

Oil Sheen Detection: An Alternative to On-Line PPM Analyzers

Introduction

Discharge of hydrocarbons in industrial water is restricted by environmental authorities in most countries to a few parts per million (ppm). Environmental authorities currently monitor wastewater, stormwater, and cooling water discharges from industries that may contaminate public waters, sea, rivers, and lakes. Many companies cannot treat the whole quantity of water that is discharged from their premises into public water. This untreated water may carry hydrocarbons resulting from unnoticed accidental leaks and spills. Upsets in the treatment systems may cause discharge of ppms far in excess of the permitted amount.

On-Line ppm Analyzers

Due to the risks of discharging hydrocarbons with untreated water and upsets in water treatment systems, many companies have been trying to install on-line ppm analyzers. Most of these analyzers use optical detection techniques such as:

- Extraction by solvent and detection of oil by infrared light
- Visible light scattering for turbidity measurement
- Infrared light scattering
- Laser scattering
- Ultraviolet light absorption

Many of these on-line optical analyzers do not provide a satisfactory solution due to the following problems:

- a. The measurement can be influenced by non-hydrocarbon particles.
- b. The measurement can be influenced by the cleanliness of the measuring cell walls.
- c. The measurement can be biased by non-contaminating turbine particles, that are coated with very thin layers of oil and are detected as large amount of oil in error.
- d. The measurement might be biased due to detection of non-contaminating organics (e.g. in TOC analyzers).

- e. It is difficult to obtain a representative sample from a water surface where oil normally floats.
- f. Certain analyzers require different calibration for different hydrocarbons.
- g. Many of the analyzers are expensive to buy and operate due to complicated installation, sophisticated sampling and filtration mechanism, etc.
- h. Many of these analyzers do not perform reliably after a short running period. They often require frequent recalibration and maintenance. Users who lack expertise in calibration have to depend on the support of the manufacturer.

Leakwise Oil Sheen Detectors and Laboratory Analysis – An Alternative Solution

In view of the problems encountered by users of optical ppm monitors, many companies prefer now to use as an alternative solution:

- a. Laboratory analysis of manual samples, in order to satisfy the requirements of the authorities for PPM monitoring.
- b. On-line monitoring with Leakwise Oil Sheen Detectors (ID-223 or ID-221) in order to satisfy the need for:
 - On-line continuous detection of upsets in the wastewater treatment system.
 - On-line continuous detection of hydrocarbon discharges resulting from leaks or spills into untreated water.

Implementation of Leakwise Detectors

Monitoring of Water Discharge from Oil/Water Separators

An ID-223 Oil Sheen Detector (or an ID-221 Oil Sheen Detector) can be installed in a retention canal or in a retention tank after the oil/water separation system. In the event of hydrocarbon detection, it will trigger an alarm and shut off the water discharge gate. In some sites, there is no retention canal, and the water is dis-

charged from the separator directly into the public water through a pipeline. In these cases, a settling tank is mounted on the pipeline (or on a by-pass). The ID-223 Oil Sheen Detector, which is installed in this settling tank, will close the discharge valve in case of oil sheen detection.

Stormwater and Cooling Water Monitoring

An ID-223 Oil Sheen Detector is installed in stormwater collection sumps and cooling water canals. If water is indicated, it will be directly discharged into the sea or river or public drainage. If oil or oil on water is detected, the ID-223 Detector will close the water discharge valve (or gate) and will open the valve (or gate) to the water treatment system.



ID-223/500 installed in a flow stilling outlet tank, monitoring oil/water separator discharge.

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The Americas

GE Analytical Instruments
6060 Spine Road
Boulder, CO 80301-3687 USA
T +1 800 255 6964
T +1 303 444 2009
F +1 303 527 1797
geai@ge.com

Europe/Middle East/Africa

GE Analytical Instruments
Unit 3, Mercury Way
Urmston, Manchester
UK M41 7LY
T +44 (0) 161 864 6800
F +44 (0) 161 864 6829
geai.europe@ge.com

Asia Pacific

GE Analytical Instruments
5 United Plaza
1468 Nanjing Rd (W)
Shanghai 200040
China
T +86 021 3222 4555
geai.asia@ge.com

www.geinstruments.com

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300 00058 Rev C
MC08-201