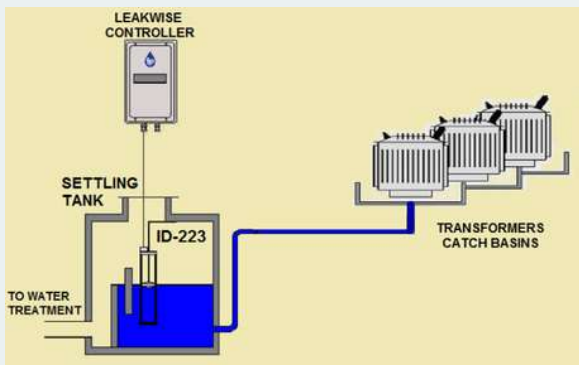


# TRANSFORMER SUBSTATIONS DATA CENTERS

Data centers are among the most power-intensive facilities being built today. That power arrives through a dedicated on-site substation containing several oil-filled transformers, each holding thousands of gallons of insulating and cooling fluid. A catch basin is built under each transformer to contain small leaks, or the entire fluid volume in the event of a significant breakdown. Data center substations are normally unmanned, and continuous remote monitoring of oil leaks is essential for meeting operational, safety and environmental requirements.



## Transformer Oil Leak Detection

Small oil leaks or spills drain into the catch basin. This oil can be carried away with the rain into the public storm drain system when the catch basins are overfilled with water. To prevent this, water is collected from the catch basins into a central sump of the substation. From there it is discharged by gravity or by a pump into the public storm drain system or to a nearby river.

A Leakwise Oil Sheen Detector is installed in the sump, or even directly inside the catch basin. When an oil sheen is detected on the water, or at the bottom of the sump if it is dry, an alarm is set off.

## Early Warning, Before Overheating

Cooling depends on fluid circulating to the external radiators. Most external leaks begin as seepage from a gasket, flange, valve stem or weld, at drops per hour. Winding and top-oil temperature sensors respond only once enough fluid has been lost to degrade heat transfer.

Leakwise detects the fluid that has left the tank at the earliest observable point: a layer as thin as 0.3 mm on the water surface in the containment, with alarm response meeting the 30-second requirement of FM Class 7745.



## Multi-Storey and Vertical Data Centers

In land-constrained markets, transformers are distributed across several floors instead of a single ground-level yard. A leak on an upper floor can travel through floor drains, enter the cooling infrastructure or reach a watercourse, so a sensor is installed on every floor carrying oil-filled plant.

At an 11-storey hyperscale data center, Leakwise ID-223 sensors were selected over conductive leak-detection cable: the building's liquid cooling system and climate meant a liquid-presence detector could not distinguish cooling water or condensate from transformer fluid. The signal was integrated to the site management platform and used to trigger drainage isolation.



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## Fuel Storage and Site Separators

Standby generation adds diesel bulk storage, day tanks, transfer and unloading areas to the site. Leakwise sensors detect diesel as readily as insulating fluid, so one monitoring network covers the substation containments, the fuel bunds and the site oil/water separator.

Monitoring the separator confirms its performance and gives assurance that no hydrocarbon is carrying over to the final discharge point. Where lateral flow exceeds about 30 cm/sec, the sensor is fitted in a stilling well, as shown.

## All Transformer Fluids Detected



Three families of transformer fluid are in service: mineral oil, mostly naphthenic, which remains the most common; silicone; and bio-based or ester fluids.

Leakwise sensors detect all three.

## Proven In Transformer Substations

Schneider Electric, Singapore data center · Con Edison, New York · Potomac Electric (PEPCO) · Northland Power, Ontario · Pacific Power, Australia · Electro Corp., New Zealand · FrieslandCampina, Netherlands · University of California · Dofasco, Canada

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