asset management platform integrates real-time sulfide data

The Danish SaaS company APX10 is integrating the novel SulfiLogger™ sensor in the company's new big data analytics platform data|APEX. Using a combination of dynamic data modelling and real-time sensor data, the SaaS platform provides a complete and dynamic overview of a water utility's city-wide hydrogen sulfide challenges enabling efficient and informed mitigation actions.

Background

Every year, hydrogen sulfide induced corrosion causes water utilities around the world to waste a significant part of their operating budgets on repairs and replacements of prematurely deteriorated wells, pipes, pumps and other assets. Without access to a full and dynamic overview of the cause and magnitude of their hydrogen sulfide challenges, utilities are often forced to make important asset management decisions on an uninformed basis, which might cause them to replace healthy assets prematurely or overlook severely damaged ones altogether.

The new asset management software data|APEX by APX10 addresses this

problem by enabling water utilities to make big decisions on an informed basis.

Sensor integration

data|APEX is a big data analytics platform for water utilities comprising a default framework and a range of specialized modules. In the H₂S module, force mains are analyzed using dynamic modelling techniques to predict which end-of-pipe discharge wells and nearby urbanized areas are likely to be affected by the consequences of hydrogen sulfide degassing.

The screening tool highlights potentially problematic areas using color gradient overlays on maps embedded with GIS

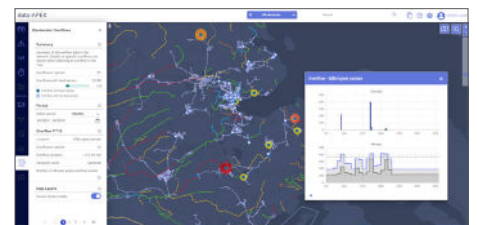


Figure 1: Visualization of one of the modules in the data|APEX platform.

data of sewer lines, wells, pumping stations and other assets. Utilities are then able to assess and prioritize further inspections to understand the scope and cause of a problem in greater detail by integrating real-time sensor data from

About APX10

APX10 believes that the digital transformation of infrastructure owners and operators will be a game changer. As a SaaS company with core competences in the water industry and strong roots in the Danish utility market, the company is set forth to bring utility best practise into the digital age.

About data|APEX

data|APEX is a big data analytics platform, that analyses data related to water network, smart meters, IoT devices and public data available. Relying on industry specific AI and strong network effects from water utilities, data|APEX predicts conditions and criticality, visualized on maps and dashboards.

the SulfiLogger™ sensor in the data|APEX platform.

Setup and results

Using the data|APEX platform, the Danish water utility Struer Forsyning identified a potentially problematic force main south of the city Struer. With a major highway located above a potentially affected gravitational line, it was of vital importance for the utility to initiate actions to prevent or minimize hydrogen sulfide degassing and maximize the lifespan of the line. Although Struer Forsyning already doses chemicals, the utility suspects the current dosing rate is insufficient.

To understand the situation in greater detail, two SulfiLogger™ H₂S sensors were installed in the pumping station sump before the force main and in the gravitational line after the end-of-pipe discharge. Using the online sensor signal from these two installations, Struer Forsyning adjusted the dosing rate to match actual H₂S peak levels resulting in a complete elimination of the hydrogen sulfide problem as visualized in the data|APEX platform interface in Figure 2.

Perspectives

Although dynamic modelling and simulations provide an excellent screening tool for capturing daily variations in hydrogen sulfide formation under

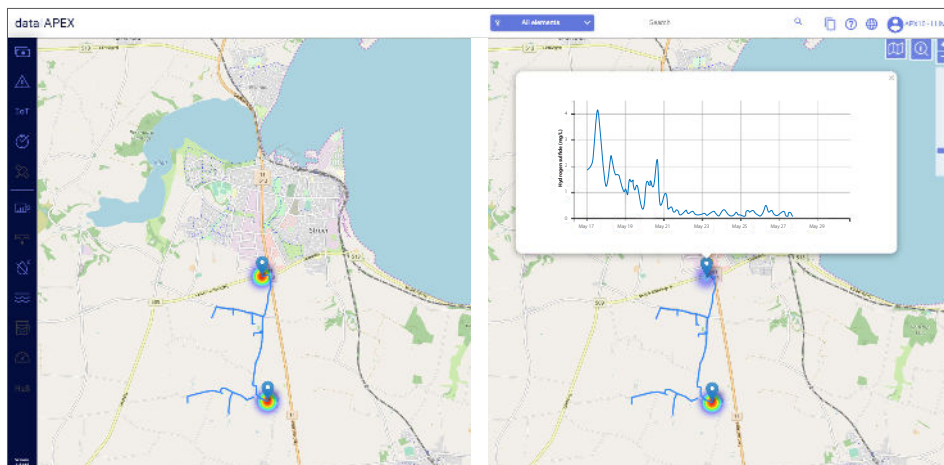


Figure 2: Visualization of the H₂S module in data|APEX before and after Struer Forsyning decided to increase the injection rate at the chemical dosing station in the beginning of the force main. The potential for hydrogen sulfide degassing is visualized using color gradient circles around the blue marker points, while a click on a marker expands this view with real-time sensor data in a pop-up window.

ideal conditions, they are still unable to capture the full effect in complex sewer networks with branched connections or unpredictable industrial sewage discharge.

To understand the dynamic effects of such networks, real-time sensor data is required, which, in cooperation with state-of-the-art modelling solutions, can improve our understanding of hydrogen sulfide formation in sewer networks for efficient mitigation actions.



Figure 3: SulfiLogger™ H₂S sensor with extension pipe in pump station sump.



About the SulfiLogger™ H₂S sensor

Our latest innovation, The SulfiLogger™ H₂S sensor, is a novel sensor for continuous, online monitoring of dissolved H₂S in raw wastewater. It is well suited for installation in various placements in wastewater collection systems including lift stations/pumping stations, end-of-pipe, force mains and gravity sewer lines.



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