Ionics Agar Environmental Ltd.

AGAR LEAKWISE® OIL ON WATER MONITORING SYSTEMS

APPLICATION NOTE #9

HYDRO-ELECTRIC POWER PLANTS

A. Oil Detection in Water Collection Sump under Turbines

Water carries oil leakages from turbine bearings and other leaking sources into a large sump, which is built under the turbines. In most plants, pumps installed at the bottom of the sump discharge the water directly to the river.

An Agar Leakwise ID-221 floating oil detector is installed in a perforated 6" stifling well. The Leakwise detectors use the high frequency electromagnetic absorption technology, and are capable of detecting presence of a 300 micron (0.3mm) oil layer and measure its growth up to 25mm. The Leakwise sensors are not sensitive to dirt and oil coating and to changes in water conductivity. The detector has low & high user selectable alarm set points in the range of 0.3-2.5 mm of oil on water. A “Low” oil alarm can be set off, for example, at 2 mm oil layer; upon this alarm, the operators know that in the near future they need to clean or skim the oil from the water surface. A "High" oil detection alarm can be set off, for example, at 2O mm oil layer; upon this alarm, the operators know that there may be a catastrophic leak into the sump and immediate actions must be taken.

In some hydroelectric power plants, the sump pumps discharge the water into oil/water separators. Water is pumped from the separator into retention tanks and from there back to the river. An ID-223 oil sheen detector installed in the retention tank will alarm at the presence of 0.3 mm oil. An Agar Leakwise ID-225 oil thickness monitor, installed in the separator, can measure continuously the thickness of the oil layer in the range of 4-l00 mm. The information is displayed via 4-20 mA output signal in the control room. The operators use this information to decide when to skim the oil. The ID-225 sensor can also automatically start and stop a skimming pump.

B. Oil Detection In Transformer Substation

Oil and rainwater are collected from under the power plant's transformers into an underground tank. An ID-223 installed in this tank detects leaks of transformer oil, and can be used for preventing discharge of oily water into the river or public drainage system.

C. Detection of Hydraulic Oil in Dam Gates

Darn gates are operated by hydraulic pressure. Strict environmental regulations forbid any discharge of leaking hydraulic oil into the river. An ID-223 oil sheen detector can be used in dry or wet sumps built by the hydraulic pumps at the dam gates.