Ionics Agar Environmental Ltd.

LEAKWISE® OIL ON WATER MONITORING SYSTEMS

APPLICATION NOTE #4

_OIL SHEEN DETECTION - AN ALTERNATIVE SOLUTION TO ON-LINE PPM ANALYSERS

Introduction

Discharge of hydrocarbons in industrial water is restricted by environmental authorities in most countries to a few PPMs. Environmental authorities are currently monitoring waste water, stormwater and cooling water discharges from industries which may contaminate public waters, sea, rivers, lakes, etc.

Many companies can't treat the whole quantity of water which 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 the permitted amount.

On-line PPM Analysers

Due to the risks of discharging hydrocarbons with untreated water and due to the risks of upsets in water treatment systems, many companies have been trying to install on-line PPM analysers. Most of these analysers 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.
* Ultra violet light absorption.

Many of these on-line optical analysers 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 turbide particles which are coated with very thin layers of oil and are detected as "large amount of oil".
d._The measurement might be biased due to detection of non-contaminating organics (e.g. in TOC analysers).
e._It is difficult to obtain a representative sample from water surface where oil normally floats.
f._Certain analysers require different calibration for different hydrocarbons
g._Many of the analysers are expensive to buy and operate due to: complicated installation, sophisticated sampling and filtration mechanism, etc.

LEAKWISE® - APPLICATION NOTE #4

h._Many of these analysers do not perform reliably after a short running period. They too often require recalibration and maintenance. Users who lack expertise in calibration have to depend on the support of the manufacturer.

Leakwise Oil Sheen Detectors & 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 needs for:

_* On-line continuous detection of upsets in the waste water treatment system.

_* On-line continuous detection of hydrocarbon discharges resulting from leaks or spills into untreated water.

Implementation of Leakwise® detectors

1.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 set off an alarm and shut off the water discharge gate. In some sites, there is no retention canal, and the water is discharged from the separator directly into the public water through a pipe-line. In these cases, a settling tank is mounted on the pipe-line (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.

2._Stormwater & 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.