



Ionics Agar Environmental Ltd.

LEAKWISE® OIL ON WATER MONITORING SYSTEMS

APPLICATION NOTE #6

POWER DISTRIBUTION

1. Transformer Substation

Utilities have hundreds of transformer substations. In each substation there are usually several transformers. Each transformer contains a high volume of insulation oil. A catch basin is built under the transformer in order to contain small leaks or all of the transformer oil, in case of a major breakdown. Most substations are unmanned, and continuous remote monitoring of oil leaks is essential for meeting safety and environmental requirements.

Transformer oil leak detection

Usually small oil leaks or spills drain into the catch basin. This oil can be carried away with the rain into the public stormdrain system, when the catch basin is over-filled with water. In order to prevent this, water is collected from the catch basin of the transformers into the central sump of the substation. From there it is discharged by gravity, or by a pump into the public stormdrain system. An ID-223 oil sheen detector is installed in the sump (if there is no sump, it can sometimes be installed directly in the catch basin). When an oil sheen is detected on the water, an alarm in the remote control center is set off, and the sump's water pump or discharge valve will be shut off.

Reduction of oil removal and water treatment costs

Following the oil alarm, the maintenance personnel will come to remove the oil. Alternatively, they may choose to pump the "oily water" into an oil retention tank. In this retention tank an ID-225 oil thickness monitor can be installed to monitor the thickness of oil layer. After a short retention time, water can be drained from the bottom of the tank and additional oily water can be added to it until the oil layer is thick enough to be removed (for example by a vacuum skimming truck). This process can prevent the removal of "oily water" before enough oil has accumulated in the tank.



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2. Underground Power Distribution.

In large cities, high voltage power cables are run underground. These cables are insulated with large quantities of oil, which is constantly pumped along the cable through underground pumps. Transformers are installed in building cellars and in underground vaults. The access to these cables and supporting equipment is through manholes. The underground cable service manholes can fill up with water and utility maintenance teams have to pump the water out into the drainage system. If oil is detected, the water has to be removed for treatment. Oil detection can be done either in a fixed installation of ID-221 or ID-223 detectors or by manually using a transportable ID-223 Oil Sheen Detector which can be operated by 12 VDC from the service trucks.