

Major Southeastern Utility Switches to Pall Water Sensors to Measure Moisture in Transformer Oil

Overview

Transformer oils are used to insulate oil-filled transformers and some types of high-voltage electrical equipment. Since these oils play a critical role in helping to cool and maintain the insulation properties of the transformer, the oils must remain stable at high temperatures and should have extremely low water content.

A major utility in Southeastern U.S. had been measuring the moisture in their transformer oil by using the Karl Fischer (KF) process for many years. They measured approximately 1500 samples per year.

Harmful Effects of Water in Oil

Transformer oil should be tested regularly for water content as a preventative measure to avoid major damage to the transformer and its internal parts.

Water contamination in fluids can cause numerous problems such as additive depletion, oil oxidation, corrosion, reduced lubricating film thickness, microbial growth, and reduction of dielectric strength. These costly problems can be averted with continuous monitoring of oil water content so that timely action can be implemented. Lubricating and insulating fluids should be operated without the presence of free water and with dissolved water levels at 50% saturation or considerably lower in the case of insulating oils (20%).

Problems with Using Karl Fischer Method

A major problem that the utility faced with the KF process was the lack of consistency in the moisture content readings. In addition, the oil samples used in the KF process were considered hazardous waste and the utility had to discard them in an eco-friendly way in order to comply with regulations.



To solve these problems, they looked into alternative ways of monitoring moisture content in their transformer oil.

Advantages of Pall Water Sensors

The utility tested the Pall WS Series water sensors and were very pleased with the results. Eventually, they stopped using the Karl Fischer process entirely and now use Pall water sensors exclusively.

In addition to the consistent moisture readings provided by the Pall water sensors, the utility preferred Pall sensors since they don't produce any hazardous waste. This helped the utility in their 'going green' efforts.

Other benefits of the Pall WS Series sensors mentioned by the utility include:

- Easy to operate
- Easy to maintain
- Provide instant reading
- Better utilization of lab personnel time

“Pall water sensors have worked extremely well for us. They offer accurate and consistent moisture readings, along with easy maintenance. Pall sensors have also helped us in our environmental efforts by eliminating the hazardous oil that we had to dispose of when we were using the Karl Fischer method.”

Senior Lab Services Manager,
Major Southeastern Utility



Pall WS10 Water Sensor

About Pall WS10 Series Water Sensors

The Pall WS10 Series water sensor is a reliable, low-cost, in-line monitoring solution for measuring dissolved water content in hydraulic, lubricating and insulating fluids. Specifically designed for use in harsh and often remote industrial environments, WS10 water sensors transmit data continuously to the user's control systems as a key component in the predictive maintenance of plant and machinery.

Features

- A sensing probe directly immersed in the fluid to monitor dissolved water content and temperature
- Water content output in % saturation
- Temperature in °C or °F
- High pressure option up to 100 bar (1450 psi)
- Simple and flexible installation, easy to operate
- Robust all in-one modular housing and sensing probe design

Applications

Pall WS10 water sensors can be used in a variety of applications including:

- Primary Metals
 - ◆ Rod mill high speed lube systems
 - ◆ Cold mill tandem mill
 - ◆ Tilt furnace HPU's
- Power Generation
 - ◆ Gear box lube oil
 - ◆ Turbine lube oil
 - ◆ Transformer oil
 - ◆ Hydraulic oil
- Pulp and Paper
 - ◆ Dryer section lube systems
 - ◆ Wet end lube systems
 - ◆ Press section hydraulic/lube systems
 - ◆ Powerhouse - steam turbine lube systems
- Industrial in-plant
- Automotive
- Offshore / petrochemicals

About Pall Corporation

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