SENSING EXCELLENCE

Multisensor

CASE STUDY

Monitoring of seawater for VOC pollution following accident in Vietnam

Application Dossier: No. XVIII

Application

Monitoring seawater for VOC pollution following illegal toxic waste discharge

Product

Two MS1200 standard version, no touchscreen, with 4-20 mA output and plastic sampling tanks

MS1200
Oil in Water Monitor

Background

The Vietnam marine life disaster, also known as the Formosa incident, occurred in April 2016 and caused massive marine life destruction across four central provinces in Vietnam. The crisis was traced to the illegal discharge of toxic industrial waste by Formosa Ha Tinh Steel, a Taiwanese-owned steel plant. The company admitted responsibility on 30 June 2016, months after widespread environmental protests and public outcry.

Formosa Ha Tinh Steel discharged wastwater containing toxins and VOCs exceeding legal limits through an ocean sewage pipe. Vietnamese scientists and authorities confirmed that the waste originated from the Vũng Áng Economic Zone, where the steel plant was located. Reports revealed that Formosa had imported 300 tons of chemicals to clean the pipe shortly before the disaster.

While early government statements speculated alternative causes like red tides, these claims were refuted by experts and environmental organisations.

The disaster led to extensive ecological damage, protests on 1 May 2016, and demands for transparency in the investigation. Although Formosa eventually took responsibility, the incident exposed lapses in environmental governance and prompted a stricter approach to environmental protection.

Application

Following the accident The Ministry of Natural Resources and Environment (MONRE) in Vietnam established a seashore water monitoring station in central Vietnam.

In April 2021, Multisensor Systems was contacted to discuss the application. After some discussions, two MS1200 were selected for the monitoring of toxic volatile organic compounds (VOCs) in seawater in Ha Tinh province in 2021.

This station is used to monitor the quality of seawater and to detect any toxic compounds that may enter the sea. One of the key parameters to monitor is the presence of VOCs and oil in water as it was determined this to be one of the most representative parameters to look out for.

Two monitors have been installed in this station to provide a good representation of pollution in the water.

Customer

Ministry of Environment, Vietnam.

Problem

Detecting VOCs and industrial effluents in seawater near to an industrial area to provide real-time alerts, timely alarms, prevent major disasters and allow for the prompt identification of offenders.

Product

Two MS1200 standard version, no touchscreen, with 4-20 mA output and plastic sampling tanks.

MS1200 and filtering system installed side by side

Installation Facts

The water sample is pumped through a pipe to a shelter where the MS1200 is mounted on the wall.

The primary challenge in sea water monitoring involves the process of sampling sea water, specifically, the transportation of seawater to the monitoring station through pumping. This process is susceptible to potential damage from waves, sand, salt, and the possibility of pipe blockage due to other marine life.

To solve these issues there are two filters in the system:

- A primary filter located at the suction head, which is continuously exposed to seawater. This filter is susceptible to damage from strong waves and salt,

necessitating frequent replacement.
- A secondary filter is situated within the station housing. This filter is positioned before the seawater reaches the analyser.

Thanks to this setup the analysers can continuously monitor the seawater and perform in the harsh marine environment.

These are the kind of filters installed at the intake to avoid barnacles and other marine life colonising the piping.

Did you know?

Chemicals used to clean industrial pipes are formulated to dissolve residues such as scale, rust, grease, and organic deposits that accumulate during operations. Common cleaning agents include acids (e.g., hydrochloric or sulphuric acid), alkaline solutions (e.g., caustic soda), and specialised detergents.

For industrial systems, these chemicals are often combined with surfactants, dispersants, and corrosion inhibitors to enhance cleaning efficiency while protecting the integrity of the pipes.

Volatile organic compounds (VOCs) are frequently present in industrial pipe-cleaning solutions, particularly in solvents and detergents.

VOCs such as methylene chloride, toluene, and benzene are commonly used due to their ability to dissolve grease and organic residues.

Why Multisensor?

The customer was looking for a system that could perform in the harsh environment and preferred a contactless technology able to detect a wide variaty of compounds.

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However, their volatility means they readily evaporate, contributing to air pollution and posing inhalation risks to workers. When disposed of improperly, VOC-containing cleaning agents can contaminate water sources, disrupt ecosystems, and generate secondary pollutants such as ground-level ozone.

For more information

Visit: www.multisensor.co.uk
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Multisensor Systems is a developer and supplier of Water and Gas Analysers specialising in oil in water and hydrocarbon analysers, oil in water detectors, VOC monitors and THM analysers based in the United Kingdom.

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